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Long distance travel in Europe today: Experiences with a new survey

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ABSTRACT

The paper discusses the problems of long distance travel surveys, with examples from recent studies, and presents results of a new long distance survey approach to overcome these problems.

As part of the 6th Framework funded KITE project (A Knowledge Base for Intermodal Passenger Travel in Europe), a new survey methodology based mainly on the MEST (Methods for European Surveys of Travel Behaviour) and INVERMO (Intermodale Vernetzung) surveys was developed and tested in three different European countries. The method starts with a journey roster of basic items for the long distance journeys undertaken and a stage form for details about the last three long distance journeys.

First, a short overview of conventional household travel surveys of long distance travel is given, followed by a description about their main problems and the survey approach which was chosen to overcome these. The second part presents the long distance journey rates from the KITE surveys and presents corrected rates from a homogenous hazard-model for Switzerland, the Czech Republic and Portugal. These figures are compared with the results of the majority of long distance dedicated surveys.

INTRODUCTION AND BACKGROUND

Long distance travel is a growing travel market segment, but reliable data and statistics about long distance travel are rather rare. Information about long distance travel has to provide answers to many different questions. For transport policy, fares paid and costs incurred are central in the process of coordinating between different existing transport facilities and for the planning of new ones. Thus information about travel costs, prices of competitive modes and reasons for mode choice are absolutely required. In the context of transport planning, information about trip costs are equally useful as they provide insight into the cost structures, such as vehicle operating costs, user charges, taxes and tolls. Long distance travel data is especially needed for tourism, energy and environmental policies.

Long distance travel is only in rare cases a part of daily mobility (e.g. salesmen or ambassadors). Therefore, such movements are reported with low frequencies in surveys of daily mobility at least for distances over 400 km (1). However national travel surveys (NTS) dedicated to daily mobility are the only source for long distance travel in many European countries (e.g. in Denmark or Netherlands). The problem with these surveys is the difficulty of obtaining representative statistics of long distance travel even with relatively big samples. Therefore, in most national travel surveys, additional modules are dedicated to long distance travel with the exceptions mentioned above. In addition to surveying mobility on a given day, the most common format in these surveys is to ask respondents to report their long distance journeys for a reporting period of four or more weeks (e.g. Great Britain NTS (2002-2004) (2), French NTS (1993-1994) (3), Swiss Microcensus on Travel Behavior (2005) (4), and Swedish RES (2005/2006) (5)). Surveys exclusively dedicated to long distance travel are a less frequent data source. But past surveys show very different levels of long distance travel demand for similar countries, which make those numbers hard to trust (e.g. DATELINE (6)) (1).

Because of this data gap the European Commission funded KITE (A Knowledge Base for Intermodal Passenger Travel in Europe) which aims at providing information for stakeholders in the field of long distance intermodal travel (7). As mentioned above a central part of KITE was the development and test in a pilot survey of a suitable survey methodology that to close the remaining information gaps. These pilot surveys were carried out in Switzerland, the Czech Republic and Portugal to cover a range of languages and socio-economic conditions.

First, an overview about available and comparable long distance travel surveys is given. The survey methodology of the KITE pilot survey is described next. Finally, the long distance demand figures are analyzed and compared with other data sources.

AVAILABLE LONG DISTANCE TRAVEL DATA FROM HOUSEHOLD SURVEYS

The survey work within KITE is a conventional household travel survey. In contrast to other survey approaches (e.g. mobile phone tracking, ticket sale figures, credit card payments on highway toll booths or cross border counts (8)), which provide only information on one particular facet of long distance travel activity, conventional household travel surveys give additional information, which is crucial for understanding and modeling individual long distance travel activities (9).

TABLE 1 gives an overview of available household surveys with information on long distance travel, which are later used to compare the results from the KITE pilot surveys. For a more comprehensive overview see (1).

