REVIEW OF TRAVEL SURVEY USEFULNESS

Peter Endemann, Planungsverband Ballungsraum Frankfurt/Rhein-Main,
peter.endemann@planungsverband.de

ABSTRACT

Behavioural travel surveys are highly meaningful in the context of planning and policy formulation at different levels and tackle a wide range of transport issues. There are numerous surveys undertaken all over the world, but survey purposes and the potential usefulness for everyday application in research and practice is not often clearly laid out. Surveys serve for a variety of purposes far beyond the most obvious modelling issue. Moreover, given the difficulty of generating funds for those quite expensive surveys, there is a necessity to bundle survey activities. Furthermore, large and mostly cost-intensive national travel surveys (NTS) can serve for multiple purposes. They even bear the advantage that regional or local add-ons to the sample size allow comparability as they respect the same design and methodology.

This paper shows in general, that several national household travel surveys do fulfil strategic objectives in terms of statistical requirement, mobility patterns, evaluation and planning of the national transport infrastructure network and policy formulation. Therefore, in most of the cases data feed the respective transport model or serve as some relevant key indicator. In this first section, it will be shown that only few surveys go beyond this point and conceive the travel survey as an instrument using a holistic approach which would be of greater benefit for all. Furthermore, it is rarely the case that other institutions benefit from organising add-ons to the national sample size even if it is possible. With this respect, some insights from the German National Travel Survey will be helpful.

The literature review visualises the possible benefits of household travel surveys. Among them there are: Effectiveness of policies within the land-use/transport context, understanding travel behaviour and change, public transport planning and marketing, plausibility for other studies, monitoring, benchmarking of regions and modes. This non exhausting exercise shows that national travel surveys could be better marketed if the benefits and advantages of carrying out such a survey were clearly communicated through the objectives. Furthermore, the inclusion of planning and transport organisations in the up-date process of the German NTS stresses the suitability of this tool for a wider range of purposes.

Keywords: Travel Survey Benefits, Survey Marketing, National (Household) Travel Surveys, Urban & Regional Planning

1. INTRODUCTION

Behavioural travel surveys are highly meaningful in the context of planning and policy formulation at different levels and tackle wide range of transport issues. Surveys can serve for a variety of purposes far beyond the most commonly imposing modelling issue. Nonetheless, the usefulness and serving purposes do not appear to be expressed clearly or convincing, especially when referring to the needs of policy makers at different spatial planning levels and in the transport sector. Moreover, given the difficulty of generating funds for quite expensive surveys, there is a necessity to bundle survey activities. Especially large and mostly cost-intensive national travel surveys (NTS)[1] can serve for a wide range of purposes and bear even the advantage that through regional or local add-ons to the sample size comparability is given as they all respect the same design and methodology. According to Bonnel and Armoogum (2005), a national travel survey can fulfil many different objectives. They thus argue that countries pursue different objectives when undertaking a NTS. The authors captured their information through a questionnaire sent to the responsible survey managers or designers, they are convinced that if specifically asked, the survey objectives would be manifold.

If this is the case, what do behavioural surveys and in particular NTS intend? Why are the objectives not clearly laid out? Why is there an apparent lack in communicating the purposes of a survey? In order to stress this obvious gap between the usefulness of a survey and the information strategy, an overview of the German case will be given. The motivation for analysing the usefulness of NTS derives from the experiences the author had with the German NTS and the preparatory process for the ultimate edition[2]. The following excursus will enable the reader to better understand this background.

The preparation of the fifth edition of Germany's NTS, MiD 2008, started in early 2006 when the responsible German Ministry of Transport, Building and Urban Affaires (BMVBS[3]) published a preliminary call for proposals in its city transport research programme.[4] Some issues were raised roughly in a standardised format stating that data from former MiD 2002 were too old due to the EU-enlargement, fuel price changes and emergence of the low cost airline market. To sum up, a replication of the former MiD 2002 was required. However, benefits for potential co-funding of add-ons at the regional and the local level and the further procedure, deadlines etc. had not been specified. In order to raise awareness for the realisation of the next MiD and to ensure their involvement in the further development, several organisations – including the inter-municipal planning association the author works for – ranging from the federal state level to the local level and including research and public transport bodies, issued a paper in November 2006. The paper addressed some requirements for the replication of MiD from a broad user perspective and contained data variable suggestions and definitions for the questionnaire. Subsequently, BMVBS informed subsequently transport ministries at the federal state level and some interested organisations about the intention to carry out a new NTS. It was then in June 2007 when the new MiD 2008 was commissioned by BMVBS and the details for co-funding add-ons were communicated. The two contractors organised an informing event together with the responsible federal ministry. In August 2007, a user workshop discussed possible modifications to the

questionnaire and data processing requirements. In the view of the author – shared by numerous other organisations – a clear overview of the survey purposes, the visualisation of the benefits for potential co-financing institutions were lacking. For the Federal State of Hesse, some partners issued papers illustrating the multiple survey benefits in order to achieve a broader participation (cf. Planungsverband, 2006). In the end, eight partners financed an add-on of three times of the sample size the Federal State of Hesse had in the basic sample for Germany. Moreover, some new partners could be found in Hesse as elsewhere in Germany. In the author's view, shared by other participants, more partners could have been recruited if more time had been allotted to prepare the survey and to outline the survey usefulness for different organisations.

Goal and Structure of the Paper

Given the context of the German NTS described above and since national travel surveys are an important source to describe mobility patterns, the intention of this paper is to highlight survey benefits with a special focus on NTS analysis which can help to increase acceptability of surveys and contribute to ensure their existence in the long-run. Concerning the latter, this paper focuses on the obviously communicated objectives stated in official documents or papers using the respective NTS database. In doing so, the intention is to stress the awareness or the lack of awareness survey designers attribute to the benefits of a survey. Furthermore, if more marketing is done, such an instrument could attract more users and thus make funding easier. Though it is intended to gather as many surveys as possible, there are language barriers and restricted access to relevant documents which hinder to obtain a complete picture of the existing national travel surveys. The Austrian Federal State of Lower Austria is included as an example as it uses a similar survey design. The paper briefly summarises some relevant issues requiring travel surveys. This is followed by a comparison of some national household travel surveys and an analysis of the suitability of the surveys' objectives for planning and transport research and practice issues. In addition to this, results from different travel surveys will be presented exemplarily in order to stress the data's usefulness for relevant transport and planning issues. The paper will conclude with some suggestions on how to better address travel surveys and how to make them more attractive for the potential stakeholders at different institutional levels.

2. THE SCOPE OF TRAVEL SURVEYS

This chapter presents a literature review on the function of behavioural transport surveys. This is followed by an overview of criteria which are relevant for the planning process and which can be obtained from appropriate travel surveys.

The Role of Travel Surveys

With respect to national travel surveys, there exist some comparing studies focusing on the survey methodology and the comparability issue itself (Bonnel and Armoogum, 2005; De La

Fuente Layos, 2005; Marconi et al., 2004; Kunert et al., 2002). To the knowledge of the author, few have tackled the practical aspect on the specific survey objectives/purposes and their usefulness for practitioners and the research community (Bonnel and Armoogum, 2005). It is worth to mention that in their handbook "Survey Methods for Transport Planning" Richardson et al. (1995) dedicate two sections on the survey purposes and objectives stating that survey objectives should be laid out clearly as they exert a considerable impact on the choice of the methodology. Though the authors distinguish between more precise objectives requiring project planning and describe a more generalised research survey, they show a good example how the survey objectives could be stated. This list can always be expanded to make the benefits of the survey tangible as the authors argue (Richardson et al., 1995). Within the transport planning process travel surveys serve two primary roles: describing travel trends in order to understand the travel demand and to identify fields of interventions in a better way. Surveys further enable modellers to forecast travel and identify long-term problems and solutions (TRB, 2008). The new TRB update of the travel survey manual emphasises the benefits of a travel survey in a newly added section which will be referred to hereafter (Endemann et al., 2010).

