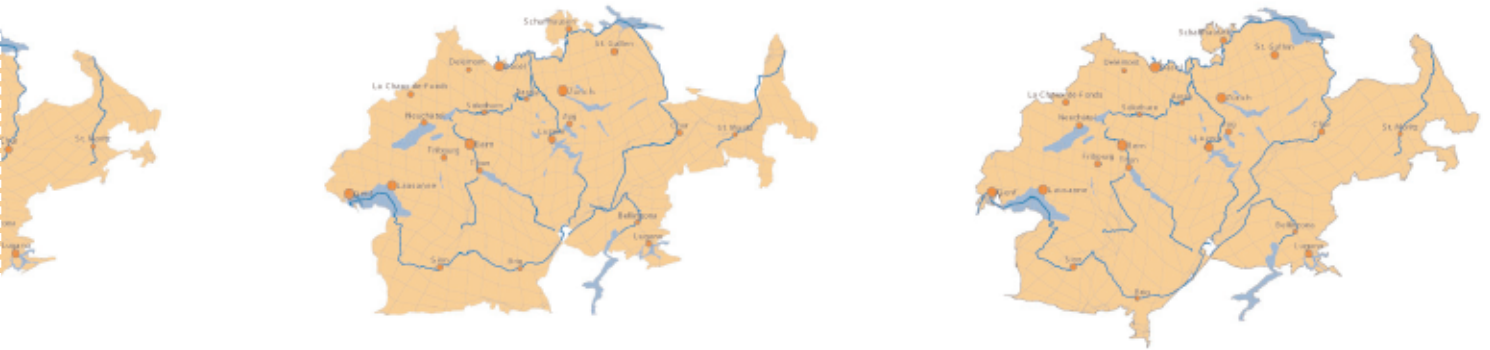


Institute for Transport Planning and Systems

Self-evaluation report

1999 – 2003 with Publications



1990

2000



K.W. Axhausen / U. Weidmann / H.-P. Lindenmann / P. Spacek

October 2004



1960

1970

1980



***Self-evaluation report
1999 – 2003***

Self-evaluation report**Institute for Transport Planning and Systems 1999 – 2003**

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Summary

This comprehensive report summarizes the work of the Institute for Transport Planning and Systems (Institut für Verkehrsplanung und Transportsysteme: IVT) from 1999 to 2004 against the background of changes in the department and inside the Institute: teaching, research, funding, publications, professional activities, and a SWOT analysis leading to a discussion of future strategy. Its analysis and detail expand on the chapters included in the official departmental evaluation report.

The institute has a thirty-year history. During this time, all transport research and teaching within the department was drawn together under its auspices. From a maximum of five chairs in the mid-1980's the staff complement has fallen to currently two without any substantial reduction in the scope of our teaching. The third post required for a proper balance and coverage of teaching and research is currently under threat, which is particularly unfortunate as the EPFL is slow in realising its promise to replace and expand the transport staff compliment in Lausanne. For the time being the responsibilities of the third chair are shared by its two senior researchers, to whom the president of ETH has delegated this task.

Since the last review, the president of the ETH has transferred the tasks of the earlier ORL Institute to the Netzwerk Stadt und Landschaft (NSL) (Network City and Landscape), which now involves the IVT as a full member. While the organisational form is looser, the teaching responsibility is wider and includes the development of joint D-ARCH/D-BAUG MSc courses in urban design, spatial and infrastructure planning. In response to the last review, the Institute has ended its involvement in the routine testing of weighing-in-motion systems, guard rails and road surfaces and focuses its work on academically motivated experiments and measurement campaigns.

The organisational structure of the IVT has remained the same, while two of the three professors were replaced during the last years. Its three groups are:

- Transport Systems: Road Transport (H.-P. Lindenmann and P. Spacek; 2002)
- Transport Systems: Public Transport (Prof. U. Weidmann; 2004)
- Transport Planning (Prof. K.W. Axhausen; 1999)

The mission of the IVT is:

- Generation of new knowledge for the planning, design, operation, and maintenance of transport systems
- Transfer of this knowledge through teaching, further education, and applied research

which it realises (1999-2003 averages) with about 40 full-time members of staff, who teach 20 hour/week and term, supported by a budget of 5.7 mio SFr, of which 40% (2.2 mio) are outside funds.

During the review period, the Department has implemented two new degree programmes, in particular from 2003 the new bachelor courses. As part of the introduction of the MSc stage and within the NSL framework, the IVT will start to offer jointly with the IRL an MSc in Spatial Development and Infrastructure Systems. This two year course will revolve around a core (about $\frac{1}{3}$ of the course load), which will also be compulsory for the students of the Architecture department's course on urban and landscape design. In addition, the IVT will offer modules for courses organised in mathematics and environmental sciences. The teaching load of the IVT will therefore remain at the current high levels, to which the successful short courses have to be added. The Master course, as currently planned, can be taught with the available teaching resources, but without a third professor, problems could develop over the medium term.

The number of PhD students has been increased substantially during the review period. Eleven degrees were awarded to students supervised by IVT professors. There are currently 15 students registered with the professors of the institute, but Prof. Weidmann has only just started to recruit students.

The funding base of the institute's research is well diversified, including the relevant Swiss sources, but also European Union, German and recently UK government funding. The Institute's members are in turn very active in professional organisations, especially the Swiss norming body VSS, but also internationally. The publication strategy was traditionally focussed on guidelines and lecture notes, but has recently stressed successfully refereed and professional journal publication.

The focus of the road transport group is on geometric design of highways, traffic management, asset management and road safety. Its unique system of tracking vehicles unobserved has resulted in new insights into driver behaviour in curves and on gradients. The work on safety audits and on the national road safety strategy is currently being implemented. The railway operations, its simulation and freight logistics were stressed by Prof Weidmann's predecessor at the public transport group, while he wants to turn his attention to systems engineering questions in the railway industry. Its OpenTrack railway operations simulation tool has become a market leader in its field, which is reinforced by the OpenTimetable tool for the analysis of railway performance. The transport planning group concentrates on the measurement and modelling of travel behaviour. Within this frame the work addresses the conduct of long duration surveys, the modelling of the rhythms of daily behaviour and of longer term choices, the construction of large scale network models for the analysis of accessibility change in the short and long run. Its results provide insight into the valuation of the travel experiences, which is translated into relevant professional guidance. The collection of long duration surveys built up at the institute is the largest worldwide. (The report provides relevant project summaries for each group, as well as complete project lists).

The policy environment outside ETH is both promising and difficult for transport research. It is promising because policymakers and system operators need advice, guidance, and tools for a number of pressing issues. It is difficult, because research budgets of federal agencies have not only stopped growing, but are being cut as emphasis shifts to applied and development work. The larger academic environment is favourable for transport-related research. It is a domain that interacts with many other research areas concerned with the understanding, modelling, and forecasting of everyday life and the provision of

necessary infrastructure services, and it flourishes through exchanges across disciplinary borders. Its engineering core is enriched by these processes, and it is able to address more and technically broader issues than ever before.

The Institute and its groups are well integrated into the Swiss administrative, professional, and research environment, as can be seen from the involvement in professional associations, high level advice or the funding obtained. These involvements are appropriately balanced with international ones. The groups of the IVT have been able to pursue certain topics over many years, such as driver behaviour, daily and longer term spatial behaviour and its modelling, and simulation of public transport time tables and networks. The IVT's national and international reputation has grown accordingly.

During the review period the IVT has increased the number of PhD students, reviewed publications, and involvement in international conferences and seminars. As an engineering institute in a non-English speaking country, it has the additional responsibility and commitment to publish its results in German, thus making them available to practitioners and the public who do not read academic or English language journals.

The IVT's priorities reflect our mission and our wish to develop the Institute as a strong research and teaching institution serving Switzerland and the wider professional community.

The implementation of the joint Master course Spatial Development and Infrastructure Systems from winter term 2006/07 is our first teaching priority. The short course and seminar activity will be maintained at current levels to ensure the on-going transfer of our work into practise.

The broad funding base of the Institute should allow us to maintain our research activities at current levels. The first priority is to increase the share of academic funding bodies, such as SNF or ETH, to support more fundamental and blue skies work required to advance the state-of-the-art of field research.

While there is no need at the moment to re-organise the IVT fundamentally, the Institute needs to find ways of integrating post-docs into its structure and to open up possibilities for long-term employment for some of the younger senior staff. The Institute also needs to find better ways of integrating into the NSL to take advantage of this challenging, but potentially very productive collaboration with the Architecture Department. Finally, the Institute will do its best to secure the appointment of the third professor, so that the successful balance of work in transport planning, as well as road and public transport system engineering can be maintained and developed.

Keywords

Evaluation, D-BAUG, IVT, ETH Zürich

Preferred citation style

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1 Structure and context

1.1 Background

The Institute for Transport Planning and Systems (Institut für Verkehrsplanung und Transportsysteme: IVT) has a thirty-year history. During this time, all transport research and teaching within the department was drawn together under the auspices of one institution. The initial impetus came from Prof. Martin Rotach in 1975, while the section ‘Highway and Railway Engineering’ was added after the election of Prof. Grob as Rektor of the ETH in 1985 and the dissolution of his Institute for Highway and Railway Engineering. At this point, there were five chairs. This number has steadily declined since, as neither Prof. Grob’s nor Prof. Rotach’s chairs (early 1990’s) were filled again. During the last decade, the work of the IVT was shared between three chairs. While Prof. Hidber’s and Prof. Brändli’s posts were filled relatively quickly (Axhausen, 1999; Weidmann, 2004), the chair in Transport Systems – Road Traffic (Prof. Dietrich) remains unfilled and subject to discussion. The resulting organisational form is discussed below.

Further discussion about the third professorial post is handicapped by similar uncertainties at EPFL. The departments D-BAUG and ENAC agreed to co-ordinate their appointment policy (see Departmental report) in late 2002. Part of this agreement was an understanding that ENAC would quickly expand their transport staff, while D-BAUG would maintain a professorial staff complement of three posts. Unfortunately, ENAC has so far not carried out their part of this agreement. It still has not advertised the post of the recently retired Prof. Bovy and has not outlined an official plan to add posts. Our difficulties in getting permission to advertise the third post are comparable. Recent discussions in the Department even suggest the removal of the post.

Until 2002, research on highway materials and construction was administered by the IVT, but directed by Dr. Caprez of the Institute for Geotechnics (IGT). This confusing arrangement was clarified by allocating responsibility for this research to the IGT, while research on the driver/surface interaction remains with the IVT. As part of this reorganisation, the *Rundlauf* testing facility for the continuous cyclical loading of road surfaces (located at the EMPA) was handed over to the IGT.

Responding to the last review, the IVT has reorganised two strands of its laboratory work since 1999. The weighing-in-motion calibration tests came to an end in 2003. The guard-rail impact tests have been transferred to TSR Engineering, Zürich, a spin-off firm founded by a former IVT employee.

While the IVT has undergone substantial internal change since the last review, it has also been repositioned within the Department and ETH overall due to the disbanding of the ORL (Institut für Orts-, Regional- und Landesplanung; Institute for Spatial Planning) in October, 2002. The ORL was an interfaculty institute sponsored by Architecture (D-ARCH) and Civil, Environmental and Geomatics Engineering (D-BAUG), with the goal of advancing research and teaching at the interface between urban design, landscape architecture, and planning. This mission was transferred to the Netzwerk Stadt und Landschaft (NSL) (Network City and Landscape), which now involves the IVT as a full member. While the organisational form is looser, the teaching responsibility is wider and includes the development of a joint D-ARCH/D-BAUG MSc course in urban design and spatial planning (See below). A first set of research projects is currently under way and more are planned in the context of the NFP 54 “Sustainable development of the built environment”.

1.2 Organisation

The IVT is organised into three groups. While each group has its own profile and mission, they all contribute to the goals and the mission of the Institute. The groups are:

- Transport Systems: Road Transport (H.-P. Lindenmann and P. Spacek)
- Transport Systems: Public Transport (Prof. U. Weidmann)
- Transport Planning (Prof. K.W. Axhausen)

These groups are led by a full professor (chair), with the exception of the group Transport System: Road Transport. Due to the vacant chair, and the discussion about its re-advertisement, the group is chaired by its senior scientists: Mr. P. Spacek and Mr. H.-P. Lindenmann. IVT's 2002 agreement with the president of ETH gives them the same rights and responsibilities as a professor in matters of teaching, research and personnel.

The director of the Institute (Institutsvorsteher) is responsible for co-ordination of joint activities, particularly IVT teaching, common support staff, and supervision of the joint budget. He also represents the Institute in relevant departmental committees. Regular internal events consist of a research seminar in October and a staff meeting each semester. The research seminar is open to members of the NSL and invited senior colleagues from EPFL.

The common staff consists of a 50% senior co-ordinator, Dipl.-Ing. Mrs. Z. Oblozinska and three administrators sharing 190% FTE. The technicians of the Institute are part of the group Transport Systems: Road Transport.

1.3 Mission

The mission of the IVT is:

- Generation of new knowledge for the planning, design, operation, and maintenance of transport systems
- Transfer of this knowledge through teaching, further education, and applied research

which is translated by each group into specific goals:

Transport systems: Road transport

- Research, teaching, and advice on design, construction, operations, and maintenance of road infrastructures with focus on traffic operations and traffic safety. Special attention is given to urban networks and the interfaces between the motorways/freeways and the remaining trunk road system in agglomerations.

Transport systems: Public transport:

- Generation of new knowledge for an economical public transport system and network through the advancement of methods and models for operation, infrastructure management, and design.
- Transfer of this knowledge through teaching, further education, and applied research focussed on freight and passenger transport systems and processes.

Transport planning:

- Generation of new knowledge about the structures of spatial and, in particular, travel behaviour through the advancement of methods for its observation, measurement, description, and modelling on a micro and macro scale
- Transfer of this knowledge through teaching, further education, and applied research, particularly through work on large scale networks and demand models, and on the parameters of cost-benefit analysis.

1.4 Funding and resources

The following tables provide an overview of the resources available to the Institute: persons (Table 1), full time equivalents (Table 2), funds (Table 3) and office space (Table 4).

Table 1 IVT: Persons employed (as of November of each year)

	1999	2000	2001	2002	2003	2004
Professors (Plan)	3	3	3	2	2	2
Assistant professors (Plan)	-	-	-	-	-	-
Professors	3	3	2	2	1	2
Assistant professors	-	-	-	-	-	-
Senior scientists	6	6	6	5	5	5
PhD students	8	10	11	14	14	15
Teaching/research assistants	17	19	19	18	16	16
Technical staff	4	4	4	3	3	3
Senior administrative staff	1	1	1	1	1	1
Administrative staff	4	4	4	4	4	3
Total	43	47	46	47	44	45

Table 2 IVT: FTE (as of November of each year)

	1999	2000	2001	2002	2003	2004
Professors (Plan)	3.00	3.00	3.00	2.00	2.00	2.00
Assistant professors (Plan)	-	-	-	-	-	-
Professors	3.00	3.00	2.00	2.00	1.00	2.00
Assistant professors	-	-	-	-	-	-
Senior scientists	5.00	5.00	6.00	5.00	5.75	5.50
PhD students	7.75	10.00	11.00	13.40	12.90	13.20
Teaching/research assistants	13.50	15.00	14.45	13.00	13.60	14.10
Technical staff	4.00	4.00	4.00	3.00	3.00	3.00
Senior administrative staff	1.00	1.00	1.00	0.50	0.50	0.50
Administrative staff	1.80	1.80	1.80	1.80	1.80	1.80
Total	36.05	39.80	40.25	38.70	38.55	40.10

Table 3 IVT: Annual budgets (in current kSFr)

	1999	2000	2001	2002	2003	2004
ETH funded salaries	3123	3063	3578	3728	3092	
Operating Costs	176	177	157	159	161	
IT-support	76	77	77	76	81	
Outside funding	1472	2159	2304	2466	2441	
Road transport	554	913	1256	541	362	
Public transport	461	522	512	611	550	
Transport planning	457	724	536	1314	1529	
Total	4847	5476	6116	6429	5775	

Table 4 IVT: Floor space (m²)

	1999	2000	2001	2002	2003	2004
Offices	624	624	624	605	605	605
Laboratories	320	320	320	139	139	139
Support	609	609	609	571	571	571
Teaching	197	197	197	197	197	197
Total	1750	1750	1750	1512	1512	1512

2 Teaching

2.1 Current degree and future plans

The current degree programme (Studienplan 1999) is structured around specialisations of 16 SWS (weekly hours of lecturing per term) across four semesters. The IVT offers one specialisation and an additional 16 SWS of electives. In addition, the IVT contributes to post-graduate courses in spatial planning and landscape architecture and the Diploma-programme in environmental sciences (Table 5).

Table 5 IVT: Lecturing load [h/week and term] (including non-D-BAUG programmes)

	1999	2000	2001	2002	2003	2004
Transport system: Road transport	6.00	5.50	7.30	3.90	5.60	6.60
Transport system: Public transport	3.50	2.50	4.80	5.20	5.50	6.40
Transport planning	6.00	6.00	5.40	9.40	8.40	7.90
Sum per term	15.50	14.00	17.50	18.50	19.50	20.90

Continuing their tradition, the Transport Systems groups produce detailed class notes, which serve as textbooks, both internally and externally (See the literature lists for details). The specialisation attracts around seven students each year, who usually combine it with a specialisation in structural engineering or construction management. Unfortunately, the students in the other two departmental degree programmes cannot choose transport as a specialisation, even if they wished.

The change to the BSc/MSc system has begun for the IVT, along with the rest of the department. We offered one of the topics in second semester group projects, and found that it was well received. The two required courses are now scheduled in the 4th and 5th term, but they will be presented with a slightly increased number of lecture hours. The department, the IRL, and IVT all wish to offer an MSc programme in spatial development and infrastructure systems. The internal planning for this programme is well advanced, but the co-ordination with the D-ARCH within the framework of the NSL is delaying progress at this point.

2.2 Thesis work

The IVT attracts a fair number of students for the semester (7 weeks full time work) and diploma thesis work (13 weeks full time work) (Table 6 and Table 7). The theses can be either research-oriented or problem solving. In recent semesters, the Transport Planning group supervised a minor in the Urban Design diploma thesis of the architectural degree course. These 21 students were counted as MSc thesis students, as the supervision effort was similar to that of a D-BAUG student.

Table 6 IVT: Number of theses supervised by members of the Institute by type

	1999	2000	2001	2002	2003	2004	Total
PhD dissertations	1	1	1	2		6	11
Members of the Institute	-	-	1	1	-	6	8
External students	1	1	-	1	-	-	3
PhD examiner at other universities	-	1	3	1	1	3	9
MSc theses	9	3	11	18	24	14	79
D-BAUG students	9	3	7	10	5	6	40
Other ETH students	-	-	2	4	18	6	30
Students of other universities	-	-	2	4	1	2	9
Semester projects	13	18	20	9	5	30	95
D-BAUG students	13	18	18	9	3	20	81
Other ETH students	-	-	2	-	1	3	6
Students of other universities	-	-	-	-	1	7	8

Table 7 IVT: Number of theses supervised by members of the Institute by group

	1999	2000	2001	2002	2003	2004	Total
Transport system: Road transport							
PhD	-	-	-	-	-	-	-
Diploma thesis students	-	-	-	-	-	1	1
Semester thesis students	3	8	6	1	-	20	38
Transport system: Public transport							
PhD	1	-	1	1	-	3	6
Diploma thesis students	9	3	5	8	6	1	32
Semester thesis students	8	8	11	7	3	3	40
Transport planning							
PhD	-	1	-	1	-	3	5
Diploma thesis students	-	-	6	10	18	12	46
Semester thesis students	2	2	3	1	2	7	17

2.3 Doctoral students

The previous generation of professors (Rotach, Grob, Brändli, Dietrich and Hidber in the case of the IVT) did not emphasise a PhD education for their staff members. A total of about twenty PhDs were granted between 1975 and 1998 to IVT staff members. This attitude is changing noticeably in the institute, the department, and ETH engineering departments, as evidenced by the numbers in Table 6 (Table 9 lists the topics for the degrees awarded since 1999). Prof. Axhausen and Prof. Weidmann are committed to an active group of PhD students at the IVT, as seen in Table 8.

Table 8 IVT: Doctoral theses begun

Name		Title/Area	Referees	Period
Michael	Balmer	Real time activity rescheduling in a parallel model of traffic flow	Nagel, TU Berlin Axhausen	2004-
Sigrun	Beige	The dynamics of life style choices over the life cycle	Axhausen Wegener, Universität Dortmund Maggi, USI, Lugano	2003-
Michael	Bernard	A uniform approach to the definition of the design load for transport facilities	Axhausen Brilon, Ruhruniversität Bochum	2003-
Michaela	Bürgle	Agent-based simulation of the land-use system	Axhausen	2004-
Saikumar	Chalasanani	Data fusion for travel demand data	Axhausen	2003-
Martin	Frick	A dynamic simulation of daily travel demand	Axhausen	2003-
Philipp	Fröhlich	Growth of the specific travel demand: Switzerland 1950-2000	Axhausen Bell, Imperial College, London	2001-
Jeremy	Hackney	Choice of connection/route in an agent-based simulation of travel demand	Axhausen	2003-
Michael	Löchl	Land use and accessibility change	Axhausen	2004-
Stefan	Schönfelder	Urban rhythms	Axhausen Bhat, University of Texas, Austin	1999-
Martin	Tschopp	Accessibility change and economic growth	Axhausen Elsasser, Universität Zürich	2002-
Urs	Waldner	Environmental assessment of land use change	Schmid, IRL Axhausen	2004-
Siegfried	Weinmann	Impact of mental maps on route choice	Axhausen Nagel, TU Berlin	2000-

Table 9 IVT: Doctoral theses completed since 1999

Name		Title	Referees	Period
Franz J.	Gallati	Stability problems of continuous metre-gauge track in curves with small radii	Brändli Borer FH Chur	1997-1999
Daniel	Hürlimann	Object oriented modelling of railway infrastructure and operations	Brändli, Anderheggen, ETH Zürich	1995-2001
Jörg	Jermann	GIS-based analysis of the catchment area of stations	Brändli Giger, D-BAUG Axhausen	2000-2004
Michael	Kohler	Track modulus of ballast track	Brändli Leykauf, TU München	1993-2002
Helmut	Köll	Flashing green in signal control: Impact on traffic safety and capacity	Axhausen Sammer, Universität für Bodenkultur, Wien	1998-2002
Arnd	König	Measurement and modelling of transport supply reliability	Axhausen Zumkeller, Universität Karlsruhe	2000-2004
Ulrich	Schäffeler	Network design principles for public transport networks	Brändli Bovy, TU Delft	2000-2004
Robert	Schlich	Measurement of the similarity of travel behaviour	Axhausen Timmermans, TU Eindhoven	2000-2004
Anja	Simma	Travel behaviour as a function of socio-demographic and spatial factor	Axhausen Sammer, Universität für Bodenkultur, Wien	1996-2000
Markus	Ullius	Use of time-table performance data for the improvement and risk analysis of rail way operations – Open Timetable	Brändli, Widmayer, ETH Zürich Zehnder, ETH Zürich	2000-2004
Milenko	Vrtic	Simultaneous route and mode choice model	Axhausen Lohse, TU Dresden	2000-2004

2.4 Short courses, seminars and conferences

2.4.1 Post graduate studies

The IVT does not offer courses of its own, but contributes to various courses offered by others within ETH (NDS Spatial Planning (*Raumplanung*) and NDS Landscape Architecture (*Landschaftsarchitektur*))

2.4.2 Post graduate courses

Group Transport Planning organizes an annual one-week seminar for doctoral students with Imperial College, London, Universität Karlsruhe, the Technical Universities of Berlin and München, and the Universität für Bodenkultur, Vienna.

2.4.3 Short courses

The Transport Systems – Public Transport group has offered attractive and well-attended three and four day short courses for public transport practitioners (20-30 attendees) alone and in cooperation with the Swiss Federal Railroads since 1995. It plans to continue these courses.

The Transport Planning group offered a successful 5 day short course on transport planning methods to 20 engineers from Switzerland and Germany in 2003 and 2004. It is planning to supplement this base course with specialized offers in alternate years.

2.4.4 Conferences, symposia and workshops

The IVT offers a regular series of half-day (June and December) and full-day seminars (January), which attract between 40 and 125 attendees from Switzerland and Germany, involving both outside speakers and contributions from IVT members. Additional well-publicised ad-hoc seminars are offered by visitors to the Institute.

Together with the former coordinator of the NFP 41, the IVT initiated a series of national research conferences: the annual English-language *Swiss Transport Research Conference* (www.strc.ch), was held for the 4th time this spring. It brings together about 70-80 researchers and doctoral students from all Swiss institutions involved in transport research for a three day exchange based on written papers. The conference is co-funded by the relevant national administrations. It is now jointly organized by IVT, ENAC (EPF Lausanne), USI, Lugano, and the Universität St. Gallen.

Prof. Axhausen organized the 10th International Conference on Travel Behaviour Research in Lucerne during August 2004. It is the most important international conference in this field and was attended by 170 researchers from around the world. The next conference in this triennial series is planned for Kyoto in 2006.

3 Research

This section sets out the research context in which the Institute operates, as well as the research undertaken by each of the groups. Here we provide a discussion of main research areas, a list of projects undertaken in the last five years, and abstracts of four typical research projects to provide a better picture of the styles and strengths of each group.

The distribution of the Institute's publications by type and group represents the diversity of its work. (see Table 10). Not mentioned here are the many Swiss norms that are directly based on our work or, in a different type of service, the datasets published in the Institute electronic data archive. As always, written results cannot fully measure the impact of an academic institution. This is particularly true in a country like Switzerland, where the IVT functions partly as a substitute for a government operated research lab, like the BAST in Germany, Volpe Institute in the USA, or INRETS in France.

Table 10 IVT: Research output by type of publication (1999-2003)

Type of publication	Group			Total
	Road transport	Public transport	Transport planning	
Refereed journal papers	-	-	16	16
Refereed papers in books and proceedings	1	-	19	20
Professional magazines	10	11	12	33
Published books and reports	13	5	11	26
Invited contributions	1	8	31	40
Unpublished reports	31	12	20	62
Working and conference papers	1	3	46	49
Other contributions	1	4	-	5
Total	58	43	155	251

3.1 Context and research sponsors

The IVT draws on a wide range of sponsors and programmes to fund its research (Table 11). ETH provides the foundation through its regular funding of teaching/research assistants, including some funding for students on an hourly basis. This funding covers the requirements of teaching, administration, and technical support and provides a base for research. This is especially important, as the ETH research fund and the SNF only provide for 60% posts for doctoral students. Our experience has shown us that this amount needs to be supplemented by 20% to 40% to recruit and retain high quality staff in a tight labour market for transport planners and engineers.

The internal ETH research fund, as well as the SNF seem to maintain informal limits on the total amount of funding available for any one group in any one period. They also cap awards by limiting the award period and total funding. While follow-on funding is possible, it increases the administrative overhead of a project. The IVT was largely absent from the last major national transport research programme (NFP 41), but initiatives like these provide good opportunities, as evidenced by the NFP 48 project awarded. The

Institute hopes to be strongly involved in the current NFP 54 “Sustainable Development for Built-up Areas”, which is in the application phase. The Institute has participated in other research programmes, such as those operated by the EU, the German Ministry of Research and Technology, and the UK Department of Transport.

However, the central outside funding source for the Transport Systems: Road Transport and Transport Planning groups is the SBT (Strassen, Brücken, Tunnel – roads, bridges, tunnels) Research Fund operated by the Federal Highways Agency (ASTRA), which draws on a share of the gasoline tax to support road transport research. While some projects are organised directly by the ASTRA, the bulk of the funding is structured, prepared, tendered, and administered by the volunteer organizations VSS and SVI. The VSS sponsored research is dedicated to developing new (or improving existing) guidelines (Swiss Norms), while the SVI research is more oriented toward basic research. However, this makes the label *Programme Research* for the SBT funded work problematic.

Given the mission of the IVT, we do not engage in straightforward consulting (state-of-practise), but focus instead on work that addresses state-of-the-art or state-of-the-technology issues. The small number of university level transport research groups and the relatively generous funding available has drawn a number of very well qualified consultancies into the research market; these are the IVT’s main competition for SBT grants and government projects.

The group Transport Systems: Public Transport has a different profile, as the SBT funding is normally not relevant to its work. Next to the obvious projects for public transport undertakings, it has developed a series of successful grants in the last two EU Framework Programmes.

Table 11 Funding sources

Abbreviation	Name	Location	Type
AGS	Alliance for Global Sustainability	Zürich	Programme Research
ARE	Federal Office of Spatial Development	Berne	Government
ASTRA	Federal Highways Agency	Ittigen	Government
BAK	BAK	Basel	Industry
BAV	Federal Public Transport Office	Berne	Government
BBW	Federal Office of Education and science	Berne	Government
BMFT	Programme „Understanding Mobility better“; German Ministry of Research and Development	Bonn	Programme Research
BUWAL	Federal Office of Environment, Forest and Landscape	Berne	Government
DfT	Department for Transport	London	Programme Research
ETH	ETH Research Fund	Zürich	Research Council
EU	EU 5th Framework Programme	Brussels	Programme Research
FVS	Swiss Road Safety Fund	Berne	Government / Insurers
glow	glow – Das Glattal	Opfikon	Government
Kt Zürich	Kanton Zürich	Zürich	Government
NCHRP	National Cooperative Highway Research Programme	Washington	Programme Research
NFP 48	National Research Programme 48	Berne	Programme Research
SBB	Swiss Federal Railroads	Berne	Industry
SBT	Research Fund Road, Bridges, Tunnels	Berne	Programme Research
SNF	Swiss National Fund	Berne	Research Council
TA-Swiss	Swiss Technology Assessment Centre	Berne	Government

3.2 Transport Systems: Road Transport

3.2.1 Areas of work

The research of the Group covers highway geometric design, traffic management and engineering, maintenance, and asset management. All three research areas are strongly related to road safety, which represents the fourth research area of the group (See also Table 13 for a list of the relevant projects and Table 12 for the external funding involved).

In the field of **geometric highway design** the main focus is improving the dynamic driving models underlying Swiss design standards. During the past seven years, several investigations were carried out to collect and analyze driving behaviour, particularly in curves, on up- and downgrades, and in different types of intersections. This research also served to quantify the effects of several road traffic law changes on driving behaviour.

This year, for the first time, a study will begin quantifying speed-dependent elements of standard cross section profiles, such as clearances of vehicles in motion and transverse clearances between various road users with and without opposing traffic - depending on passing speed, lane width and shape, and clearance of lateral obstacles, taking vehicles' dimensions into account..

One of the group's specialties is basic research on driver behaviour in curves, e.g. paths or tracks of vehicles along curves on two-lane highways in rural areas and their relationship with accident occurrence. For this purpose, we have developed a special measuring system, consisting of twelve autonomous measuring posts, which are built into regular delineator poles. The delineator poles serve both as housings for instruments and as camouflage. The measuring system enables the detection of pass-through times and vehicle speeds, direction of the passing vehicles, and vehicle lengths as well as lateral distance between vehicles and measuring poles. Dedicated software was developed for the necessary analyses., allowing for reconstruction of the speed and track sequence of individual vehicles, and a graphic illustration of the sequence against the background of the actual curve situation.

In the field of **traffic management**, a strategy was developed for traffic control systems on freeways in agglomeration areas where the road infrastructure cannot be expanded. The strategy rests on two pillars; an operational widening of local bottlenecks (conversion of the service lane), and integrated ramp metering. For the latter, appropriate adjustments to the control algorithms had to be developed. Applications will be realized with traffic control installations in the Zurich area. A pilot installation starts operation in August 2004.