TABLE 1 Analyzed household travel surveys with information on long distance travel (11,12,4,6,13,14)

Survey	Spatial Coverage	Survey Year	Everyday Travel Diary	Long Distance Travel Definition	Long Distance Travel Reporting Period
INVERMO	Germany	1999-2002	No	>100 km network	8 weeks
MiD	Germany	2002	Yes	Overnight stay	12 weeks
Micro Census	Switzerland	2005	Yes	Excursions > 3 h overnight stay	2 weeks 8 weeks
DATELINE	EU 15 + CH	2001/02	No	>100 km crow-fly	(holiday journeys) 12 months (other journeys) 3 months
MEST/TEST	France, Portugal, Sweden, UK Switzerland,	1996/97	No	>100 km crow-fly	8 weeks
KITE	Czech Republic, Portugal	2008/09	No	>100 km crow-fly	8 weeks

It covers two types of surveys: Mobility diary surveys (National Travel Surveys) with a focus on every day travel, and surveys dedicated to long distance travel. In the following, a brief overview describes the characteristic problems of long distance surveys in general and the characteristics of the surveys in TABLE 1.

General problems of long distance travel surveys

The core of the design problem of long distance travel surveys is their exclusion of journeys below a minimum distance or duration. The movements to be reported are rare events requiring long reporting periods to increase the chance that the respondent can report at least one journey and that the contact is not wasted in terms of capturing information about travel. Counterbalancing this is the problem of recalling events, which might have happened weeks ago, in some detail, which limits the reporting period to a range of four to eight (twelve) weeks, given the relatively low salience of routine long distance travel for many above average frequency travelers (15).

Long distance Travel Definitions

In surveys of daily mobility, the study objective is clear: capture all movements of the respondents for a day, excluding only movements within large facilities, such as shopping centers or factories. Even this basic question is open to discussion in the case of long distance travel. Because the division between movements relevant to long distance travel, the related decision making and the irrelevant local movements needs to be defined, as it is impossible to ask the respondents to report all movements undertaken during a multi-day long distance journey (See (14) for a more thorough discussion).

Tourism and transport planning are the two main focuses of long distance travel surveys. On the one hand it is possible to differentiate long distance travel from daily mobility by the duration of being away from home; on the other hand it is possible to define it by a minimum distance travelled from a certain base location. While the duration of a stay is the main focus when looking at tourism where data is needed for supply and marketing decisions, the duration of stay is not crucial for transport planning, where the data need is more focused on route/mode choices which are determined in part by distance. The decision to use distance as a criterion is widely accepted in transport planning long distance surveys, but the exact cut-off and type of

distance (crow-fly or network distance) were never harmonized and vary from country to country and survey to survey.

For the analysis in this paper, long distance journeys are defined as journeys including outbound trip and return trips to destinations at crow-fly distances of at least 100 km. We adopted this definition because it is the EUROSTAT definition which was used in the DATELINE survey, and DATELINE was the only Europe wide survey so far.

In some surveys crow-fly distances were not available (German MiD, German INVERMO). In these cases we corrected reported distance to be network distance and recalculated crow-fly distances using observed detour factors (Germany: 1.28 (16)). In the case of travel diary surveys with focus on everyday travel, we first analyzed single trips and then calculated the number of journeys based on the assumption that one long distance journey includes two long distance trips.

Recall problems

The definitions in long distance surveys have further implications on travel data beyond the problems mentioned above. As long distance journeys are rare events, it is necessary to have a relatively long reporting period, and therefore recall problems occur.

The duration of the reporting period interacts as a design variable with the basic unit of the reporting chosen (i.e. stage¹, trips or journey) and therefore the level of detail, as this implies a certain recall burden for the respondent. The analysts' desire for detail has to be traded off against the response burden and recall difficulty of stages or even trips undertaken some time ago. A four-week reporting period might be compatible with stages while a twelve-week reporting period only with journeys.

In postal questionnaires this issue is compounded by the issue of how to provide for the "standard" trip or journey: is it a simple out-and-return journey or a complex trip involving multiple stages. A paper form cannot accommodate certain levels of complexity in a self-completion context, which limits the possibility to choose the base unit and to define it. Related to this is the question of how frequent travelers or repeated trips can be supported for such repeated journeys, as those to the weekend home or to the location of a current work assignment. In the first case, one would like to reduce the response burden by either simplifying the task or by reducing the reporting period, but has to avoid offering shortcuts to everyone.

Fatigue effects

A relatively long reporting period for surveying rare events creates the further problem of fatigue effects. The response burden distribution in long distance travel surveys is highly skewed in contrast to daily mobility surveys because of the highly skewed travel frequency distribution. To avoid the tedium of repeating the description of very similar journeys for frequent travelers, one could offer shortcuts. While both things can be achieved in CATI/CAPI contexts, they are not as easily possible on paper forms without inviting other respondents to use these short-cuts. In addition, one is interested in the details of those journeys of frequent travelers, if one has doubts about the identity of those repeated journeys.