(Transport) Planning Requirements

Griffith et al. (2000) stress the necessity to carry out travel surveys by providing knowledge on the demographic, socioeconomic, and trip-making characteristics of individuals and households and contribute to sharpening the understanding of travel in relation to the choice, location and scheduling of daily activities. Implicitly, they underpin change as a main driver of doing surveys. This is evidenced by enumerating some issues on the agenda policy makers face to and which require provision of appropriate data (Griffiths et al., 2000: 3):

> "A continued concern with greenhouse gases, air quality, and urban congestion, and the need to address these issues with more policy-sensitive travel forecasting models […];
>
> A resulting emphasis on sustainable transport systems, requiring greater use of nonmotorized transport, new public transport options, and nontransport solutions to transport problems;
>
> A need to give greater consideration to urban freight and commercial vehicle movements in addressing traffic and environmental problems;
>
> The desire to use and enhance the effectiveness of intelligent transportation system (ITS) technologies;
>
> A greater concern with various forms of user-pays solutions such as toll roads and other road pricing schemes; and
>
> Increased trends toward privatization of road and public transport systems, creating a greater commercial need for timely and accurate market data on travel patterns."

A good example of how surveys impose for serving planning objectives are the policy recommendations for addressing the problem of transport and the environment issued by the Royal Commission on Environmental Pollution in the United Kingdom. Four of the eight issues addressed in this paper require explicitly figures and forecast values that can effectively be obtained through behavioural surveys or observations. Among them are future targets on reducing the number of car trips accompanied by an increase of bicycle use at a certain proportion and the reduction of carbon dioxide emissions (Banister, 2002). Similarly, the UK indicators to support the sustainable development strategy enumerate several targets requiring an appropriate measurement technique. The UK Transport White Paper 2010 defines clear targets accordingly (Banister, 2002). Issues for travel surveys derived from this exercise relate to forecasting, monitoring and benchmarking between transport modes.

Prior to the German National Travel Survey, in 2006, the Planungsverband issued a paper outlining the reasons why participation was considered necessary. The relevant aspects are included in Table 1. The new TRB manual on travel surveys takes on similar issues stating that a more behavioural orientation of travel surveys is required in order to feed models with the appropriate information on the motivations for the individual's trip and mode choice decision (Endemann et al., 2010). Table I summarises areas of intervention and the respective issues. They will applied for the travel survey appraisal in chapters 3 and 4.

Table I: Issues of Travel Survey Usefulness

Area	Issues
National policy	Effectiveness of national policies
	Specific issues of national policies
Regional & urban planning	Effectiveness of policies within the land-use/transport context
Travel behaviour knowledge	Understanding travel behaviour
	and change
	specific issues
Mode specific requirements	Road
	Cycling and Walking
	Public transport planning and marketing
Monitoring	
Benchmarking	Geographical areas
	Modes
Other	Plausibility for other studies
	Filling statistical gaps

Source: own processing, based on: Endemann et al., 2010; Planungsverband 2006; Banister, 2002

3. OBJECTIVES OF NATIONAL TRAVEL SURVEYS

This section describes some basic survey characteristics related to frequency, data availability, information organisation of events and possibility of involving third parties to co-finance add-ons to the sample size. Then survey purposes are assessed according to their

suitability for transport related planning issues more in-depth. Table II gives an overview of some national travel surveys, and table III summarises the survey purposes according to the issues established previously.

Survey Overview

Periodicity

Countries like Finland, The Netherlands, Switzerland and the United Kingdom count with a long tradition of undertaking travel surveys regularly. Belgium, France, Norway, the United States and Germany reveal to be carried out irregularly. In the German case is partly due to budget restrictions. The German Mobility Panel fills this gap partly as this rotating panel is carried out annually (Zumkeller, 2008). Furthermore, the so-called SrV[5] is a regular five year cross-sectional survey but limited to a number of cities especially concentrated in Eastern Germany where it originated in the early-seventies (Ahrens, Ließke and Wittwer, 2005). South Africa, Spain and Lower Austria have started more recently. Referring to survey frequency, regular surveys are repeated at least every six years. The United Kingdom, the Netherlands, Denmark and New Zealand conduct ongoing surveys on an annual basis. The United Kingdom uses a quasi-panel approach (Anderson et al., 2009).

Quality and degree of information

An available website is one basic ingredient to disseminate information. All studied cases have a website with results available whereas the Danish website is currently under revision. The quality and degree of information differs substantially from country to country. France and Norway have no official website, though basic information and some results are provided on-line.[6] Belgium has an official website which allows password-protected access to the data and results.[7] The Spanish website[8] presents some tables and a methodology document which is similar for the Dutch NTS. The South African and Finish websites are simple, but all information can be found easily.[9] Germany, The Netherlands, New Zealand, Switzerland, the USA and the United Kingdom include more detailed information with some reports, information on data access and presentations on specific issues.[10] In the author's view, Switzerland and the United States offer the most complete service with information on all survey years, issue-specific articles, a special section for regional add-ons in a user friendly style which should not be neglected given the overwhelming information load in the internet.

Add-ons

The usefulness of a survey depends on its suitability for regional issues and therefore, the possibility for regional add-ons to the sample size is one attracting factor. This is the case for Denmark, Germany's MiD since 2002, New Zealand, The Netherlands, Norway, South Africa, Switzerland and the United States. In the case of Denmark, only few organisations benefited from this opportunity as the NTS sample size allows already a detailed analysis. In the United States and Switzerland however, several States respectively cantons financed

add-ons to the sample size. In France, this is only the case for five regions which may be due to an existing standard of household travel surveys, the “enquêtes ménages déplacements”, applied to numerous French cities and agglomerations (Gascon, 2010; Nangeroni, 2010; Armoogum et al., 2007). As a good example of including potential regional or local add-on organisations, Switzerland starts the planning for the inclusion one year before the final decision has to be taken (Bundesamt für Statistik, Bundesamt für Raumentwicklung, 2008).

Table II: Overview of the studied National Travel Surveys (NTS)

Country	Name of Survey	Acronym	First Edition	Ultimate Edition	Periodicity	Add-ons	Seminars	Data on website	Results on website
Belgium BE	Mobility in Belgium	MOBEL	1998	1998	none			●	●
Denmark DK	Transportvane-Undersøgelsen	TU	1992	2005	annual	●	Trafikdage, yearly conference including NTS-papers	currently not available	currently not available
Finland FI	Valtakunnallinen henkilöliikennetutkimus	HLT	1974	2004	every 6 years			●	●
France FR	Enquête Nationale sur les Transports et les Déplacements	ENTD	1966	2007	irregular	●	1/2010: Info-Workshop		●
Germany DE	Mobilität in Deutschland	MiD	1976	2008	irregular	●	7/2007: Regional-add ons users' workshop 8/2009: Official presentation 9/2009: Workshop on the survey contents	●	●
Lower Austria AT	Mobilität in Niederösterreich		2003	2008	regular	n.a.			●
Netherlands NL	Mobiliteitsonderzoek Nederland	MON	1978	2008	annual	●		●	●
New Zealand NZ	Household Travel Survey		1989	2008	annual - since 2003	●			●

Country	Name of Survey	Acronym	First	Ultimate Edition	Periodicity	Add-ons	Seminars	Data on website	Results on website
Norway NO	Den nasjonale reisevaneundersøkelsen	RVU	1985	2005	irregular	●			●
South Africa ZA	National Household Travel Survey	NHTS	2003	2003	none	●	6/2006: African Workshop, 3/2006: Seminar on the National Household Travel Survey[11]	●	●
Spain ES	Encuesta de Movilidad de las Personas Residentes	MOVILIA	2001	2006 / 2007	none				●
Switzerland CH	Schweizer Mikrozensus	MZ	1974	2005	every 5 years	●	3+9/2008: Information on new MZ 2010		●
United Kingdom UK	National Travel Survey	NTS	1965	2008	annual			●	●
USA US	National Household Travel Survey	NHTS	1969	2009	irregular	●	8/2009: Workshop on add-ons 10/2010: Using National Household Travel Survey Data for Transportation Decision Making	●	●