In connection with the COST 352-Action „Influence of modern in-vehicle information systems (IVIS) on road safety requirements“, investigations are planned on individual traffic- and driving behaviour and how they are influenced by supporting in-vehicle systems and other factors. For the behavioural assessment, laboratory experiments are scheduled in co-operation with the Institute of Psychology at the University of Zurich.

The work on **maintenance and asset management** focuses on measurement and quality assessment of road surfaces. The results were crucial to the recent nationwide assessment of Switzerland's motorway/freeway and trunk road network. . We are starting a joint research project with the IBB for the evaluation of different forms of Public – Private – Partnerships (PPP) for operational maintenance and re-

habilitation of municipal roads. We are leading an effort to set up a group of co-ordinated research projects on the scheduling of maintenance activities.

In the fields of maintenance management and road safety, great emphasis is placed on grip characteristics of road pavement, particularly the effects of skid resistance on traffic accidents. Several projects have been conducted on this topic. Thanks to our measuring instrument (Stuttgarter Reibungsmesser) we have accumulated a valuable, long-term collection of data covering a period of approximately 20 years.

Road safety research has emphasized two areas. We have developed a new approach to road safety audits, which enables the evaluation of projects. This method will be adopted as a national guideline. The second area covers the methodology for analysis of accident black spots in road networks that has been developed by our group in collaboration with the Swiss Council for Accident Prevention. This method is already standardised as a national guideline. In this field, we intend to develop a new approach to enable the early identification of dangerous sites in road networks. The aim is to suggest preventive measures before accident accumulations occur („accident prognosis“).

In the field of maintenance road-work during traffic, current investigations are focussing on improving traffic flow and traffic safety at and around highway construction sites.

Table 12 Transport Systems Road Transport: number and funding of research projects (including funds for subcontractors)

	1999	2000	2001	2002	2003
On-going projects [n]	10	14	13	16	14
Finished projects [n]	3	4	3	3	7
External funding [kFr]	554	913	1256	541	362
ETH	-	-	-	-	-
NSF, SPP, SBT	-	-	-	-	-
KTI, Government agencies	275	422	408	374	260
Industry	-	-	-	-	-
EU 5 th Framework	-	-	-	-	-
Services	279	491	848	167	102

Table 13 Transport Systems: Road Transport, Research projects

Source	Title	Budget [kFr]	Start	End	Partner	Area			
						Highway geometric design	Traffic management and engineering	Maintenance management	Road safety
FVS	Measuring method for Acceleration Severity Index (ASI)	195	1996	1999	W. Schüler, Zurich				x
SBT	Speeds in curves	113	1997	1999		x			
SBT	Evaluation and application of impact load dampers (crash cushions)	157	1996	2000					x
BUWAL	Traffic flow on motorways; 25 years of IVT-measurements	30	1998	1999			x		
FVS	Effects of 30 km/h zone signposting	90	1997	2000			x		
FVS	Traffic safety databank; pilot study	107	1997	2000					x
FVS	Accident occurrence on high volume motorways and free-ways	95	1998	2000	Police of Kanton Zurich				x
SBT	Noise behaviour of different pavements	245	1996	2000				x	
ASTRA	<i>Minimum speed limit for heavy vehicles to goods transport</i>	20	2000	2001	Dr. Pitzinger, Zurich		x		
ASTRA	Maintenance and asset management of highway installations; concept 99/00	13	1998	2001	Rafi Management, Amstein & Walther, IMC, Zurich			x	
SBT	Methods for the evaluation of traffic safety (Safety Audits)	193	1998	2002					x
SBT	Basic parameter for federal road safety politics (VESIPO); Evaluation of operational and infrastructural policies	80	2000	2002					x
SBT	Speed on upgrades and downgrades	218	1998	2003		x			
SBT	Experiences in town centre streetscape design	45	1999	2003	M. Schwob Architekten, Bubendorf	x			

Project titles in italics indicate that the institute was not the project co-ordinator

Table 13 Transport Systems: Road Transport, Research projects (Continued)

Source	Title	Budget [kFr]	Start	End	Partner	Area			
						Highway geometric design	Traffic management and engineering	Maintenance management	Road safety
Kanton Zurich	Strategies for traffic control systems on motorways/freeways in agglomeration areas		2000	2003	Dr. Pitzinger, Zurich		x		
ASTRA	<i>Pavement management, global valuation</i>	20	1999	2003	Rafi Management, Zurich			x	
ASTRA	Pavement conditions on the Swiss federal highways	160	1999	2003	Schniering, Essen and VIAGROUP, Zürich			x	
SBT	Skid resistance on freeways, Comparison of measurement results SRM and SCRIM	180	2000	2003				x	
Swiss Insurance Association	Effects of passively illuminated pedestrian crossing (HMB reflectors) on traffic safety	185	2002	2003	tacag, Zurich				x
ASTRA	Visual pavement monitoring (Index 1)	30	2002	2003	Schniering, Essen and VIAGROUP, Zürich			x	
SBT	Methods and procedures for identifying general and local measures to increase road safety	96	1998	2004	Police of Kanton Zurich				x
SBT	Capacity of high volume Roundabouts	149	1999	2004			x		
SBT	Traffic flow and road safety of road works on motorways/freeways: improvement measures	236	2000	2005	W. Schüler, Police of Kanton Zurich		x		x

Project titles in italics indicate that the institute was not the project co-ordinator

Table 13 Transport Systems: Road Transport, Research projects (Continued)

Source	Title	Budget [kFr]	Start	End	Partner	Area			
						Highway geometric design	Traffic management and engineering	Maintenance management	Road safety
SBT	Requirements of skid resistance and optimisation of the relevant parameters	186	2001	2004	LAVOC EPFL			x	
ASTRA	<i>Evaluation of different forms on Public – Private – Partnerships (PPP) for operational maintenance and rehabilitation of municipal roads</i>	140	2004		IBB ETHZ			x	
SBT	Speed-dependent elements of the standard cross section profile	178	2004	2006		x			
BBW	COST 352: Influence of in-vehicle information systems on road requirements (IVIS)	394	2004	2008	Institute of Psychology, UNI Zurich		x		x

Project titles in italics indicate that the institute was not the project co-ordinator

3.2.2 Accident occurrence on heavily used motorways

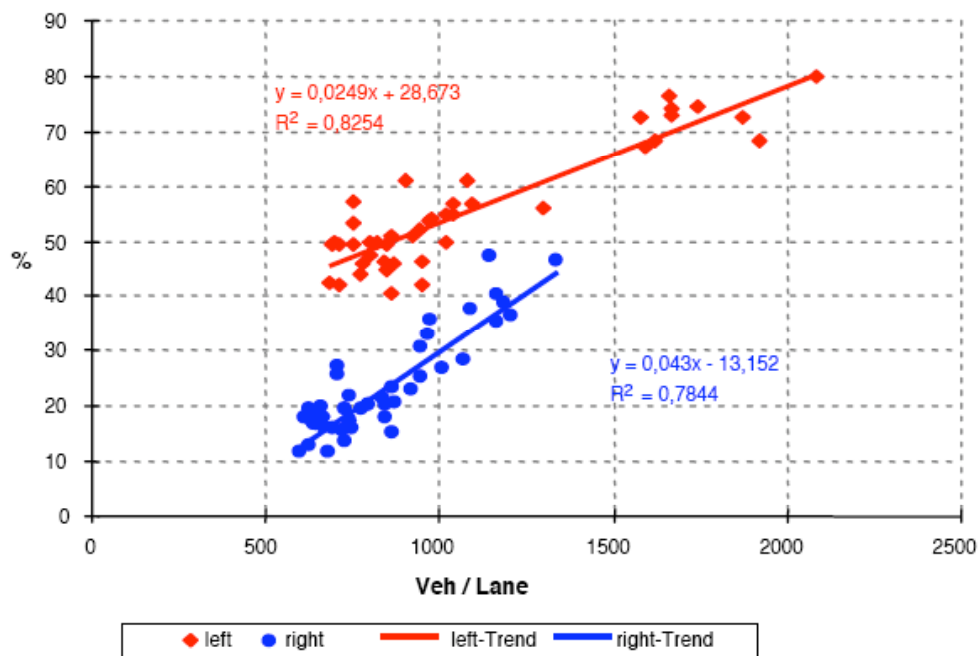
This study was supported by the Fund for Traffic Safety and had two goals. The first was to identify causes for the constant increase in accidents on heavily used stretches of motorways. A secondary aim was to use these findings to develop traffic safety measures for these stretches.

Six heavily used motorway segments, some with high volume merging areas, were chosen for the study. Based on available police accident records, it became clear that the majority of accidents occur in the merging areas, and most often at the point of entry into the motorway lanes. For this reason, analyses of traffic flow, recorded on video, were concentrated on these locations.

The study led to the following conclusions and recommendations:

- Measures to increase traffic safety on heavily used motorways must focus on the merging areas.
- The recommended approach involves improving traffic flow conditions shortly before, and during, periods of heavy traffic by ramp metering, lane allocation, and variable speed control.
- Continuous traffic management could be further enhanced by controlling distances between vehicles and their speed.
- The study also showed that an audit of acceleration ramps should be undertaken.

Figure 1 Share of gaps below 2 sec in motorway merging areas



Source: Lindenmann, Weber, Ranft and Chabot-Zhang (2000)

3.2.3 Speeds in curves

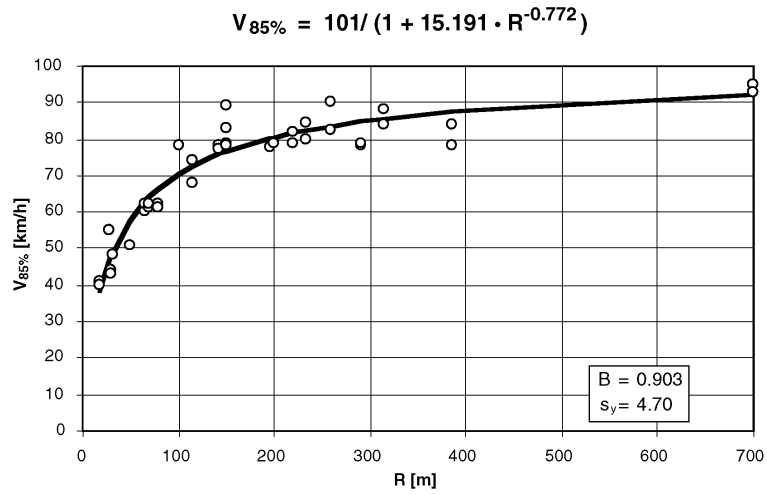
This project focused on the relationship between curve radius and speed in curves on roads outside settled areas (rural roads), subject to the general speed limit of 80 km/h, while controlling for other design elements, in order to evaluate existing design standards of the VSS (Association of Swiss Road and Traffic Engineers). The project also examined changes in speed behaviour since earlier measurements in 1978, when the speed limit was 100 km/h.

Speed was measured in 23 curves with radii between 18 and 700 m. The measuring instruments also tracked individual vehicles along the curve. Only the speed of unobstructed vehicles was analysed. The most important results of this research are summarized as follows:

- Distribution of speed on circular arcs
 - Speed in curves, particularly in curves with larger radii, clearly became more homogeneous compared to 1978.
 - Speed differences $V_{85\%}/V_{15\%}$ and standard deviations were substantially reduced compared to 1978.
 - Standard deviations increase with increasing speed as they did in 1978; however, they were lower for larger radii

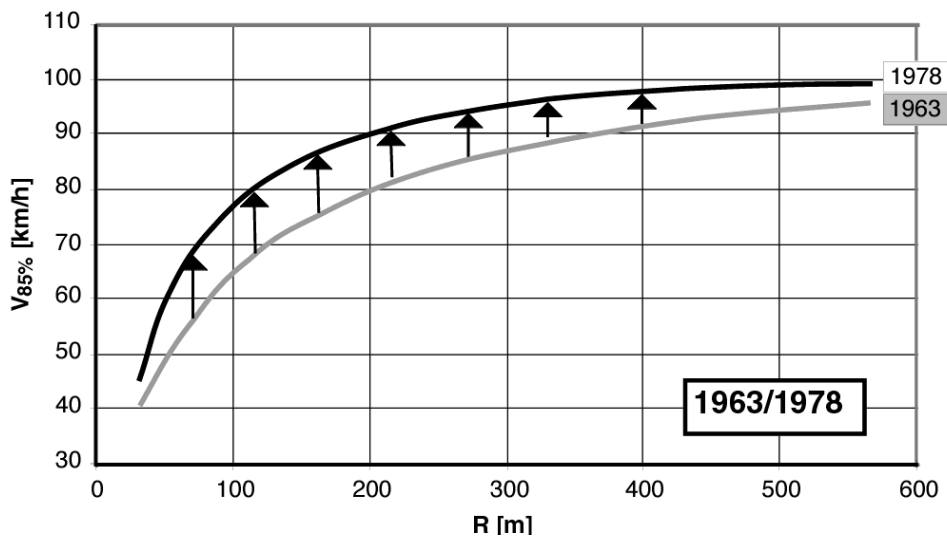
- Speed profiles/speed adjustment
 - The u-shaped speed profile (deceleration on the approach to / acceleration after the circular arcs) in curves with radii $>$ approx. 140 m was almost never observed anymore.
 - Accordingly, within the transition curves to mid sized and larger radii, almost no decelerations occur.
 - The values of the average deceleration determined for curves with smaller radii ($R <$ approx. 115 m) correspond favourably to the value assumed for the speed model of the existing standard.
 - In 1978, decelerations were also observed within the first half of circular arc. Practically no such behaviour was observed in 1998.
- Speeds as a function of the curve radius
 - As in 1978 a straightforward connection between speeds and radii could not be established (Figure 2). A radius dependency of the speeds in the narrower sense does not exist. Nevertheless for design purposes this correlation is judged to be useful. The variation of the measured values became somewhat smaller compared to 1978 (Figure 3 and Figure 4).
 - Both the average- and the V85%-speeds in the circular arc were reduced compared to 1978. However, for radii larger than approx. 150 m, the V85%-values exceeded the speed limit of 80 km/h.
 - The comparison of the regression curves suggests that for $R >$ 100 m the V85%-values for 1998 were up to 10 km/h lower than in 1978. For smaller radii the differences are lower. Only for radii $<$ 45 m were the 1998 V85%-values up to 5 km/h higher than 1978. (Kay; please check this to make sure I understood the sentence right..thanks! K.)
- Lateral acceleration and friction demand on the circular arc
 - Similar to the changes in speeds, lateral accelerations on circular arcs with radii of more than 45 m were reduced compared to 1978.
 - The demand on radial friction (coefficient f_R) in curves has decreased in line with the lateral acceleration. In curves with radii $>$ approx. 200 m, values calculated in 1998 are lower than those in the existing standard; however in radii $<$ approx. 150, m radial friction clearly exceeded the standard's values.

Figure 2 $V_{85\%}$ -speeds in the middle of the circular arc as a function of the curve radius (1998)



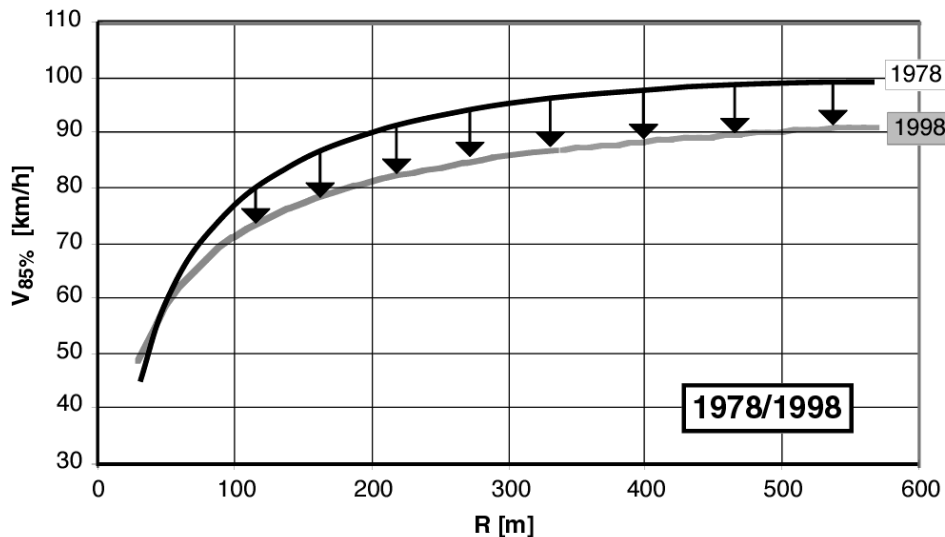
Source: Spacek and Belopitov (1999)

Figure 3 Comparison of curves for $V_{85\%} = f(R)$ in 1963/1978 (no limit / 100 km/h limit)



Source: Spacek and Belopitov (1999)

Figure 4 Comparison of curves for $V_{85\%} = f(R)$ in 1978/1998 (100 km/h limit / 80 km/h limit).



Source: Spacek and Belopitov. (1999)

- Speeds in curves and others design elements
 - High correlations were found between speeds and the degree of curvature as well as between speeds and lengths of circular arcs. The speeds in curves also depend on road width in the circular arc and on sight distances.
 - Small degrees of curvature (between 30 gon and 50 gon) proved problematic, as they increase speeds. The same holds for curves with a short circular arc (with a driving time < 2 s)

According to existing standards, design speed in curves is based on physical characteristics and available pavement grip; it is applied to roads, which should be designed according to observed driving dynamics. Due to the 80 km/h speed limit, the difference between the observed $V_{85\%}$ (1998) and design speed of VP (according the existing standard) has decreased. From this point of view, an adjustment of the existing standard and its function $VP = f(R)$ is not considered necessary at the present time. The function VP in curves is in line with foreign guidelines, which recommend speeds based on physical models.

3.2.4 Speed on Upgrades and Downgrades

It has been more than 20 years since the speed behaviour of passenger cars and heavy vehicles on upgrades and downgrades was last investigated in Switzerland. At that time, rural highways were subject to a general speed limit of 100 km/h. No comprehensive surveys were undertaken after the introduction of the general 80 km/h speed limit. New surveys were also necessary for heavy vehicles anticipating the plan allowing vehicles of up to 40 metric tons in weight. The heavy vehicle quotas agreed in the bilateral negotiations with the European Union came into effect on January 1, 2001; thus one of the initial aims of this study in 1999 was to make „before“ situation (28 ton weight limit) surveys. The effects of increased weight limits (and resultant reduced statutory minimal power to mass ratio for heavy motor vehicles) on speed behaviour were investigated through corresponding measurements in the “after” situation during the summer of 2002. This research project attempted to determine changes in the relationship between

vertical gradients and vehicle speed, thus enabling any desirable modifications to relevant design standards. Speed on upgrades and downgrades relates, directly or indirectly, to several geometric design elements, in particular those discussed in SN 640 138a „Auxiliary lanes on upgrades and downgrades“. Approximately 40 measurements of traffic flow on freeways and main rural highways were made.

For passenger cars, an increased homogeneity was evident in the speed distribution of 1999 compared to 1978 surveys. The speed difference between fast ($V_{85\%}$) and slow ($V_{15\%}$) cars is about 20 km/h, irrespective of vertical gradient. In 1978, it was approximately 5 to 10 km/h greater. Moreover, on upgrade stretches, in contrast to downgrade stretches, a slight dependence of speed on gradient was apparent. The increased homogeneity referred to above is due to a reduction in the speed of fast cars. It was also established that the sustained speed of passenger cars on upgrades of up to 8 % is below that of 1978 – by as much as 8 km/h on low upgrades. A slight increase in speed was recorded only in the case of very substantial upgrades.

In the case of heavy vehicles, the 1999 surveys reflected a clear tendency toward a lower speed as vertical gradient increases. The speed distribution for heavy vehicles turned out to be slightly less homogenous than that for cars. Nevertheless, the speed difference between fast ($V_{85\%}$) and slow, loaded ($V_{15\%}$) vehicles has also declined markedly between 1983 and 1999, resulting in more homogenous speed behaviour. The surveys of 2002 showed a slight increase in speed difference on upgrades compared to 1999, while a further reduction was observable on downgrades. In the case of the $V_{15\%}$ (representative of the crawl speed of loaded heavy vehicles), some very large increases were recorded in both 1999 and 2002 vs. 1983. The measurements of $V_{15\%}$ on upgrades were slightly lower in 2002 than in 1999, while a further increase was recorded on downgrades. The decrease of heavy vehicles' crawl speed on upgrades in 2002 was less than feared in various quarters in advance of the authorization of trucks of up to 40 tons gross laden weight.

The crawl speed of unhindered heavy vehicles was markedly higher in 1999 than in 1983, both on upgrades (on average +13.7 km/h), and on downgrades (between +10 km/h on low downgrades and +16 km/h on steep ones). The surveys of 2002 revealed a slight reduction in crawl speed (-3.8 km/h on average) on upgrades compared to 1999, whilst a further increase in crawl speed (+4.8 km/h on average) was recorded on downgrades. Nevertheless, crawl speed of heavy vehicles on upgrades today (2002) is about 10 km/h higher than in 1983. Since the speed limit for trucks has not changed, the increased speed is due partly to technical improvements in the heavy vehicle fleet and partly to the fact that haulage firms supply vehicles with superior engines for transalpine freight traffic. This means that they greatly exceed the statutory minimal power to mass ratio of 5.0 kW/t. This hypothesis was confirmed by analysis of the weigh-in-motion (WIM) measurements on the Gotthard route.

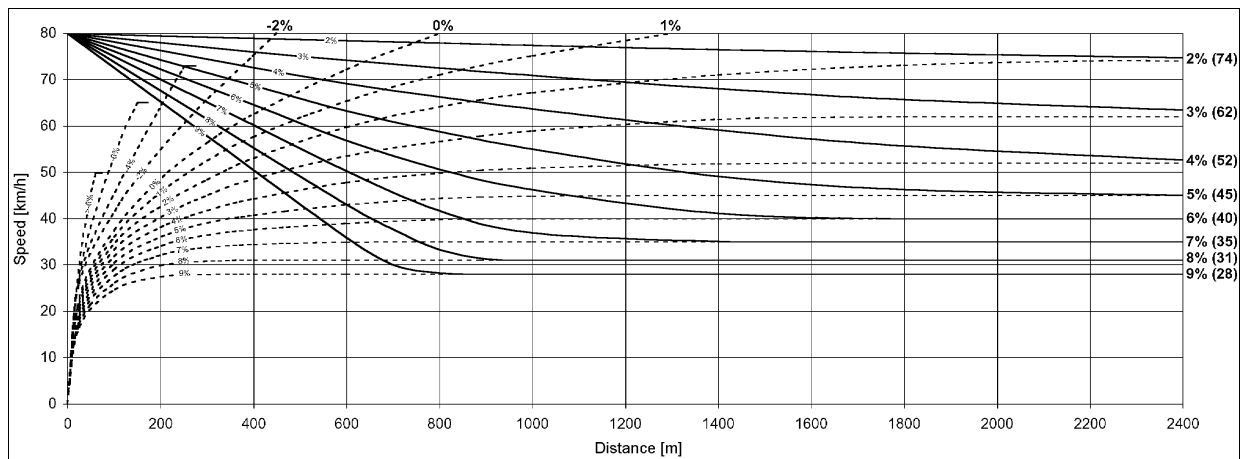
Statistical analyses of heavy vehicle fleets in Switzerland show that, since the introduction of the distance-based heavy vehicle fee (LSVA), there have been marked increases in the numbers of both light delivery trucks (+5.4%) and particularly heavy vehicles with trailers (+11.6%). With regard to operating weights (total weight of the vehicle and its load during the journey), an increase of nearly 11% in trucks of over 26 tons was recorded following the introduction of the LSVA, but decreases were evident in lower weight categories.

The WIM analysis for north-south traffic in the summer of 2002 revealed a marked increase in the number and percentage share of commercial vehicles with operating weights above the old weight limit of 28 tons, compared to the corresponding period in 1999 (increase at the Gotthard, e.g., from 6.5% to 19%). Estimated continuation of this trend caused the research body (IVT) to reduce crawl speed on the design standard-based upgrades by 10% compared to 2002 results.

Measurement results were supplemented by microscopic simulations of deceleration processes and start-up accelerations for trucks, using various power to mass ratios and rear-axle ratios on various

grades. Comparing empirical and simulated values a new typical heavy vehicle was defined with a specific power to mass ratio of 11.1 hp/t and recommendations were drawn up for the design standard. In addition, new speed profile recommendations were developed for heavy vehicle crawl speed on upgrades and downgrades (Figure 5).

Figure 5 Acceleration and deceleration curves of the design heavy vehicle on different grades



Source: Koy and Spacek (2003)

3.2.5 Methods for evaluation of traffic safety (Safety Audit)

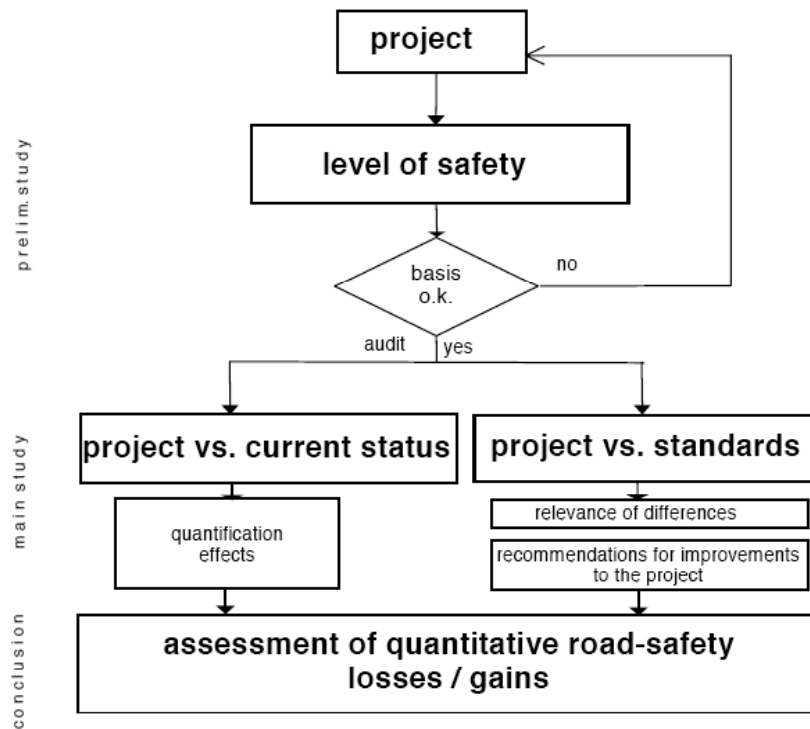
Changes on road infrastructure are bound to have safety consequences. In Switzerland, no procedure to conduct a coherent, objective project examination of these effects had ever been established. Ongoing research has now developed a safety audit procedure concentrating on road and traffic safety evaluation. Similar to an environmental impact statement, it provides all road infrastructure projects with a risk and danger evaluation. Negative effects on traffic safety should be identified in advance of any system change (preferably by a neutral third party) through a standardized audit process, which will also help to spread best practice. Such an audit has to be simple, practical, and relevant, and it should be able to test planned projects to determine all aspects and levels of road and traffic safety. It should fit into the existing planning and assessment procedures.

The process was designed based on a thorough review of international experience and national research, shown in Figure 6. In addition to the audit function, the process should identify improvements in the scheme under review.

This audit procedure, unlike those currently used, is divided into a preliminary and a main examination summarized in a written report. The main task of the preliminary examination is to determine the general safety level of the existing road infrastructure. The safety level of a road infrastructure (or parts of it) indicates possible risks, compared to similar roads, highlighting accidents or potentially dangerous situations. It enables the auditor to determine the locations of accident-black spots or those with a low safety level.

After the determination of the safety level of the existing infrastructure, the main examination follows with actual traffic safety evaluation. This is divided into two comparative examinations.

Figure 6 Structure of the proposed safety audit



Source: Lindenmann and Doerfel (2002)

The first comparison examines the relevant safety indicators of the existing road infrastructure and those of the current project, with the latter ideally showing an improvement. Expected negative effects on traffic safety should be identified at this point. The assessment is based on proposed changes in infrastructure as well as expected changes in traffic flow.

The second comparison correlates the project itself and the standards. It goes without saying that a complete conformation to guideline design is most probably unachievable because of cost compromises or legal objections. Never the less, the comparison is helpful in recognizing trade-offs with the help of standards, guidelines and professional experience. What effect the differences between the actual project and standards would have on traffic safety shall be recorded by the auditor and are also part of the concluding report.

The research report provides a first collection of checklists and of quantification proposals. This new procedure has been tested by external project managers for two different road schemes. Their experiences will be integrated into the final proposal.

3.3 Transport Systems: Public Transport

3.3.1 Areas of work

The following sections describe the research focus of the group, however, there are also ongoing projects for public administration, transport companies, and public transport industry in areas such as administrative and financial management of public transport, or infrastructure and rolling stock investment decisions.

Freight Transport and Logistic: Since 1990, the IVT has pursued research projects in the field of freight transport, which is a crucial competence and important business of Swiss railway companies due to their geographical position in Europe. Furthermore, freight railways are affected directly by the EU's open access-policy; they must respond with new, specifically, international business models. The Freight transport research projects and consulting for SBB are focussed on the intermodal transport chain covering road, air, water, and rail as well as special rail operation questions. **Rail Operation:** A traditional focus is the optimisation of rail operations in conjunction with the design of rolling stock and infrastructure. The aim here is minimisation of infrastructure and rolling stock investment for new transport services and optimisation of transport services on existing infrastructure. Matching the EC-direction 91/440, Switzerland required its railways to provide separate accounts for their networks and their operations. This separation changed traditional rail operation processes. The group supports railway infrastructure companies in finding and defining new processes for the optimised utilisation of their limited capacity.

Track Construction: Most research on track structures is standard gauge oriented. But in many countries, notably Switzerland, there are large metre gauge railway networks. The group works to adapt research results to meter-gauge structures, and to complement and extend the findings with its own research projects. For example, the IVT adapted design methods to the needs of meter-gauge railways and investigated the problematic nature of continuously welded track in tight curves (60 – 200m).

Rail simulation: The group views rail simulation primarily as a tool for supporting rail operation planning, online management, and infrastructure planning. It is based on traditional rail operation research. The simulation tools, *Open Track* and *Open Timetable*, which were developed in-house in recent years, have been adopted by many European railway infrastructure companies and specialised consultants.

Professor Weidmann, in post since June, 2004, sees the following areas within public passenger and freight transport systems (railway, bus, aviation, shipping) research as the focuses of the group: (i) development of networks and services, (ii) planning and realisation of infrastructures and (iii) network management and maintenance. Complementary subjects are traveller behaviour, transport policy, and sustainability. His research aims are the optimisation of system designs, investment strategies for network operators, and cost-effective maintenance methods.

Table 14 summarizes the flow of research projects and funds, while Table 15 details them individually.