The same questions recur when looking at the design of the question sets for each reporting unit: number of items, complexity of the items, and complexity of the available pre-coded answers. The designer has to trade-off desired detail against respondent boredom and response burden. This issue interacts with the design of the questions on the page, where multiple units on each page save postage and reduce the footprint of the forms but give the impression of complexity through the busyness of the page.

This brief discussion has highlighted the special difficulties inherent in conducting surveys of long distance travel, where the complexity of the subject, the resulting response burdens and the data needs have to be balanced so that valid and useful data are obtained at reasonable cost.

¹ Stage (unlinked trip) is the continuous movement with one mode/means of transport (including any pure waiting times); a trip is the sequence of stages between two activities; a journey is the sequence of trips from home and back home (17).

Characteristics of available surveys and survey elements with focus on long distance travel

In order to overcome the problems of surveying long distance travel with instruments designed for capturing everyday travel, specific long distance travel surveys have been developed. The concept of long distance travel surveys generally revolves around the question: "Tell me about your long distance travel in the last x weeks". The general idea here is to focus on long distance travel but cover a longer period of time, leading to an increased number of records of long distance journeys.

Hence, long distance travel surveys differ with respect to the method of collecting the information from the respondent: While some surveys (German MID [CATI and postal], Swiss Micro Census [CATI]), collect the information on long distance travel exclusively by retrospective interviews, other long distance travel surveys employ sophisticated formats of surveying long distance travel activities:

- INVERMO was a long distance travel panel survey with a two stage approach. First, a screening survey (CATI) was conducted to assign respondents into three groups according to their long distance mobility. Second, the respondents (stratified by long distance travel activity level) were sent a long distance mobility diary (self administered, mail back) which they were to fill in during an eight week period. Three subsequent panel survey waves were conducted (11).
- The DATELINE survey focused exclusively on long distance travel and followed a two-phase approach. In phase one, respondents reported travel of over 100 km crow-fly distance for the purposes of "holiday" in the previous 12 months, as well as "other private" and "business" in the previous three months, and "commuting" for the previous four weeks. Thereafter, some of these journeys (up to six, including the two most recent holiday journeys) were selected at random while oversampling very long journeys. In phase two, the selected journeys were reported in detail on the trip level. The same basic survey design was implemented in all the countries. However, survey unit (household, person) and methodology (postal, telephone) varied from country to country. Response rates varied as well, also because in some countries the survey was mandatory (6).
- The MEST/TEST survey was carried out in France, Portugal, Sweden and the UK. The survey approach included two sequential questionnaires to counterbalance the burden for the interviewees, the first one contained a roster for all journeys with a destination further away than 100 km crow fly distance with basic characteristics and the second asked for trip details of up to three of the most recent journeys. The methodology used varied among countries (postal, telephone) (13).

THE KITE SURVEY METHODOLOGY

The KITE survey builds on the experiences of these previous long distance travel surveys. In addition to the normal household data and person data, a protocol of three steps was used to conduct the long distance travel survey.

Even though the long distance travel definition for the analysis was 100 km crow-fly, for the survey a relatively low cut-off of 75 km was chosen. The objective of this was reducing the effect of the errors in the reported journey length and interviewee bias in the perception of distances. The usual 100 km boundary was imposed afterwards when the geocodes of journey destinations were available. Shorter journeys were removed from the further analysis.