Detailed Survey Objectives

Beside the by most of the other NTS shared aspect of describing mobility patterns, the Belgian NTS aims at providing knowledge for developing infrastructures and formulating policies to adapt transport to the users' needs. In doing so, the objectives contain a clear national and regional focus as the survey is split up according the three larger regional units. As an important transfer aspect, data serve authorities to improve travelling conditions.[12] [13] The survey instrument is used to fill statistical gaps in terms of slow mobility and to link travel behaviour to the demographic and geographical situation. It is further intended to use TU to respond to the various institutional needs (Vejdirektoratet, 2001).[14] The Finish HLT particularly focuses on using the results for improving mobility and traffic safety conditions, to reduce the environmental impacts of transport. It then emphasises to describe the link from personal mobility to affecting factors such as demographic, temporal and geographic variations (WSP, 2006). The French ENTD tackles especially questions of access to mobility, i.e. car access, access to and the availability of transport modes and the used type of public transport fares. There is furthermore a strong interest in environmental issues, interregional/international travel demand and infrastructure planning (Armoogum and Quetelard, 2009; Inrets, 2008). Insights from the German MiD feed the Federal Transport Infrastructure Plan (BVWP) based on a transport model. This has to be updated repeatedly. Furthermore, it should enable to identify changes in mobility patterns and be useable for regional and municipal stakeholders and researchers (Infas and DLR, 2010a; Ahrens et al., 2007). According to the objectives set for the MiD 2008, MiD should estimate the effects of changes in the overall framework, i.e. retail hours, fuel prices, demographic structure. The final report contains a whole section with potential survey applications to better understand travel behaviour (Infas and DLR, 2010b). The travel survey of Lower Austria has a strong concept serving as a decision-making document for the regional transport strategy (Landesverkehrskonzept) which requires insights on the implementation of an environmental and cost-efficient mobility, on sustainable mobility change and knowledge on the magnitude of people's mobility needs (Amt der NÖ Landesregierung and NÖ Landesakademie, 2009). The Dutch MON contains very few information on the survey objectives and aims generally at providing mobility knowledge of the Dutch population and the factors underlying it (Ministerie van Verkeer en Waterstaat and Rijkswaterstaat, 2009; Van Evert, 2004). The on-going survey of New Zealand has a strong monitoring part as the yearly results feed the so-called Monitoring Indicator Framework and specifically contribute to the valid estimation of changes in risk and travel occurring over time. Traffic safety is an important aspect since estimates of crash risks for different road users become more evident through the survey. Moreover, the survey is used to evaluate road use and road safety programmes. The Norwegian RVU aims at investigating people's travel activity and travel patterns as well as describing how travel activity varies among different groups in the population (Denstadli, 2006). The first South African NHTS lists a wide range of objectives including knowledge on national and regional mobility and the reasons explaining it: the benchmark issue, the fulfilment of national and regional policy requirements and especially public transport subsidies and social exclusion aspects. These objectives are clearly laid out in the official report which contains a magnitude of results for either the national and regional level

(Department of Transport, 2005). All documents are available on the website of the Transport Ministry. In order to make the results and the methodology known to the professional world, seminars have been organised where the further outcome of the survey as well as numerous research activities tackling different angles of mobility within the NHTS were presented. The Spanish MOVILIA has been carried out for the second time and aims at providing insights for transport models and thus useable for better infrastructure planning This appears to be simple but has an important transfer aspect since the NTS addresses to local and national policy markers, public transport operators, researchers etc. (Ministerio de Fomento, 2008). Detailed results can be found at the respective webpage as indicated previously. The Swiss MZ has one of the most holistic approaches including a concept for regional add-ons to the sample size and an extensively expressed list of research stimulating issues encouraging researchers to take benefit of the rich database. Yet the origin of the MZ lies in the necessity to draft a national master plan pursuing a mode integrating approach which obviously needed fundamental knowledge on mobility and a repeating survey instrument. The survey enables to analyse travel behaviour and its interaction with land-uses, to monitor behavioural change, to forecast traffic and to develop scenarios. From the beginning the MZ should demonstrate its usefulness itself (Simma, 2003). Beside these national policy related requirements, the MZ also responds to various spatial and transport planning purposes at either national, regional and municipal level: strategy for leisure mobility and slow modes, infrastructure planning and more specifically infrastructure funds, agglomeration development programmes, future development of large rail and station sites. As an important step in the decision-making process, the MZ delivers regular input for national and regional personal transport models. Similar to the afore-mentioned South African NHTS, benchmarking indicators comparing agglomeration and rural spaces provide an additional value to the usefulness (Evéquoz et al., 2003). The British NTS emphasises the comparison between modes as a benchmarking ingredient. Since it is repeated annually, the build-up of a picture of long term changes in personal travel is suggested and therefore it is used to forecast future traffic levels and more specifically to monitor accident rates amongst different types of road users. With respect to the understanding of people's travel behaviour, the NTS focuses on school trips, the evolution of pupils' bus usage, the circumstances in which people will tend to use cars or public transport, the use of transport facilities of different population groups. In this, a special look is made at groups with access restrictions, namely children, disabled people and elderly people. With respect to the latter, the take-up of pensioner specific public transport tickets is target of detailed travel behaviour analyses as at the same time the relationship between increased driving licence holding and falling bus use among pensioners need to be highlighted. The increasing level of women's car ownership and the consequences for their mobility patterns is another upcoming issue in the NTS. In terms of national policy, an annual mileage for cars is established from the NTS data in order to advise on road and fuel tax. Finally, it is intended to make all findings and the data available to other organisations (Anderson et al., 2009). The website is one important ingredient to achieve this transfer goal. Comparable to the two predecessors, the NHTS of the United States covers a wide range of issues. The survey further aims at analysing changes in travel behaviour over time, trip generation rates and the relationship of travel behaviour with the underlying factors such as the demographics of the traveller. Furthermore, NHTS data are used to assess people's perception of the public transport system. The NHTS

is further designed to evaluate the implications for the nation's transport infrastructure, to gauge the necessity to plan new (infrastructure) investments, to apply it to the regional and urban transport planning process and to many other modelling purposes. Since regional add-ons are widely used, the NHTS is a useful element pacing the floor for the further benchmarking goal and the assessment the consistency with local data. This is an interesting transfer element as well as an extensive list showing the benefits the NHTS has for areas like medicine when determining crash exposure rates of drivers/passengers, traffic safety when looking at the accident risk of school-age children and for social service agencies when evaluating how low-income households meet their travel needs (Department of Transportation, 2004).

Table III: Outcome of NTS Survey Objectives Classification

	Travel Behaviour				Bench mark		Policy						Planning			Other				
Country	Knowledge	Change	Specific Issues	Monitoring	Geographical Areas	Modes	National	Specific Issues	Mode Specific Car	Mode specific Public Transport	Mode Specific Cycling & Walking		Model	Infrastructure	Regional/Urban	Institutional Knowledge	Transfer /Service	Filling Statistical Gaps / Plausibility		Research stimulation
Belgium	●						●							●	●	●				
Denmark	●		●													●		●		
Finland	●		●				●	●												
France	●		●					●		●				●	●					
Germany	●	●	●	●			●						●			●				
Lower Austria	●	●	●				●	●								●				
Netherlands	●	●	●																	
New Zealand		●	●	●				●	●									●		
Norway	●		●																	
South Africa	●		●		●		●	●		●					●					
Spain	●												●	●		●				
Switzerland	●	●	●	●	●		●	●			●		●	●	●	●				●
United Kingdom	●	●	●	●		●	●	●	●	●					●	●				●
USA	●	●	●	●	●		●	●		●			●	●	●	●		●		●

Findings

In general, several national travel surveys do fulfil a strategic objective in terms of statistical requirement, national transport infrastructure network planning and evaluation, mobility

patterns and policy formulation. Therefore, most data feed the respective transport model or serve to describe relevant key indicators. When discriminating for the criteria set in table I, traditional NTS like New Zealand, Switzerland, the United Kingdom and the USA lay out the objectives more clearly and more in-depth while many others lack this clarity. However, South Africa is one of the newest NTS that defines a wide range of planning and policy oriented clauses suggesting that decision for NTS was preceded by some relevant reasons, similar to the origins of the Swiss travel survey (Simma, 2003). In particular, it was found:

1. Almost all NTS consider knowledge on mobility characteristics as a key survey driver, accompanied by some specific travel behaviour issues mentioned partially: Appraisal of public transport (usage), fares, target-groups, identification of disadvantages is specified by South Africa, the United Kingdom, France, the United States and more generally by Norway. South Africa and the United Kingdom tackle questions of social exclusion. The United Kingdom focuses more in-depth on car use and ownership among certain groups. Germany, Lower Austria, New Zealand, Switzerland, the United Kingdom and the USA explicitly highlight changing travel patterns as a reason for doing a NTS. Monitoring is only referred to in the case of Germany, New Zealand, Switzerland, the United Kingdom and the USA but not in the case of Finland, the Netherlands and Denmark, though they are carried out repeatedly.