Table 14 Transport Systems Public Transport: Number and funding of research projects (excluding consulting work)

	1999	2000	2001	2002	2003
On-going projects [n]	2	3	3	2	2
Finished projects [n]	2	1	1	1	2
External funding [kFr]	461	522	512	570	550
ETH	-40	-50	-	3	-
NSF, SPP, SBT	-	-	-	30	70
KTI, Government agencies	33	71	8	105	105
Industry	311	233	151	302	224
EU 5 th Framework	27	125	305	130	110
Services	50	43	48	41	41

Table 15 Transport systems – Public transport: Research projects

Source	Title	Budget [kFr] IVT part	Start	End	Partner	Area				
						Transport	Freight Transport...	Logistics	Rail Operation	Track construction
EU	<i>IMPULSE</i>	212	1996	1999	10 partners	x				
SBB	Open track and Open TimeTable	100	1998	2004	SBB					x
BBW (COST)	COST 339 Small Containers	200	1998	2001	Guha AG (CH) and 10 countries		x			
ETH, SBB	Bonus/Malus System	60	1998	1999				x		
EU	<i>IDIOMA</i>	80	1998	2000	Rapp AG und Guha, Zürich, Neuweiler AG Kreuzlingen, ACTS AG, Bern	x	x			
ETH, VöV	Track modulus of ballast track	110	1999	2002					x	
EU	<i>INHOTRA</i>	300	2000	2003	9 partners	x				
EU	<i>PORTAL</i>	300	2000	2003	47 partners	x				
ASTRA	<i>VSS Terminals</i>	90	2003	2004	Rapp AG Zürich		x			
BAV	Glossar Public Transport	40	2003	2004		x				

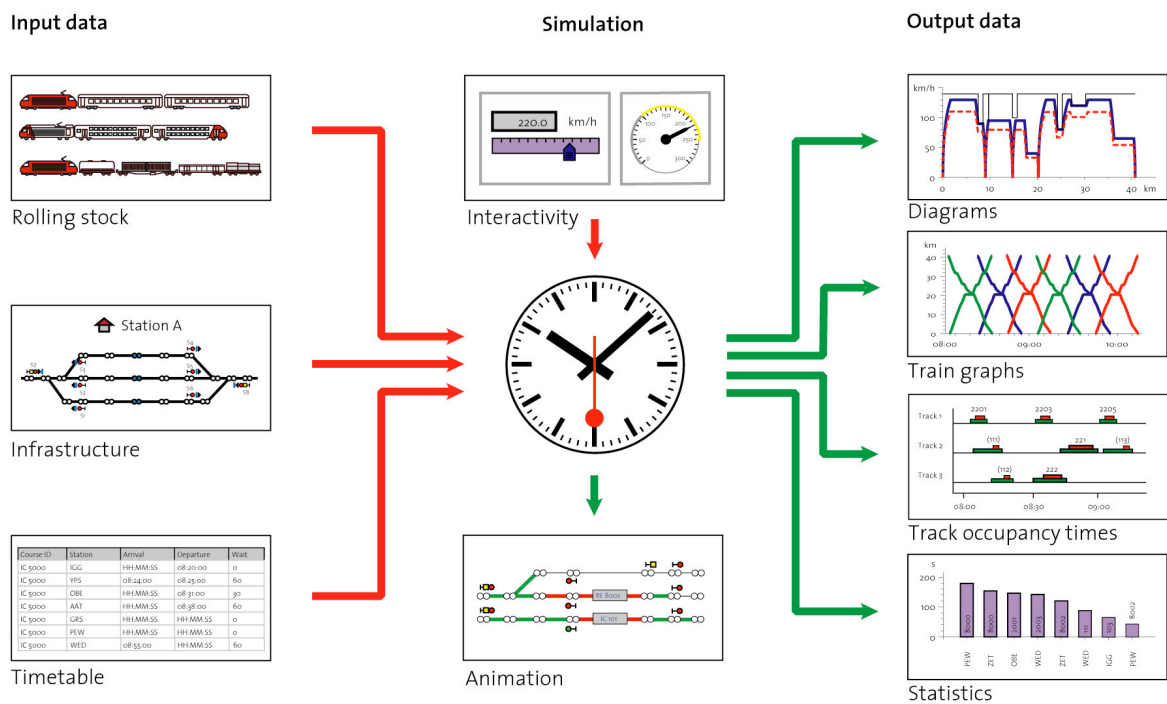
Project titles in italics indicate that the institute was not the project co-ordinator

3.3.2 Open Track and Open Timetable

OpenTrack is a planning and simulation tool for railway operations, which the group is continuously developing and refining. OpenTrack supports the analysis of all essential design problems of a railway operator: railway operations (line and node capacity, bottlenecks, headways, timetables, propagation of delays), infrastructure design (evaluation of variants, evaluation and design of signalling systems), and rolling stock planning (scheduling, requirements). An animation mode shows running trains, prepared routes, and current signal aspects. The simulation also generates numerous types of evaluation summaries and diagrams. The interface of the simulation allows user actions (e.g. simulation of disturbances) while the process is running. Special functions support user analysis of the extensive output data, especially the progress of the simulation.

The OpenTimeTable software shows how trains deviated from their timetable in the recent past, and when and where delays tend to arise. OpenTimeTable enables users to study systematic delays and to fine-tune timetables, creating more attractive services and increasing capacity utilisation. In the near future, OpenTimeTable will offer features that automatically analyze train operations over time and notify users of any systematic trend in timetable adherence.

Figure 7 Overview of Open Track



3.3.3 European RTD projects in intermodal freight transport

Intermodal transport combines the best features of different transport modes. The group's extensive knowledge fosters independent consulting on many current questions surrounding intermodal transport. Much of our research and consulting work has taken place within the framework of European research and technological development (RTD) projects. The group has provided scientific and expert support in the following projects.

In.Ho.Tra stands for *Interoperable Intermodal Horizontal Transshipment*, and it helps develop and test horizontal transshipment technologies for smaller terminals. In contrast to traditional transloaders, In.Ho.Tra devices are small, inexpensive to buy and run, energy-efficient, easy to automate, and can operate under the railway catenaries. Deploying such devices in smaller terminals allows for dense terminal network with the desirable short initial and final road stages of shipment.

IDIOMA stands for both initial and final stages in intermodal freight transport and of urban pickup and delivery services.

In the Zurich test region, three subprojects were carried out for IDIOMA:

- The FURMIA horizontal transshipment device was developed and field-tested in terminals with small and medium volumes. It is inexpensive to buy and should help lower operating costs of such locations.
- The Combibox system worked on integrating smaller shipment sizes within the intermodal logistics chain and easing loading and unloading. Its field test involved commercial freight movements of boxes, particularly a city freight van offering services between Rothenburg and Zurich.
- ACTS is the German acronym for Rolling Container Transport System. The project helped pinpoint the needs of the consumer-goods market for ACTS, estimated its potential, and investigated compatibility problems with conventional intermodal transport.

COST actions 315 and 339 analyzed the consequences of introducing containers under 20 and over 40 feet long in European transport systems.

The IMPULSE program aimed to improve transshipment technology and thus make intermodal transport more competitive. It focused on future scenarios/methodologies for railway operations and their consequences on elements of the transport chain (transshipment terminals, rolling stock, and road distribution).

Figure 8 Examples of intermodal freight



Source: SBB

3.3.4 Bonus/Malus System for Train Delays

In the context of EU directive 91/440, most European railways have separated infrastructure management and train operations into two separate companies. The goal of this separation is to achieve more transparency in the performance of railway services and to reduce production costs through competition. However, this separation could mean that the various entities might no longer work together smoothly. To avoid this danger, and to guarantee the quality of transport services, the Swiss Federal Railways (SBB) asked the group to develop a quality-assurance instrument. A research grant from the Swiss Federal Institute of Technology Zurich also supported this work.

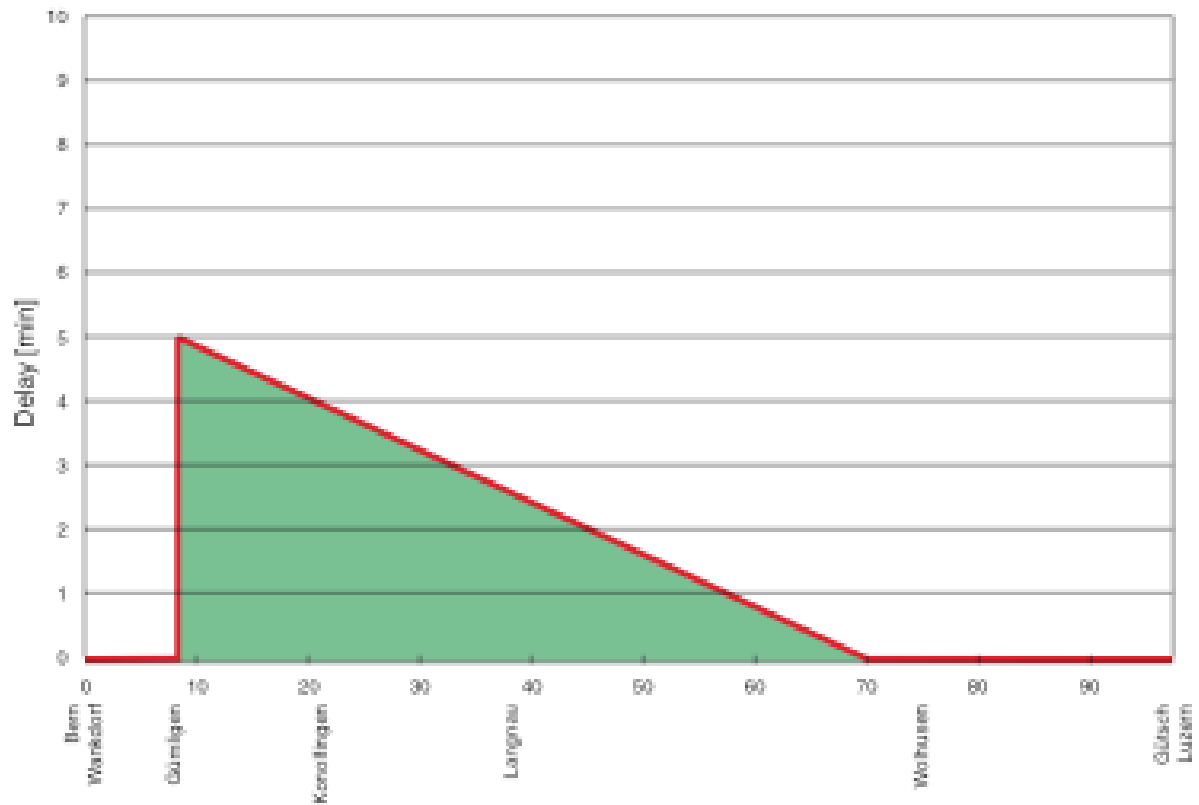
In 1998 and 1999, the IVT developed a bonus/malus system. This system, when implemented, will serve as an incentive for all participants to cooperate in maintaining a smooth and punctual system operation. Specifically, in the future, any member entity causing a disturbance will pay a penalty, and those affected by the disturbance will receive compensation. The study devised both complex and a simple bonus/malus systems, and under each system, the costs of a disturbance form the basis for the calculation of a penalty payment.

The complex bonus/malus system records the precise effects of a disturbance. This recordkeeping requires an elaborate IT program that renders short-term implementation of this system unlikely.

To implement a system short term (within a few months), the project proposed a simple bonus/malus system. For the calculation of the malus amount, which a party must pay if it causes a disturbance, the effects of the disturbance are merely estimated. Calculation of the amounts of bonuses to be paid to parties affected by the disturbance is based on the simple assumption that, during a given period, the disturbance affects all partners in proportion to the volume of transport services they provide.

In the simple bonus/malus system, the central dispatcher must merely note the location and the initial delay in minutes in a table that also contains trains' running characteristics. The time reserves in the timetable help estimate both the location where the train will have recovered from the delay, and the previous delay on each track section and node. A delay on a given track section and node translate into penalty points and then into Swiss francs. The penalty payments go into a fund that is periodically distributed to infrastructure managers and train operating companies affected by third-party delays.

Figure 9 Example calculations of delays and malus-points



Line dependant penalty points: $0.5 * 5 \text{ [min]} * 61.3 \text{ [km]} * 1.2 \text{ [factor line 460]} = 183.85 \text{ [pts.]}$
 Price per point: $0.93 \text{ [CHF/pt.]} \text{ at a delay of } 5 \text{ [min]}$
 Malus : $183.85 \text{ [pts.]} * 0.93 \text{ [CHF/pt]} = 171 \text{ [CHF]}$

Source: Hofer (1999)

3.4 Transport Planning

3.4.1 Areas of work

The group Transport Planning changed directions with the appointment of Prof. Axhausen in March, 1999. Building on his earlier work, the group has since pursued six mutually reinforcing topics:

- Long-duration travel diaries and observations
- Rhythms of daily behaviour
- Longer term life style choices
- Accessibility and spatial change
- Large network and travel demand models
- Valuation of generalized cost elements

There is no one-to-one match between research areas and projects, which in many cases contribute to more than one area. The projects, partners involved, and funding details are listed in Table 16, together with their contribution to various areas of research. Table 17 summarizes the number of projects and the funding by source.

The following paragraphs summarize the work undertaken in these areas, while the following four subsections highlight four individual projects.

Long-duration travel diaries and observations: The IVT currently has the world's most extensive collection of recent long-duration travel diary data: Six-week travel diaries in Karlsruhe (1999), Halle (1999), Thurgau (2003); 12-week leisure activity diary (Kanton Zürich, 2002), plus the five-week Uppsala diary (1971). The underlying surveys were designed, and their implementation supervised, by the institute. The ideas developed from these surveys have begun to influence general practice in the field; e.g. the next Swiss national travel survey.

For the GPS-data set from Borlänge, the institute developed automated approaches to the imputation of trip purpose and trip identification. This work is supplemented by the development of metadata standards for travel behaviour data.

Rhythms of daily behaviour: The long-duration surveys available at the institute make it possible, for the first time, to describe the home range of travellers, as well as their individual activity spaces. We have developed relevant measures for these, and have been able to show that their link with the usual socio-demographic variables is weak. On the other hand, we have also been able to show for the first time how important behavioural innovation is for travel behaviour using completely new combinations of place and trip purpose.

The transfer of these new measures to other datasets providing origin-destination information is possible and has been successfully demonstrated for commuting behaviour. Again, we are now able to characterize changes in the commuting sheds of all Swiss municipalities in new and comprehensive ways.

Longer term life style choices: The approach of the group emphasises longer term choices of persons and households (home and work locations; mobility tool ownership: licence, car, public transport, season tickets, bicycles) as the frame for daily behaviour. We are exploring interactions between these choices using new data sets, but are also widening the frame of reference. We have introduced the term mobility biography to describe these dynamics and are starting to develop suitable surveys to test our hypotheses formally. We have highlighted the embedded nature of travel behaviour within the social network of the traveller and demonstrated this impact using some initial small-scale surveys.

Accessibility and spatial change: The existing econometric literature about interaction between transport infrastructure, economic growth, and spatial change is handicapped by two factors: overly large spatial unit or very short time series. The simulation models currently available in Switzerland to evaluate the land use transport interaction are too simplistic and omit long-term life style choices.

The first shortcoming has been addressed by the development of a unique data set, which describes the available regional-level transport infrastructures and public transport services in Switzerland since 1850, covering the period after 1950 in great detail. This is matched by a socio-economic database describing all – about 3000 – Swiss municipalities for this time period. While the mapping of the accessibility change over this time period and at this level of detail is already important, it is clear that these initial descriptive analyses must lead to appropriate econometric data modelling to link investment to economic or spatial

change (See the Figure enclosed at the end of the report) . This work has begun with the doctoral work of Tschopp and Fröhlich.

In the context of the NSL (Network City and Landscape), which is a joint initiative of the D-BAUG and D-ARCH, the group (has started to develop an agent-based model of land-use transport interaction. This work will integrate existing work on longer-term life style choices, and will interact with new, dynamic daily travel behaviour models. .

Large scale network and travel demand models: The commercial or in-house modelling capabilities for cost-benefit analysis available for Swiss local, regional and national authorities are severely limited, as this area of work has not received sufficient funding over the last two decades. The group has provided an important stimulus by implementing new regional, national, and European-level state-of-the-art network and travel demand models.

The route and mode choice models estimated here are increasingly used in general practice and the origin-destination matrices provide important starting points for other applications. The study of the impacts of Swiss tilting trains demonstrated in a methodologically convincing way that choice parameters derived from stated preference surveys produced in this case forecasts of a quality equal or superior to those derived from revealed preference data. This is an important contribution to the on-going discussion about the suitability of these data sources.

Valuation of generalized cost elements: For the first time, Switzerland is developing a formal cost-benefit guideline within the framework of a wider assessment of project sustainability. Prof Axhausen chairs the professional committee (VSS) in charge of the development of the CBA-guidelines.

In this context, the institute has undertaken the first Swiss study of the value of travel time savings and, notably, the first study to estimate the value of travel time reliability. The state-of-the-art estimates provide trip-purpose specific values and clearly show mode, income, and distance dependence of the valuations. The distance dependence has never previously been demonstrated in such clear terms. Reliability values are as important as those for the travel time savings, highlighting the need to reconsider investment decisions which stress speed at the expense of reliability.

Table 16 Transport planning: research projects

Source	Title	Budget [kFr]	Start	End	Partner	Area					
						Long duration...	Rhythms...	Life style choices	Accessibility	Large scale models	Valuation
BMFT	<i>Mobiplan</i>	277	1999	2001	RWTH, Aachen; PTV, Karlsruhe	x	x				
BMFT	<i>Mobidrive</i>	180	1999	2001	RWTH, Aachen; PTV, Karlsruhe	x		x			
EU	<i>EXPEDITE</i>	114	2000	2002	Rand Europe, Leiden					x	
EU	<i>Dateline</i>	25	2000	2003	Socialdata	x	x				
BMFT	<i>Contrasting spaces and spatial partnerships</i>	325	2000	2003	TU Berlin	x		x			
SBB, ARE	Estimation of a bi-modal demand model for „Bahn 2000“	100	2000	2001	Prognos, Basel					x	
ARE, SBB	Ex-post analysis of forecasts with different parameter sets	150	2000	2001	USI, Lugano					x	
SBT	Activity-oriented travel demand models	40	2000	2001	Widmer, Frauenfeld			x		x	
SBT	Swiss value of travel time savings: scoping study	47	2000	2002	Abay+Meier, Zürich						x
SBT	Reliability as a choice variable	49	2000	2003							x
SNF	Accessibility and spatial change in Switzerland, 1950-2000	283	2001	2003	Universität Bern, Universität Neuenburg				x	x	

Project titles in italics indicate that the institute was not the project co-ordinator

Table 16 Transport planning: research projects (Continued)

Source	Title	Budget [kFr]	Start	End	Partner	Area						
						Long duration...	Rhythms...	Life style choices	Accessibility	Large scale models	Valuation	
NCHRP	Standardized Procedures for Personal Travel Surveys	6	2001	2004	LSU, Baton Rouge							x
AGS	<i>Comparing travel patterns in the USA, Japan and Europe</i>	94	2001	2004	MIT, Cambridge; University of Tokyo			x				
SBT	Patterns of weekend leisure travel	145	2001	2003		x	x	x				
TA-Swiss	<i>The networked vehicle</i>	8	2001	2002	ASIT, Bern; econcept, Zürich							
SBT	Meta-data standards for trip generation surveys	50	2002	2004								
SBT	<i>Development of Swiss models for route choice under RTI</i>	35	2002	2005	EPF Lausanne							X
ETH	<i>Large Scale Multi-Agent of Travel...</i>	90	2002	2005	D-INF, ETH Zürich							X
SBT	Estimation of static and dynamic origin-destination matrices from traffic counts	139	2002	2004	Imperial College, London; PTV Swiss, Berne							X
UVEK	Disaggregate forecasts of mobility tool ownership and use: 2000-2030	265	2002	2004				x				X
ETH	Structure and use of human activity spaces (Borlänge-Data)	182	2002	2005			x					
SBT	Swiss value of travel time savings	193	2002	2004	Rapp Trans, Zürich							x
NFP 48	Accessibility and travel behaviour of leisure travellers in the Alps	360	2002	2005					x			

Project titles in italics indicate that the institute was not the project co-ordinator

Table 16 Transport planning: research projects (Continued)

Source	Title	Budget [kFr]	Start	End	Partner	Area					
						Long duration...	Rhythms...	Life style choices	Accessibility	Large scale models	Valuation
SNF	Accessibility and spatial change in Switzerland, 1950-2000; Extension	117	2003	2004	Universität Bern, Universität Neuenburg				x	x	
SBT	An uniform system of design loads for transport infrastructures	205	2003	2005							
BAK	<i>Regional accessibility among European areas</i>	86	2003		BAK, Basel				x		
glow	Networked cities	5	2003	2003		x					
Kt Zürich	Network service quality	51	2003	2004						x	
EU	<i>OPUS</i>	308	2003		Imperial College, London						
SBT	Stability of travel patterns	153	2003	2005	Widmer, Frauenfeld	x	x				
EU	<i>ETIS Base</i>	146	2003	2005	NEA, Rotterdam						
SBT	Estimation of national origin-destination matrices by mode	200	2004	2006	Emsch + Berger, Zürich					x	
Kt Zürich	Cantonal public transport demand model	130	2004	2006	EB+P, Zürich; PTV, Karlsruhe					x	
DfT	<i>Social networks and future mobilities</i>	25	2004	2005	University of Lancaster	x					
SNF	Accessibility and regional disparities	110	2004	2006		x					

Project titles in italics indicate that the institute was not the project co-ordinator

Table 17 Transport planning: number and funding of research projects (including funds for subcontractors)

	1999	2000	2001	2002	2003
On-going projects [n]	2	10	10	16	20
Finished projects [n]	-	-	5	4	7
External funding [kFr]	457	850	536	1313	1071
ETH	-	-	94	272	-
NSF, SPP, SBT	-	136	428	777	475
KTI, government agencies	457	475	6	265	509
Industry	-	100	-	-	-
EU 5 th Framework	-	13	-	-	454
Services	-	-	8	-	91

Funds are credited in the year of the project start

3.4.2 Thurgau 2003 six-week diary

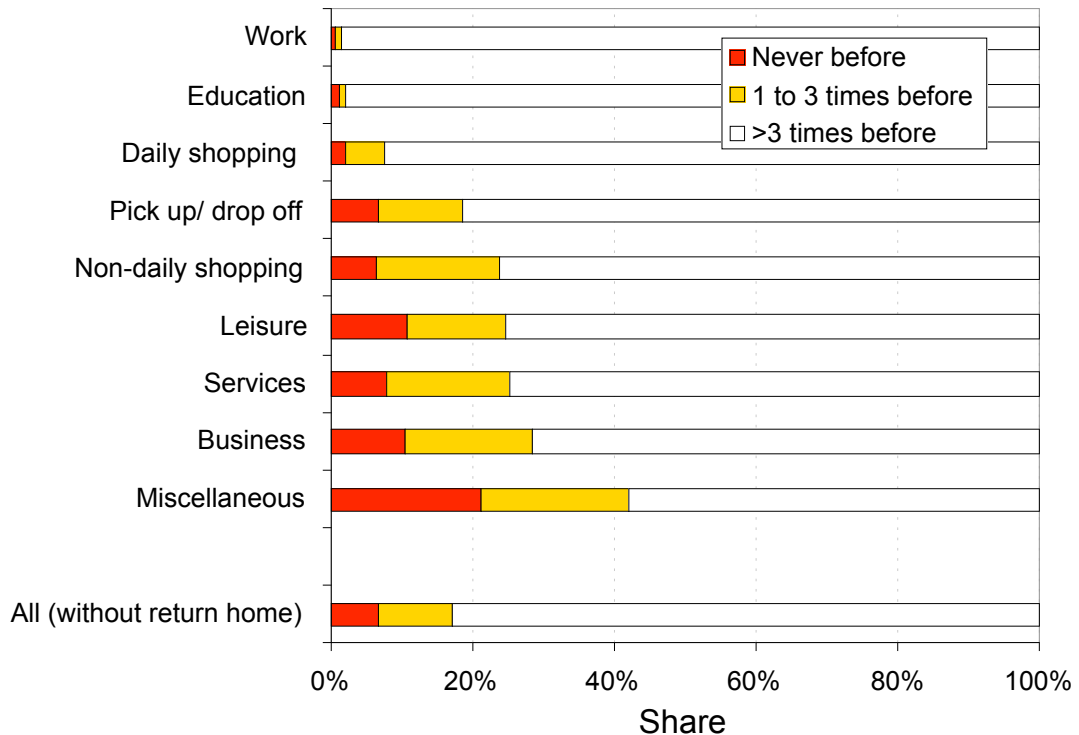
The observation of travel (and activity) patterns over long time periods is rare in transport planning due to the complexity of diary instruments for the respondents. The scarcity of data is in striking contrast to the modelling needs at the forefront of state-of-the-art, highly advanced activity scheduling models. While passive observation tools, such as GPS or GSM, have the advantage of low respondent burdens and precise measurement of time-space paths of travellers, they cannot obtain the qualitative aspects of the behaviour; the best possible alternative are imputations for activity type, number of persons participating, etc.

Against this background, the group continued the work started with the 1999 Mobidrive survey and the 2001 Zürich twelve-week leisure survey. In fall/winter 2003, together with the Ingenieurbüro Widmer, Frauenfeld, they conducted a new six diary survey in the rural and small town environment of Thurgau. The survey protocol and diary forms followed the Mobidrive example, but reflected the insights gained from the earlier surveys. The forms added questions about the social networks of the respondents, asked for planning horizons of the activities, whether the visited location was new, (See Figure 10) and also requested the group size of both the trip and the joint activity.

260 persons in 99 households participated, as planned. While recruitment was difficult, the respondents rarely abandoned the survey once they started. The trip rates are above the Swiss national averages and fatigue was not a problem.

The analysis of the data has just begun. It will focus on behavioural stability in activity involvement in respect to both timing and location of activities. The availability of the matching Mobidrive survey invites comparison between the urban context of the German respondents and the rural and small town context of Thurgau. The data will also be important to our on-going development of simulation models of activity scheduling and execution, as they allow the calibration of household interaction and scheduling models over time.

Figure 10 Share of location innovation by activity type [%]



3.4.3 Human activity spaces

The activity space idea – which was developed in parallel with a range of related approaches to describe individual perception, knowledge, and actual use of space in the 1960s and 1970s (see Golledge and Stimson, 1997 for a discussion) – attempts to represent the space containing places frequented by an individual over a period of time. Activity spaces are (geometric) indicators of the observed or realised daily travel patterns (see also Axhausen, 2002). This is emphasised here, because related concepts such as the action space (e.g. Horton and Reynolds, 1971), the awareness space (e.g. Brown and Moore, 1970), the perceptual space (e.g. Dürr, 1979), mental maps (e.g. Lynch, 1984) or space-time prisms (e.g. Lenntorp, 1976) describe the individual potentials of travel – based on spatial knowledge, mobility resources, the objective supply of opportunities etc.

Very few studies have concentrated on detailed measurement of individual activity spaces (Dijst and Vidakovic, 1997; Dijst, 1999)¹ so far. The recent availability of the multi-week Mobidrive travel data now makes it feasible to measure the extent of individual activity spaces and to test hypotheses about the usage of urban space and the multi-centred structure of our daily mobility (see Axhausen, Zimmermann,

¹ It should be noted that there is a range of studies of spatial behaviour and activity spaces on the aggregate level of sociodemographic groups or zones (see e.g. Kutter, 1973; Zahavi, 1979; Beckmann, Golob and Zahavi, 1983a, b; Holzapfel, 1980; Scheiner, 2001). Those studies use cross-sectional travel or time-use data.

Schönfelder, Rindsfuser and Haupt, 2002 for details of the study). This work has since been extended to other data sets, such as the 2003 Thurgau survey and two large GPS-based observational datasets from Sweden and Denmark. For the first time, it is possible to characterise human *home ranges* in a consistent way.

Figure 11 details basic features and benefits of the three main approaches developed to measure activity spaces. While measuring size is crucial, further attributes, like clusters and their structures, are also important. Further methods have been defined to characterise these internal structures.

The analysis of the measurements aims to identify behavioural differences between groups, e.g. socially disadvantaged groups or handicapped persons; to identify growth trends; to determine whether the structure of the environment has an impact; and to challenge the naïve assumptions behind the choice set definition in destination choice models. Furthermore, the methods have been transferred to characterise other point patterns, such as the inbound and outbound catchment areas of cities or firms.

3.4.4 Evaluating the quality of SP and RP forecasts with a national transport model

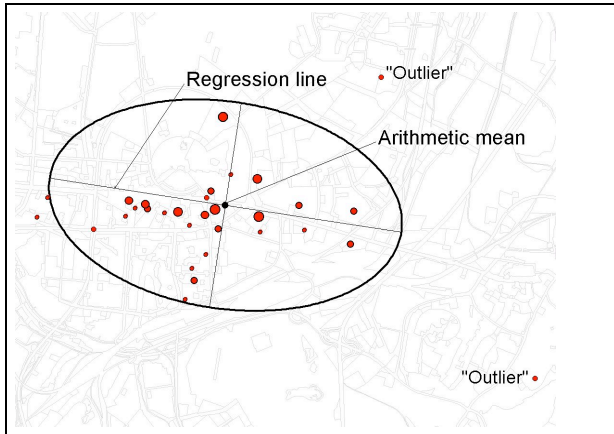
For the last two decades, Switzerland has not maintained national level transport demand models. The new skills available at the IVT since 1999 have allowed federal agencies and the Federal Railroads to build up this capability with our help. In addition, there was little local experience with either random utility models or stated preference data. Most forecasts were based on aggregate own-elasticities.

The introduction of a new train service provided an opportunity to advance the state of the national models, and to test the quality of stated preference (SP) versus reveal preference (RP) versus elasticity based forecasts. This methodological question had never been addressed at this level of spatial scale or complexity in the literature before. The train service changes are based on new tilting rolling stock, which allows for the reduction of travel times between Zürich, Neuchâtel, Lausanne, and Geneva. The project had to forecast the effect of those changes, using all three parameter sets, while simultaneously controlling for any change in the motorway system. The quality of the forecasts was assessed against the 2001 traffic counts, which was the target year of the forecasts.

The first part of the project was the calibration of the previous year's (1999) model system, based on earlier work of the group (Vrtic, Axhausen, Koblo and Vödisch, 2000). The parameters of the timetable-based public transport assignment model were estimated from a new SP route choice experiment. The survey, with a 70% response rate and 1500 respondents, also involved mode choice SP experiments. The variable sets of the mode and route choice experiment overlapped. The parameter estimates of the two experiments were very similar, which increased confidence in the results.