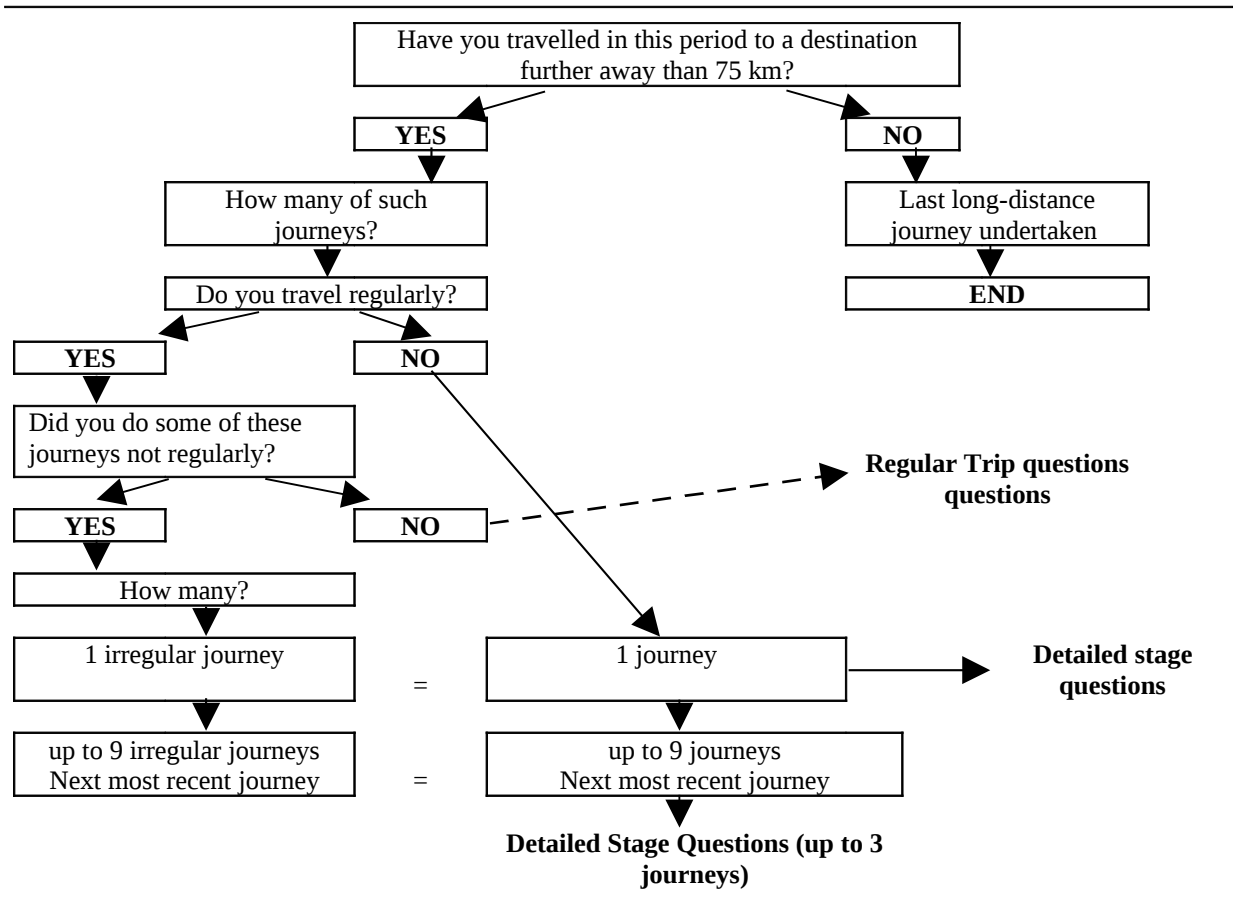
In addition to the 75 km threshold the survey period was with eight weeks relatively long. As discussed above, this is inconsistent with the desire to obtain detailed information on the stage level. To resolve this imbalance, a two stage survey arrangement from the MEST and the INVERMO survey was retained for the survey protocol:

First, a screening by CATI/Face-to-Face is implemented to screen the relevant respondents and filter out frequent long distance travelers to help the respondent with an abbreviated description of repeated journeys.

Second, a journey roster is employed which retrieves the basics of the journeys undertaken during the reporting period: date of departure/return, destination, main mode, main purpose and size of party. Detailed stage descriptions were only obtained for the three most recent journeys in the second part.

In addition, to avoid repeated questions for frequent long distance travelers and to lower their response burden, a special commuter/regular trip questionnaire asks only for one of these repetitive journeys. This should reduce the refusal rate of this very important traveler segment. The logic of the protocol is graphically presented in FIGURE 1.

FIGURE 1 Logic of the protocol



In Switzerland and Portugal the surveys were carried out as a CATI and in the Czech Republic as a face-to-face interview.

SURVEY PERIOD AND RESPONSE RATES

The KITE survey was carried out between November 2008 and March 2009 in 4 waves, whereas the last three waves were of equal size and the first one was smaller to allow last adjustments. The response rates of the KITE survey vary from country to country. One influential factor here is the respective survey protocol. The response rates are given in TABLE 2.