2. The regional benchmarking benefit is only acknowledged by South Africa, Switzerland and the USA. The British is the only NTS specifying a benchmark of transport modes.

3. Most NTS refer to national policy as a further objective. Mode specific aspects are often related to road use and traffic safety, accident risks but very few NTS point out benefits for public transport or slow modes (Switzerland).

4. Planning related issues concentrate mainly on (transport) infrastructure planning and contain a general remark on regional and local benefits.

5. Only few surveys go beyond this point. In there, Switzerland, the United Kingdom and the USA identify regional and local benefits and encourage researcher and subsequent organisations to take benefit from the database.

6. This goes alongside with the demand from institutions to co-fund add-ons to the national sample size. With this respect, insights from the German National Travel Survey as well as from the Swiss and the US NTS are useful.

7. The availability of all information on a website is one strong disseminating element and was widely used. Moreover, this includes the dissemination of any results stressing the survey usefulness and making it tangible for practitioners, researchers and stakeholders.

4. EVIDENCING TRAVEL SURVEYS RESULTS

This chapter uses examples from different NTS and additional surveys in order to illustrate survey benefits for the respective purposes. Despite the magnitude of literature from many NTS and additional surveys, the idea is to provide results from the Rhine-Main regional sample size add-on in order to stress the usefulness of one survey for several issues.

Overall Experiences

The two federal institutions, organising the Swiss MZ 2005, published a comprehensive, user-friendly report containing results on overall mobility indicators, travel patterns, target-group specific information, long distance travelling and information on the interaction of travel behaviour with spatial structure and within different regions, statements on transport policy and comparisons with previous surveys. Other NTS issued reports as well. Two further NTS should be highlighted: New Zealand and the United States issued several brief reports related to specific issues on their websites. In the case of New Zealand they are consistent with the objectives focused on road and traffic safety.[15] Besides own papers and references to articles using the US NHTS, the US-webpage contains numerous specific and emerging issues, e. g. “Changes in the U.S. Household Vehicle Fleet, The ‘Carbon Footprint’ of Daily Travel, Vacation Travel, Energy Use and Fuel Efficiency, Congestion: Non-Work Trips in Peak Travel Times, Travel Characteristics of New Immigrants.” These issues should encourage professionals to discuss on the respective topic and to use the data accordingly.[16] From the author’s own experience, data from the MiD 2002 were explicitly analysed for a booklet published in 2005 which draws a clear picture of the mobility in the region, the Federal State of Hesse and explains the factors affecting people’s travel behaviour and mobility. It furthermore gives guidance for regional and urban planning and public transport. For similar purposes, papers have been published elsewhere (cf. Endemann and Maleika, 2005).

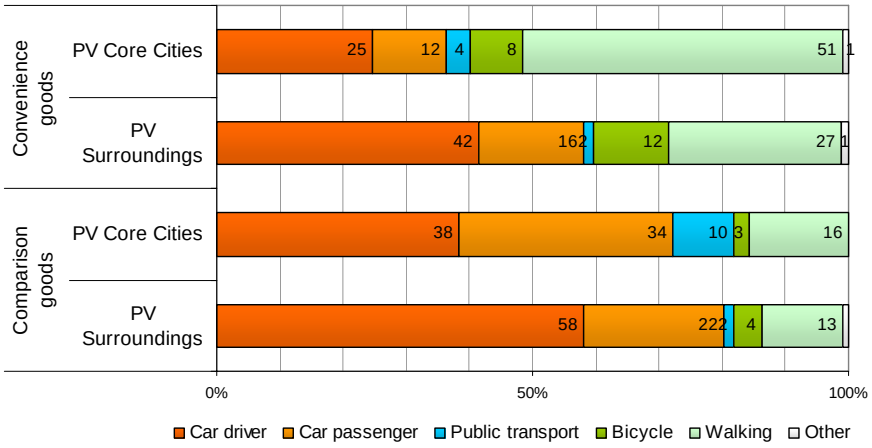
Avoiding the Need to Travel

As travel behaviour studies intend to provide insights for substituting physical by virtual mobility, Hjorthol and Gripsrud (2009) merged data from the Norwegian RVU 2005 with data from an extra-module about PC/Internet use at home and found less evidence on the substitution effect on overall mobility. According to the US NHTS instead, there is a growing number of telecommuters when comparing the 2001 results with those of 1995. [17]

Reviewing the Suitability of Spatial Strategies and Principles

Behavioural Surveys are appropriate to explore the link between spatial structure and travel behaviour. Siedentop et al. (2005) used the German MiD 2002 to analyse more in-depth the influence of spatial structures on travel behaviour given the different centrality of metropolitan areas in Germany. The findings allow to better understand the (changing) range of travel

patterns between monocentric and more polycentric urban regions. Based on the US 1985 NHTS, Cervero (1996) evidenced the appropriateness of locating retail facilities close to the residential areas which avoids commuting by car as trip chaining is less appropriate. Moreover, while using a personal survey in Berlin, the German researcher Holz-Rau (1991) confirmed that locating shopping within a 500 m walking distance exerts strong influence on shopping without car. Handy (1992) visualises the effects of land-use on travel behaviour with respect on non-working trips and finds that surveys should not only focus on the distribution of mixed land-uses within the neighbourhood or urban fabric as regional shopping centres might be attractive as well (Handy, 1992). The following fig. 1 shows shopping trips made in the Frankfurt/Rhine-Main region based on the dataset of the regional sample add-on to the German MiD. It visualises how the modal split varies when discriminating type of shopping and considering the different spatial context. The results further reveal that a good offer of neighbourhood shopping facilities for convenience goods within walkable distances would decrease car use even if a car is permanently available.



n = 4,156 shopping trips; Rhine-Main (Planungsverband)
Source: MiD 2002, analysed by Planungsverband Ballungsraum Frankfurt/Rhein-Main

Figure 1 – Rhine-Main mode-split discriminated for shopping type (own processing)

Christensen and Fosgerau (2002) deliver an exercise of evaluating the effects of different spatial structures on travel behaviour using the Danish NTS and suggest that locating workplace nearby rail stations. According to them, it reveals to be more promising in reducing trip distances and number of trips by car than a concentration of residential areas around train stations would exert. Jovicic and Wadum (2002) use data from the Danish NTS in order to feed the respective traffic model for Copenhagen for road pricing purposes. They demonstrate that forecast proved to be very realistic and effects of road pricing would have a similar impact of traffic reduction as it was the case for a comparable project in Stockholm at this stage. In a study carried out for the German Federal State of North-Rhine Westphalia, a household survey revealed potentials for this policy of concentrating new settlements close to rail stations by comparing the travel behaviour and mobility habits of residents according to availability and quality of public transport as well as accessibility to services. Fig. 2 illustrates: Whereas 21 % of all persons in the areas with a rail station use public transport at least 3 times a week, in the other areas only 15 % are regular customers. This is confirmed for people with permanent car availability – 14 % vs. 8 % (Müller and Endemann, 2000).