Figure 11 Measuring activity spaces: overview of basic concepts

a) Confidence ellipses



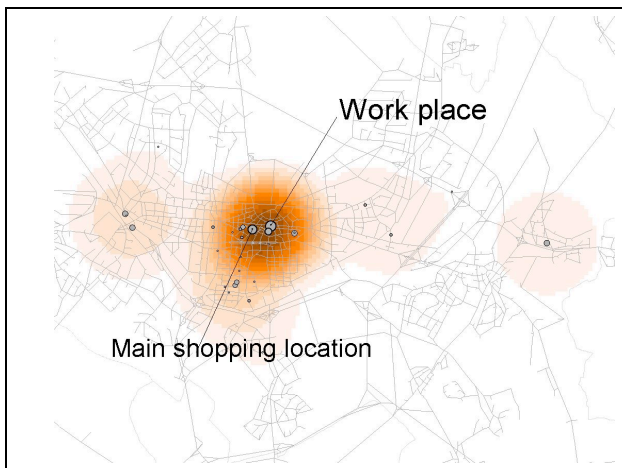
Basic approach: probability; smallest possible area in which a defined share of all visited locations is situated

Measure: size of area (plus direction of main axis)

Special feature/quality: shows dispersion of visited locations

Precedent in studies of the home ranges of animals (Jennrich, 19xx)

b) Kernel densities



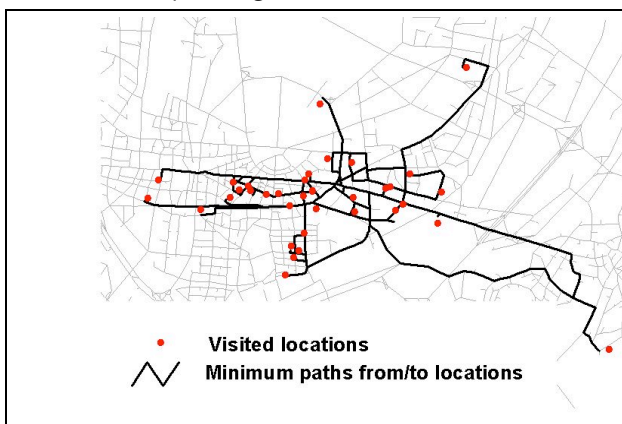
Basic approach: density surface; based on the proximity of activity locations

Measures: a) area covered exceeding a certain threshold value, b) "volume"

Special feature/quality: represents local clusters / sub-centres within individual activity space

Adaptation of an idea well established in many areas of spatial analysis.

c) Minimum spanning trees (networks)



Basic approach: smallest possible geometry based on all observed origin-destination relations

Measure: a) height of tree, b) size of buffered area around tree

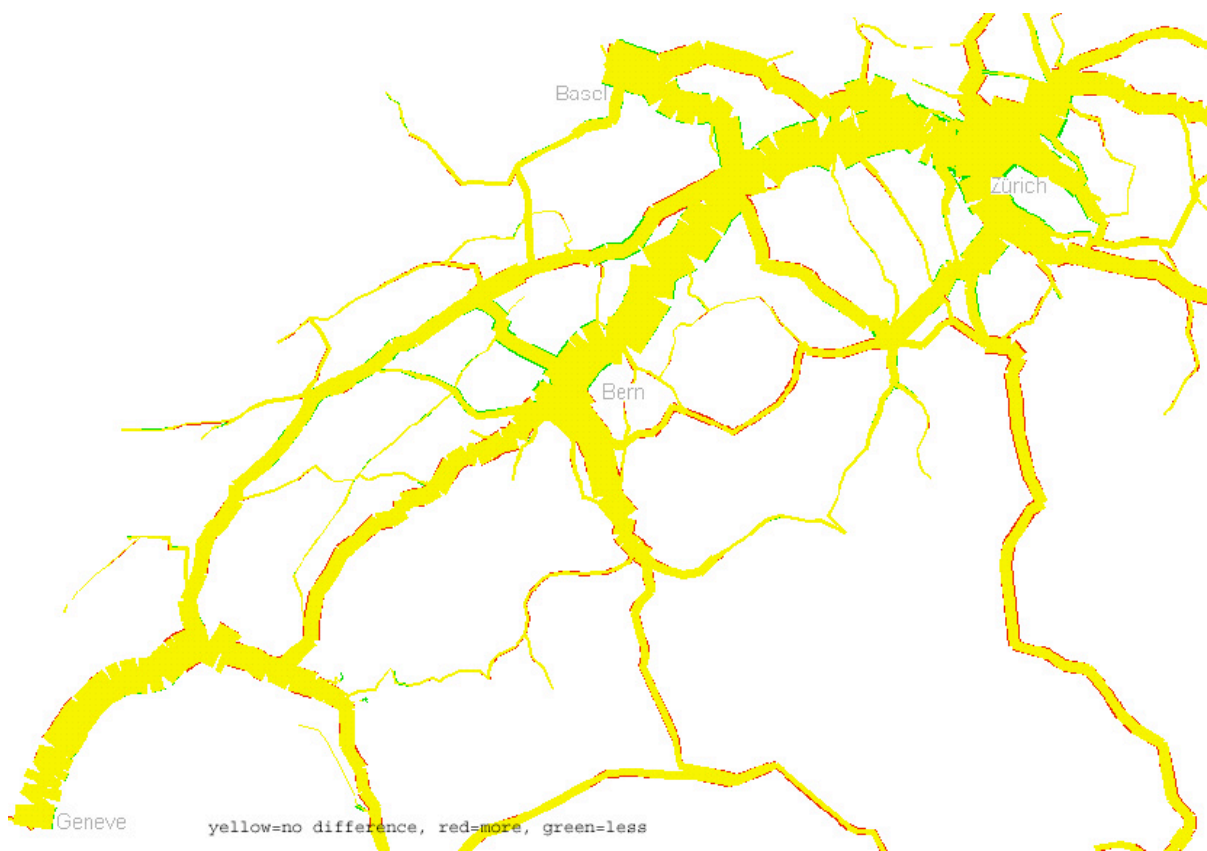
Special feature/quality: indicator for the perception of urban space

New approach consistent with the ideas of mental mapping.

Source: Schönfelder and Axhausen, 2003

The ‘before’ calibration, in which both existing car and public transport matrices were adjusted to fit the available counts, was of high quality. After expanding these 1999 matrices with a growth factor to 2001, the new route shares and mode choices were calculated three times using a pivot-approach (see Figure 12 for an example), once for each parameter set. The scale of the SP error distribution was not constrained against the RP distribution. The results were compared against individual counts, against corridor cross sections, as well as against the best estimate of total matrix volume, again estimated against all available 2001 counts. The SP based forecasts performed consistently best in each type of comparison. While the differences from other methods were not large in relative terms, the other forecasts showed some systematic errors, which obviously make application problematic.

Figure 12 Absolute differences in link volume: SP-based forecast and traffic counts [Railway network]



Source: Vrtic and Axhausen, 2004

In conclusion, the study provided the Federal Offices and the SBB with a well calibrated demand forecasting system, which has since been adopted in a number of sponsors' internal studies. It also provided further evidence of SP – based parameters' suitability for forecasting. However, the study raises the question whether the accepted practise of rescaling error distributions is appropriate. Could it be that the RP error distribution is actually less relevant for forecasting than the SP error distribution?

3.4.5 2003 Swiss value of travel time savings

For the first time, the VSS is preparing an official cost-benefit guideline for road investments and policies. As part of this effort, the ASTRA supported (via the SVI) a study of Swiss travel time savings values, also for the first time. In collaboration with Rapp Trans, John Bates, and Michel Bierlaire, the IVT organised, conducted, and analysed a specialised set of SP experiments. After two careful pre-tests, 1150 persons replied to route and mode choice experiments customised to the characteristics of a trip they described in an earlier RP interview.

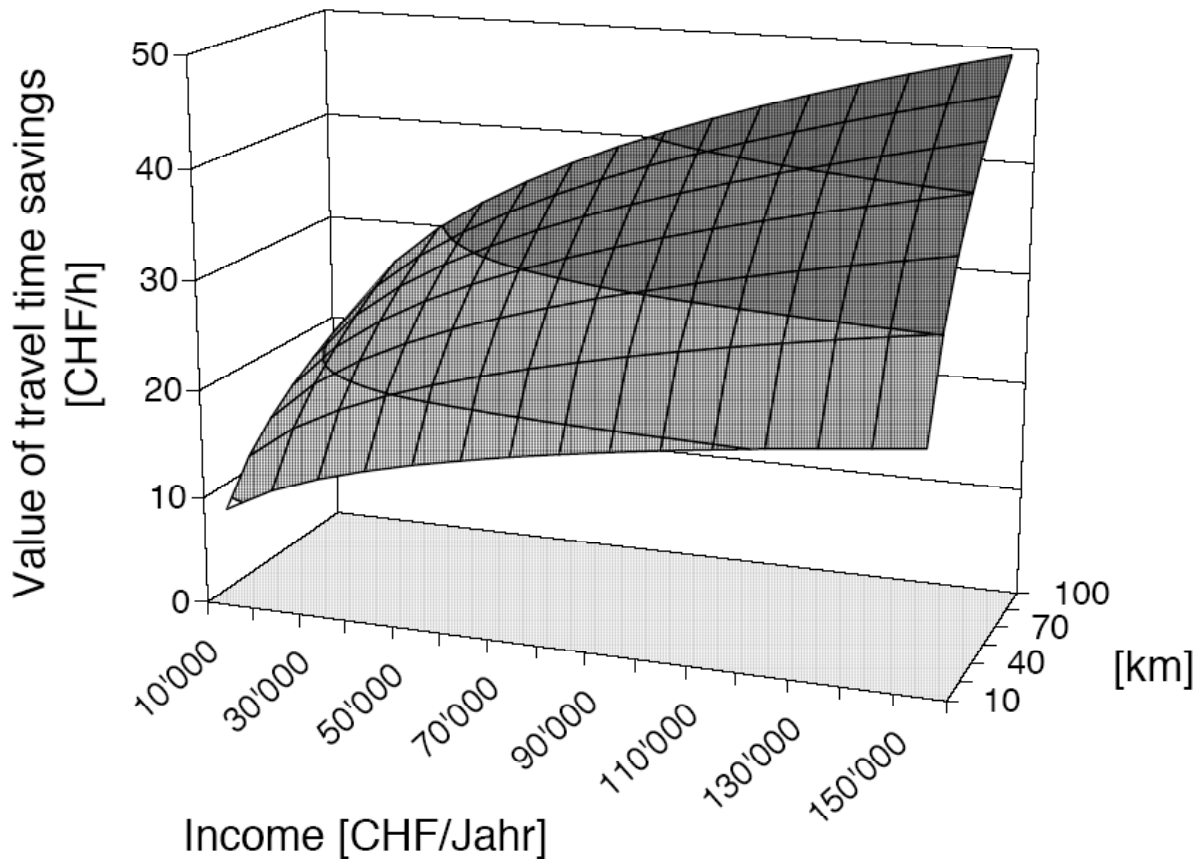
A very careful and comprehensive step-by-step modelling strategy was adopted, which increased the complexity by adding different groups of variables, and later by estimating joint models for the different SP data sets. All calculations were performed with Biogeme (see <http://roso.epfl.ch/biogeme>). Thus, the final utility function incorporates those blocks of variables that had improved model fit, tested individually with the basic model including only the stated choice experimental variables:

- Inertia variables (car and PT-season ticket ownership, mode of the reported trip)
- A random parameter formulation of the travel cost variable
- Elasticity of the cost parameters with respect to income and trip distance
- Interactions between travel time and trip purpose

The combination of these elements provided new insights into the structure of the travel time valuations. The effects of distance and income elasticities were particularly striking (see Figure 13 for the example of Swiss commuters). Against this background, discussions about short travel time savings are less relevant, because the impact of mean trip distance at a particular location is more decisive. In addition, the composition of the travellers with respect to their incomes needs to be given more weight. The tests performed of that hypothesis, (that short time saving should be given smaller weights), were negative.

The study also documents fully how markedly its sample had drifted away from a nationally representative sample due to various stages of self-selection: participation in the original interview, acceptance to participate in a second survey, and finally response to a complex SP exercise. The derivation of nationally representative VTTS therefore required a reweighing to the population mean with regards to trip length and income. The resulting mean VTTS values by trip purpose are equivalent to 30% to 50% of the average hourly wage.

Figure 13 2003 Value of travel time savings for Swiss commuters



Source: König, Abay and Axhausen (2004)

4 Professional activities

Members of the Institute are very involved in professional, generally unpaid, work in Switzerland and elsewhere. The two professional organisations SVI and VSS (especially the latter, due to its role as developer of national norms and guidelines and as a central funding body) play central roles, Mr Lindenmann is especially active here. Prof. Axhausen's role as the Associate editor of *Transport Research A* and earlier of multiple editorial boards is noteworthy on the international side.

Table 18 lists the most relevant activities of the Institute. The remaining activities are listed in Table 20 (5 pages) in Appendix B.

Table 18 List of Important professional activities

Organisation	Committee	Special function	Member	Period
	Steering Committee Postgraduate course Transport telematics at ETHZ		Spacek	2003-
10 th IATBR Conference	Organising committee	Chair	Axhausen	2001-2003
ASTRA	Project co-ordination ZEB-NS		Lindenmann	2002-2003
ASTRA	Impact of the 40t weight limit	Co-ordinator	Spacek	2001-2003
Baudirektion Kt. Zürich	Working group: Traffic control systems on Motorways		Spacek	2000-
BAV	Technical advisory group for AlpTransit (TBT-AT)		Weidmann	2004-
CCICE	Transport Working Group for China		Brändli	2001-2002
COST 339	Small Container	Chair	Wichser	2001
COST 345	Assessing Highway Structures		Lindenmann	2001-2003
COST 352	Driver Information Devices		Lindenmann	2003-
EPFL	International Steering Committee "17th International Conference on Magnetically Levitated Systems and Linear Drives"		Keller	2001-2002
Fürstentum Liechtenstein	Advisory group new modes		Wichser	2003
HSR	Advisory board of the department for spatial planning		Keller	2001-
HSW	External examining committee for public transport managers		Brändli	2001-2003
Austrian Transport Ministry	Expert commission Semmeringtunnel/Südbahnssystem		Brändli	2001-2002
SVI	Working group "Informatics in transport planning"		Vrtic	2001-
SVI	Board		Weidmann	2004-
Swissrail	Export committee		Brändli	2001-2003
SZF	Board		Keller	2001-2003
Transport Reviews	Book review editor		Axhausen	2001-2003

Table 18 List of Important professional activities (Continued)

Organisation	Committee	Special function	Member	Period
Transportation Research A		Associate editor	Axhausen	2003-
TRB/FGSV	Steering Committee, 2nd International Symposium on Highway Geometric Design		Spacek	1999-2000
VESPIO	Working group A14:30		Lindenmann	2003-
VÖV	Working group Bau		Wichser	2001-2003
VSS	EK 2.02 Transport planning	Chair	Axhausen	1999-
VSS	EK 8.03 Interfaces between rail and road		Brändli	2001-2003
VSS	FK 8 Public transport		Brändli	1999-2003
VSS	FK 7 Maintenance management	Chair	Lindenmann	2001-
VSS	Co-ordination committee		Lindenmann	2001-
WCTR	Scientific committee		Axhausen	2002-

5 Outlook and future plans

5.1 Starting point

Generation change in the Institute's leadership has dominated the review period. The uncertainties surrounding the appointment processes (e.g. succession within Transport systems: Public transport), the difficulties of new beginnings (Transport Planning, as well as Transport Systems: Road Transport), and the implementation of two new curricula (Diplom 1999 and BSc 2003) have influenced our work. The wider changes in the department, particularly the closing down of the ORL and the setting up the NSL, required close attention to position the IVT for a successful future. The on-going uncertainties about the appointment of a third professor in the next planning period (2008-2011) dampen activities in the affected group (Transport Systems: Road Transport), as they cloud the longer term perspectives. Still, the ETH funding base is sound overall and allows us to respond to the challenges ahead.

The policy environment outside ETH is, paradoxically, both promising and difficult for transport research. It is promising because policymakers and system operators need advice, guidance, and tools for a number of pressing issues: management and maintenance of transport systems at the capacity point, regulatory and ensuing organisational change, realisation of the transport safety objectives (VESIPO), forecasting of the land-use transport interaction in an environment guided by on-line information and real-time pricing signals², and project evaluation under budgetary and environmental justice constraints. It is diffi-

² The Swiss discussion on road pricing and tolling has been officially started by the relevant federal agency in May of this year.

cult, because research budgets of federal agencies have not only stopped growing, but are being cut as emphasis shifts to applied and development work.

The larger academic environment is favourable for transport-related research. It is a domain that interacts with many other research areas concerned with the understanding, modelling, and forecasting of everyday life. (e.g. urban design, land use planning, economics, sociology, computing, and operations research), and it flourishes through exchanges across disciplinary borders. Its engineering core is enriched by these processes, and it is able to address more and technically broader issues than ever before. Funding is as easy or difficult as ever and often depends on the availability of dedicated programme research, which can seldom be forecast. Thus, longer-term research agendas rely on funding sources that change at random intervals.

5.2 Strengths, weaknesses, opportunities, and threats (SWOT-analysis)

To avoid the repetitiousness inherent in a SWOT analysis, the following discussion brings together pertinent strengths, weaknesses, opportunities, and threats. We have omitted typical headings.

The Institute and its groups are well integrated into the Swiss administrative, professional, and research environment, as our numerous involvements in professional societies and the success of our short courses and seminars show. This strength is also a weakness, as these time-consuming involvements preclude engagement on the international scene. Still, the recent experiences of the groups Public Transport and Transport Planning have shown that a better balance is possible.

The groups of the IVT have been able to pursue certain topics over many years, such as driver behaviour, daily and longer term spatial behaviour and its modelling, and simulation of public transport time tables and networks. The IVT's national and international reputation has grown accordingly. The direction of these efforts is, on the other hand, too strongly focussed on a small number of senior staff, which creates imbalances and bottlenecks. It also creates threats, as the Institute cannot offer the non-professorial staff long term perspectives due to ETH personnel policy, which restricts the number of permanent senior staff per chair to one. The Institute has no tradition of incorporating post-doctoral students into its structure, which could alleviate this stress.

The planned arrival of a Master course in *Spatial Development and Infrastructure Systems* is a big opportunity for the Institute to improve the balance of its recruiting. Too often, the Institute has had to limit itself to recruitment among civil engineering students with transport specialisations, whose research skill set needed substantial supplements in statistics, operation research, computing, or GIS. The new Master course should allow us to provide students from diverse disciplinary backgrounds with good domain knowledge and understanding. This should help us, and the wider transport community, to satisfy the various skills requirements more easily. The Master course, as currently planned, can be taught with the available teaching resources, but without a third professor, problems could develop over the medium term. The additional teaching requirements will have to be fulfilled, whenever possible, by using elements from the Master course to avoid overloading the teaching staff. The Institute considers this additional teaching as an opportunity to build bridges to Mathematics, Environmental Sciences, Landscape Architectures, Computer Science, and other departments within ETH.

In the past, academic aspects of IVT research were somewhat neglected, as visible in the small number of PhDs granted and the low share of peer-reviewed publications before 1999. While this reflected the prevailing ethos of ETH engineering departments, the IVT has started to address this weakness in recent

years through sustained increases in the number of PhD students, publications, and involvement in international conferences and seminars. As an engineering institute in a non-English speaking country, it has the additional responsibility and commitment to publish its results in its native language (German), thus making them available to practitioners and the public who do not read academic or English language journals. ETH policy on the admission of PhD students is overly rigid in its acceptance of non-ETH graduates, in particular with accepting course work undertaken elsewhere. This often creates problems, as the Institute's PhD students sometimes have non-standard or non-engineering backgrounds. The Institute hopes that this issue, and the issue of the missing doctoral level courses, will be addressed in the near future, as our own MSc course can only partially solve this problem.

5.3 Future priorities and plans

The IVT's priorities reflect our mission and our wish to maintain the Institute as a strong research and teaching institution serving Switzerland and the wider professional community.

The implementation of the joint Master course *Spatial Development and Infrastructure Systems* from winter term 2006/07 is our first teaching priority. While the organisational form has not been finalised, nor the involvement of our colleagues from Architecture clarified at this point, we are optimistic that these issues can be resolved during the winter term. Our additional teaching involvements inside ETH will be structured and prepared afterwards. The short course and seminar activity will be maintained at current levels to ensure the on-going transfer of our work into practise.

The broad funding base of the Institute should allow us to maintain our research activities at current levels. The first priority is to increase the share of academic funding bodies, such as SNF or ETH, to support more fundamental and *blue skies* work required to advance the state-of-the-art of field. It would also provide more opportunities for academic publication. The issues to be addressed are (in alphabetical order):

- Extension of the on-going work on driver behaviour,
- Impact of transport telematics, and traffic control systems
- Integrating learning, personal biographies and social networks into travel forecasting models
- Integration of the work on the short term and long term dynamics through development-appropriate simulation models
- Investment strategies and cost-benefit analysis for infrastructure and rolling stock, and their implementation processes
- Maintenance management
- Methodologies for safety audits and safety forecasting
- New strategies for services and production in passenger and freight transport (inter-modality)
- Regulatory policy and policy strategies and their organisational implementation

While there is no need at the moment to re-organise the IVT fundamentally, the Institute needs to find ways of integrating post-docs into its structure and to open up possibilities for long-term employment for some of the younger senior staff. The Institute needs also needs to find better ways of integrating into the NSL to take advantage of this challenging, but potentially very productive collaboration with the IRL and the Architecture Department. Finally, the Institute will do its best to secure the appointment of the third professor, so that the successful balance of work in transport planning, as well as road and public transport system engineering can be maintained and developed.

Appendix A List of organisations

Table 19 List of organisations and committees (in German)

Abkürzung	Name	Ort
ASTRA	Bundesamt für Strassen	Berne
COST	Coopération européenne recherche scientifique et t.	Brussels
DfT	Department for Transport	London
DVWG	Deutsche Verkehrs-Wissenschaftliche Gesellschaft e.V.	Bergisch-Gladbach
EPFL	Ecole Polytechnique Fédérale de Lausanne	Lausanne
FDC	FrontBase Developer Connection	
FEHR	Forum of European National Highway Research Laboratories	Brussels
FGSV	Forschungsgesellschaft für das Strassen- und Verkehrswesen	Cologne/Berlin
FSU	Fachverband Schweizerischer Raumplanerinnen und Raumplaner	Berne
HSR	Hochschule für Technik	Rapperswil
HSW	Hochschule für Wirtschaft	Lucerne
IATBR	International Association for Travel Behaviour Research	Austin, TX
Ifmo	Institut für Mobilitätsforschung der BMW Gruppe	Berlin
ION-CH	Schweizerisches Institut für Navigation	Bern
ISCTSC	International Standing Committee for Transport Survey conferences	Sydney, NSW
LITRA	Informationsdienst für den öffentlichen Verkehr	Berne
MSE	Management der Strassenverhaltung, Ausschuss CH	Berne
SAP-VT	Schweizer Automatik Pool, Sektion Verkehrstelematik	Zurich
SGBF	Schweizerische Gesellschaft für Boden- und Felsmechanik	Zurich
SIA	Schweizerischer Ingenieur- und Architektenverein	Zurich
SLG	Schweizerische Lichttechnische Gesellschaft	Berne

Table 19 List of organisations and committees (continued)

Abkürzung	Name	Ort
STRC	Swiss Transport Research Conference	Ascona
SVI	Vereinigung Schweizerischer Verkehrsingenieure	Zurich
SVWG	Schweizerische Verkehrswissenschaftliche Gesellschaft	Berne
SVU	Schweizerischer Verband der Umweltfachleute	Berne
SZF	Schweizerische Vereinigung für Zukunftsforschung	Berne
TRB	Transportation Research Board	Washington
UEEIV	Union Europäischer Eisenbahn-Ingenieurverbände / Eurail Forum	Frankfurt
UITP	Public Transport International	Brussels
UNEP	United Nations Environment Programme	Paris
VAP	Verband Schweizerischer Anschlussgleis- und Privatgüterwagenbesitzer	Zurich
Verkehrssicherheitsrat	Schweizerischer Verkehrssicherheitsrat	Berne
VÖV	Verband öffentlicher Verkehr	Berne
VSS	Schweizerischer Verband der Strassen- und Verkehrsfachleute	Zurich
WCTR	World Conference on Transport Research	Lyon

Appendix B List of further professional activities

Table 20 Further professional activities (in German)

Organisation	Committee	Special function	Member	Period
ASTRA	Fachexpertengruppe Datenmodell Langsamverkehr		Jermann	2003
ASTRA	Expertenkommission Verkehrssicherheit		Lindenmann	1995-
ASTRA	MISTRA, Begleitkommission extern		Lindenmann	2001-2003
ASTRA	Projektteam und -resonanzgruppe „Mindestgeschwindigkeiten für schwere Motorwagen zum Gütertransport“		Spacek	2000-2002
ASTRA	Verkehrstelematik-Plattform Intelligent Transport Systems (ist-ch)	Vertreter ETHZ	Spacek	2004-
Baden Regio		Experte öV	Brändli	2001-2003
Degenstiftung		Beirat	Brändli	2001-2003
Dudelange LU	Binnenerschliessung öV	Experte	Brändli	2001
DVWG	Bezirksvereinigung Württemberg; Vorstand	Vorstandsmitglied	Kölble	2002-2003
DVWG	Junges Forum, Bezirksvereinigung Württemberg	Stellv. Sprecher	Kölble	2002-2003
ETH	Kommission „Zukunft ORL“		Axhausen	2001-2002
ETH	Arbeitsgruppe Bachelor/Master D-BAUG		Axhausen	2001-2003
ETH	Beirat des Collegium Helveticums		Axhausen	2001-2004
ETH	Nutzung / Erschliessung ETH Höggerberg		Brändli	2001
ETH	Arbeitsgruppe Bachelor/Master D-BAUG		Jermann	2002-2003
ETH	Wahlvorbereitungskommission Assistenzprofessur Infrastruktursysteme D-BAUG		Keller	2003
ETH	Unterrichtskommission D-BAUG		Schäffeler	2002-2003
ETH	Arbeitsgruppe Bachelor/Master D-BAUG		Stingelin	2001
ETH	Unterrichtskommission D-BAUG		Stingelin	2001
ETH	Departementskonferenz	Vertreter Dozenten	Wichser	2001-2003

Table 20 Further professional activities (Continued)

Organisation	Committee	Special function	Member	Period
Euro-Conference	Organisationskomitee "ITS and behavioral response"		Axhausen	2002-2003
Euro-Conference	Organisationskomitee "Progress in activity-based analysis"		Axhausen	2003-2004
FEHRL	Working Group „European Harmonisation of Friction and Unevenness Measurements“		Horat	2001
FGSV	AA 1.11 Messung und Vorausschätzung des Verkehrs		Axhausen	1999-2003
FGSV	AA 1.11.17 Methoden der Panelbefragung		Axhausen	2003
FGSV	AA 3.18 Theoretische Grundlagen des Strassenverkehrs		Axhausen	1999-2001
FGSV	AK 1.11.15 Methoden computergestützter Erhebungen zum individuellen Verkehrsverhalten		König	2001-2003
glow.das glattal	Arbeitsgruppe "Modellvorhaben Glattalstadt" im Rahmen der Agglomerationspolitik des Bundes	Experte	Keller	2002-2003
HSR	Expertenteam zur Evaluation des Moduls „Visuelle Kommunikation“ an den Abt. R und L		Keller	2003
HSR	Wahlausschuss Professur Raumplanung		Keller	2002-2003
HSR/FH Nürtingen	Internationaler Masterstudiengang „Regionalentwicklung/Regionalmanagement“		Keller	2003
Ifmo	Kuratorium		Axhausen	2001-2003
Innsbrucker Nordkettenbahnen GmbH	Projekt Nordkettenbahnen Neu	Vorsitzender, Projekt- und Arbeitsgruppe	Brändli	2002-2003
International Standing Committee for Transport Survey Methods Conferences	Organisationskomitee		Axhausen	1999-2002
ION-CH	Vertretung des IVT		Spacek	2001-
IVB	Projektgruppe Strassenbahnkonzept Innsbruck		Axhausen	2001
IVB	Projektgruppe Strassenbahnkonzept Innsbruck	Vorsitz	Brändli	2001

Table 20 Further professional activities (Continued)

Organisation	Committee	Special function	Member	Period
Journal of Advanced Transportation	Editorial Advisory Board		Brändli	2002
Kt. Glarus	Wettbewerb Entlastungs- und Erschliessungsstrasse Glarnerland	Preisrichter in Jury	Spacek	2001
Kt. Glarus	Projektleitung Erschliessungs- und Entlastungsstrasse Glarnerland	Projektleiter	Spacek	1999-2001
LITRA		Vorstand	Brändli	2001-2003
LITRA	Vorstand		Weidmann	2004-
Luxemburg	Künftiges öV-Angebot der Region Luxemburg-Süd	Experte	Brändli	2001-2003
Luxembourg	Überarbeitung Gesamtplanung Luxemburg	Experte	Brändli	2002-2003
Masterplan Bern	Projektwettbewerb Bahnhofplatz	Experte	Brändli	2001
Novatlantis, Nachhaltigkeit im ETH-Bereich; Kt. Basel-Stadt; FH beider Basel	Workshop "Nachhaltige Stadtentwicklung dank Kooperation"	Experte	Keller	2002-2003
ÖAMTC	Kuratorium Akademie		Axhausen	2003
Öst. Kolleg	Wissenschaftlicher Beirat		Axhausen	2001-2003
SAP-VT	Arbeitsgruppe Verkehrstelematik: Nationales Verkehrslenksystem		Weber	2002-2003
SBB	Zukunftswerkstatt Div. Personenverkehr '02	Experte	Keller	2002
Senatsverwaltung für Stadtentwicklung	Workshops Nahverkehrsplan Berlin		Brändli	2001
SLG	Informationsgruppe Öffentliche Beleuchtung		Lindenmann	1999-
SLG	FG 52: Tunnelbeleuchtung		Lindenmann	1999-2003
SMARTRAQ	Wissenschaftlicher Beirat		Axhausen	1999-2001
Stadt Bern	Ideenwettbewerb, Wankdorfplatz	Fachpreisrichter	Brändli	2001-2002
Stadt Chur, SBB, RhB	Studienauftrag Bahnhofplatz: Beurteilungsgremium	Fachpreisrichter	Brändli	2001
Stadt Solothurn/SBB/	Studienauftrag Bahnhofplatz	Fachpreisrichter	Brändli	2001
Stadttourismusverband Innsbruck	Wettbewerb Zentrumsnahe Anbindung Hungerburg (Nordkette Innsbruck)	Präsident der Jury	Brändli	2001-2002

Table 20 Further professional activities (Continued)

Organisation	Committee	Special function	Member	Period
STRC	Organisationskomitee		Axhausen	1999-2003
SVI	Experten-Workshop Zutrittssysteme Zürich-West	Experte	Keller	2002
SVI	Begleitkommission FA 71/00		Keller	2001-2003
SVI	Begleitkommission FA 01/515		Keller	2002-2003
SVI	Begleitkommission FA 513/01		Laube	2003
SVI	Begleitkommission FA 01/06		Laube	2001-2003
SVI	Begleitkommission FA 74/00		Laube	2001-2003
SVI	Begleitkommission FA 1999/322		Vrtic	2003
SVI	Begleitkommission FA 2000/386		Vrtic	2003
SVI	Begleitkommission FA 99/322		Vrtic	2001-2002
SVU	Umsetzung Kyoto-Protokoll und CO ₂ -Gesetz in der Schweiz		Carle	2003
SVWG	Vorstand		Axhausen	2001-2003
SZF	OK Tagung Zukunft Bildung		Keller	2002
SZF	OK Tagung „Risiko“		Keller	2003
SZF	OK Tagung „Wertewandel“		Keller	2003
Transport Reviews	Editorial Board		Axhausen	1999-2001
Transportation	Editorial Board		Axhausen	1999-2003
Transportation Research C	Editorial Board		Axhausen	1999-2003
TRB	A1Co2 Passenger Travel Demand Forecasting		Axhausen	1999-2004
TRB	A1Do8 Urban Transportation Data and Information Systems		Axhausen	1999-2004
TRB	3rd International Symposium on Highway Geometric Design	Länderdelegierter	Spacek	2004-
UEEIV	7. Kongress Eurailforum 2004 Spanien Wissenschaftliches Komitee		Brändli	2002-2003
UEEIV		Beirat	Brändli	2002-2003
UNEP	UNEP Mobility Forum	Experte	Carle	2003
Unterhalt 2000	Projektleitung ASTRA		Lindenmann	2001-

Table 20 Further professional activities (Continued)