TABLE 2 Response rates of the KITE long distance travel survey

	Switzerland (Random-sample CATI)		Portugal (Random sample CATI)		Czech Republic Face-to-face with on- street recruitment	
	[%]	Sample	[%]	Sample	[%]	Sample
Base sample	100	4,160	100	5,333	100	1,933
Non-response reasons						
Problem with the phone number	21	855	2	112		
Refusal	20	847	15	816		
Non-contact	1	56	51	2,693		
Age-problem	21	888	4	229		
Language-problem	11	454	0	0		
Other	1	50	6	331		
Interviews conducted	24	1,010	22	1,152	64	1,237
Mean interview duration (min)		17		17		37

The response rates have to be analyzed against the background of a maximum of 15 calls over several weeks. The samples are random, representative for the population, and controlled for age, gender and income. Because of the relatively small sample size, the samples are not representative for different regions within the countries.

For the Czech sample a quota sample was used. An exact non-response statistic is therefore not available for the data. The high number of non-contacts in the Portuguese sample occurs because the survey administrators stopped trying to reach a part of the sample after they reached the requested numbers of interviews. However, the persons in the base sample had at least one call attempt. The high share of problems with the phone number in the Swiss sample is caused by the change of an available official address and telephone number sample. This caused adjustments in the address-databases of the commercial survey companies, which has an effect on the sample quality and causes these phone-number problems.

The response rates are acceptable given the relatively long duration of the interviews. The share of refusers, only 20.4 % in Switzerland and 15.3% in Portugal, is low compared to other long distance surveys, such as 27 % in Norway (18).

The average interview duration for the telephone interviews is remarkably shorter than for the face-to-face interviews. This is not directly comparable, because the software used in a CATI makes the interview process much more efficient.

Based on the answers in the first part of the survey, in the second wave a customized stated preference survey was sent to self-identified respondents, which is not part of this paper, but an analysis of the data can be found in (19).

LONG DISTANCE TRAVEL DEMAND AND MODE USE

Numbers of long distance journeys

Travel demand calculated for the KITE survey

The simplest way to calculate the number of long distance journeys as an indicator for long distance travel demand is to gross up the mean number of reported regular and non-regular long distance journeys per person during the reporting period (8 weeks in the KITE survey) to a whole year.

As compared to just use the reported number of journeys during the reporting period, the KITE questionnaire design allows use of additional and more precise information to calculate the numbers of long distance journeys, e.g. the last long distance journey undertaken, if an interviewee did not undertake such a journey during the reporting period. KITE data yields information about regular and non-regular long distance journeys during the reporting period. The frequency of regular journeys and date of non-regular journeys are

known. All of this information is combined using a survival function $S(t)=Pr(T>t)$, which is the probability that the time between two long distance journeys will remain “alive” at a particular age, to calculate the hazard rate. In this case the hazard rate is the mean time between long distance journeys. Information about the period between two events or long distance journeys undertaken is available as completely observed periods or as left- or right-censored periods, meaning that the start or end of the periods are not observed. According the survey protocol described in FIGURE 1, TABLE 3 gives an overview about the data used to calculate the mean survival time between two long distance journeys. Unobserved periods are in the data if the reported journey took place before the reporting period or if it is the first or last reported journey; in this case either the journey before (not asked) or after (in the future) is not known.

TABLE 3 Journey intervals in the KITE survey

Data source	Censoring		
	Left (Begin not observed)	Uncensored	Right (End not observed)
Last long distance journeys before the 8 week reporting period			x
Regular journeys		x	
Non-regular journeys	First one reported	x	
	between		x
	Last one reported		x

There are different approaches to model the durations. In parametric models the underlying hazard rate or transition rate, i.e., the rate at which events occur, is parameterized in terms of its probability distribution, e.g., Weibull, Gompertz, exponential, gamma, log-logistic and log-normal distributions (20). A semi-parametric alternative is represented by the Cox proportional hazard model (21; 22). Here it is not necessary to make assumptions about the particular distributional form of the durations. This makes it preferable over its parametric alternatives (23). In the Cox model the hazard rate for the i^{th} individual is defined as follows

$$h_i(t) = h_0(t) \exp(\beta' x_i),$$

where $h_0(t)$ denotes the baseline hazard function and β'_{xi} are the parameters and covariates, which is here a constant. The hazard rate for the Cox model is proportional as the hazard ratio for the two individuals i and j is written as:

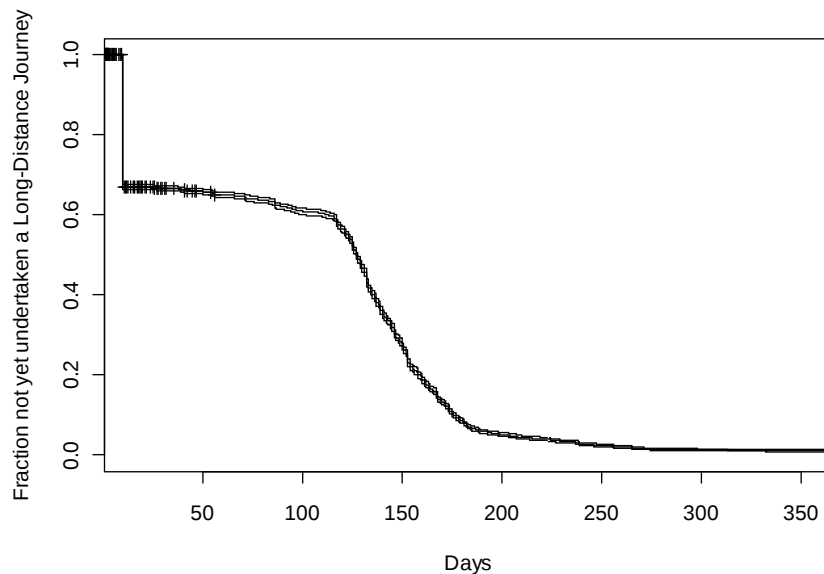
$$\frac{h_i(t)}{h_j(t)} = \exp(\beta'(x_i - x_j))$$

which demonstrates that this ratio is constant over time (23). The estimation method in the Cox model is the maximum partial likelihood method and allows to estimate the parameters β' without specifying the baseline hazard function $h_0(t)$. This method is based on the assumption that the intervals between successive duration times contribute no information regarding the relationship between the hazard rate and the covariates, but rather the ordered duration times (23).

If T is the time between two long distance journeys and its cumulative distribution function is $F(t)$ on the interval $(0, \infty)$. Its survival function is:

$$R(t) = P(\{T > t\}) = \int_t^\infty f(u) du = 1 - F(t).$$

This is the inverse of the cumulative distribution function and imputes the unknown, censored information. FIGURE 2 shows the survival rate calculated for the period between two long distance journeys.

FIGURE 2 Survival function for all reported journeys

The calculated mean survival time is 41.2 days, which corresponds to 8.4 journeys per person per year: 8.2 in Switzerland, 9.0 in the Czech Republic, and 8.2 in Portugal. The non corrected mean numbers of long distance journeys are 9.6% smaller with 7.6 in total, 6.9 in Switzerland, 8.9 in the Czech Republic and 6.8 in Portugal. The relative difference among the countries for the uncorrected numbers is larger than for the corrected, and seems to be unreasonable, as there is no logical explanation why people in the Czech Republic should travel more than people in Switzerland or Portugal.

The data shows that specifically the number of persons who did not report a long distance journey during the reporting period is much lower in the Czech Republic (18.7%) than in Switzerland (48.05%) or Portugal (49.6%). The differences among the countries for the survival model corrected data are present, but they are smaller because the additional information about the last undertaken long distance journey outside the reporting period is integrated in the calculation.

The cut-off at 100 km in the KITE dataset excludes overall 18% of the journeys, which are between 75 and 100 km long. This is more or less the same share as journeys between 100 and 125 km have (19%). From a methodological view this is interesting, as it would be expected, that there would be a decrease of the shares with distance (see FIGURE 3). This means that in the lower distance band the interviewees do not give all the journeys, because they believe the distance would be too low. This is a strong argument for choosing a lower boundary (75 km) in the survey than the actual definition (>100 km) is.

Comparison of long distance travel demand results of the KITE survey

To compare the survey results of the KITE pilot survey with other available data, household travel data is used. Household travel data provides the same units of analysis, even if origin and quality vary. The surveys used for the comparison are described on page 2 ff.

As there is no primary data available from a long distance survey for a direct comparison of the data for Switzerland, Portugal and the Czech Republic, post-processed harmonized figures are used which Kuhnimhof et al. present in (1). These harmonized figures for different European countries also include figures for Switzerland and Portugal, which are used to compare them with the results from the KITE survey. They suggest using NTS daily mobility diary data for the 100 - 400 km range and adding the long distance travel demand from long distance travel survey for distances above 400 km. This procedure is suggested because the travel demand results larger figures in the lower distance band from the daily mobility diaries than in the most compared long

distance surveys. As it is very unlikely that travelers would make up journeys and that a possible selective survey participation of mobile individuals does this discrepancies, it is more likely that these results are produced by recall effects in long distance surveys.