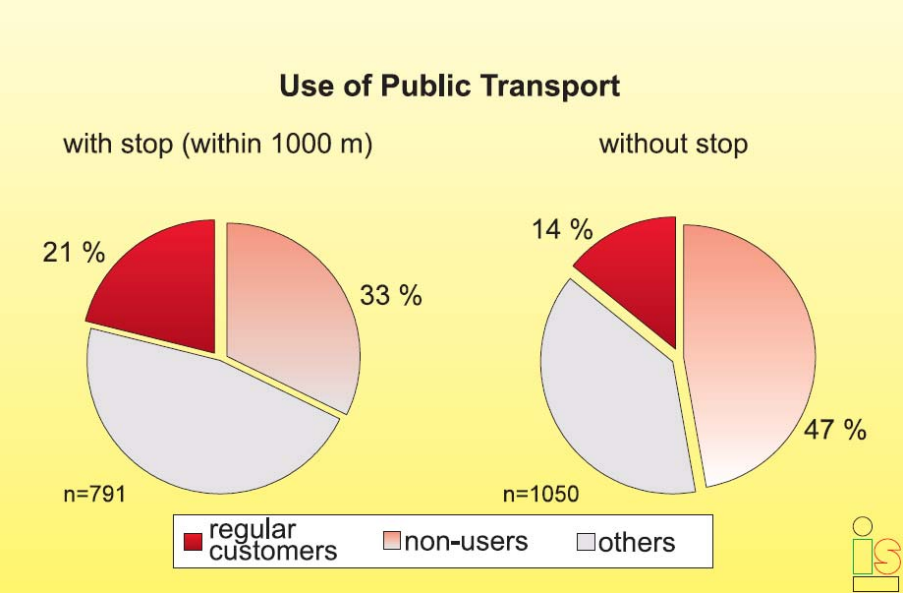
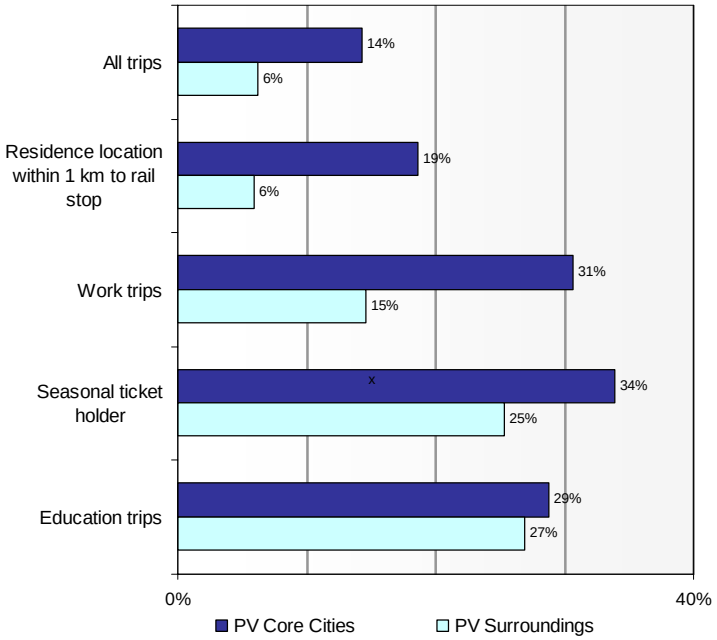


Figure 2 – Use of Public Transport Usage, self-assessment (Müller and Endemann, 2000: 239)

Moreover, Cervero (1995) proved the benefits of Stockholm's rail served and self-contained satellite towns which attract and generate travel every day in both directions with high levels of public transport use. Another study containing a three waves household survey is realized currently in order to estimate mode shift along a new planned rail corridor in Perth; Western Australia (Olaru and Curtis, 2007).

Public Transport Planning and Marketing

In Germany, according to the legislation, a transport association has to collect data on revenue distribution between the different transport operators almost every five years by carrying out on-board passenger surveys. In the Greater Montreal Area, these data are obtained from a household survey being carried out every five years (Chapleau, 1992). Moreover, a household travel survey enables public transport planners and marketers to estimate the potential demand, identify new target-groups and to explore the link of transport modes' availability and usage. In this, panel surveys prove usefulness as they analyse intrapersonal variations over a longer period than one day. Findings from the German Mobility Panel revealed therefore potentials of public transport use and multi-modality by observing mobility patterns throughout an entire week or even longer as done by the Berlin transport company evidencing the use of monthly travelcards (Dähne and Reinhold, 2008; Zumkeller et al. 2005). In Germany and South Africa, the National Travel Survey is similarly used to identify potentials by market segmentation (Department of Transport 2005, Endemann, Maleika 2005, Follmer et al 2004). Based on the different socio-demographic and socio-economic data paired with information on mobility habits of persons, the German MiD 2002 allows to define some marketing relevant demand segments for public transport companies. This exercise was made for a transport area in Northern Germany (Follmer et al. 2004).



n = 4,053 trips (education) up to 23,6771 (all trips), Rhine-Main (Planungsverband)
Source: MiD 2002; analysed by Planungsverband Ballungsraum Frankfurt/Rhein-Main and *traffiQ*

Figure 3 –Public Transport Share according to (adapted from Planungsverband et al., 2005: 53)

Fig. 3 illustrates the strengths and weaknesses of public transport when discriminating for different purposes, area types and mobility options by using data from the MiD 2002 add-on for the Federal State of Hesse (Planungsverband et al., 2005).

Walking and Cycling

Nowadays, people tend to walk less which exerts a negative impact on health. The US NHTS 2001 data showed that proportion of walking trips up to one mile is below the minimum required health standard (Ham et al., 2005). The Danish NTS 1998/99 report visualises that at distances below 300 m every eight trip is still done by motorised vehicles (Vejdirektoratet, 2001).

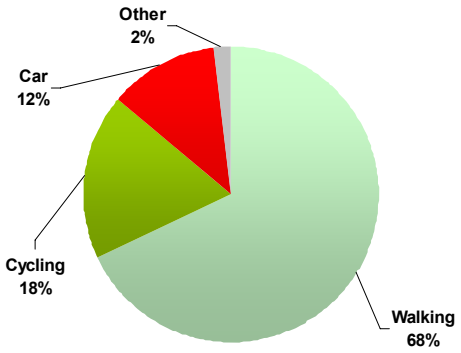


Figure 4 – Modal Split of trips up to 300 m from the Danish NTS (adapted from: Vejdirektoratet, 2001: 31)

An analysis of the South African NHTS reveals the importance of the so far neglected walking and cycling modes in the overall modal split in previous studies. The study illustrates

similar walking proportions for various discretionary purposes regardless of the spatial structure (Behrens, 2006). Similarly, the Government of New Zealand published fact sheets on walking and cycling in order to raise awareness for non-motorised mobility which especially in the latter case is low. [18]

Benchmarking of Regions and Cities

Among public transport companies, awareness of customer satisfaction with their product is of great importance also in terms of comparing with other areas. The German SrV-System provides every five years insights on mobility indicator in different cities and is therefore a good benchmark source (Ahrens et al., 2005). In the same way, regional and local add-ons to the overall sample size of the German MiD proved to be useful since comparisons could be made for transport associations and modal split among certain target groups (Infas 2004). WSP (2006) show a good example for benchmarking regions in terms of commuting distances derived from the Finish HLT. As stated previously, the French "enquêtes ménages déplacements" allowing a comparison of different cities and agglomerations using the same methodology bears the valuable advantage of benchmarking cities and their transport policies as well as changes over time. Fig. 5 illustrates changes in car use in different French urban areas.

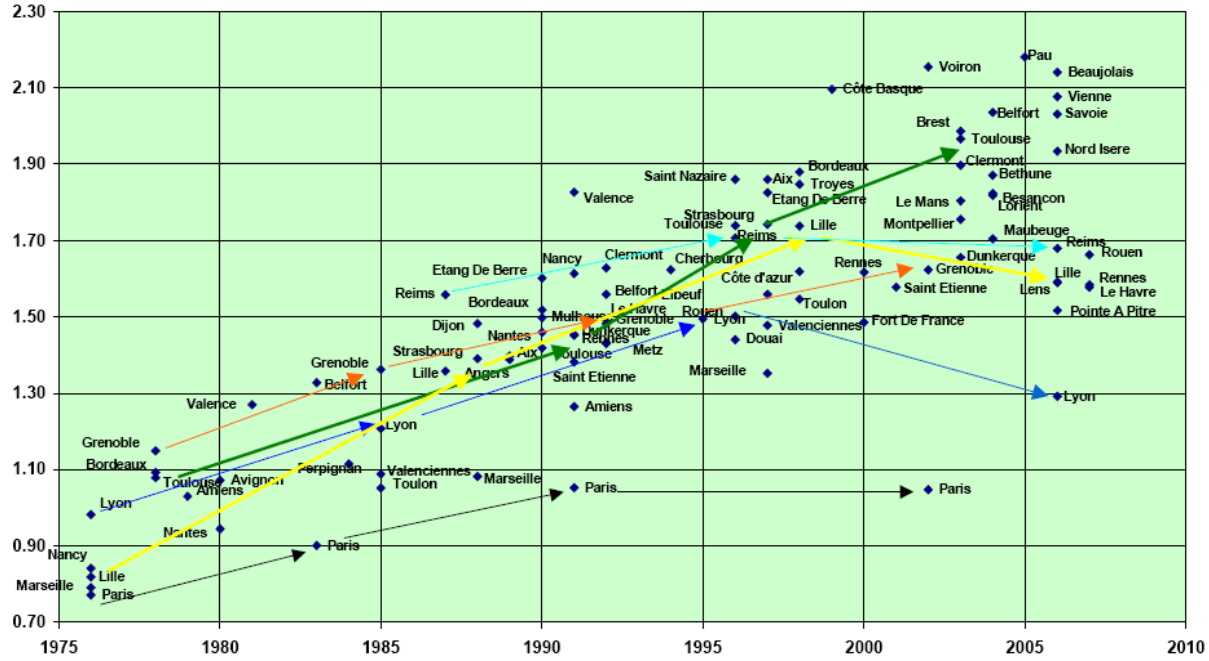
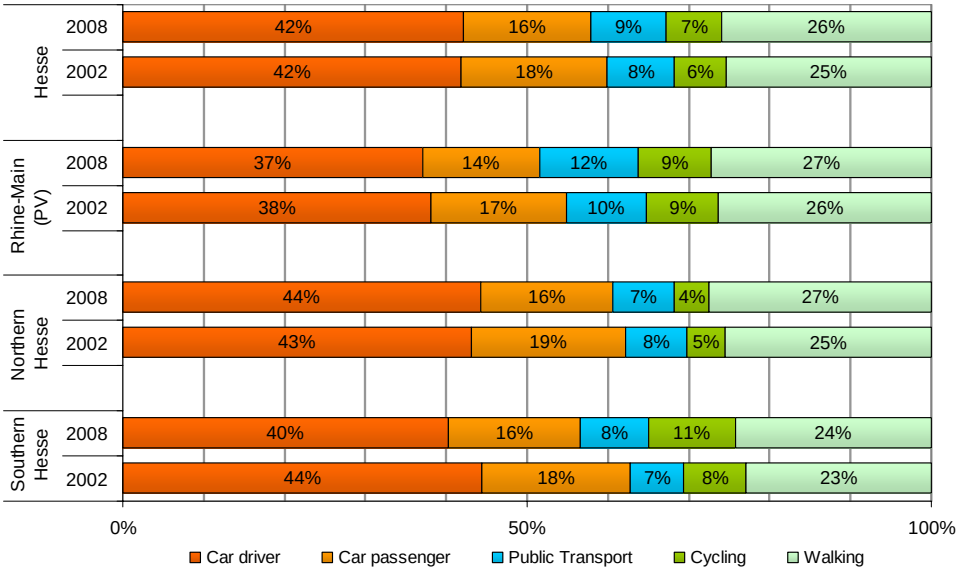