Organisation	Committee	Special function	Member	Period
VAB	Schiedsgericht Einstellungsverträge SBB		Brändli	2002-2003
VBG	Stadtbahn Glattal	Experte	Brändli	2001-2002
Verkehrssicherheitsrat	Projektgruppe „Verkehrssicherheit innerorts“		Spacek	2001-2003
VÖV	Arbeitsgruppe Bau	Gast	Kohler	2001
VÖV	Regelwerk Technik der schweizerischen Eisenbahnen (POL RTE)	Leitung	Weidmann	2004-
VÖV	Komm. Güterverkehr, Projektteam Verbesserung Qualität G durch Produktionsprozesse G und Trassenmanagement		Wichser	2003
VÖV	Arbeitsgruppe Trambahnen	Ständiger Gast	Wichser	2001-2003
VSS	EK 2.04 Projektbearbeitung		Axhausen	2003
VSS	EK 3.08 Leistungsfähigkeit		Axhausen	2002-2004
VSS	FK 2 Planung und Projektierung		Axhausen	1999-2004
VSS	FK 3 Verkehrstechnik		Belopitov	2001-
VSS	EK 3.05 Gestaltung und Betrieb	Präsident	Belopitov	2001-
VSS	EK 3.04 Verkehrssicherheit		Doerfel	2003-
VSS	EK 5.03 Dimensionierung und Abnahme		Horat	2001
VSS	EK 3.08 Leistungsfähigkeit	Präsident	Koy	2002-
VSS	FK 3 Verkehrstechnik		Koy	2002-
VSS	EK 3.06 Verkehrsbeeinflussung HLS		Laube	2001-
VSS	EK 3.07 Verkehrsbeeinflussung HVS		Laube	2001-
VSS	EK 9.01 Grundlagen und Begriffe		Lindenmann	2003-
VSS	FK 9 Verkehrstelematik		Lindenmann	2001-
VSS	EK 7.01 Erhaltungsmanagement, Grundlagen		Schiffmann	2004-
VSS	EK 7.11 Eigenschaften der Fahrbahnoberfläche		Seiler	2003-
VSS	EK 2.10 Passiver Schutz		Shojaati	2001-2003

Table 20 Further professional activities (Continued)

Organisation	Committee	Special function	Member	Period
VSS	EK 2.05 Linienführung	Experte	Spacek	1991-
VSS	EK 2.06 Knoten	Experte	Spacek	1991-
VSS	EK 3.08 Leistungsfähigkeit	Experte	Spacek	2002-
VSS	EK 9.07 Fahrzeugführer-Unterstützung		Weber	2004-
VSS	EK 8.02 Grundlagen		Wichser	2003
VSS	EK 8.04 Kombiniertes Güterverkehr		Wichser	2001-2003
VSS	Koordinationskommission		Lindenmann	1999-
VSS	EK 3.04 Verkehrssicherheit		Lindenmann	2001-
VSS	EK 7.09 Gesamtbewertung im MSE	Präsident	Lindenmann	2001-
VWI	Kuratorium		Weidmann	2004-
Wettbewerb Schweizerhof	Jury (Preisgericht)		Lindenmann	2001-2003

Appendix C CVs of the senior staff in alphabetical order

Kay W. Axhausen (from March 1999)

Born 8. 10. 1958 in Heidelberg, German and Austrian citizen

Education

1984-1989	Universität Karlsruhe, Dr.-Ing (PhD) in Transport Planning
1982-1984	University of Wisconsin-Madison, M.S. in Civil Engineering
1978-1982	Universität Karlsruhe, B.Eng-equivalent in Civil Engineering

Professional experience

1999-	ETH Zürich, Full Professor for Transport Planning
1995-1999	Leopolds-Franzens-Universität, Innsbruck, Full Professor of Road Transport
1991-1995	Imperial College, London, Lecturer and Senior Lecturer
1989-1990	Transport Studies Unit, University of Oxford, Research and Senior Research Officer
1984-1989	Institut für Verkehrswesen, Universität Karlsruhe, Research Officer

Current major professional activities

2004	VSNU evaluation panel for architecture (TU Delft and Eindhoven), member, 2004
2003-	Transportation Research, Associate Editor
2003-	International Association for Travel Behaviour Research, chair
2002-	World Conference of Transportation Research, member, Scientific Steering Committee
2002-	Institut für Mobilitätsforschung, Berlin, Kuratorium, member, 2002-
2000-	VSS, chair, EK 2.02 Transport Planning
2000-	VSS, member, FK 2 Planning and Design
1996-	TRB, member, ADB40 Passenger Travel Demand Forecasting; ADC10 Urban Transportation Data

Peter Giger

Born 1945 in Zürich, Swiss citizen

Education

1981-1984	ETH Zurich, Dr. sc. techn. ETH
1965-1970	ETH Zurich, dipl. Bauing. ETH

Professional experience

1985-	ETH Zurich, IVT, (leading scientist and lecturer)
1979-1985	ETH Zurich, Institute for Road, Railway and Rock Construction (chef of the section Railway Construction)
1972-1979	Swiss Federal Railways (Project Manager for the Construction of new railway lines)
1970-1971	ETH Zurich, Institute for Statics and Construction (Assistant)

Peter Keller (until April 2004)

Born 6. 11. 1944 in Basel, Swiss citizen

Education

- | | |
|-----------|--|
| 1975–1977 | ETH Zürich, NDS Raumplanung (MSc Spatial Planning) |
| 1964-1970 | ETH Zürich, dipl.-ing. Architecture |

Professional experience

- | | |
|-----------|--|
| 1983- | ETH Zürich, IVT, Wissenschaftlicher Adjunkt (Senior Lecturer) for Spatial Planning |
| 1977-1983 | ETH Zürich, ORL, Oberassistent (Lecturer) for Planning Methods |
| 1970-1975 | Planungsbüro Ueli Roth, Architect and Planner |
| 1970-1971 | ETH Zürich, ORL, Assistant |

Major recent professional activities

- | | |
|-----------|--|
| 1998- | HSR Rapperswil, Department of Planning, member of the advisory council |
| 1982-1983 | City of Zürich, Jury member, urban design competition Rigiplatz |

Hans-Peter Lindenmann

Born 6.7.1946 in Gelterkinden, Kanton Basel-Landschaft, Swiss citizen

Education

- | | |
|-------------|-------------------------------|
| 1966 – 1971 | ETH Zurich, dipl. Bauing. ETH |
|-------------|-------------------------------|

Professional experience

- | | |
|-------------|--|
| 2002 - | ETH Zurich, Senior scientist and lecturer; chair of Transport Systems – Road Transport |
| 1990 – 2002 | ETH Zürich, Lecturer and senior scientist |
| 1998 | Visiting Lecturer at the Nanjing University of VR China, Transportation College (Prof. W. Huang) |
| 1978 - 1990 | ETH Zürich, Senior research officer |
| 1975 - 1978 | ETH Zürich, Research officer |
| 1971 - 1975 | Tiefbauamt Basel-Landschaft, Chief of the Section Road Design |

Current teaching

- | | |
|-------------|---|
| ETH | See list below |
| FHZ Lucerne | Road Design, Road Construction, Transportation Systems, 1984- |

Current major professional activities

- | | |
|-------------|---|
| 1996- | VSS, President of FK7, Road Maintenance, Chair of several EK's |
| 2004 - | COST 352, In-vehicle Information Systems, member of the Swiss Group |
| 1998 – 2002 | COST 345, Assessing Highway Structures, MC-Member |
| 1982 – 1996 | VSS, Vice – President of the FK3, Traffic and Transportation |
| 1998 - | VSS, member FK9, Transportation and Telematics |
| 1996 - | Road Safety expert in UVEK - Committee |
| 1994 - | Traffic and Transportation Safety expert in UVEK Committee VESIPO |
| 1992 - | Road Maintenance expert in ASTRA Committee MSE |

Peter Spacek

Born 8.6.1946 in Brünn (Czech republic), Swiss citizen

Education

1972-1973	ETH Zürich, dipl. Bauing. ETH
1965-1969	Technical University Brünn, Civil and geomatics engineering

Professional experience

2002-	ETH Zurich, Senior scientist and lecturer; chair of Transport Systems – Road Transport
1998-	ETH Zürich, IVT, Lecturer
1987-1998	ETH Zürich, IVT, Senior scientist
1978-1987	ETH Zürich, IVT, Senior research officer
1975-1978	ETH Zürich, IVT, Research officer
1969-1972	Stadt Winterthur, Urban Planning Department, Traffic engineer

Current teaching: See list below

Major recent professional activities

2004-	Third International Symposium on Highway Geometric Design, member of the scientific committee and corresponding author of TRB committee A3A08 Operational Effects of Geometrics
1999-2003	Co-ordinator of the ASTRA research on the impacts of the 40t-weight limits on road performance
2000-	Scientific advisor for the implementation of the new traffic control system for the trunk road and motorway system of the Kanton Zürich
1990-1996	Chair of VSS EKs „Alignment“ and „Intersections“

Ulrich Weidmann (from June 2004)

Born 1963 in Chur, Swiss citizen

Education

1988-1994	ETH Zurich, Dr. sc. ETH
1983-1988	ETH Zurich, dipl. Bauing. ETH

Professional experience

2004-	ETH Zurich, Professor for Transport Systems
2003-2004	Head of business unit Engineering Railway Systems, Swiss Federal Railways, Infrastructure division.
2001-2002	Head of department Engineering Railway Systems, Swiss Federal Railways, business unit Facility Management
1999-2000	Deputy head of business unit Regional Transportation, Swiss Federal Railways; head of department Strategies and Development respectively Planning
1998	Head of department Regional Transportation, Swiss Federal Railways/Passenger Transport division
1995-1998	Planification Engineer at Swiss Federal Railways, Passenger Transport division; from 1997 on deputy head of Planification department
1994-1995	Planification Engineer at Swiss Federal Railways, Operating division
1988-1994	Scientific collaborator at ETH Zürich, IVT

Jost Wichser, dipl. Bauing. ETH

Born 1947 in Glarus, Swiss citizen

Education

1967-1973 ETH Zurich, dipl. Bauing. ETH

Professional experience

1989- ETH Zurich, IVT (leading scientist and lecturer)
 1984-1989 Rhetian Railways Chur (chief of planning and project and track management)
 1978-1983 Rhetian Railways Chur (track maintenance manager)
 1974-1978 Rhetian Railways Chur (project engineer for infrastructure)
 1973-1974 Stadtplanungsamt Zurich (traffic engineer in planning departement)

Major recent professional activities

1990- VöV Arbeitsgruppe Bau, guest member
 1990- VöV Arbeitsgruppe Trambahnen, member
 1997-2003 Braunwaldbahnen AG, board chairman
 1998-2001 COST 335 Small Container, chairman
 2001- VSS EK 8.02 Special Questions Public Transport, member
 2001- VSS EK 8.04 Freight Transport, member

Milenko Vrtic (from July 2004)

Born October 13, 1965, Banja Luka, Bosnian citizen

Education

2004 PhD in transport planning, TU Dresden
 1994-1990 University of Sarajevo, MA Traffic Engineering

Professional experience

1999- ETH Zürich, IVT, Research officer
 1993-1999 Prognos AG, Basel; Transport planner
 1991-1992 Municipal public transport operator, Banja Luka; Traffic engineer and group manager

Major recent professional activities

2002- SVI Committee „Computer science in the traffic planning“, member

Appendix D 2003/04 lecturing responsibilities by group

Table 21 Transport systems - Road transport: Courses taught in 2003/04

Course	Sem	Class	hours /week	Title	Lecturer	No. of Students
CE, G+P	2	A/S	2.0	Project study	Spacek; Linden- mann	20
CE, G+P	4	L	1.5	Transport systems II	Spacek; Linden- mann	88
CE	5	L	1.0	Network models and simulation	Linden- mann	8
CE	5	L	1.0	Traffic engineering	Spacek	9
CE	6	L	1.0	Design of transport infrastructures	Spacek	13
CE	6	L	2.0	Traffic control systems	Spacek; Linden- mann	5
CE	7	L	1.3	Construction and maintenance of transport infrastructure	Linden- mann	12
CE	8	L	2.0	Environmental impact	Linden- mann; Spacek	10
CE	8	L	1.3	Maintenance management	Linden- mann	10

Table 22 Transport systems – Public transport: Courses thought in 2003/04

Course	Sem	Class	hours /week	Title	Lecturer	No. of Students
CE	4	L	1.5	Transport systems II	Giger	88
CE	5	L	1.0	Traffic Engineering	Giger	12
CE	5	L	2.0	Operations Research	Giger	9
CE	6	L	1.0	Design of transport infrastructures	Giger	12
CE	7	L	1.0	Construction and maintenance of transport infrastructure	Wichser	13
CE	7	L	2.0	Operations- and infrastructure management	Wichser	10
CE	8	L	0.7	Maintenance management	Wichser	12
CE	8	L	1.0	Transport logistics	Wichser	10
CE	8	L	2.0	Selected topics	Wichser	10

Table 23 Transport planning: Courses thought in 2003/04

Course	Sem	Class	hours /week	Title	Lecturer	No. of Students
NDK Entscheidungsfaktor Raum	1	L	0.7	Module Transport Planning	Axhausen	30
NDS Raumplanung	1	L	0.7	Module Transport Planning	Axhausen	25
NDS Landschaftsarchitektur		L	0.7	Module Transport	Axhausen	15
CE,G+P	3	L	2.0	Transport Planning	Axhausen	80
CE	6	Lab	2.0	Measurement and Modelling Laboratory	Axhausen	3
CE	6	L	2.0	Transport Concepts	Axhausen	10
D-UMNW		L	0.7	Technology and the Environment	Axhausen	60
CE	7	L	2.0	Measurement and Modelling	Axhausen	3
CE	5	L	1.0	Network models and simulation	Axhausen	8
CE	5	L	2.0	Settlement, Environment, Transport	Keller	10

Appendix E List of key publications by group

E.1 Transport systems – Road transport (by author)

- Lindenmann, H.P. (2000) Erhaltungsmanagement Verkehrsanlagen, Optimierung und Baustellenkoordination (Maintenance and asset management, optimization and co-ordination of road works), *Strasse und Verkehr*, 86 (12) 443-445.
- Lindenmann, H.P. and Th. Koy (2000) Beurteilung der Auswirkungen von Zonen Signalisationen (Tempo 30) in Wohngebieten auf die Verkehrssicherheit (Evaluation of the traffic safety effects of 30 km/h signposting in residential areas), *Strasse und Verkehr*, 86 (9) 342-347.
- Pitzinger, P. and P. Spacek (2001) Erfahrungen mit Rampenbewirtschaftungen in der Schweiz (Experiences with ramp metering in Switzerland), *Strasse und Verkehr*, 87 (2) 46 – 54, VSS Zürich.
- Spacek, P. (1999) Geschwindigkeiten in Kurven (Speeds in Curves), *Strasse und Verkehr*, 85 (5) 84-88.
- Spacek, P. (1999) Spurverhalten und Unfallgeschehen in Kurven (Driver behaviour and accident occurrence in curves), *Strassenverkehrstechnik*, 43 (2) 68-75.
- Spacek, P. (2000) Spannungsfeld Strassenentwurf und Verkehrspolitik am Beispiel der Schweizerischen Alpenübergänge (Highway geometric design and transport politics as an area of tension: The example of the Swiss alpin passes), in *Festschrift Prof. G. Weise*, 49-60, Fakultät Verkehrswissenschaften "Friedrich List", TU Dresden, Dresden.
- Spacek, P. (2000) Track behavior and accident occurrence in curves on two-lane highways in rural areas, Proceedings of the 2. International Symposium Highway Geometric Design, 288-299, TRB, Washington, D.C.
- Spacek, P. (2000) Trassierungselemente und Geschwindigkeit (Elements of alignment and speed), *Strasse und Verkehr*, 86 (12) 434-439.
- Spacek, P. (Forthcoming) The basis of the Swiss design standard for roundabouts, *Transportation Research Record*.
- Spacek, P. (Forthcoming) The influence of speeds on the design standards in Switzerland, *Transportation Research Record*.

E.2 Transport systems (by author)

- Brändli, H. (2000) Verkehrsverlagerung im europäischen Alpen transit, *Die Verkehrswirtschaft*, (12) 1417.
- Brändli, H. (2002) Die Zukunft der Eisenbahn aus verkehrswissenschaftlicher Sicht, *ZEVrail Glasers Annalen*, 125 (6) 252-260.
- Hofer, M. (1999) Bonus/Malus System zur Gewährleistung der Betriebsqualität auf dem für den freien Netzzugang geöffneten SBB-Netz, *Schriftenreihe*, 122, IVT, ETH Zürich, Zürich.
- Hürlimann, D. (2002) Objektorientierte Modellierung von Infrastrukturelementen und Betriebsvorgängen im Eisenbahnwesen. *Schriftenreihe*, 125, IVT, ETH Zürich, Zürich.
- Hürlimann, D. (2003) RailML, Ein generelles Austauschformat für Eisenbahndaten. *Sonderausgabe Schriftenreihe DVWG "Transport and Logistics"*, 22-26, DVWG, Berlin.
- Kohler, M. (2002) New insight into track Modulus of ballast track. *Railway Engineering*, 1 (7) 34
- Wichser, J. (2002) Technical and operational developments needed for a better success of intermodal freight transport, *Rail Transport Journal, Volume XI*, 31-35, Institute for Rail Transport New-Dehli,
- Wichser, J. and U. Schäffeler (2003) Report on Modules, Materials & IPR. *Deliverable 4 of PORTAL project concerning Promotion of Results in Transport Research and Learning*, IVT, ETH Zürich, Zürich.
- Wichser, J. et al. (2001) COST 339 Small Containers, final report, Commission of the European Communities, Luxemburg.
- Wichser, J., M. Engel, M. Hecht and T. Rickenberg (2000) Mittelflur-Reisezugwagen. Ein neuartiges Waggon- und Zugskonzept für Betreiber und Fahrgäste, *Eisenbahn Ingenieur*, 51 (2) 16-22

E.3 Transport planning – Public transport (by author)

- Axhausen, K.W. (2000) Geographies of somewhere: A review of urban literature, *Urban Studies*, **37** (10) 1849-1864.
- Axhausen, K.W. (2004) Social networks and travel: Some hypotheses, in K. Donaghy (ed.) *Social Dimensions of Sustainable Transport: Transatlantic Perspectives*, Ashgate, Aldershot.
- Axhausen, K.W., T. Haupt, B. Fell and U. Heidl (2002) Searching for the rail bonus: Results from a panel SP/RP study, *European Journal of Transport and Infrastructure Research*, **1** (4) 353-369.
- Axhausen, K.W., J.-L. Madre, J.W. Polak and Ph.L. Toint (eds.) (2003) *Capturing Long Distance Travel*, Research Science Press, Baldock.
- Axhausen, K.W., M. Tschopp and P. Fröhlich (2003) Zur Entwicklungsdynamik der Verkehrsnachfrage im Personenverkehr: Hintergründe und Erwartungen, *VDI Berichte*, **1799**, 3-20, VDI Verlag, Düsseldorf.
- Axhausen, K.W., A. Zimmermann, S. Schönfelder, G. Rindsfuser and T. Haupt (2002) Observing the rhythms of daily life: A six-week travel diary, *Transportation*, **29** (2) 95-124.
- Schlich, R. and K.W. Axhausen (2003) Habitual travel behaviour: Evidence from a six-week diary, *Transportation*, **30** (1) 13-36.
- Schönfelder, S. and K.W. Axhausen (2003) Activity spaces: Measures of social exclusion?, *Transport Policy*, **10** (4) 273-286.
- Simma, A. and K.W. Axhausen (2001) Structures of commitment and mode use: A comparison of Switzerland, Germany and Great Britain, *Transport Policy*, **8** (4) 279-288.
- Vrtic, M. und K.W. Axhausen (2003) Überprüfung von Prognoseansätzen im Personenverkehr: Ergebnisse einer Vorher-/Nachheruntersuchung, *Internationales Verkehrswesen*, **55** (9) 392-399.

Appendix F Additional References

- Axhausen, K.W. (2002) A dynamic understanding of travel demand: A sketch, *Arbeitsberichte Verkehr- und Raumplanung*, 119, Institut für Verkehrsplanung, Transportsysteme, Strassen- und Eisenbahnbau, ETH, Zürich.
- Axhausen K.W., A. Zimmermann, S. Schönfelder, G. Rindsfuser and T. Haupt (2002) Observing the rhythms of daily life: A six-week travel diary, *Transportation*, 29 (2) 95-124.
- Brown, L.A. and E.G. Moore (1970) The intra-urban migration process: A perspective, *Geografiska Annaler*, 52B (1) 1-13.
- Dijst, M. and V. Vidakovic (1997) Individual action space in the city, in Ettema, D. and H.J.P. Timmermans (eds.) *Activity Analyses*, 117-134, Pergamon, London.
- Dijst, M. (1999) Two-earner families and their action spaces: A case study of two dutch communities, *GeoJournal*, 4 (3) 195-206.
- Downs, R. and D. Stea (1977) *Maps in Mind – Reflections on Cognitive Mapping*, Harper & Row, New York.
- Dürr, H. (1979) *Planungsbezogene Aktionsraumforschung – Theoretische Aspekte und eine Pilotstudie*, Beiträge der Akademie für Raumforschung und Landesplanung, 34, Hannover.
- Golledge, R.G. and R.J. Stimson (1997) *Spatial Behavior*, The Guilford Press, New York.
- Lenntorp, B. (1976) *Paths in space-time environment: a time geographic study of possibilities of individuals*, Lund Studies in Geography, Ser. B. Human Geography, 44, Department of Geography, The Royal University, Lund.
- Lynch D. (1960) *The Image of the City*, MIT-Press, Cambridge.
- Vrtic, M. and K.W. Axhausen (2004) Forecast based on different data types: A before and after Study, paper presented at the 9th WCTR, Istanbul.
- Vrtic, M. K.W. Axhausen, R. Koblo and M. Vödisch (2000) *Entwicklung bimodales Personenverkehrsmodell als Grundlage für Bahn 2000, 2. Etappe, Herleitung einer Modal-Split Funktion*, report to the SBB and the Dienst für Gesamtverkehrsfragen, IVT, ETH Zürich and Prognos AG, Zürich and Basel.

*Publications and presentations
January 1999 – June 2004*

Publications and presentations: January 1999 to June 2004

October 2004

Abstract

This list includes all publications and presentations of IVT members of staff.

Keywords

Literature list, presentations, IVT, ETH Zürich

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1 Swiss norms based on IVT research

1.1 Transport Systems: Road Transport

- VSS (1981, 1991) SN 640 080 a bzw. SN 640 080 b, Projektierung: Geschwindigkeit als Projektierungselement, VSS, Zürich.
- VSS (1986) SN 640 138a, Linienführung: Zusatzstreifen in Steigungen und Gefällen, VSS, Zürich.
- VSS (1988, 1995) SN 640 123 bzw. SN 640 120, Linienführung: Quergefälle in Geraden und Kurven, Quergefältsänderung, VSS, Zürich.
- VSS (1991) SN 640 081, Projektierung, Grundlagen: Übergangsempfehlungen zu SN 640 090, SN 640 110, SN 640 138 und SN 640 147, VSS, Zürich.
- VSS (1992) SN 640 090 a, Projektierung: Sichtweiten, VSS, Zürich.
- VSS (1992) SN 640 273, Knoten: Sichtverhältnisse, VSS, Zürich.
- VSS (1996) SN 640 100 a, Linienführung: Elemente der horizontalen Linienführung, VSS, Zürich.
- VSS (1996) SN 640 135, Linienführung: Mittelstreifenüberfahrten, VSS, Zürich.
- VSS (1998) SN 640 250, Knoten: Grundlagennorm, VSS, Zürich.
- VSS (1999) SN 640 262, Knoten: Knoten ohne Kreisverkehr, VSS, Zürich.
- VSS (1999) SN 640 018, Leistungsfähigkeit, Verkehrsqualität, Belastbarkeit: Freie Strecken auf Autobahnen, VSS, Zürich.
- VSS (1999) SN 671 831, Strassenverkehrstelematik: Grundlagennorm, VSS, Zürich.
- VSS (1999) SN 640 007, Strassenverkehrsunfälle: Unfallzahlen, Unfallstatistiken, Unfallkosten, VSS, Zürich.
- VSS (2000) SN 671 832, Strassenverkehrstelematik: Begriffssystematik, VSS, Zürich.
- VSS (2000) SN 640 008, Strassenverkehrsunfälle: Analyse von Unfallzahlen, Unfallstatistiken, Vergleiche und Entwicklungen, VSS, Zürich.
- VSS (2000) SN 640 263, Knoten: Knoten mit Kreisverkehr, VSS, Zürich.
- VSS (2001) SN 640 010, Strassenverkehrsunfälle: Unfallanalysen sowie Kurz-, Gefahren- und Risikoanalysen, VSS, Zürich.
- VSS (2003) SN 640 138a, Linienführung: Zusatzstreifen in Steigungen und Gefällen, VSS, Zürich.
- VSS (2003) SN 640 904, Erhaltungsmanagement (EM), Gesamtbewertung von Fahrbahnen, Kunstbauten und technischen Ausrüstungen: Substanz- und Gebrauchswerte, VSS, Zürich.
- VSS (2003) SN 640 521c, Ebenheit: Qualitätsanforderungen, VSS, Zürich.
- VSS (2003) SN 640 925b, (Anhang) Erhaltungsmanagement der Fahrbahnen (EMF): Anleitung zur visuellen Zustandserhebung und Indexbewertung mit dem Schadenkatalog, VSS, Zürich.
- VSS (2003) SN 640 925b, Erhaltungsmanagement der Fahrbahnen (EMF): Zustandserhebung und Indexbewertung, VSS, Zürich.
- VSS (2004) SN 640 273a, Knoten: Sichtverhältnisse, VSS, Zürich.
- VSS (2004) SN 640 263a, Knoten: Knoten mit Kreisverkehr, VSS, Zürich.
- VSS (2004) SN 640 900a, Erhaltungsmanagement (EM), Grundnorm, VSS, Zürich.

2 Lecture notes

2.1 Transport Systems: Road Transport

Dietrich, K. and P. Spacek (1996, 1999) Verkehrsbeeinflussung (Traffic management), Lecture notes, IVT, ETH Zürich, Zürich.

Lindenmann, H.P. (2003) Bau und Erhaltung von Verkehrsanlagen (Construction and maintenance of traffic facilities), Lecture notes, IVT, ETH Zürich, Zürich.

Lindenmann, H.P. (2003) Verkehrsauswirkungen, Teil: Verkehrsauswirkungen auf die Umwelt (Environmental impact of traffic, part: Traffic effects on environment), Lecture notes,, IVT, ETH Zürich, Zürich.

Lindenmann, H.P. (2004) Erhaltungsmanagement (Maintenance management), Lecture notes,, IVT, ETH Zürich, Zürich.

Lindenmann, H.P. and P. Spacek (2001) Verkehr II: Betrieb und Erhaltung von Verkehrssystemen, Teil Individualverkehr (Regulation and maintenance of traffic systems, part: Individual traffic), IVT, ETH Zürich, Zürich.

Lindenmann, H.P. and P. Spacek (1991, 1999) Verkehrskreisel (Roundabouts), Zusammenstellung bisheriger Erkenntnisse, Lecture notes,, IVT, ETH Zürich, Zürich.

Spacek, P. (2001) Verkehrstechnik GZ (Traffic engineering), Teil Individualverkehr, Lecture notes,, IVT, ETH Zürich, Zürich.

Spacek, P. (2003) Verkehrsauswirkungen, Teil: Sicherheit von Verkehrsanlagen (Environmental impact of traffic, part: Road Safety), Lecture notes,, IVT, ETH Zürich, Zürich.

Spacek, P. (2004) Entwurf von Strassen GZ (Geometric highway design), Lecture notes, IVT, ETH Zürich, Zürich.

Spacek, P. and H.P. Lindenmann (2002) Verkehrsbeeinflussungssysteme (Traffic control systems), Lecture notes, IVT, ETH Zürich, Zürich.

2.2 Transport Systems: Public Transport

The Group maintains a system of lecture notes for individual lectures or groups of lectures which are distributed as appropriate

2.3 Transport planning

The Group maintains a website to distribute the overheads for the required course on transport planning (see <http://www.ivt.ethz.ch/education/verkehrsplanung>), where the students also find associated notes and papers.

3 Refereed journal papers

3.1 Transport Systems: Road Transport

Spacek, P. (forthcoming) The basis of the Swiss design standard for roundabouts, *Transportation Research Record*.

Spacek, P. (forthcoming) The influence of speeds on the design standards in Switzerland, *Transportation Research Record*.

3.2 Transport Planning

Axhausen, K.W. (2000) Geographies of somewhere: A review of urban literature, *Urban Studies*, **37** (10) 1849-1864.

Axhausen, K.W. and P.G. Brandl (1999) The dynamics of LRT growth: the case of Karlsruhe since 1975, *Transport Reviews*, **19** (3) 221-240.

Axhausen, K.W., T. Haupt, B. Fell and U. Heidl (2002) Searching for the rail bonus: Results from a panel SP/RP study, *European Journal of Transport and Infrastructure Research*, **1** (4) 353-369.

Axhausen, K.W., A. Simma and T. Golob (2001) Pre-commitment and usage: cars, season-tickets and travel, *European Research in Regional Science*, **11**, 101-110.

Axhausen, K.W., A. Zimmermann, S. Schönfelder, G. Rindsfuser and T. Haupt (2002) Observing the rhythms of daily life: A six-week travel diary, *Transportation*, **29** (2) 95-124.

Bhat, C.R., T. Frusti, H. Zhao, S. Schönfelder and K.W. Axhausen (2004) Intershopping duration: An analysis using multi-week data, *Transportation Research*, **38B** (1) 39-60

Bhat C.R., A. Sivakumar and K.W. Axhausen (2003) An analysis of the impact of information and communication technologies on non-maintenance shopping activities, *Transportation Research*, **37B** (10) 857-881.

Brandl, P. and K.W. Axhausen (1999) Karlsruhe 1975-1995: a case study of LRT development, *Transportation Research Record*, **1623**, 155-164.

Frusti, T., C.R. Bhat and K.W. Axhausen (2003) An exploratory analysis of fixed commitments in individual activity-travel patterns, *Transportation Research Record*, **1807**, 101-108.

Köll, H., M. Bader and K.W. Axhausen (2003) Driver behaviour during flashing green before amber: A comparative study, *Accident Analysis and Prevention*, **36** (2) 273-280.

Kreitz, M., K.W. Axhausen, K.J. Beckmann and M. Friedrich (2002) Mobjiplan: an Internet-based personal mobility advisor, *Transport Policy*, **9** (2), 155-168.

Raney, B., N. Cetin, A. Völlmy, M. Vritc, K.W. Axhausen and K. Nagel (2003) An agent-based microsimulation model of Swiss travel: First results, *Networks and Spatial Economics*, **3** (1) 23-42.

Schlich, R. and K.W. Axhausen (2003) Habitual travel behaviour: Evidence from a six-week travel diary, *Transportation*, **30** (1) 13-16.

Schlich, R., S. Schönfelder, S. Hanson and K.W. Axhausen (2004) The structures of leisure travel: Temporal and spatial variability, *Transport Reviews*, **24** (4) 219-228

Schönfelder, S. and K.W. Axhausen (2003) Activity spaces: Measures of social exclusion?, *Transport Policy*, **10** (4), 273-286.

- Simma, A. and K.W. Axhausen (2001) Structures of commitment and mode use: A comparison of Switzerland, Germany and Great Britain, *Transport Policy*, 8 (4) 279-288.
- Simma, A. and K.W. Axhausen (2002) Within-household allocation of travel: The Case of Upper Austria, *Transportation Research Record*, **1752**, 69-75.
- Simma, A. and K.W. Axhausen (2004) Interactions between travel behaviour, accessibility and personal characteristics: The case of the Upper Austria, *European Journal of Transport and Infrastructure Research*, **3** (2) 179-198.
- Simma, A and K.W. Axhausen (2004) Commitments and modal usage: An analysis of German and Dutch panels, *Transportation Research Record*, **1854**, 22-31.
- Widmer J.-P., and C.-Hidber (2000) Effects of rail stations at airports in Europe, *Transportation Research Record*, **1703**, 90-97.