To observe if the KITE survey comprise similar recall effects, the distribution of the journeys per person per year in 100 km distance bands are compared in 1 with other surveys. Switzerland is the only country to compare the KITE results with the figures from a NTS diary. FIGURE 3 shows higher numbers for the low distance band as for the higher distances. Therefore the figures for KITE are not enriched with the data from the Swiss NTS for the following sections.

FIGURE 3 Journey length distributions from selected surveys for Switzerland, Portugal and the Czech Republic

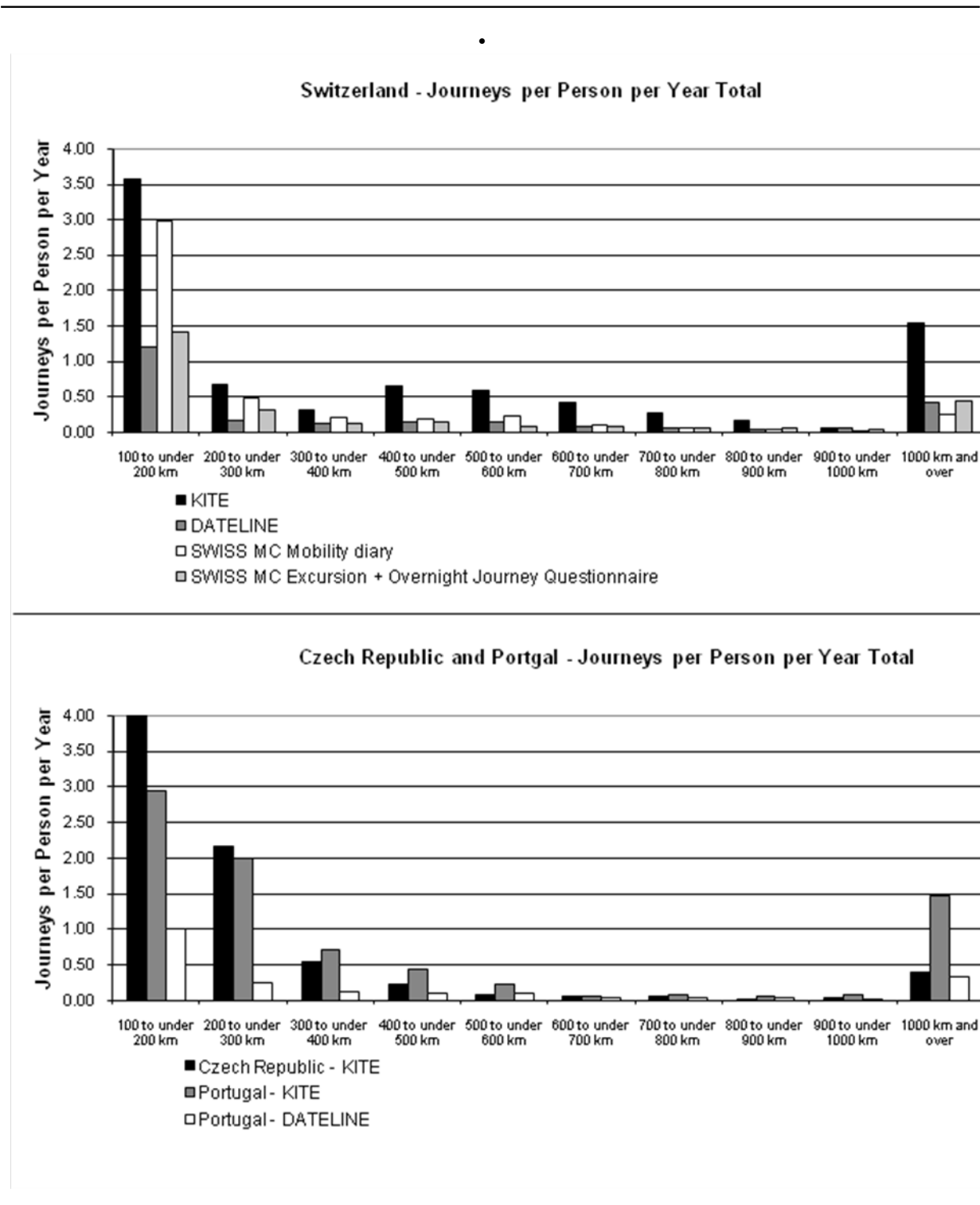
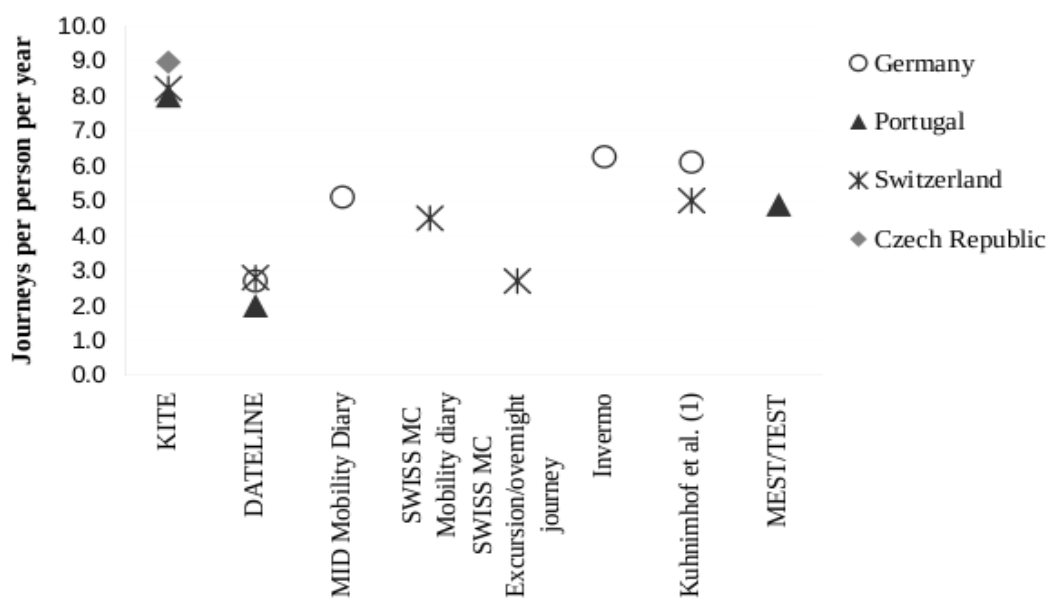