Figure 5 – Evolution of number of car trips in French cities (Gascon, 2010)

Changes over Time/Monitoring

WSP (2006) use the Finish NTS in order to identify changes between two survey times. Viinikainen and Kalenoja (2009) go further into detail and emphasise the changes observed through the NTS over the three periods having carried out so far. Hubert (2009) does a similar exercise for France comparing the NTS of 1994 and 2008 but identifying almost no changes, though the number of trips diminished in greater agglomerations. The report on the

Norwegian NTS provides an extensive comparison of mobility change over the three survey periods revealing growing motorisation, car use and trip lengths and longer journeys. In short, a shift towards less sustainable transport options is perceivable (Denstadli et al. 2006). Countries like Germany in turn suggest that there is a slight reduction of car use with respect to its market share though in absolute terms the amount of vehicle kilometre travelled increased. Since the description of changes in mobility and travel patterns over time is one essential element of travel surveys, other countries presented results accordingly (cf. Scheiner 2010; Betts, 2008; Bundesamt für Statistik, Bundesamt für Raumentwicklung, 2007; Holz-Rau and Scheiner, 2006; Simma, 2003; Hu and Young, 1999; Kloas and Kunert, 1994). The results from the two regional add-ons for Hesse of MiD 2002 and MiD 2008 confirm this (Fig. 6)



n = 63,183/66,513 trips, Hesse, excl. regular business trips
Source: MiD 2008/2002, analysed by Planungsverband Ballungsraum Frankfurt/Rhein-Main and *traffiQ*

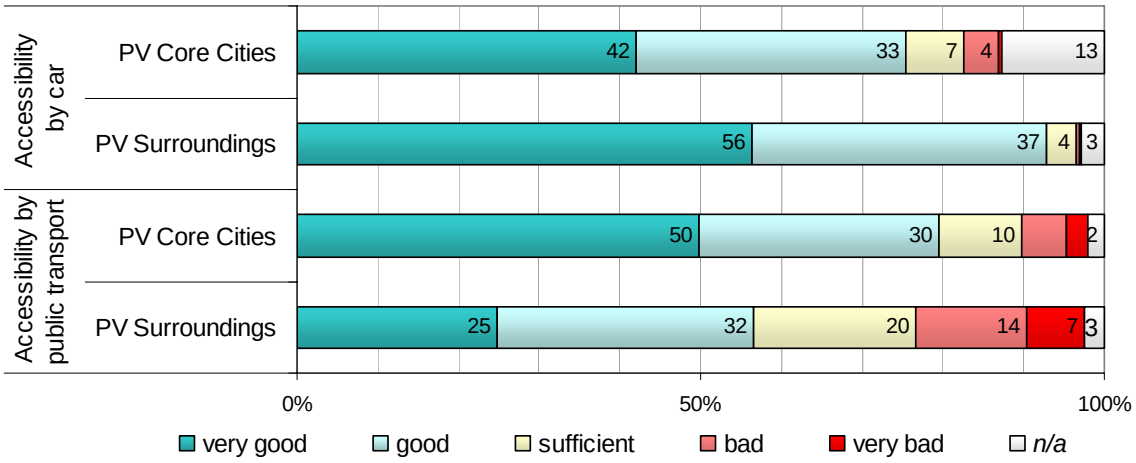
Figure 6 – Monitoring modal-split in Hesse and selected regions (own processing)

The knowledge of population and spatial structure changes justifies the use of a panel survey when monitoring the intra-personal mobility changes. However, in order to estimate cross-regional or national changes, repeated cross-sectional allow an appraisal of monitoring the development effects in a country, region or city and their link to travel behaviour. The Swiss National MZ and the UK National Travel Survey – amongst others – are therefore an interesting example since they are undertaken within a fix-period (Chalasani 2005, Bonnel and Armoogum 2005). Based on NTS time series, a recently published trend of mobility in Great Britain suggests a decoupling of transport from economic development as the annual car traffic mileage grows at a lower rate than overall mobility performance. According to the scope of the British NTS, it has to be added that growing overseas travel is not included in the NTS (Le Vine et al., 2009).

Attitudes

Even though one should be careful expanding up the survey questionnaire, the Swiss MZ 2005 shows some interesting results. It revealed that only 16 % of commuting car owners

experience regularly congestion which in the case of holiday trip making is a lot lower (Bundesamt für Statistik, Bundesamt für Raumentwicklung, 2007). Data from the German MiD 2002 add-on for Rhine-Main suggest that enlargement of the street and road network is not necessary and more efforts towards public transport have to be made (Endemann and Maleika, 2005).



n = 5,804 interviewed persons over 13 years, Rhine-Main (Planungsverband)
Source: MiD 2002
analysed by Planungsverband Ballungsraum Frankfurt/Rhein-Main and *traffiQ*

Figure 7 –Accessibility to usual destinations in the view of residents (Endemann and Maleika, 2005)

Data Plausibility

Data from the German NTS were used to harmonise public transport usage with official statistics. It was found that data differ because in official statistics – based on passenger census – transfer passengers are double counted (Kloas, 2005). The strength of comparing travel results from different cross-sectional surveys reveals at the same time its weaknesses as authors like Kloas and Kunert (1994) stress when analysing the German NTS 1976, 1982 and 1989. They found that often methodological effects avoid a clear comparison between the observed periods.

5. RECOMMENDED SURVEY REQUIREMENTS

As trip-making is not just for self-purpose, this non exhausting exercise visualises that usefulness of a survey is not automatically implied. Experiences from the German MiD reveal the uncertainty of carrying out a survey regularly which is partly due to budget restrictions. Another reason lies in a lack of institutionalisation, difficulty in promoting the survey and to achieve higher level of acceptance which in turn would justify its existence and ensure the funding. In this sense, the Swiss MZ is successful since the responsible institutions have permanently fulfilled the task to demonstrate the survey usefulness for various purposes as it was stated at the beginning. The justification of such an instrument has also a cost-benefit standpoint. National travel surveys could hence be better marketed if the objectives were clearly laid out and communicated appropriately alongside with the benefits and advantages of such a survey. Furthermore, the inclusion of planning and transport organisation in the up-

date process of the German NTS stresses the suitability of this tool for a wider range of purposes. These aspects are now further outlined.