4 Refereed papers in books and proceedings

4.1 Transport Systems: Road Transport

Spacek, P. (2000) Track behavior and accident occurrence in curves on two-lane highways in rural areas, *Proceedings of the 2. International Symposium Highway Geometric Design*, 288-299, TRB, Washington, D.C.

4.2 Transport Planning

Axhausen, K.W. (1999) Non-response and data yield: Experiences from Austria and France, Paper presented at International Conference on Non-Response in Surveys 1999, Portland, October 1999.

Axhausen, K.W. (1999) Surveying long-distance travel: effects of survey contexts and protocols, in Statistics Sweden (ed.), *Official Statistics in a Changing World*, Proceedings of the 3rd International Conference on Methodological Issues in Official Statistics, 141-149, Statistics Sweden, Stockholm.

Axhausen, K.W. (2000) Definition of movement and activity for transport modelling, in D.A. Hensher and K.J. Button (eds.) *Handbook of Transport Modelling*, I, 271-284, Elsevier, Oxford.

Axhausen, K.W. (2000) Presenting and preserving travel data, in P.M. Jones and P. Stopher (eds.) *Transport Surveys: Raising the Standards*, *Transportation Research Circular*, E-C008, II-F-1-II-F-19.

Axhausen, K.W., T. Haupt, B. Fell and U. Heidl (2001) Zürich; also "Searching for the rail bonus: Results from an SP/RP panel", Paper presented at the 80th Annual Meeting of the Transportation Research Board, Washington, D.C., Januar 2001.

Axhausen, K.W., H. Köll and M. Bader (2002) Stated Preferences and Conjoint Analysis: A comparison using mode choice, in E. Stern, I. Salamon and P.H.L. Bovy (eds.) *Travel Behaviour: Spatial Patterns, Congestion and Modelling*, 2197-217, Edward Elgar, Cheltenham.

Axhausen, K.W., S. Schönfelder, J. Wolf, M. Oliveira and U. Samaga (2003) 80 weeks of GPS-traces: Approaches to enriching the trip information, Paper presented at 86th Annual Meeting of the Transportation Research Board, Washington, D.C. Januar 2004.

Axhausen, K.W. and M. R. Wigan (2003) Public use of travel surveys: The metadata perspective, in P. Stopher and P.M. Jones (eds.) *Transport Survey Quality and Innovation*, 605-628, Pergamon, Oxford.

Bhat, C.R., S. Srinivasan and K.W. Axhausen (2004) An analysis of multiple interactivity durations using a unifying multivariate hazard model, paper presented at *the 83rd Annual Meeting of the Transportation Research Board*, Washington, D.C., January 2004.

Cirillo, C. and K.W. Axhausen (2002) Comparing urban activity travel behaviour, Paper presented at 81th Annual Meeting of Transportation Research Board, Washington, D.C., January 2002.

Cirillo, C. and K.W. Axhausen (2002) Mode choice in complex tours, Proceedings of ETC 2002, Cambridge, September 2002.

Doherty, S.T., K.W. Axhausen, T. Gärling and E.J. Miller (2002) A conceptual model of the weekly household activity-travel scheduling process, in E. Stern, I. Salamon and P.H.L. Bovy (eds.) *Travel Behaviour: Spatial Patterns, Congestion and Modelling*, 233-264, Edward Elgar, Cheltenham.

Kitamura, R., T. Yamamoto, Y.O. Susilo and K.W. Axhausen (2004) On the day-to-day variability of prism vertex location, paper presented at *the 83th Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2004

- Lleras, G.C., M.E. Ben-Akiva, K.W. Axhausen, T. Furutani, A. Schäfer and A. Simma (2003) Fundamental relationships specifying travel behaviour – An international travel survey comparison, paper presented at 85th Annual Meeting of the Transportation Research Board, Washington D.C., Januar 2003.
- Madre, J.-L., K.W. Axhausen and M.O. Gascon (2003) Immobility: A microdata analysis, Paper presented at 10th International Conference on Travel Behaviour Research, Lucerne, August 2003.
- Raney, B., N. Cetin, A. Völlmy, M. Vrtic, K.W. Axhausen and K. Nagel (2003) Towards an activity-based microscopic simulation of all of Switzerland, Paper presented at 85th Annual Meeting of the Transportation Research Board, Washington, D.C. Januar 2003.
- Raney, B., A. Voellmy, N. Cetin, M. Vrtic and K. Nagel (2002) Towards a microscopic traffic simulation of all of Switzerland, Proceedings of the International Conference of Computational Science ICCS'02, Amsterdam, Juni 2002.
- Schlich, R. (2001) Analysing intrapersonal variability of travel behaviour using the sequence alignment method, Paper presented at European Transport Conference 2001, Cambridge, September 2001.
- Schlich, R. (2003) Homogenous groups of travellers, Paper presented at 10th International Conference on Travel Behaviour Research, Lucerne, August 2003.
- Schönfelder, S. (2003) Between routines and variety seeking: The characteristics of locational choice in daily travel, Paper presented at 10th International Conference on Travel Behaviour Research, Lucerne, August 2003.
- Simma, A. and K.W. Axhausen (2001) How do parents manage everyday life? - The case of the Upper Austria Region (Europe), Paper presented at 80th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2001.

5 Papers in professional magazines

5.1 Transport Systems: Road Transport

- Chabot-Zhang, Y. (2000) 25 Jahre IVT-Messungen zum Verkehr, *Strasse und Verkehr*, **86** (10) 363-367.
- Horat M. (2001) Äquivalenzfaktoren nach Schwerverkehrsklassen, *Strasse und Verkehr*, **87** (5) 233.
- Lindenmann, H.P. (2000) Erhaltungsmanagement Verkehrsanlagen, Optimierung und Baustellenkoordination, *Strasse und Verkehr*, **86** (12) 443-445.
- Lindenmann, H.P. and T. Koy (2000) Beurteilung der Auswirkungen von Zonen Signalisationen (Tempo 30) in Wohngebieten auf die Verkehrssicherheit, *Strasse und Verkehr*, **86** (9) 342-347.
- Pitzinger, P. and P. Spacek (2001) Erfahrungen mit Rampenbewirtschaftungen in der Schweiz, *Strasse und Verkehr*, **87** (2) 46 – 54, VSS Zürich.
- Seiler, L. and M. Shojaati (2002) Neue Umrechnungsfaktoren für verschiedene Strassen- und Fahrzeugtypen, *Strasse und Verkehr*, **88** (12) 521 - 525.
- Shojaati M. (2001) Rissbildung in Zementstabilisierungen – neue Überlegungen, *Strasse und Verkehr*, **87** (2) 61-63 .
- Spacek, P. (1999) Spurverhalten und Unfallgeschehen in Kurven, *Strassenverkehrstechnik*, **43** (2) 68-75.
- Spacek, P. (1999) Geschwindigkeiten in Kurven, *Strasse und Verkehr*, **85** (5) 84-88.
- Spacek, P. (2000) Trassierungselemente und Geschwindigkeit, *Strasse und Verkehr*, **86** (12) 434-439.

5.2 Transport Systems: Public Transport

- Brändli, H. (1999) Sicherheit! - Sicherheit?, *Strasse und Verkehr*, **85** (5) 195-198.
- Brändli, H. (2001) Die Bahnen im Zwiespalt zwischen Fakten und Interessenpolitik „Schienen der Welt international“, Spezialausgabe zum Weltkongress AICCF/UIC/CEM.
- Brändli, H. (2002) Die Zukunft der Eisenbahnen aus verkehrswissenschaftlicher Sicht, *ZEVrail Glasers Annalen*, **125** (6) 252 - 260.
- Brändli, H. (2003) Mehr Innovation in der Mobilität ist gefragt, *Kommunalmagazin*, **10**, 7-11.
- Brändli, H. (2003) Verkehrsverlagerung im europäischen Alpen transit, *Die Verkehrswirtschaft*, **12**, 14-17.
- Brändli, H. and C. Plüss (1999) Bahnhofsvorplätze, *Eisenbahntechnische Rundschau*, **48** (7-8) 439-443.
- Kohler, M. (2002) New insight into track modulus of ballasted track, *Railway Engineering*, **1** (7) 34.
- Nash, A. (2002) Roads policy: End of the road, *Transport Report*, **25** (3) 10.
- Schäffeler, U. (2001) Oft zu geringe Abstände, Haltestellenabstände im ÖPNV, *Nahverkehr*, **19** (3) 24-27.
- Wichser, J. and M. Hofer (1999) Gedanken zu einem schweizerischen Binnenkombi-Verkehrskonzept, *Schweizerische Eisenbahnrevue*, **12** (99) 551-553.
- Wichser, J., M. Engel, M. Hecht and T. Rieckenberg (2000) Mittelflur-Reisezugwagen. Ein neuartiges Waggon- und Zugskonzept für Betreiber und Fahrgäste, *Eisenbahningenieur*, **51** (2) 16-22.

5.3 Transport Planning

- Axhausen, K.W. (2003) Zur Verkehrsentwicklung: Die letzten und die nächsten 50 Jahre, *Agrarwirtschaft und Agrarsoziologie*, **13** (2) 31-44.
- Axhausen, K.W., T. Haupt, B. Fell and U. Heidl (2001) How much of a rail bonus is there? *Urban Transport International*, **34** (3-4) 14-16.
- Axhausen, K.W. and G. Sammer (2001) stated responses: Überblick, Grenzen, Möglichkeiten, *Internationales Verkehrswesen*, **53** (6) 274-278.
- Köll, H., M. Bader and K.W. Axhausen (2001) Regelwidriges Fahrverhalten an Lichtsignalanlagen – Empirische Ergebnisse aus Österreich, Schweiz und Deutschland, *Strassenverkehrstechnik*, **45** (7) 313-317.
- Köll, H., M. Bader and K.W. Axhausen (2002) Entscheidungsverhalten an Lichtsignalanlagen mit und ohne Grünblinker als Ankündigung der Übergangszeit Gelb, *Strassenverkehrstechnik*, **46** (7) 339-345.
- Schlich, R., A. König and K.W. Axhausen (2000) Stabilität und Variabilität im Verkehrsverhalten, *Strassenverkehrstechnik*, **44** (9) 431-440.
- Schmid, M. and K.W. Axhausen (2000) Reaktionen des Freizeitverkehrs auf Kraftstoffpreisänderungen: Empirische Ergebnisse, *Zeitschrift für Verkehrswissenschaft*, **71** (4) 333-354.
- Tschopp, M., R. Sieber, P. Keller and K.W. Axhausen (2003) Demographie und Raum in der Schweiz, *DISP*, **153**, 25-32.
- Vrtic, M. (2000) Methodenvergleich für die Schätzung von Nachfrageelastizitäten, *Strasse und Verkehr*, **86** (9) 348-351.
- Vrtic, M. (2000) Optimierung von Routenwahlmodellen für den öffentlichen Verkehr, *Nahverkehr*, **18** (9) 46-50.
- Vrtic, M. and K.W. Axhausen (2003) Experiment mit einem dynamischen Umlegungsverfahren, *Strassenverkehrstechnik*, **47** (3) 121-126.
- Vrtic, M. and K.W. Axhausen (2003) Überprüfung von Prognoseansätzen im Personenverkehr: Ergebnisse einer Vorher-/Nachheruntersuchung, *Internationales Verkehrswesen*, **55** (9) 392-399.
- Vrtic, M. and K.W. Axhausen (2004) Verkehrsmittelwahl auf der Grundlage von Stated-Preference-Daten, *Strasse und Verkehr*, **90** (4) 23-28.

6 Published books and reports

6.1 Transport Systems: Road Transport

- Doerfel M., H.P. Lindenmann, P. Spacek (2002) Grundlagen für eine Strassenverkehrssicherheitspolitik des Bundes (VESIPO); Teil Infrastruktur und Betrieb, final report for VSS 2000/01, *Schriftenreihe*, **1023** des UVEK, Bern.
- Horat M., L. Seiler and M. Caprez (2000) Anzahl Äquivalenter Einheitsachslasten verschiedener Fahrzeugtypen, final report for VSS 11/00, *Schriftenreihe*, **477**, Bundesamt für Strassen, UVEK, Bern.
- Koy, T. and P. Spacek (2003) Geschwindigkeiten in Steigungen und Gefällen, final report for VSS 1998/079, *Schriftenreihe*, **1054**, Bundesamt für Strassen, UVEK, Bern
- Lindenmann, H.P. and T. Koy (2000) Auswirkungen der Zonensignalisation (Tempo 30) auf die Verkehrssicherheit, report to the Swiss Road Safety Fund, Bern.
- Lindenmann, H.P., R. Weber, B. Ranft and Y. Chabot-Zhang (2000) Unfallgeschehen auf stark belasteten Autobahnen, report to the Swiss Road Safety Fund, Bern.
- Lindenmann, H.P. et al. (2001) Erhaltungsmanagement der Strassenverkehrsanlagen, Generelle Fachkonzepte, MSE 99/00, final report for VSS 15/00, *Schriftenreihe*, **492**, Bundesamt für Strassen, UVEK, Bern.
- Lindenmann, H.P., Y. Chabot-Zhang and N. Jafari (2001) Verkehrssicherheitsdatenbank: Pilotbetrieb mit grossem Datensatz, report to the Swiss Road Safety Fund, Bern.
- Lindenmann, H.P. and M. Doerfel (2002) Verkehrssicherheitsbeurteilung (VSB) (Safety Audit), FA 304.97.01, final report to the Swiss Road Safety Fund, Bern.
- Lindenmann, H.P., M. Doerfel, M. Weissert, Ch.A. Huber and R. Allenbach (2003) Unfallauswertung: Statistik, Auswertung und Analyse von Strassenverkehrsunfällen, Massnahmen, final report for VSS 1997/054, *Schriftenreihe*, 1064, Bundesamt für Strassen, UVEK, Bern.
- Lindenmann, H.P., F. Schiffmann and T. Weber (2003) Zustandserfassung und –bewertung Nationalstrassen, Fahrbahnen, final report for Bundesamt für Strassen, Bern.
- Lindenmann H.P., I. Belopitov and P. Spacek (2004) Leistungsfähigkeit hochbelasteter Kreisel, final report for VSS 1998/076, *Schriftenreihe*, Bundesamt für Strassen, UVEK, Bern.
- Lindenmann, H.P., M. Laube and H.M. Burger (2004) Auswirkungen passivbeleuchteter Fussgängerstreifen auf die Verkehrssicherheit, report to the Swiss Insurance Association, Zurich.
- Shojaati, M. and W. Schüler (2000), ASI-Measuringmethod, report to the Swiss Road Safety Fund, Bern.
- Shojaati, M., L. Seiler and M. Caprez (2002) Tägliche äquivalente Verkehrslast TF verschiedener Strassentypen in der Schweiz, final report for VSS 14/96, *Schriftenreihe*, 1017, Bundesamt für Strassen, UVEK, Bern.
- Spacek, P. and I. Belopitov (1999) Geschwindigkeiten in Kurven, final report for VSS 1996/01, *Schriftenreihe*, **420**, Bundesamt für Strassen, UVEK, Bern.

6.2 Transport Systems: Public Transport

- Hofer, M. (1999) Bonus/Malus-System zur Gewährleistung der Betriebsqualität auf dem für den freien Zugang geöffneten SBB Netz, *Schriftenreihe*, **122**, IVT, ETH Zürich, Zürich.
- Hürlimann, D. (2002) Objektorientierte Modellierung von Infrastrukturelementen und Betriebsvorgängen im Eisenbahnwesen, *Schriftenreihe*, **125**, IVT, ETH Zürich, Zürich.
- Kohler, M. (2002) Der Bettungsmodul für den Schotteroberbau von Meterspurbahnen, *Schriftenreihe*, **126**, IVT, ETH Zürich, Zürich.
- Sautter, P., K.-D. Steinbach and C. Kölble (2002) Anwenderleitfaden Optimierung von Busverkehren, IGV, Stuttgart.
- Wichser, J. et al. (2001) COST 339 Small Container, final report to DG TREN and COST, IVT, ETH Zürich, Zürich.

6.3 Transport Planning

- Abay, G. and K.W. Axhausen (2001) Zeitkostenansätze im Personenverkehr: Vorstudie, final report for SVI 42/00, *Schriftenreihe*, **472**, Bundesamt für Strassen, UVEK, Bern.
- Axhausen, K.W., J.-L. Madre, J.W. Polak and Ph.L. Toint (eds.) (2003) *Capturing Long Distance Travel*, Research Science Press, Baldock.
- Dasen, S. (1999) Carpools im Spannungsfeld mit dem öffentlichen Personenverkehr, *Schriftenreihe*, **121**, IVT, ETH Zürich, Zürich.
- Gärling, T. and K.W. Axhausen (eds.) (2003) Habitual travel choice, *Transportation*, **30** (1).
- König, A. and K.W. Axhausen (2003) Verlässlichkeit als Entscheidungsvariable, Final report for SVI 44/00, *Schriftenreihe*, **1039**, Bundesamt für Strassen, UVEK, Bern.
- König, A., K.W. Axhausen and G. Abay (2004) Zeitkosten im Personenverkehr - Hauptstudie, final report for SVI 534/01, *Schriftenreihe*, **1065**, Bundesamt für Strassen, UVEK, Bern.
- Mühlethaler, F., M. Arend, K.W. Axhausen, S. Martens and M. Steierwald (2003) Das vernetzte Fahrzeug: Verkehrstelematik für Strasse und Schiene, *Report TA-DT*, **33/2003**, Zentrum für Technologiefolgen-Abschätzung und Bundesamt für Strassen, Bern.
- Mayer-Kreitz, M., M. Bäumer, O. Eberhard, A. König, I. Koßmann, M. Lenz and C. Sommer (2003) *Methoden computergestützter Erhebungen zum individuellen Verkehrsverhalten*, FGSV, Köln.
- Oblozinska, S. (Hrsg.) (1999) Beiträge zur Soziologie und Politologie im Verkehr, *Schriftenreihe*, **123**, IVT, ETH Zürich, Zürich.
- Schlich, R., A. Simma and K.W. Axhausen (2004) Determinanten des Wochenendfreizeitverkehrs, final report for SVI 73/00, *Schriftenreihe*, **1071**, Bundesamt für Strassen, UVEK, Bern.
- Vrtic, M., K.W. Axhausen, M.G.H. Bell, S. Grosso and W. Matthews (2004) Methoden zum Erstellen und Aktualisieren von Wunschlinienmatrizen im motorisierten Individualverkehr, final report for SVI 2000/379, *Schriftenreihe*, **1066**, Bundesamt für Strassen, UVEK, Bern.
- Vrtic, M., K.W. Axhausen, F. Rossera and R. Maggi (2003) Verifizierung von Prognosemethoden im Personenverkehr, Report to SBB and the Bundesamt für Raumentwicklung (ARE), IVT, ETH Zürich and USI Lugano, Zürich and Lugano, 2003.
- Vrtic, M., O. Meyer-Rühle, S. Rommerskirchen, P. Cerwenka and W. Stobbe (2000) Sensitivitäten von Angebots- und Preisänderungen im Personenverkehr, final report for SVI 44/98, *Schriftenreihe*, **449**, Bundesamt für Strassen, UVEK, Bern.
- Widmer, P. and K.W. Axhausen (2001) Aktivitäten-orientierte Personenverkehrsmodelle, Forschungsauftrag SVI 46/99, *Schriftenreihe*, **471**, Bundesamt für Strassen, UVEK, Bern.

7 Invited contributions

7.1 Transport Systems: Road Transport

Spacek, P. (2000) Spannungsfeld Strassenentwurf und Verkehrspolitik am Beispiel der Schweizerischen Alpenübergänge, in *Festschrift Prof. G. Weise*, 49-60, Fakultät Verkehrswissenschaften Friedrich List, TU Dresden, Dresden.

7.2 Transport Systems: Public Transport

Brändli, H. (2002) Entwicklungsperspektiven des Logistiksystems Schiene unter dem Einfluss der EU-Verkehrspolitik, Tagungsband Internationales Verkehrssymposium Bregenz, *Schriftenreihe*, **56**, 21 – 23, ÖVG, Wien.

Brändli, H. (2002) Tatsachen, Meinungen, Wissenschaft und Praxis am Beispiel der Südbahn, *IVS-Schriftenreihe*, **14**, 65 – 75, IVS, TU Wien, Wien.

Carle, G. (2003) Brennstoffzellen für den Automobilbau im Wettbewerb, in: *Innovative Forschung und Lehre im Dienste einer nachhaltigen und integrierten Verkehrspolitik*, *Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft e.V.*, 19-22.

Hürlimann, D. (2003) RailML - ein generelles Austauschformat für Eisenbahndaten, Sonderausgabe der Schriftenreihe der DVWG aus Anlass der Internationalen Fachmesse "transport logistics", 22-26, DVWG, Berlin.

Hürlimann, D. and V. P. Krauss (2003) RailML - Einheitliche Datenschnittstellen für Eisenbahnen, *Tagungsband der 19. Verkehrswissenschaftlichen Tage*, 105-115, TU Dresden.

Kölble C. (2002) Ernüchternde Blicke auf den Güterverkehr in Deutschland, Rezension von: Deiters, J. (ed.) *Umweltgerechter Güterverkehr*, *DISP*, **151**, 109.

Kölble, C. (2003) Die Anwendung der Betriebssimulationssoftware OpenTrack und die Rückkoppelung mit Forschung, Entwicklung und Lehre, in *Innovative Forschung und Lehre im Dienste einer nachhaltigen und integrierten Verkehrspolitik*, 30-32, DVWG, Berlin.

Wichser, J. (2002) Technical and operational developments needed for a better success of intermodal freight transport, *Institute of Rail Transport New-Dehli*, Volume XI, No. 1, 31 – 35.

7.3 Transport Planning

Axhausen, K.W. (1999) Nachfragemodelle für den ÖPNV auf der Grundlage von RP und SP Daten, in FGSV (Ed) *HEUREKA: Optimierung in Verkehr und Transport*, 59-72, Köln.

Axhausen, K.W. (1999) What type of management and pricing?, in ECMT (ed.) *Which changes for transport in the next century?*, 383-399, ECMT, Paris.

Axhausen, K.W. (2003) Analysis of the MEST and related survey work, in K.W. Axhausen, J.L. Madre, J.W. Polak and P. Toint (eds.) *Capturing Long Distance Travel*, 130-147, Research Science Press, Baldock.

Axhausen, K.W. (2003) Definitions and measurement problems, in K.W. Axhausen, J.L. Madre, J.W. Polak and P. Toint (eds.) *Capturing Long Distance Travel*, 8-25, Research Science Press, Baldock.

- Axhausen, K.W. (2003) Embedded case study methods: Integrating quantitative and qualitative knowledge by R.W. Scholz and O. Tietje, *Transport Reviews*, **23** (4) 521-522.
- Axhausen, K.W. (2003) Flexible Urban Transportation by J.L. Gifford, *Transport Reviews*, **23** (4) 519-521.
- Axhausen, K.W. (2003) MEST survey work, in K.W. Axhausen, J.L. Madre, J.W. Polak and P. Toint (eds.) *Capturing Long Distance Travel*, 84-107, Research Science Press, Baldock.
- Axhausen, K.W. (2004) Social networks and travel: Some hypotheses, in K. Donaghy (ed.) *Social Aspects of Sustainable Transport: Transatlantic Perspectives*, Ashgate, Aldershot.
- Axhausen, K.W., P. Fröhlich and M. Tschopp (2003) Zur Entwicklungsdynamik der Verkehrsnachfrage im Personenverkehr: Hintergründe und Erwartungen, *VDI Berichte*, **1799**, 3-20, VDI Verlag, Düsseldorf.
- Axhausen, K.W., P. Fröhlich, M. Tschopp and P. Keller (2004) Erreichbarkeitsveränderungen in der Schweiz und ihre Wechselwirkungen mit der Bevölkerungsveränderung 1950-2000, in W. Gemerith, P. Messerli, P. Meusburger and H. Wanner (Hrsg.) *Alpenwelt - Gebirgswelten, Inseln, Brücken, Grenzen*, 309-317, Deutschen Gesellschaft für Geographie, Bonn and Bern.
- Axhausen, K.W. and P. Fröhlich (2004) Public investment and accessibility change, in H. Held and P. Marti (eds.) *Bauen, Bewirtschaften, Erneuern – Gedanken zur Gestaltung der Infrastruktur*, 207-224, vdf, Zürich.
- Axhausen, K.W. and A. König (2001) Mobilitätswerkzeuge und Wohnstandorte: Mوبiplan stated choice – Experimente, *Stadt Region Land*, **71**, 185-193.
- Axhausen, K.W. and R. Pendyala (2002) Microsimulation, Workshop report, in H. Mahmassani (ed.) *In Perpetual Motion: Travel Behaviour Research Opportunities and Application Challenges*, 583-592, Elsevier, Oxford.
- Axhausen, K.W., J.L. Madre, J.W. Polak and P. Toint (2003) Recommendations for a European survey of long-distance travel and associated research, in K.W. Axhausen, J.L. Madre, J.W. Polak and P. Toint (eds.) *Capturing Long Distance Travel*, 298-319, Research Science Press, Baldock.
- Axhausen K.W., D.M. Scott, A. König and C. Jürgens (2004) Locations, commitments and activity spaces, in M. Schreckenberg and R. Selten (eds.) *Human Behaviour and Traffic Networks.*, 205-230, Springer, Berlin: Springer.
- Blinde, J. and R. Schlich (2002) Freizeitmobilität und Wohnsituation, in M. Gather and A. Kagermeier (eds.) *Freizeitverkehr, Hintergründe, Probleme Perspektiven*, *Studien zur Mobilitäts- und Verkehrsforschung*, **1**, 35-53, Verlag MetaGIS Infosysteme, Mannheim.
- Keller, P. (1999) (K)ein neues Bild der Stadt, M. Koch and W.A. Schmid (Hrsg.) *Die Stadt in der Schweizer Raumplanung, Ein Lesebuch - Martin Lendi gewidmet*, 62-73, vdf, Zürich.
- Keller P. and C. Heimgartner (2001) The challenges of Alpine transit traffic, in M. Price, T. Kohler, T. Wachs and A. Zimmermann (eds.) *Mountains of the World - Mountains, Energy and Transport*, 28-29, Centre for Development an Environment, Geographisches Institut, Universität Bern, Bern.
- König, A. and K.W. Axhausen (2001) Verkehrsentscheidungen in Mobidrive, *Stadt Region Land*, **71**, 165-176.
- Nagel, K. and K.W. Axhausen (2001) Workshop report: Microsimulation, in D.A. Hensher (ed.) *The Leading Edge in Travel Behaviour Research*, 239-246, Pergamon, Oxford
- Rindsfuser, G., T. Perian and S. Schönfelder (2001) Raum-Zeit-Analyse individueller Tätigkeitsprofile – Erste Annäherung auf der Basis einer Längsschnitterhebung, *Stadt Region Land*, **71**, 89-105.
- Schlich, R. (2003) Alles nur Spielerei? Narrativität in Verkehrsprognosen, in M. Matthias (ed.) *fakt&fiktion 0.7 - Narrativität und Wissenschaft*, 192-199, Chronos Verlag, Zürich.
- Schlich, R., B. Kluge, S. Lehmann and K.W. Axhausen (2002) Durchführung einer 12-wöchigen Langzeitbefragung, *Stadt Region Land*, **73**, 141-154.

- Schlich, R., A. Simma and K.W. Axhausen (2004) Kontraste im Diffusen: Erklärungsmodelle für den Freizeitverkehr, in L. Diemel, H.-P. Meier-Dallach and C. Schröder (eds.) *Die neue Nähe: Raumpartnerschaften verbinden Kontrasträume*, 186-206, Franz Steiner Verlag, Wiesbaden.
- Schlich, R. and S. Schönfelder (2001) Zwei Sichten der Aktivitätenteilnahme: Tagebücher und Aktivitätshäufigkeitsbögen, *Stadt Region Land*, **71**, 147-163.
- Schönfelder, S. and K.W. Axhausen (2000) Periodizität im Verkehrsverhalten: Erste Ergebnisse mit Überlebenszeitmodellen, *Stadt Region Land*, **69**, 131-144.
- Schönfelder, S. and K.W. Axhausen (2001) Mobidrive - Längsschnitterhebungen zum individuellen Verkehrsverhalten: Perspektiven für raum-zeitliche Analysen, in M. Schrenk (ed.) *Tagungsband CORP 2001*, **2**, 315-321, Technische Universität, Wien.
- Schönfelder, S. and K.W. Axhausen (2001) Modelling the rhythms of travel using survival analysis, in C. Kaspar, C. Laesser and T. Bieger (eds.) *Jahrbuch 2000/2001 Schweizerische Verkehrswirtschaft*, 137-162, SVWG, St. Gallen.
- Schönfelder, S. and K.W. Axhausen (2003) On the variability of human activity spaces, in M. Koll-Schretzenmayr, M. Keiner and G. Nussbaumer (eds.) *The Real and Virtual Worlds of Spatial Planning*, 237-262, Springer, Heidelberg.
- Schönfelder, S., K.W. Axhausen, N. Antille and M. Bierlaire (2002) Exploring the potentials of automatically collected GPS data for travel behaviour analysis - A Swedish data source, in J. Möltgen and A. Wytzisk (eds.) *GI-Technologien für Verkehr und Logistik*, 155-179, Institut für Geoinformatik, Universität Münster, Münster.
- Simma, A. and K.W. Axhausen (2002) Destination and mode choice for skiing trips within Switzerland, *Stadt Region Land*, **73**, 211-220.
- Simma, A., R. Schlich and K.W. Axhausen (2002) Destination choice modelling of leisure trips: The case of Switzerland, in A. Arneberger, C. Brandenburg and A. Muhar (eds.) *Monitoring and Management of Visitor Flows in Recreational and Protected Areas*, 150-158, Universität für Bodenkultur, Wien.
- Steinmetz R. and P. Keller (2003) Verkehr und Erreichbarkeit, in A. Eisinger and M. Schneider (eds.) *Stadtland Schweiz*, 84-99, Birkhäuser-Verlag, Basel.
- Vrtic, M. and K.W. Axhausen (2000) Modelle der Verkehrsmittelwahl: Regionale Wege in der Schweiz, *Stadt Region Land*, **69**, 193-204.
- Vrtic, M. and K.W. Axhausen (2002) Modelle der Verkehrsmittelwahl aus RP- und SP Datengrundlage, FGSV (ed.) *Heureka 02*, 293-310, FGSV, Köln.
- Vrtic, M., P. Fröhlich and K.W. Axhausen (2003) Schweizerische Netzmodelle für Strassen- und Schienenverkehr, in T. Bieger, C. Laesser and R. Maggi (eds.) *Jahrbuch 2002/2003 Schweizerische Verkehrswirtschaft*, 119-140, SVWG, St. Gallen.

8 Unpublished reports

8.1 Transport Systems: Road Transport

- Lindenmann, H.P. (1999) Zustandserfassung und –bewertung Nationalstrassen (ZEB-NS) (Konzeptstudie), IVT, ETH Zürich, Zürich.
- Lindenmann, H.P. (2001) A2/6, Zubringer Zentrum, Projektoptimierung, final report, TBA Kanton Luzern, Luzern.
- Lindenmann, H.P. (2003) Griffigkeitsgutachten für die Kantone SO, ZH, SG, VS und für das ASTRA (SZ, OW), IVT, ETH Zürich, Zürich.
- Lindenmann, H.P. (2003) Lärmgutachten für den Kanton LU A2, Grosshof, Lochhof, IVT, ETH Zürich, Zürich.
- Lindenmann, H.P. and F. Schiffmann (2003) Visuelle Zustandserfassung von Fahrbahnen, IVT, ETH Zürich, Zürich.
- Spacek, P. (1999) Auswirkungen des bilateralen Landverkehrsabkommens auf den alpenquerenden Strassengüterverkehr: Abschätzung der Veränderungen in der Verkehrsauslastung der Nationalstrasse A2 Basel-Chiasso, Report to Bundesamt für Strassen.
- Spacek, P. (1999) Knoten Voltaplatz Basel, Verkehrstechnische Beurteilung der Kreiselvarianten, IVT-ETH Zürich, im Auftrag des Polizei- und Militärdepartementes des Kantons Basel-Stadt
- Spacek, P. (1999) Nationalstrasse A1, Nordumfahrung Zürich: Gubristtunnel, Geschwindigkeitsverhalten im Bereich des Nordportals, IVT-ETH Zürich, im Auftrag der Kantonspolizei Zürich, 1999
- Spacek, P. (1999) Umfahungskonzept Unteres Glarnerland, Phase 1: Konfliktanalyse, Erläuternder Bericht zu Handen der Fachkommission, Report to the Baudirektion des Kantons Glarus
- Spacek, P. (2000) Erschliessungs- und Entlastungsstrasse Glarnerland: Technische Vorgaben für das Vorprojekt, IVT, ETH Zürich, Zürich, Report to the Baudirektion des Kantons Glarus.
- Spacek, P. (2000) Heraufsetzung der zulässigen Höchstgeschwindigkeit für schwere Anhängerzüge und Sattelmotorfahrzeuge, report to Bundesamt für Strassen, Bern.
- Spacek, P. (2001) K53.3 Oberlandstrasse, Umfahrung Wetzikon, Sicherheitstechnische Projektbeurteilung, IVT-ETH Zürich, im Auftrag der Baudirektion des Kantons Zürich.
- Spacek, P. (2002) Stadion / Einkaufszentrum St. Gallen-West; Second Opinion zum Überbauungsplan, Report to the Tiefbauamtes Stadt St. Gallen, Zürich.
- Spacek, P. (2002) Strassenraumgestaltung in Näfels; Report to the Baudirektion Kanton Glarus.
- Spacek, P., M. Ghielmetti and P. Pitzinger (2001) Nationalstrasse A13, Soazza – Thusis: Gutachten Verkehrssicherheit, report to Kantons Graubünden, Zürich.
- Spacek, P., M. Ghielmetti and P. Pitzinger (2002) Nationalstrasse A13, Soazza – Thusis: Ergänzungsgutachten Verkehrssicherheit, Teil 2, report to Kantons Graubünden, Zürich.
- Spacek P. and T. Koy (2003) Verkehrssimulation im Kreisel Feldmoosstrasse in Lachen (SZ), report to Verkehrskommission des TCS, Sektion Schwyz.
- Spacek P. and T. Koy (2003) Verkehrstechnisches Gutachten Kreisel Acherli in Seewen (SZ), report to ASTRA, Bern.
- Spacek, P. and H.P. Lindenmann (2001) J2 Umfahrung Liestal, Zusätzlicher Halbanschluss Gasstrasse, Verkehrstechnische Projektbeurteilung im Auftrag des Tiefbauamtes des Kantons Basel-Landschaft, IVT, ETH Zürich.

- Spacek, P. and P. Pitzinger (2000) Mindestgeschwindigkeit für schwere Motorwagen zum Gütertransport (MINGE), Synthesebericht, IVT, ETH Zürich, Zürich und Ingenieurbüro Dr. P. Pitzinger, im Auftrag des Bundesamtes für Strassen.
- Spacek, P. and P. Pitzinger (2000) Verkehrsbeeinflussungssystem Zürich Nord, Konzept, Baudirektion Kt. Zürich, Tiefbauamt.
- Spacek, P. and P. Pitzinger (2001) Verkehrsbeeinflussungssystem Limmattal-Gubrist, Konzept, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.
- Spacek, P. and P. Pitzinger (2001) Verkehrsbeeinflussungssystem Winterthur, Konzept, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.
- Spacek, P. and P. Pitzinger (2001) Verkehrsbeeinflussungssystem Zürich West, Konzeptionelle Ergänzungen, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.
- Spacek, P. and P. Pitzinger (2002) Konzept für ein reduziertes Verkehrsbeeinflussungssystem Limmattal – Gubrist, Tiefbauamt, Baudirektion Kt. Zürich, Zürich.
- Spacek, P. and P. Pitzinger (2002) Verkehrsbeeinflussungsanlagen Westumfahrung Zürich; Ergänzung: Anschlussbewirtschaftungen, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.
- Spacek, P. and P. Pitzinger (2002) Verkehrsbeeinflussungssysteme an HLS im Kanton Zürich report to Baudirektion Kt. Zürich, Tiefbauamt Zürich
- Spacek, P. and P. Pitzinger (2002) Vorprojekt Verkehrsbeeinflussungssystem Zürich Nord: Teil "Anschlussbewirtschaftung", Tiefbauamt, Baudirektion Kt. Zürich, Zürich.
- Spacek, P. and P. Pitzinger (2003) A1, Limmattal – Gubrist, Anschlussbewirtschaftungen/Verkehrslenkung, Sofortmassnahmen: Verkehrsingenieur-Vorprojekt, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.
- Spacek, P. and P. Pitzinger (2003) Verkehrsbeeinflussungsanlagen Westumfahrung, Anschlussbewirtschaftungen: Konzept und Verkehrsingenieur-Vorprojekt, report to Baudirektion Kt. Zürich, Tiefbauamt Zürich.

8.2 Transport Systems: Public Transport

- Bojanic, B. and C. Kölbl (2003) Reduzierung der Fahrzeiten durch Geschwindigkeitserhöhung in Gleisbögen auf der Südostbahn SOB, 1. interim report, IVT, ETH Zürich, Zürich.
- Brändli, H. (2000) Kurz - und mittelfristige Angebotsüberprüfung Rhätische Bahn, report to the RhB, Chur, IVT, ETH Zürich, Zürich.
- Brändli, H. and K. Bless (2000) Messkonzepte zur Erfassung der Produktivität im Schienenverkehr der Schweiz, report GVF 358A, IVT, ETH Zürich, Zürich.
- Carle, G. (2003) Competition within the fuel cell industry for the automotive sector, Fuel Cell Today, Knowledge Bank - Reports, London.
- Carle, G. (2003) Einrichtungen und Publikationen der Zukunftsforschung: Ein Überblick, IVT, ETH Zürich und Schweizerische Vereinigung für Zukunftsforschung, Zürich.
- Kölbl, C. (2002) Stabilitätsuntersuchung Bern – Luzern, Zürich, report to SBB AG, Division Infrastruktur, Bern.
- Kölbl, C. and Keller, P. et al. (2002) Transportation Sector, in: E. Jochem, D. Favrat K. Hungerbühler, P. Rudolph von Rohr, D. Spreng, A. Wokaun and M. Zimmermann (eds.) Steps towards a 2000 Watt-Society: Developing a White Paper on Research & Development of Energy-Efficient Technologies, Pre-study, Final Report, CEPE Zürich, LENI EPF Lausanne, D-CHEM ETH Zürich, D-MAVT ETH Zürich, PSI Villigen, EMPA Dübendorf.

- Nash, A. (2002) Joint use of railway infrastructure by high speed rail in Europe, report to Minate Transportation Institute, San Jose State University, San Jose.
- Ullius M. (2002) OpenTimeTable, Benutzerdokumentation R o.16a, IVT, ETH Zürich, Zürich.
- Schäffeler, U. and J. Wichser. (2001) Country Report Switzerland, Workpackage 2, report to PORTAL, IVT, ETH Zürich, Zürich.
- Wichser J. and M. Kohler (2003) Schweizerische Südostbahn, Zustandsanalyse der Gleisanlagen Ost, IVT, ETH Zürich, Zürich.
- Wichser, J., and U. Schäffeler (2003) Deliverable 4 (Results of WP3, 4, 5 & 6) Report on Modules, Materials & IPR, PORTAL project concerning Promotion of Results in Transport Research and Learning, May 2003.
- Wichser, J. and U. Schäffeler (2003) Zwischenbericht zum Projekt Achsquerkräfte bei Eisenbahnwagen infolge von Bogenfahrten, KTI Projekt 5735.1 KTS, IVT, ETH Zürich, Zürich.

8.3 Transport Planning

- Axhausen, K.W. (1999) Fahrerlaubnisse, PW's und Abos: Die Dynamik von Erwerb und Nutzung, report for Univox 1999, GfS, Zürich.
- Axhausen, K.W. (2000) Activity-based modelling: Research directions and possibilities, paper in D. Simmonds and J.J. Bates (2000) New Look at Multi-Modal Modelling, report for the Department of Environment, Transport and the Regions, London, Cambridge and Oxford.
- Axhausen, K.W. (2001) Verkehrsmarkt im Gleichgewicht?, report for Univox 2001, GfS, Zürich.
- Axhausen, K.W. and M. Youssefzadeh (1999) Towards a new European long-distance diary survey: analysis of the MEST pilots, *MEST Deliverable, D3 and D4*, report to the CEC, Fakultät für Bauingenieurwesen und Architektur, Leopold-Franzens-Universität, Innsbruck.
- Axhausen, K.W. and M. Youssefzadeh (2003) Auswertung und Konsolidierung von Marktforschungsdaten, *Arbeitsbericht Verkehrs- und Raumplanung, 172*, IVT, ETH Zürich, Zürich.
- Axhausen, K.W., S. Beige and M. Bernard (2004) Perspektiven des Schweizerischen Verkehrs bis 2030: Module Mo4 und Mo5 Besitz von Mobilitätswerkzeugen-Fahrleistungen/Betriebsleistungen und Verkehrsleistungen, report to the ARE, IVT, ETH Zürich, Zürich.
- Beckmann, K.-J., C. Jürgens, M. Kreitz, K.W. Axhausen, A. König, R. Schlich, S. Schönfelder, M. Friedrich, T. Haupt, A. Zimmermann, H.-J. Klein, M. Kehle and B. Krebs (2002) Mobiplan, final report, Institut für Stadtbauwesen, RWTH Aachen, PTV AG, IVT, ETH Zürich, Institut für Soziologie, Universität Karlsruhe, Aachen, Karlsruhe, Zürich.
- Beige, S. and K.W. Axhausen (2003) Besitz von Mobilitätsressourcen und deren Nutzung sowie Änderungen des Wohnortes, report for Univox 2003, GfS, Zürich.
- Bleisch, A. and Ph. Fröhlich (2003) Die Erreichbarkeit von Regionen, IBC Modul Erreichbarkeit Phase 1, final report, BAK Basel Economics, Basel.
- De Jong, G., J. Baak, M. E. Ben-Akiva, P. Burge, J. Fox, H. F. Gunn, C. Lu, M. Pieters, B. Zondag, P. Berguin, S. Godart, A. Henry, N. van Isacker, S. Gayda, P.L. Coppola, A. Improta, V. Marzano, A. Papola, I. B. Hovi, M. Killi, G. C. Lillehammer, F. Voldmo, S. Algers, I. Jarlebring, J. Widell, M. Düsterwald, L.-Klinge.-Habermann, J. Polak, P. Fröhlich, M. Vrtic and K. W. Axhausen (2002) EXPEDITE: Expert-system based predictions of demand for internal transport in Europe, final report for EU-Commission, 2000-AM-10816, Rand Europe, Leiden.
- Fell, B., T. Haupt, U. Heidl, A. Wirth, K.W. Axhausen and D. Lohse (1999) Präferenzanalyse Dresden 1998/1999, report to the Dresdener Verkehrsbetriebe, PTV AG, Karlsruhe.

- Haubold, I. and K.W. Axhausen (1999) A real-time recording system, *TEST Deliverable, D2*, report to the CEC, Fakultät für Bauingenieurwesen und Architektur, Leopold-Franzens-Universität, Innsbruck.
- Keller, P. (2002) Entwicklungen des Transitverkehrs-Systems und dessen Auswirkungen auf die Raumnutzung in der Schweiz (COST 340): Interim report 1.4.2001-31.3.2002, IVT, ETH Zürich, Zürich.
- Köll, H., K.W. Axhausen and M. Bader (2003) Verkehrsstromanalyse und Verkehrsmittelwahlverhalten Region Leiblachtal/Bregenz: Teilbericht Verkehrsmittelwahl, report to the Amt der Landeshauptstadt Bregenz, Ingenieurbüro Köll, Reith.
- Köll, H., M. Bader and K.W. Axhausen (2002) Auswirkungen des Grünblinken auf die Verkehrssicherheit und Leistungsfähigkeit verkehrsabhängiggesteuerter Lichtsignalanlagen, report to the BM für Verkehr, Innovation und Technologie and the Verkehrssicherheitsfonds, Ingenieurbüro Köll, Reith.
- Mandel, B., J. Hackney, E. Szimba and O. Schnell (2003) D3 Report of WP4: Work Plan, Data Needs and Project Pilot, ETIS Base Project, NEA, Rijswijk.
- Roth, U. and P. Keller (2002) Vision und Kooperation in der Glattalstadt (Zürich Nord), Projektskizze für ein Modellvorhaben zur Agglomerationspolitik des Bundes, Büro ur and IVT, ETH Zürich, Zürich.
- Szimba, E., J. Hackney, B. Mandel, B., O. Schnell and M. Schoch (2003) D3 Report of WP7: Work Plan, Data Needs and Project Pilot, ETIS Base Project, NEA, Rijswijk.
- Vrtic, M., K.W. Axhausen, M.G.H. Bell, S. Grosso and W. Matthews (2004) Methoden zum Erstellen und Aktualisieren von Wunschlinienmatrizen im motorisierten Individualverkehr, final report for SVI 2000/379, *Schriftenreihe*, 1066, Bundesamt für Strassen, UVEK, Bern.
- Vrtic, M. K.W. Axhausen, R. Koblo and M. Vödisch (2000) Entwicklung bimodales Personenverkehrsmodell als Grundlage für Bahn 2000, 2. Etappe, Herleitung einer Modal-Split Funktion, report to the SBB and the Dienst für Gesamtverkehrsfragen, IVT, ETH Zürich and Prognos AG, Zürich and Basel.
- Zimmermann, A., K.W. Axhausen, K.J. Beckmann, M. Düsterwald, E. Fraschini, T. Haupt, A. König, A. Kübel, G. Rindsfuser, R. Schlich, S. Schönfelder, A. Simma and T. Wehmeier (2001) Mobidrive: Dynamik und Routinen im Verkehrsverhalten: Pilotstudie Rhythmik, final report to Bundesministerium für Forschung und Technologie, PTV AG, IVT, ETH Zürich and Institut für Stadtbauwesen, RWTH Aachen, Karlsruhe, Zürich and Aachen.

9 Working and unpublished conference papers

9.1 Transport Systems: Public Transport

- Brändli, H. (2000) Tramway and LRT-Systems in Swiss Transport Policy, LRT Workshop, Kaiserslautern, März 2000.
- Brundell-Freij K. and U. Schäffeler (2003) Newsletter Nr. 6, PORTAL project concerning Promotion of Results in Transport Research and Learning, www.eu-portal.net, May 2003.
- Jermann, J. (2002) Vergleich verschiedener Ansätze der GIS-gestützten Potenzialberechnung, Paper presented at 2. Swiss Transport Research Conference 2002, Monte Verità, März 2002.
- Schäffeler, U. (2002) Line density and headway optimisation of urban public transport, Paper presented at 2nd Swiss Transport Research Conference, Ascona, März 2002.

9.2 Transport Planning

- Armoogum, J., K.W. Axhausen, J.-P. Hubert and J.-L. Madre (2004) Immobility and mobility seen through trip based versus time use surveys, paper presented at the 7th International Conference on Travel Survey Methods, Los Suenos, August 2004.
- Axhausen K.W., P. Keller, R. Schlich and A. Simma (2002) Transport Infrastructure, Tourist Behaviour and Spatial Structure in Landscapes and Habitats of the Alps (NFP 48 Project), in Tagungsband Kick-off-Meeting, NFP 48, SNF, Bern.
- Axhausen, K. W., M. Frick (2004) Nutzungen, Strukturen, Verkehr, Arbeitsberichte Verkehr- und Raumplanung, **205**, IVT, ETH Zürich, Zürich.
- Axhausen, K.W. (1999) Bürger oder Kunde: Das Dilemma der Verkehrsteilnehmer, Inaugural lecture at the ETH Zürich, Arbeitsbericht Verkehrs- und Raumplanung, **20**, IVT, ETH Zürich, Zürich.
- Axhausen, K.W. (2002) A dynamic understanding of travel demand: A sketch, Arbeitsbericht Verkehrs- und Raumplanung, **119**, IVT, ETH Zürich, Zürich.
- Beige, S. (2004) Ownership of Mobility Tools in Switzerland, conference paper, 4th Swiss Transport Research Conference, Monte Verita, Ascona, March 2004.
- Bernard, M. (2004) Notes on the design concepts for transport infrastructure: past and future, paper presentend at 4th Swiss Transport Research Conference, Monte Verita, Ascona, March 2004.
- Bierlaire, M., K.W. Axhausen and G. Abay (2001) The acceptance of modal innovation: The case of Swiss Metro, Paper presented at 1. Swiss Transport Planning Conference, Ascona, März 2001.
- Chalasanani, V.S., S. Schönfelder and K.W. Axhausen (2002) Archiving travel data: The Mobidrive example, Arbeitsbericht Verkehrs- und Raumplanung, **129**, IVT, ETH Zürich, Zürich.
- Cirillo, C. and K.W. Axhausen (2004) Evidence on the distribution of values of travel time savings from a six-week diary, Arbeitsberichte Verkehr- und Raumplanung, **212**, IVT, ETH Zürich, Zürich.
- Cirillo, C., F. Koppelman and K.W. Axhausen (2004) Modelling activity travel scheduling for workers, paper presented at the Workshop Activity-based Analysis, Maastricht, May 2004.
- Fraschini, E. and K.W. Axhausen (2001) Day on day dependencies in travel: First results using ARIMA modelling, Arbeitsbericht Verkehrs- und Raumplanung, **63**, IVT, ETH Zürich, Zürich.
- Frick, M.A. (2004) Generating Synthetic Populations using IPF and Monte Carlo Techniques: Some New Results, Conference Paper, 4th Swiss Transport Research Conference, Monte Verita, Ascona, March 2004.

- Fröhlich, P. and K.W. Axhausen (2002) Development of car-based accessibility in Switzerland from 1950 through 2000: First results, 2. Swiss Transport Planning Conference, Ascona, März 2001.
- Fröhlich, Ph. (2003) Induced Traffic: Review of the explanatory models, Paper presented at 3rd Swiss Transport Research Conference, Ascona, March 2003.
- Haefeli R. and P. Keller (2003) Überprüfung der Module "Visuelle Kommunikation" an den Abteilungen Landschaftsarchitektur und Raumplanung, Hochschule für Technik Rapperswil (HSR), Bern and Zürich.
- Heimgartner, C. (2001) System dynamic modelling of transport and land use - A first model draft, Paper presented at 1. Swiss Transport Research Conference, Ascona, März 2001.
- Heimgartner, C. (2002) Das Transport Policy Model – Fallstudie Region Zürich, Arbeitsbericht Verkehrs- und Raumplanung, **120**, IVT, ETH Zürich, Zürich.
- Keller P. and C. Heimgartner (2001) Transitverkehr im Alpenraum, Arbeitsbericht Verkehrs- und Raumplanung, **59**, IVT, ETH Zürich, Zürich.
- Keller, P. (2000) A Challenge in future transportation research and planning, paper presented Conference Energy Technologies for a Sustainable Future, Paul Scherrer Institute, Villigen, November 2000.
- Keller, P. (2001) Intermodality of network points: The planner's view, Arbeitsbericht Verkehrs- und Raumplanung, **88**, IVT, ETH Zürich, Zürich.
- Keller, P. (2002) Erreichbarkeit als Schlüsselgrösse in der Verkehrs- und Siedlungsplanung, in Reader, Zur Zukunftswerkstatt P 02, SBB Division Personenverkehr, Bern.
- Keller, P. (2002) Grundstückveräusserung und Verkehr im Äusseren St. Johann, in Bericht Workshop Pro Volta, Hochbau- und Planungsamt, Baudepartement des Kantons Basel-Stadt, Basel.
- Keller, P. (2002) Mehr Mobilität mit weniger Verkehr: eine Herausforderung der Zukunft - Einige Thesen, in Reader, Zur Zukunftswerkstatt P 02, Division Personenverkehr SBB, Bern.
- Keller, P. and R. Steinmetz (2003) Verkehr und Erreichbarkeit von Stadtland Schweiz im Standortwettbewerb, Arbeitsbericht Verkehrs- und Raumplanung, **175**, IVT, ETH Zürich, Zürich.
- König, A. and K.W. Axhausen (2001) Modelling mode choice in the Mobidrive survey, Paper presented at 1. Swiss Transport Planning Conference, Ascona, März 2001.
- König, A. and K.W. Axhausen (2002) The reliability of transportation systems and its influence on the choice, Paper presented at the 2. Swiss Transport Planning Conference, Ascona, March 2001.
- König, A., K.W. Axhausen and G. Abay (2003) Time is money - The valuation of Swiss travel times and travel time variability, Paper presented at 4th Swiss Transport Research Conference, Monte Verita, Ascona, März 2003.
- König, A., R. Schlich and K.W. Axhausen (2000) Deskriptive Darstellung der Befragungsergebnisse des Projektes Mobidrive, Arbeitsbericht Verkehrs- und Raumplanung, **37**, IVT, ETH Zürich, Zürich.
- König, A., Schlich R., Aschwanden A., Kaufmann A. and Axhausen K.W. (2000) Mobidrive: Data format guide, Arbeitsbericht Verkehrs- und Raumplanung, **32**, IVT, ETH Zürich, Zürich.
- Kreitz, M., K.J. Beckmann, M. Kehle, H.-J. Klein, B. Krebs, R. Schlich, K.W. Axhausen, A. Zimmermann and B. Fell (2000) Dokumentation der Erhebungen im Projekt Mobiplan/Documentation of the surveys within the Mobiplan project, Arbeitbericht, Fg, Institut für Stadtbauwesen, RWTH Aachen, Aachen.
- Machguth H. and M. Löchl (2004) Geokodierung 6-Wochenbefragung Thurgau 2003, Arbeitsberichte Verkehr- und Raumplanung, **219**, IVT, ETH Zürich, Zürich.
- Madre, J.-L., K.W. Axhausen and W. Brög (2004) Immobility in travel diary surveys: An overview, Arbeitsbericht Verkehrs- und Raumplanung, **207**, IVT, ETH Zürich, Zürich.
- Schlich R., A. Simma and K.W. Axhausen (2003) Zielwahl im Freizeitverkehr, Arbeitsbericht Verkehrs- und Raumplanung, **181**, IVT, ETH Zürich, Zürich.

- Schlich, R. (2001) Measurement issues in identifying variability in travel behaviour, Paper presented at 1. Swiss Transport Research Conference, Ascona, März 2001.
- Schlich, R. (2002) Fokusgruppen zum Freizeitverhalten: Eine empirische Untersuchung, Arbeitsbericht Verkehrs- und Raumplanung, **137**, IVT, ETH Zürich, Zürich.
- Schlich, R. and K.W. Axhausen (2003) Wohnumfeld und Freizeitverkehr eine Untersuchung zur Fluchttheorie, Arbeitsbericht Verkehrs- und Raumplanung, **155**, IVT, ETH Zürich, Zürich.
- Schlich, R., S. Schönfelder, S. Hanson and K.W. Axhausen (2002) Leisure travel in a historical perspective - Changes in the structures of time and space use, Arbeitsbericht Verkehrs- und Raumplanung, **107**, IVT, ETH Zürich, Zürich.
- Schönfelder, S. (2001) Some notes on space, location and travel behaviour, Paper presented at 1. Swiss Transport Research Conference, Ascona, März 2001.
- Schönfelder, S. and K.W. Axhausen (2002) Activity spaces: Measures of social exclusion? Arbeitsbericht Verkehrs- und Raumplanung, **140**, IVT, ETH Zürich, Zürich.
- Schönfelder, S. and K.W. Axhausen (2002) Measuring the size and structure of human activity spaces – the longitudinal perspective, Arbeitsbericht Verkehrs- und Raumplanung, **135**, IVT, ETH Zürich, Zürich.
- Schönfelder, S. and U. Samaga (2003) Where do you want to go today? - More observations on daily mobility, Paper presented at 3rd Swiss Transport Research Conference, Ascona, March 2003.
- Simma A. (2000) Verkehrsverhalten als eine Funktion soziodemografischer und räumlicher Faktoren, Arbeitsbericht Verkehrs- und Raumplanung, **55**, IVT, ETH Zürich, Zürich.
- Simma, A. and K.W. Axhausen (2001) Successive days, related travel behaviour? Arbeitsbericht Verkehrs- und Raumplanung, **62**, IVT, ETH Zürich, Zürich.
- Simma, A. R. Schlich and K.W. Axhausen (2002) Destinations of leisure trips, Paper presented at 2. Swiss Transport Planning Conference, Ascona, März 2002.
- Simma, A., D. Dubouloz and K.W. Axhausen (2002) Data, data structures and models, Arbeitsbericht Verkehrs- und Raumplanung, **103**, IVT, ETH Zürich, Zürich.
- Simma, A., D. Hauri and R. Schlich (2002) Beschreibung einer Datenbank zu den Schweizer Gemeinden, Arbeitsbericht Verkehrs- und Raumplanung, **118**, IVT, ETH Zürich, Zürich.
- Srivastava, G. and S. Schönfelder (2003) On the temporal variation of human activity spaces, Arbeitsbericht Verkehrs- und Raumplanung, **192**, IVT, ETH Zürich, Zürich.
- Talati, A., A. König and K.W. Axhausen (2002) A set of quality control routines for Stated Preference data, Arbeitsbericht Verkehrs- und Raumplanung, **125**, IVT, ETH Zürich, Zürich.
- Tschopp, M. (2002) Kommentierte COST Bibliographie, Arbeitsbericht Verkehrs- und Raumplanung, **108**, IVT, ETH Zürich, Zürich.
- Tschopp M., P. Fröhlich, P. Keller and K.W. Axhausen (2003) Accessibility, Spatial Organisation and Demography in Switzerland through 1850 to 2000: First Results, Paper presented at T2M conference, Eindhoven, November 2003.
- Tschopp M. and P. Keller (2003) Raumstruktur-Datenbank: Gemeindezuordnungstabelle, Arbeitsbericht Verkehrs- und Raumplanung, **170**, IVT, ETH Zürich, Zürich.
- Tschopp, M., P. Keller and K. W. Axhausen (2003) Raumnutzung in der Schweiz: Eine historische Raumstruktur-Datenbank, Arbeitsbericht Verkehrs- und Raumplanung, **165**, IVT, ETH Zürich, Zürich.
- Vrtic, M. and K.W. Axhausen (2003) The impact of tilting trains in Switzerland: A route choice model of regional- and long distance public transport trips, Arbeitsbericht Verkehrs- und Raumplanung, **128**, IVT, ETH Zürich, Zürich.
- Widmer, J.-P. (2001) Do rail stations at airports allow a better distribution of air passenger demand among airports?, Arbeitsbericht Verkehrs- und Raumplanung, **41**, IVT, ETH Zürich, Zürich.

10 Incidental pieces

10.1 Transport Systems: Road Transport

Lindenmann, H.P. (2003) Interviewartikel, *NZZ am Sonntag*, ZEB-NS, Dezember 2003.

10.2 Transport Systems: Public Transport

Brändli, H. (2001) Zukunftsperspektiven für Zürich, Sonderausgabe Magazin UNI Zürich, *Bulletin ETH*, Zürich, April 2001.

Brändli, H. (2002) Brennpunkt Alpentransit, *ETH-Bulletin*, **284**, 40 – 43, Februar 2002.

Nash, A. (2002) San Francisco: How prosperity sprung from disaster, *Land & Liberty*, Conference supplement 2002, 2-3.

Wichser, J. and Guha P. (2002) Europäische Lösungen sind gefragt, *Schweizerische Handelszeitung* (44) 63.

10.3 Transport Planning

Axhausen, K.W., M. Botte and S. Schönfelder (2004) Systematic measurement of catchment areas, CTPP 2000 Status Report August 2003, 2-3, Federal Highways Administration, Washington, DC.

Axhausen, K.W. (2003) Die trans – Redaktion stellt Fragen, in *trans scape*, 67-68, Architectura, ETH Zürich, Zürich.

Axhausen, K.W. (2003) Umbruch an der ETH Zürich, *Strasse und Verkehr*, **89** (9) 43.

Axhausen, K.W. (2003) Städtische Verkehrsplanung: Konzepte, Verfahren, Massnahmen by P. Kirchhoff, *DISP*, **152**, 127

Axhausen, K.W. (2003) Flexible Urban Transportation by J.L. Gifford, *Transport Reviews*, **23** (4) 519-521.

Axhausen, K.W. (2003) Embedded case study methods: Integrating quantitative and qualitative knowledge by R.W. Scholz and O. Tietje, *Transport Reviews*, **23** (4) 521-522.

Axhausen, K.W. (2002) Big Plans: The Allure and Folly of Urban Design by N. Kolson, *DISP*, **151**, 106.

Axhausen, K.W. (2002) Building Chicago: Suburban Developers and the Creation of a Divided Metropolis by A.D. Keating, *DISP*, **151**, 94.

Axhausen, K.W. (2001) Transport and Tourism by S.J. Page, *Journal of Retailing and Consumer Services*, **8** (1) 59

Axhausen, K.W. (2000) Trends der Mobilität, in Holderbank (eds.) Jahresbericht 1999, Holderbank, Zürich.

Axhausen, K.W. (2000) Policy and planning as public choice: Mass transit in the United States by D. Lewis and F.L. Williams, Book review, *Transport Reviews*, **21** (2) 263-265.

11 Metadata series

- Chalasani, V.S. (2004) Swiss travel behaviour Microcensus 2000, Travel Survey Metadata Series, 1, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Chalasani, V.S. (2004) Travel market Switzerland 2001, Travel Survey Metadata Series, 12, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Chalasani, V.S. (2004) Travel module of Household Income and Consumption survey (1998), Travel Survey Metadata Series, 6, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Chalasani, V.S., S. Schoenfelder, and K.W. Axhausen (2004) Mobidrive 1999, Travel Survey Metadata Series, 2, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- DATELINE consortium (2004) Design and Application of a Travel survey for European Long-distance trips based on International Network of Expertise (2001), Travel Survey Metadata Series, 7, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- König, A. (2004) Swiss values of travel time savings, Travel Survey Metadata Series, 11, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Schlich, R. (2004) 12 weeks of leisure travel survey, Travel Survey Metadata Series, 10, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Vrtic, M. (2004) Forecast based on different data types: A before and after study (Revealed Preference), Travel Survey Metadata Series, 3, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Vrtic, M. (2004) Forecast based on different data types: A before and after study (Stated Preference - Mode choice), Travel Survey Metadata Series, 4, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Vrtic, M. (2004) Forecast based on different data types: A before and after study (Stated Preference - Route choice), Travel Survey Metadata Series, 5, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Vrtic, M. (2004) Railways passenger traffic 1999/2001 (average working day), Travel Survey Metadata Series, 8, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.
- Vrtic, M. (2004) Traffic counts - Road passenger traffic (cars / average working day), Travel Survey Metadata Series, 9, Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich, Zürich.

12 Invited conference presentations

12.1 Transport Systems: Road Transport

Spacek, P. (2000) Track Behavior and Accident Occurrence in Curves on Two-Lane Highways in Rural Areas, 2nd International Symposium on Highway Geometric Design, Mainz, June 2000.

Spacek, P. (2000) Spannungsfeld Strassenentwurf und Verkehrspolitik, am Beispiel der schweizerischen Alpenübergänge, Ehrenkolloquium Prof. G. Weise, Technische Universität Dresden, Fakultät für Verkehrswissenschaften „Friedrich List“, Dresden, November 2000.