The examples presented in the previous chapter indicate a wide range of issues which could be met by a NTS. The following issues are strongly recommended as they contribute to increase the benefits of a NTS:

- Benchmarking of regions and cities: Promoting the strength of a NTS while using the same database.
- Benchmarking of Modes: A common, widely accepted database allows direct comparison of public transport organising areas etc.
- Effectiveness of spatial strategies and policies: The previous analysis showed the suitability of a travel survey for rail-oriented development, transport and land-use interaction, settlement structures.
- Mobility data and information on travel behaviour need to be monitored regularly. This should be done on a fix base in order to be independent from special events and influences and to respond to EU legislation if relevant.
- A common database would increase the acceptance of regional transport models.

A good survey needs to set clear objectives and visualise the advantages for subsequent institutional levels, public transport companies and authorities, research institutions, expert groups and professionals repeatedly and prominently. The South African example is very good as the objectives are set out in all documents the author could find. As part of a communication strategy, a website is useful as it allows good dissemination of information to a wide community of users and important stakeholders. The information should be accessible from a prominent website of the ministry or statistical office and should have a memorable name (e. g. mobilita2005.ch). It should be well communicated among the above-mentioned bodies, be well structured informing about the objectives, benefits for stakeholders, professionals, contain information about possible add-ons, show reports from other NTS years, publications using the NTS data and fact sheets in order to illustrate this clearly. The US website is a very good reference. Since a NTS has to be considered as complex matter, a broad communication strategy should include seminars on the use of the data from the organisers, benefits for subsequent levels and on the possibility for co-funding sample size add-ons. Add-ons to the sample size are essential to maintain the survey instrument attractive and accepted in the long-run. They further contribute to fulfil benefits such as inter-regional/inter-urban benchmarking, comparison between public transport authorities and their areas and thus avoid additional costs respectively. The organisation of add-ons require a good timing and marketing in order to include interesting parties from the beginning and allotting time for the preparatory and the decision making processes. To conclude, it is indispensable to illustrate examples which increase the survey acceptance among stakeholders and professionals, attract potential co-funding, encourage researcher to use the database. This snowball effect leads to new insights on mobility patterns and therefore contributes to justify the instrument itself. The following citation from the NHTS webpage illustrates the afore-mentioned assertion appropriately:

"These briefs are designed to provoke users to use NHTS data creatively, and to start a discussion on travel topics that could be addressed using NHTS." (retrieved from: http://nhts.ornl.gov/publications.shtml#issueBriefs)

6. REFERENCES

Ahrens, G.-A., Ließke, F. and R. Wittwer (2005). Mobilitätsentwicklung ostdeutscher Städte – Ergebnisse des Systems repräsentativer Verkehrsbefragungen (SrV), in: Bracher, T. et al. (ed.), Handbuch der kommunalen Verkehrsplanung. Wichmann, Heidelberg, 41st edition.

Ahrens, G.-A., Hellenschmidt, J., Ließke, F. and R. Wittwer (2007). Wenn zwei das Gleiche tun, erheben sie noch lange nicht dasselbe. Internationales Verkehrswesen, 59 (6), 270-274.

Amt der NÖ Landesregierung, NÖ Landesakademie (2009). Mobilität in NÖ, Ergebnisse der landesweiten Mobilitätsbefragung 2008. St. Pölten.

Anderson, T., Christophersen, O., Pickering, K., Southwood, H. and S. Tipping (2009). National Travel Survey 2008. Technical Report, prepared for the Department for Transport, London.

Armoogum, J. and B. Quetelard (2009). Enquête nationale transports déplacements et les enquêtes ménages déplacements. Presentation at the « 1ère Rencontre Méthodologique du PIVER », Lille.

Armoogum, J., Hubert, J.-P., Bonnel, P. and J.-L. Madre (2007). Préparer la prochaine enquête nationale transport avec un regard international. Rapport de convention N° 03 MT 68 pour la DRAST Prédit 3 GO.1.

Banister, D. (2002). Transport Planning. Spon Press, London, 2nd edition.

Behrens, R, (2006). What the NHTS reveals about non-motorised transport in the RSA. Paper presented at the National Household Travel Survey Seminar: Understanding travel habits and transport conditions in Southern Africa, Pretoria.

Betts, R. (2008). National Travel Survey: A key role in informing policy decisions. Presented at the European Transport Conference 2008, Noordwijkerhout.

Bonnel, P. and J. Armoogum (2005). National Travel Surveys – What can we Learn from International Comparisons? Proceedings of the European Transport Conference, London.

Bundesamt für Statistik, Bundesamt für Raumentwicklung (2008). Mikrozensus Mobilität und Verkehr 2010 – Information für regionale Partner, Neuchâtel.

Bundesamt für Statistik, Bundesamt für Raumentwicklung (2007). Mobilität in der Schweiz – Ergebnisse des Mikrozensus 2005 zum Verkehrsverhalten, Neuchâtel, Bern.

Cervero, R. (1996). Mixed land-uses and commuting. Evidence from the American housing survey. Transportation Research A, 30 (5), 361-377.

Cervero, R. (1995). Sustainable New Towns. Stockholm's Rail-Served Satellites, Cities, 12 (1), 41-51.

Chalasani, S. (2005). Enriching household travel survey data. Experiences from the Microcensus 2000. Paper presented at the 5th Swiss Transport Research Conference, Ascona.

Chapleau, R. (1992). La modélisation de la demande de transport urbain avec une approche totalement désagrégée. Proceedings of the 6th World Conference on Transportation Research (WCTR), Vol. 2, 937-948. Lyon.

Christensen, L. and M. Fosgerau (2002). Impacts from Different Land-Use Strategies on Travel Distances. Proceedings of the European Transport Conference, London.

Dähne, O. and T. Reinhold (2008). Monatliche Mobilitätsprofile vollständig ermitteln. Internationales Verkehrswesen, 60 (3), 68-72.

De La Fuente Layos, L.A. (2005), Short distance passenger mobility in Europe, Statistics in Focus, Transport. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NZ-05-005/EN/KS-NZ-05-005-EN.PDF, accessed 25 May 2010.

Denstadli, J.M, Engebretsen, Ø, Hjorthol, R. and L. Vågane (2006). 2005 Norwegian Travel Survey - Key results. TØI report 844/2006 (English summary). Institute of Transport Economics, Oslo.

Department of Transport (2005). The First South African National Household Travel Survey 2003, Technical Report, Pretoria.

Department of Transportation (2004). 2001 National Household Travel Survey User's Guide, http://nhts.ornl.gov/2001/usersguide/UsersGuide.pdf, accessed 25 May 2010

Endemann, P., Kockelman, K. and C. Wilder (2010). Introduction. In: Transportation Research Board's Travel Survey Methods Committee (ABJ40). THE ON-LINE TRAVEL SURVEY MANUAL. A Dynamic Document for Transportation Professionals. http://www.travelsurveymanual.org/, accessed 25 May 2010.

Endemann, P. and A. Maleika (2005). Mobility in Frankfurt/Rhine-Main – Evidence from the German National Travel Survey (NTS). Proceedings of the European Transport Conference, London.

Evéquoz, R., Gindraux, M. and A. Simma (2003). Grobkonzept – Mikrozensus zum Verkehrsverhalten. Neuchâtel, Bern.

Follmer, R., Kunert, U. and J. Engert (2004). Wie mobil sind die Deutschen? Der Nahverkehr, 22 (6), 8-17.

Gascon, M.-O. (2010). Household travel surveys: how have they changed since they came from the States in the sixties. Paper presented at the TRB Household Travel Surveys Subcommittee Meeting, Washington, D.C.

Griffiths, R., A.J. Richardson and M.E. Lee-Gosselin (2000). Travel surveys. In: Transportation in the New Millennium. Transportation Research Board, National Academy of Sciences, Washington, DC.

Ham S., Macera C. and C. Lindley (2005). Trends in walking for transportation in the United States, 1995 and 2001. Prev Chronic Dis. 2 (4), http://www.cdc.gov/pcd/issues/2005/oct/04_0138.htm, accessed 21 May 2010.

Handy, S. (1992). Regional versus Local Accessibility. Neo-Traditional Development and its Implications for Non-Work Travel. Built Environment, 18 (4), 253-267.

Hjorthol, R. and M. Gripsrud (2009). Home as a communication hub: the domestic use of ICT. Journal of Transport Geography, 17 (2), 115-123.

Holz-Rau, C. (1991). Wechselwirkungen zwischen Siedlungsstruktur und Verkehr – Verkehrsverhalten beim Einkauf. Internationales Verkehrswesen, 43 (7/8), 377-386.

Holz-Rau, C. and J. Scheiner (2006). Die KONTIVs im Zeitvergleich. Internationales Verkehrswesen, 58 (11), 519-525.

Hu, P. S. and J. R. Young (1999). Summary of Travel Trends. Paper prepared for the U. S. Department of Transportation and Federal Highway Administration. Oak Ridge/Knoxville.

Hubert J.-P. and Ph. Toint (2002). La mobilité quotidienne des Belges. PUN, Namur.

Hubert, J.-P. (2009). Dans les grandes agglomérations, la mobilité quotidienne des habitants diminue, et elle augmente ailleurs. Insée Première 1252.

Infas and DLR (2010a). Mobilität in Deutschland 2008. Summary Report, Bonn/Berlin.

Infas and DLR (2010b). Mobilität in Deutschland 2008. Final Report, Bonn/Berlin.

Infas (2004). Sechs Regionen im Vergleich. Unpublished, commissioned by six German regional and local institutions, Bonn.

Inrets (2008). Mise en perspective des Enquêtes Nationales Transports 1973/74 – 1981/82 – 1993/94 – 2007/08, Noisy Le Grand.

Jovicic, G. and D. Wadum (2002). A Travel Demand Model for Copenhagen. Proceedings of the European Transport Conference, London.

Kloas, J. (2005). Verkehrsaufkommen und Verkehrsleistung im öffentlichen Straßenpersonenverkehr (ÖSPV) und der Eisenbahnen: Vergleich der amtlichen Statistik mit Ergebnissen der Erhebung Mobilität in Deutschland 2002. Berlin.

Kloas, J. and U. Kunert (1994). Über die Schwierigkeit, Verkehrsverhalten zu messen, I+II. Verkehr und Technik, 47 (3/5), 91-99/187-197.

Kunert, U., Kloas, J. and H. Kuhfeld (2002). Design Characteristics of National Travel Surveys – An International Comparison for Ten Countries. Transportation Research Record, 1804, 107-116.

Le Vine; S., Jones, P. and J. Polak (2009). Has the Historical Growth in Car Use Come to an End in Great Britain. Proceedings of the European Transport Conference, London.

Marconi D., A. Simma and M. Gindraux (2004). The Swiss Microcensus 2005: An international comparison on travel surveys. Paper Presented at the 4th Swiss Transport Research Conference, Monte Verita.

Ministerie van Verkeer en Waterstaat / Rijkswaterstaat (2009). Mobiliteitsonderzoek Nederland 2008 – Het Onderzoek. Den Haag.

Ministerio de Fomento (2008). Encuesta de movilidad de las personas residentes en España. MOVILIA 2006-2007. Madrid.

Ministry of Transport (2009). How New Zealanders Travel. Trends in New Zealand household travel 1989 - 2008. Auckland.

Müller, G. and P. Endemann (2000). New potentials for the ”mobile home” – how to link mobility management to land-use (planning). Proceedings of the 4th European Conference on Mobility Management, Bregenz, 237-242.

Nangeroni, C. (2010). Moins de voitures dans les grandes villes. Ville, Rail & Transports, 468, 20-22.

Olaru, D. and C. Curtis (2007). Travel Minimisation and the Neighbourhood. Proceedings of the European Transport Conference, London.

Planungsverband Ballungsraum Frankfurt/Rhein-Main (2006). Mobilität in Deutschland 2007 – Informationen zum Nutzen für Hessen, Internal Paper.

Planungsverband Ballungsraum Frankfurt/Rhein-Main, *traffiQ* Frankfurt am Main and Nordhessischer Verkehrsverbund (ed.) (2005). Mobilität in Stadt und Region – Verkehrsverhalten der Bevölkerung in Rhein-Main und Hessen. Frankfurt am Main.

Richardson, A.J., Ampt, E.S. and A.H. Meyburg (1995). Survey Methods for Transport Planning. Eucalyptus Press, Melbourne.

Scheiner, J. (2010). Interrelations between travel mode choice and trip distance: trends in Germany 1976–2002. Journal of Transport Geography, 18 (1), 75–84.

Siedentop, S., S. Kausch, D. Guth, A. Stein, U. Wolf, M. Lanzendorf and R. Harbich (2005). Mobilität im suburbanen Raum. Neue verkehrliche und raumordnerische Implikationen des räumlichen Strukturwandels. Final Report of the Research Project 70.716, German National Research Programme on Urban Transport, BMVBS funded.

Simma, A. (2003). History of Swiss Travel Surveys. Paper presented at the 3rd Swiss Transport Research Conference, Monte Rosa.

Transportation Research Board (2008). Standardized Procedures for Personal Travel Surveys, NCHRP REPORT 571, Washington D.C.

Van Evert, H. (2004). The Respondent as Customer and the Customer as Respondent. Keynote Paper Presented at the 7th International Conference on Survey Methods in Transport, Playa Herradura/Costa Rica.

Vejdirektoratet (2001). TU 1998-1999 – Resultater fra transportvaneundersøgelsen. Copenhagen.

Viinikainen, T. and H. Kalenoja (2009). National Travel Surveys in Finland. Paper presented at the XXVII International Baltic Road Conference, Riga.

WSP (2006). National Travel Survey 2004-2005. http://www.hlt.fi/ (accessed 21 May 2010).

Zumkeller, D. (2008). The German Mobility Panel: Methodological considerations from the initial phase. IFV-Report 140, http://www.ifv.uni-karlsruhe.de, accessed 21 May 2010.

Zumkeller, D., P. Ottmann and B. Chlond (2005). Car Dependency and Motorization Development in Germany. Final Report, Predit Program.

---

[1] In the paper, national travel survey (NTS) is used synonymously to national household travel survey (NHTS) and relates to the household level as study subject.
[2] The author's institution co-financed a regional add-on to the ultimate German MiD sample size. The author himself was involved in the preparatory process of MiD 2008.
[3] In German: Bundesministerium für Verkehr, Bau und Stadtentwicklung.
[4] Published 3/2006 entitled "Haushaltsbefragung Mobilität in Deutschland (MiD) 2007" (project 70.801).
[5] In German: System repräsentativer Verkehrserhebungen (System of Representative Travel Surveys).
[6] Look at: http://www.inrets.fr/ur/dest/collaborations/ent.htm; http://www.toi.no/article20130-1131.html or http://www.nordicroads.com/website/index.asp?pageID=106, all accessed 21 May 2010.
[7] Look at: http://www.mobel.be (accessed 21 May 2010).
[8] Look at: http://www.fomento.es/MFOM/LANG_CASTELLANO/INFORMACION_MFOM/INFORMACION_ESTADISTICA/Movilidad/, accessed 21 May 2010.
[9] Look at: http://nasp.dot.gov.za/projects/nts/framesPage.htm; http://www.hlt.fi/, accessed 21 May 2010.
[10] Look at: http://mobilitaet-in-deutschland.de; http://www.mobiliteitsonderzoeknederland.nl; http://www.transport.govt.nz/research/TravelSurvey/; http://www.mobilita2005.ch; http://nhts.ornl.gov/; http://www.dft.gov.uk/pgr/statistics/datatablespublications/personal/, all accessed 21 May 2010.
[11] ZA Web resources: http://nasp.dot.gov.za/projects/nts/workshops/index.html and http://www.trcafrica.co.za/nhts-downloads, accessed 21 May 2010.
[12] Look at: http://www.mobel.be, accessed 21 May 2010.
[13] Official information on the survey objectives of the Danish TU could not be found easily which partly is due to the currently unavailable official website. However, the report on the 1998-99 TU contains some information on the objectives in Danish.
[14] Objectives were communicated also by E-Mail from Carsten Jensen, DTU, 21 February 2010
[15] Look at: http://www.transport.govt.nz/research/Pages/LatestResults.aspx, accessed 21 May 2010.
[16] Look at: http://nhts.ornl.gov/publications.shtml#issueBriefs, accessed 21 May 2010.
[17] Look at: http://nhts.ornl.gov/briefs/Working%20at%20Home.pdf, accessed 21 May 2010.
[18] Look at: http://www.transport.govt.nz/research/Pages/LatestResults.aspx, accessed 21 May 2010.