12.2 Transport Systems: Public Transport

Brändli H. (2003) Facts and figures; Prognosen und Perspektiven, 8. Internationale Informationstagung Weichenstellungen im Alpen transitverkehr, Luzern, October 2003.

Brändli, H. (2001) Alpenquerender Schienenverkehr unter besonderer Berücksichtigung der Erhaltungsprobleme, seminar series „Raum und Verkehr“, Universität Stuttgart, Stuttgart, March 2001

Brändli, H. (2001) Die Bahnen im Zwiespalt zwischen Fakten und Interessenpolitik, Welteisenbahnkongress AICCF/UIC/CEMT, Wien, September 2001

Brändli, H. (2001) Voraussetzungen für einen zukunftsfähigen öffentlichen Verkehr, Tagung der DVWG Berg und Mark, Bergische Universität Wuppertal, May 2001

Brändli, H. (2002) Das Landverkehrsabkommen EG-Schweiz und die Nachhaltigkeit in der schweizerischen Verkehrsplanung und Transporttechnik; Internationale Tagung „Mobilität die bewegt“, Osnabrück, May 2002.

Brändli, H. (2002) Entwicklungsperspektiven des Logistiksystems Schiene unter dem Einfluss der EU-Verkehrspolitik, Internationales Verkehrssymposium 2002 der ÖVG, Bregenz, June 2002.

Brändli, H. (2002) Grossbauten des Verkehrs – welche Probleme lösen wir? ZBV, Zürich, March 2002.

Brändli, H. (2002) Leads optimal evaluation to optimal transport? Networks for mobility; International Symposium, Stuttgart, September 2002.

Brändli, H. (2002) Was heisst Sicherheit im Strassenverkehr? Tagung Unfallverhütung VöV/VTP, Bern, March 2002.

Brändli, H. (2002) Zukunft des schweizerischen und inner-europäischen Güterverkehrs; Internationale Transport-Tage 2002, Euroforum-Jahrestagung, Basel, August 2002.

Brändli, H. (2003) Die Megatrends der Mobilität, Podium bei Kongress railtec, Dortmund, November 2003.

Brändli, H. (2003) Forum nachhaltige Verkehrspolitik (Hauptreferent), Dedelange, Luxemburg, October 2003.

Brändli, H. (2003) Innovative Projekte im Mobilitätsmarkt im In- und Ausland, 3. Berner Verkehrstagung „Neue Ideen und Projekte in der Mobilitätspolitik“, Bern, March 2003.

Brändli, H. (2003) Nachhaltigkeit im SPNV, Symposium „Das grüne Gleis“, Berlin, July 2003.

Carle, G. (2003) Fuel cells for cars - a competitive analysis, WSCSD Conference, Tokyo, March 2003.

Kohler, M. (2002) New Insight into Track Modulus of Ballasted Track, Railway Engineering – 2002, London, July 2002.

- Hürlimann, D. (2002) Bahninformatikprojekte des IVT, Tagung der Deutschen Bahn AG, Fulda, November 2002.
- Ullius, M. (2002) OpenTimeTable, DB-Tagung, Fulda, November 2002.
- Wichser, J. (2001) Einführung einer neuen Familie von intermodalen Kleinbehältern, Horber Schienentage „Neue Herausforderung in Europäischen Güterverkehr“, Horb, November 2001.
- Wichser, J. (2001) Intermodaler Güterverkehr, technische und betriebliche Voraussetzungen für den Markterfolg, Rail 21 - Jahreskongress der UIEEV Strassburg, May 2001.
- Wichser, J. (2001) Zugänglichkeit der Eisenbahn für mobilitätsbehinderte Fahrgäste, Horber Schienentage „Neue Herausforderung in Europäischen Güterverkehr“, Horb, November 2001.
- Wichser, J. (2002) Einführung eines neuen Container-Typs – Eine Herausforderung für den Europäischen Gütertransport, ISUFT 2002 Internationales Symposium Underground Freight Transportation by Capsule Pipelines and other Tube/Tunnel Systems Ruhr Universität Bochum, September 2002.

12.3 Transport Planning

- Axhausen, K.W. (2000) Verkehrstelematik – Eine Führungsaufgabe?, presentation at the Mextra – Workshop, Bern, November 2000
- Axhausen, K.W. (2001) Activity metadata, 80th Annual Meeting of the Transportation Research Board, Washington, D.C, January 2001.
- Axhausen, K.W. (2001) Herausforderungen im Verkehr und Lösungsansätze, 35. Hochschulkurs Finanzwissenschaften der Universität Innsbruck, Vill, March 2001.
- Axhausen, K.W. (2001) Mobidrive: Ein 6-Wochen Tagebuch, FSV Seminar, Rust, June 2001.
- Axhausen, K.W. (2001) Mobilität als individuelles Recht?, Festwoche der Österreichischen Raumplanung, Wien, April 2001.
- Axhausen, K.W. (2001) Sechs Fragen zur Mobilität der Zukunft, Forum des Schweizer Verkehrs, Bern, November 2001.
- Axhausen, K.W. (2003) Current transport planning research at the IVT: Models and behaviours, Schweizer Vereinigung für Operations Research Annual Meeting, Zürich, May 2003.
- Axhausen, K.W. (2003) Verkehrsentwicklung: die letzten und die nächsten 50 Jahre, Jahrestagung Schweizerische Gesellschaft für Agrarökonomie, Rapperswil, March 2003.
- Axhausen, K.W. and A. Bleisch (2003) Die Erreichbarkeit Zürichs im internationalen Vergleich, Zürcher Benchmarking Forum, Zürich, November 2003.
- Keller, P. (2002) Erreichbarkeit als Schlüsselgrösse in der Verkehrs- und Siedlungsplanung, 2. Berner Verkehrstag, Bern, April 2002.
- Schlich, R., S. Schönfelder, S. Hanson and K.W. Axhausen (2001) Freizeitmobilität im Wandel - Raumzeitstrukturen vor 30 Jahren und heute, Deutscher Geographentag, Leipzig, September 2001.
- Widmer, J.-P. (2001) Interactions between high-speed rail and air passenger transport in Europe, International Air/Rail Conference, London, July 2001.
- Widmer, J.-P. (2002) High-Speed Rail: Partner or Competitor?, ACI, Airports Council International, Annual Conference, Salzburg, March 2002.

13 Seminar presentations

13.1 Transport Systems: Road Transport

- Koy, Th. (2001) Auswirkungen von Zonensignalisationen (Tempo 30) in Wohngebieten auf die Verkehrssicherheit, 1. Swiss Transport Research Conference, Ascona, March 2001.
- Laube, M. (2001) Verkehrsverhalten und Unfallgeschehen im Bereich von Autobahnbaustellen, 1. Swiss Transport Research Conference, Ascona, March 2001.
- Lindenmann, H.P. (2003) Erhaltungsmanagement von Strassenverkehrsanlagen, Tagung VSS, Bern, September 2003.
- Lindenmann, H.P. (2001) Lokalisierung von Unfallschwerpunkten, VSS-Tagung, Bern, October 2001.
- Lindenmann, H.P. (2001) Harmonisierung Zustandsbewertung, MSE-Ausschuss Schweiz, Bern, May 2001
- Lindenmann, H.P. (2001) Sicherheitsniveau auf Nationalstrassen, MSE-Ausschuss Schweiz, Bern, November 2001.
- Lindenmann, H.P. (2002) Ausbildung im Einhaltungsmanagement an der ETH und an Fachhochschulen, MSE-Ausschuss, Bern, November 2002.
- Lindenmann, H.P. (2002) Road safety audits, bfu-Form, Bern, November 2002.
- Lindenmann, H.P. (2002) Zustandsbeurteilung Fahrbahnen, neue Normen VSS, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Neufahrn, November 2002.
- Lindenmann, H.P. (2002), Neuer Studienplan 1999, Bereich Verkehr an der ETH Zürich, Präsidentenseminar VSS, Thun, August 2002.
- Seiler, L. (2002), WIM Strategies and measures in Switzerland, International Overload Enforcement Workshop, Delft, March 2002.
- Seiler, L. (2004), Is the correlation between pavement skid resistance and accident frequency significant?, 4. Swiss Transport Research Conference, Ascona, March 2004.
- Shojaati, M. (2003) Correlation between injury risk and impact severity index ASI, 3. Swiss Transport Research Conference, Ascona, March 2003.
- Schiffmann, F. (2004) Zustandserfassung und –bewertung Nationalstrassen (Fahrbahnen) ZEB-NS, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Innsbruck, April 2004.
- Spacek, P. (1999) Auswirkungen der 40T-Gewichtslimite auf Strassen: Projektkoordination und Stand der Arbeiten, der Arbeitsgruppe des ASTRA/GS UVEK, Zürich, 1999.
- Spacek, P. (2000) Umfahrungskozept Unteres Glarnerland: Kriteriensystem für die Variantenwahl, Fachkommission der Kantonsrates, Glarus, 2000.
- Spacek, P. (2000) Mindestgeschwindigkeiten für Lastwagen auf den Alpenübergängen: Konzeption und Vollzug, Projektresonanzgruppe MINGE des ASTRA, Bern-Ittigen, 2000.
- Spacek, P. (2000) Entwurf von Freilandstrassen; Abhängigkeiten der Entwurfsgeschwindigkeit von Trassierungselementen, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Linz, 2000.
- Spacek, P. (2002) Überlegungen zum Themenbereich Entwurfsgrundlagen, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Neufahrn, 2002.
- Spacek, P. (2002) Problematik der Bewirtschaftung / Kapazitätsverbesserung von Hochleistungsstrassen, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Neufahrn, 2002.
- Spacek, P. (2003) Ausbildung Verkehrsingenieur an der ETH, Kommunikationstag Baudirektion Kt. Zürich, IVT-ETH Zürich, 2003.

- Spacek, P. (2003) Verkehrsbeeinflussung: Gründe, Arten und Systemelemente, Kommunikationstag Baudirektion Kt. Zürich, IVT-ETH Zürich, 2003.
- Spacek, P. (2003) Sicherheitsaspekte beim Strassenentwurf: 2+1-Querschnitte in der Schweiz, Dreiländer Tagung der Forschungsgesellschaften VSS/FGSV/FSV, Salzburg (A), 2003.

13.2 Transport Systems: Public Transport

- Brändli, H. (2003) ÖV System Schweiz und die grossen Infrastrukturprojekte, der Railway Study Association bei den SBB, Workshop, Luzern, June 2003.
- Brändli, H. (2001) Arbeitsreferat/Tagungsleitung Anwendertagung „Sky Eye“, Zürich, April 2001
- Brändli, H. (2001) Bahnvisionen Europa und Schweiz, Podiumsdiskussion Verkehrshaus der Schweiz, Luzern, September 2001
- Brändli, H. (2001) Der Nahverkehrsplan aus Sicht der Nutzer, Workshop 7, Senatsverwaltung, Berlin, February 2001
- Brändli, H. (2001) Integrated Road and Rail Networks, Seminar on Integrated Transport Planing, China Council For International Cooperation, Transport Working Group, Beijing, April 2001
- Brändli, H. (2001) Oeffentlicher Verkehr, Charakteristiken öV/Linienbetrieb, Sicherheit, Ausbildung Fachlehrer für Verkehr, IAP, Zürich, August 2001
- Brändli, H. (2001) Oeffentlicher Verkehr; Bedeutung, Charakteristik, Sicherheit, Recht, Ausbildung Verkehrslehrer IAP, Zürich, June 2001
- Brändli, H. (2001) Ostösterreich in der Abseitsfalle? (Ausbau Semmering), Presseorientierung Wirtschaftskammer Steiermark, Wien and Graz, June 2001
- Brändli, H. (2001) Strecken-/Kostenkapazität des Systems Eisenbahn, Sounding Board der SBB zum Vorhaben „Kapazitätssteigerung“, Bern, May 2001
- Brändli, H. (2001) Verkehrsproblematik der Stadt Baden, Oeffentliches Hearing, Stadtrat Baden, Baden, November 2001
- Brändli, H. (2001) Wege in die Zukunft; Koralmbahn, Oeffentliche Veranstaltung Wirtschaftskammer Kärnten, Wolfsberg, October 2001
- Brändli, H. (2001) Zukunftsperspektiven zum Verkehr in Zürich und der Agglomeration, Oeffentliche Veranstaltung, Zürich, August 2001
- Brändli, H. (2002) Aufbau von Zukunftsszenarien Bahn, Grundlage für „Visionsgruppe“, SF1, Zürich, October 2002.
- Brändli, H. (2002) Die verschiedenen Facetten des Besteller–Ersteller-Prinzips, Informationsveranstaltung Swissrail-SBB, Lyss, November 2002.
- Brändli, H. (2002) Grundlagen zukunftsicherer (Verkehrs-) Planungsprozesse, GV UBS, Polybahn AG, Zürich, May 2002.
- Brändli, H. (2002) Kann der Verkehrskollaps im Limmattal verhindert werden? Öffentliche Veranstaltung FDP/SP, Schlieren, January 2002.
- Brändli, H. (2002) Laudatio “Goldene Schiene 2002” des GDI; Biel, April 2002.
- Brändli, H. (2002) Verkehrsgeschichtlicher Rückblick über die Entwicklung von Zürich, Gemeinderat Wädenswil, Zürich, IVT, October 2002.
- Brändli, H. (2002) Was ist verkehrspolitisch von der Zentrumserschliessung der Regio-S-Bahn zu halten? Jahresversammlung Gruppe Bahnhof/Basiliensis, Basel, Dezember 2002.

- Brändli, H. (2003) Light Tram; mehr öV für weniger Geld, Schweizerische Trolleybustagung, Luzern, September 2003.
- Brändli, H. (2003) Drehscheibe Schweiz heute und morgen, Tagung „Mobilität und Verkehr“, Unique Airport, Zürich, May 2003.
- Brändli, H. (2003) Entwicklung ÖV in Stadt und Kanton Zürich, FDP Zürich, March 2003.
- Brändli, H. (2003) Entwicklungstendenzen im öV der Schweiz; Chancen und Risiken, IGÖV Schweiz, Bern, November 2003.
- Brändli, H. (2003) Fallstudie Zürich, der Internationale Tagung „Die grossen Infrastrukturen und die Probleme des Stadtverkehrs“, Villa Viponi (Deutsch-Italienisches Zentrum, Como, September 2003.
- Brändli, H. (2003) Transport Quality and Services, Tagung Swiss Communication and Transportation policy, Zürich, September 2003.
- Brändli, H. (2003) Universitäre Lehre im öffentlichen Verkehr, Leitung und m Workshop deutschsprachiger Eisenbahnprofessoren in der Schweiz; ETH Zürich, September 2003.
- Brändli, H. (2003) Verkehrspolitische Beurteilung, Tagung Oeffentlicher Verkehr im Aufbruch, Gewerbeverband Basel, January 2003.
- Brändli, H. (2003) Weder Verkehr noch Betrieb ohne Infrastruktur, Cargo Forum Schweiz, Verkehrsverlagerung, Bürgerstock, May 2003.
- Hürlimann, D. (2002) RailML - The Railway Markup Language, Fraunhofer Institut für Verkehrs- und Infrastruktursysteme, Dresden, April 2002¹.
- Hürlimann, D. (2003) Praktische Erfahrungen aus dem Einsatz von RailML-Schemen im Projekt HSL Zuid, Institut für Verkehrsplanung und Transportsysteme der ETH Zürich, April 2003.
- Jermann, J. (2002) GIS-gestützte Modellierung von Anmarschwegen auf Haltestellen des öffentlichen Verkehrs, AGIT 2002, Salzburg, July 2002.
- Jermann, J. (2002) Potenzialanalyse von ÖV-Haltestellen – Ein Vergleich verschiedener Ansätze, GIS/SIT 2002, Zürich, March 2002.
- Jermann, J. (2003) GIS-gestützte Analyse der Einzugsbereiche von ÖV-Haltestellen, Tagung „Fuss- und Veloverkehr in den Agglomerationen“, HSR Rapperswil, Rapperswil, October 2003.
- Kohler, M. (2002) Der Bettungsmodul für den Schotteroberbau von Meterspurbahnen, VöV, September 2002.
- Kölble C. (2003) Introduction of a new family of small intermodal boxes - A challenge in European freight transport, 2. Auslandsexkursion des AK INTERNATIONAL des Jungen Forums der DVWG, Budapest, June 2003.
- Kölble C. (2003) Neue Technologien im Kombinierten Verkehr, DVWG-sreihe zwanzigzwanzig: Der Güterverkehr im erweiterten Europa, Stuttgart, Dezember 2003.
- Ullius M. (2001) UniMeet Developer Day, Transition from MacOS X Server to MacOS X, Universität Bern, Bern, April 2001. (J)
- Wichser, J. (2001) Präsentationen Erfahrungen mit EU Forschung beim IVT als Beispiel aus der Hochschule, Medienorientierung zur Eröffnung EURESEARCH, Bern, July 2001.
- Wichser, J. (2001) Technical and operational developments needed for a better market success of intermodal freight transport, 1. Swiss Transport Research Conference, Ascona, March 2001.

¹ Siehe <http://www.ivt.baug.ethz.ch/oev/OpenTrack/Downloads/railML.pdf>.

13.3 Transport Planning

- Axhausen, K.W. (1999) Methods and technologies for European Surveys of Travel Behaviour, presentation at the Eurostat EEA Working Group Passenger Transport Statistics, Luxemburg, September 1999.
- Axhausen, K.W. (1999) Zur Erfassung der Nutzungshäufigkeiten im ÖV, presentation at the Sommertagung des Fachverbands der Schienenbahnen, Graz, June 1999.
- Axhausen, K.W. (2000) Agglomerationsverkehr heute, presentation at the Ständerarbeitsgruppe Agglomerationsverkehr, Mai 2000, Bern.
- Axhausen, K.W. (2000) Externe Kosten: Stand der Forschung in der Schweiz, presentation at the Working Group Wegekostenrechnung of the Austrian Ministry of Infrastructure, Vienna, May 2000.
- Axhausen, K.W. (2000) Die Dynamik der verkehrlichen Entwicklung, presentation at the KÖV and BPUK Annual Meeting, Bellinzona, September 2000.
- Axhausen, K.W. (2000) Rhythmen des Alltags, presentation for the ARL Working Party on Time Use, Berlin, March 2000.
- Axhausen, K.W. (2000) Rhythmik und Dynamik im Verkehr: Neue Herausforderungen für die Nachfragemodellierung, presentation at the PTV Vision Anwendertreffen, Karlsruhe, October 2000.
- Axhausen, K.W. (2000) Stated preferences and market segmentation, presentation at the Think-Up Workshop Segmentation of passenger markets users, Dresden, December 2000.
- Axhausen, K.W. (2000) Überblick, Grenzen und Möglichkeiten, presentation at the NFP 41 Seminar "Stated Preference Ansätze im Verkehr", Zürich, March 2000.
- Axhausen, K.W. (2000) Zeitaufteilung und Zeitplanung, presentation at the IfMo-Workshop Freizeitverkehr: Theoretische und empirische Motivforschung, Berlin, Dezember 2000.
- Axhausen, K.W. (2001) Ein sechs-wöchiges Panel: Erfahrungen mit der Mobidrive – Befragung, Universität für Bodenkultur, Wien, July 2001.
- Axhausen, K.W. (2001) Mobilität wohin ?, Forum der Herbstakademie der Bergischen Universität Wuppertal, Gelsenkirchen, October 2001.
- Axhausen, K.W. (2001) Mobilität: Verkehrsverhalten und Marktstruktur, Tirol Werbung Seminar „Zukunft des Tiroler Bergsommers“, Innsbruck, June 2001.
- Axhausen, K.W. (2001) Modellierung der Verkehrsnachfrage auf der Basis von Individualentscheidungen, DLR Sommerschule, Berlin, September 2001.
- Axhausen, K.W. (2001) Variability in travel behaviour: Experiences with a six-week diary, Groupe Romand Telematique, EPF Lausanne, September 2001.
- Axhausen, K.W. (2002) A dynamic understanding of travel demand: A sketch, International SSHRC-MCRI Colloquium, Quebec, June 2002.
- Axhausen, K.W. (2002) Langfristige Bindungen und das Verkehrsverhalten: Wohnstandorte, Pkw und Zeitkarten, Verkehrswissenschaftliches Kolloquium, TU Dresden, July 2002.
- Axhausen, K.W. (2002) Long-term commitments and their effects on daily travel behavior, Stella - Focus Group 3 Meeting "Society, behaviour and private/public transport", Bonn, April 2002.
- Axhausen, K.W. (2002) Social networks and travel behaviour, ESRC Workshop „Mobile network seminar series - Seminar 2: New communication technologies and transportation systems“, Lucy Cavendish College, Cambridge, February 2002.
- Axhausen, K.W. (2003) Accessibility and spatial development: The case of Switzerland between 1950 and 2000, WITS Seminar, University of Wisconsin, Madison, September 2003.
- Axhausen, K.W. (2003) Leisure, variety seeking and social networks, Danish Technical University, Kopenhagen, June 2003.

- Axhausen, K.W., S. Beige, M. Bernard and S. Schönfelder (2003) Impacts of long-term commitments on daily choices, Workshop on Behavioural Responses to Traffic Management Measures, TU Eindhoven, April 2003.
- Axhausen, K.W. and A. Bleisch (2003) Accessibility of regions: First results of the IBC development module "Accessibility", IBC Forum, Basel, June 2003.
- Axhausen, K.W. and P. Keller (2001) Der Beitrag des IVT zu "2000-Watt-Gesellschaft: Pilotregion Basel", "2000-Watt-Gesellschaft: Pilotregion Basel" Workshop 2, Basel, November 2001.
- Axhausen, K.W. and S. Schönfelder (2003) Aktionsräume und die Suche nach Abwechslung: Aktuelle Ergebnisse von Langzeitbefragungen, Universität für Bodenkultur, Wien, June 2003.
- Blinde, J. and R. Schlich (2001) Freizeitmobilität und Wohnsituation - Eine empirische Untersuchung zum Einfluß von Wohnsituation und Wohnzufriedenheit auf die Freizeitmobilität junger Menschen, 53. Deutscher Geographentag, Leipzig, October 2001
- Keller, P. (2001) Der Beitrag der Gruppe Verkehrs- und Raumplanung am IVT, Projekteingabekonferenz "Schnittstelle ÖV-IV im Alpenraum" (INTERREG IIIb), Chur, November 2001.
- Keller, P. (2001) Technologiefolgen-Abschätzung im Verkehr: Zukünftige Herausforderungen, Leitungsausschuss Schweiz, TA-Zentrum, Bern, November 2001.
- Keller, P. (2003) Erreichbarkeit als Schlüsselgrösse in der Siedlungs- und Verkehrsplanung, m Rat für Raumordnung (ROR), Bern, November 2003.
- Keller, P. (2003) Möglichkeiten von Verkehrsleitsystemen zur CO₂-Reduktion im Verkehr, sun21: Mobilitätskonzepte für morgen - Impulstagung, Workshop B, Basel, June 2003.
- Keller, P. (2003) Planernachwuchs: wofür und woher? der Zürcher Studien-gesellschaft für Bau- und Verkehrsfragen (ZBV), Zürich, November 2003.
- Keller, P. (2003) TransitRaum Schweiz: Entwicklungen des Transitverkehrs-Systems und deren Auswirkungen auf die Raumnutzung in der Schweiz, Seminar "Schiene vs. Strasse. Genese und Entwicklung der sektoriellen Verkehrspolitik im 20. Jh." Historisches Institut, Universität Bern, Zürich, June 2003.
- Schlich, R., (2003), Alles nur Spielerei ? - Narrativität in Prognosen, m Abschlussymposium „Narrativität in Wissenschaften“; Collegium Helveticum, June 2003.
- Schönfelder, S. (2001) „...things people do in time and space“ – Untersuchungen zur Alltagsmobilität, IRPUD-Forschungskolloquium, Universität Dortmund, July 2001.
- Schönfelder, S. (2003) Alltagsmobilität – Aktivitätenräume, Verkehrswissenschaftlichen Kolloquium der TU Dresden, Dresden, April 2003.
- Schönfelder, S. (2003) Activity space: Concept, measurement and first results, Verkehrswissenschaftlichen Kolloquium der Danish Technical University, Kopenhagen.
- Simma, A (2001) Verkehrsverhalten als Funktion sozio-demografischer und räumlicher Faktoren, der Preisverleihung der FSV - Forschungsgemeinschaft Strasse und Verkehr, Wien, November 2001.
- Widmer, J.-P. (2002) Accessibility by Air Passenger Transport related to Switzerland, 2nd STRC Swiss Transport Research Conference, Ascona, March 2002.
- Zimmerman, A., R. Schlich und S. Schönfelder (2001) Werthaltungen und Verkehrsverhalten - Empirische Ergebnisse in Längsschnitterhebungen, AMUS 2001, Aachen, July 2001.

14 IVT seminar and other internal presentations

14.1 Transport Systems: Road Transport

- Doerfel, M. (2002) Verkehrssicherheitsbeurteilung – Safety Audit, IVT-Seminar, Zürich, November 2002.
- Koy, Th. (2002) Geschwindigkeiten in Steigungen und Gefällen, IVT-Seminar, ETH- Hönggerberg, Zürich, November 2002.
- Koy, Th. (2003) Geschwindigkeiten in Steigungen und Gefällen, IVT-Seminar, Zürich, October 2003.
- Schiffmann, F. (2003) Zustandserfassung und –bewertung Nationalstrassen (Fahrbahnen) ZEB-NS, IVT-Seminar, Zürich, October 2003.
- Seiler, L. (2003) Korrelation Griffigkeit und Unfallgeschehen, IVT-Seminar, Zürich, October 2003.
- Shojaati, M. (2002) Korrelation zwischen dem Verletzungsrisiko von Fahrzeuginsassen und der Anprallhäufigkeit, IVT Seminar, ETH-Zürich, November 2002.
- Spacek, P. (2002) Leistungsfähigkeit von Strecken und Knoten, IVT - Seminar „Angewandte Verkehrsplanung“, für Stadtpolizei und Verkehrsbetriebe Zürich, Zürich 2002.
- Weber, Th. (2002) Verkehrstelematik-SAP, Nationales Verkehrslenksystem, IVT-Versammlung, Zürich, Juni 2002.
- Weber, Th. (2002) Fahrbahnzustand und Verkehrssicherheit auf Nationalstrassen, IVT-Seminar, Zürich, November 2002.

14.2 Transport Systems: Public Transport

- Brändli H. (2003) Presentation of Zurich transport system as a good example, 2nd Portal Conference Braunwald, March 2003.
- Brändli, H. (2001) Fakten- und Sachzwänge kontra Liberalisierung und Wettbewerb, IVT-Seminar, Zürich, June 2001
- Brändli, H. (2001) Round Table on „Small Containers“, Chairman, Joint Final IDIOMA/COST 339 Conference, Zürich, February 2001
- Kölble C. (2003) Europäische F&E-Projekte für den Kombinierten Verkehr, IVT-Seminar, Zürich, November 2003.
- Kölble C. (2003) National Demonstrator Switzerland: NETHS, InHoTra Project – Final Conference, Budapest, October 2003.
- Kölble, C. (2002) ... vom Umgang mit Software in der ÖV-Planung, IVT-Seminar, Zürich, Dezember 2002.
- Nash, A. (2002) Public Involvement Processes in San Francisco, ALP-NET Thematic Network Meeting, May 2002.
- Schäffeler, U. (2001) European research programmes on urban freight transport, PORTAL Meeting, Amsterdam, May 2001
- Schäffeler, U. (2001) New training materials on urban freight transport, PORTAL Workshop, Paris, November 2001

- Schäffeler, U. (2002) Berücksichtigung verschiedener Nutzergruppen bei der Optimierung öffentlicher Verkehrsnetze, IVT-Seminar, ETH Zürich, November 2002.
- Schäffeler, U. (2003) WP 6 state of works and overview of first results, 2nd PORTAL Conference, Braunwald, March 2003.
- Ullius, M. (2002) OpenTimeTable, IVT-Seminar, ETH Zürich, November 2002.
- Wichser, J. (2001) Entwicklungen im Güterverkehr, Kostenstrukturen bei der Produktion von Bahnangeboten, Betriebsplanung im ÖV, Linienführung Schiene SBB/IVT, dem Ausbildungskurs „Integrierter öffentlicher Verkehr“, Murten, March 2001
- Wichser, J. (2001) Optimale Strukturen aus Sicht der Angebotserstellung, Forum Braunwald „Regionalverkehr zwischen Markt und Politik“, Braunwald, September 2001.
- Wichser, J. (2001) Presentation of COST 339 results „Small Containers“, Anschlussstagung von COST 339 and IDIOMA, Zürich, February 2001
- Wichser, J. (2002) Entwicklungen im Güterverkehr, Kostenstrukturen bei der Produktion von Bahnangeboten, Betriebsplanung im ÖV, Linienführung Schiene SBB/IVT Ausbildungskurs, Integrierter öffentlicher Verkehr Murten, August/September 2002.
- Wichser, J. (2002) Optimale Strukturen aus Sicht der Angebotserstellung, Forum Braunwald, Regionalverkehr zwischen Markt und Politik, Braunwald, September 2002.
- Wichser, J. (2002) Technische Möglichkeiten neuer Betriebsformen im KLV InHoTra/IVT Workshop Chur, Dezember 2002.
- Wichser, J. (2002) Vernetzung einer Transportunternehmung und Bergbahn mit einem touristischen Bergdorf am Beispiel von Braunwald, Forum Braunwald, Regionalverkehr zwischen Markt und Politik, Braunwald, September 2002.

14.3 Transport Planning

- Axhausen, K.W. and G. Abay (2000) Entwurf einer Schweizer Zeitkosten-Studie für den Personenverkehr, presentation at the IVT Seminar Kosten-Nutzen-Analysen im Verkehr: Theorie und Praxis, Zürich, November 2000.
- Axhausen, K.W., B. Kluge and R. Schlich (2003) Zielwahl im Freizeitverkehr: Erfahrungen aus der Schweiz und Brandenburg, Öffentliche Abschlussstagung "Raumpartnerschaften und Kontrasträume", Berlin, May 2003.
- Fröhlich, P. (2002) Erreichbarkeitsgeschichte der Schweiz: Erste Ergebnisse, IVT-Seminar „Netzmodelle: Theorie und Anwendung“, ETH Zürich, June 2002.
- Keller, P. (2002) Entwicklungen des Transitverkehrs-Systems und dessen Auswirkungen auf die Raumnutzung in der Schweiz (COST 340), 3. Projekt-Meeting, Neuchâtel, March 2002.
- Keller, P. (2002) Erreichbarkeitsgeschichte der Schweiz: Anlass und Konzept, IVT-Seminar "Netzmodelle: Theorie und Anwendung", ETH Zürich, June 2002.
- Schlich, R. (2002) 12 Wochen Freizeit: Methoden und Ergebnisse eines Zürcher Panels, IVT- Seminar, Zürich, Dezember 2002.

Schlich, R., and K.W. Axhausen (2003) Wohnkontext und Fluchtmobilität - eine empirische Untersuchung basierend auf einer Langzeitbefragung, Öffentlichen Abschlusstagung Raumpartnerschaften und Kontrasträume, Berlin, May 2003.

Schlich, R. and K.W. Axhausen (2003) Wohnkontext und Fluchtmobilität - eine empirische Untersuchung basierend auf einer Langzeitbefragung, der öffentlichen Abschlusstagung des Projekts Raumpartnerschaften und Kontrasträume, Berlin, May 2003.

Vrtic, M. (2001) Dynamische Umlegung des Strassenverkehrs, IVT Seminar, ETH Zürich, Dezember 2001