FIGURE 4 shows the figures on long distance travel demand for four selected European countries. Among these, the Czechs are the most active travelers. The other countries show a comparable level of long distance travel.

The comparison between the different countries within KITE shows that the mean numbers in Switzerland, the Czech Republic and Portugal are very similar. The differences in the number of long distance travel between the countries within KITE are not huge but still seem to be systematic and have their origin in the survey methodology: In the Czech Republic the data was collected as a face-to-face interview while Switzerland and Portugal used a CATI interview. A possible explanation for the high travel rates in the Czech Republic seems to be that there is a share of persons who do not provide as comprehensive information in a CATI interview as in a face-to-face interview. The last long distance journey, if they did not undertake one during the reporting period, has helped to correct for some of those omissions. Compared to the differences between the different surveys and within the other surveys, the relative differences within KITE are rather small.

FIGURE 4 Long distance travel demand (journeys > 100 km crow-fly distance) in European countries by different surveys



Modes in KITE and long distance travel

The resulting modal split of the KITE survey is compared in TABLE 4 to the results of Kuhnimhof et al. (1) and the Swiss MC (4). Switzerland is known for a much higher share of public transport than other European countries. The modal split of the Czech Republic is very similar to the results of Germany for the shares of car journeys. Coach is a less common transport mean in Switzerland and is mostly used for longer trips of foreign born residents to visit their families in the country of their family’s origin. Overall the share of air travel is higher than in Germany and in the Swiss MC, which can be a result of the price drop in this segment over the last years.

The share of travelers using interurban rail is much higher in Switzerland than in the other countries, as the main airports in Switzerland are very easy to access with the train. As the airport in Switzerland is recently accessible with an urban public transport, this share will increase further. The high share of urban public transport for the countries beside Switzerland is mainly because of the Busses which connects the airports in the most cases with the cities. The overall use of public transport (without taxis) as a mean to access the airports is

in Switzerland (44%; 42%) is higher than for the other countries, (Germany: 34%, Portugal: 29% and Czech Republic: 32%) but the differences are smaller than for the overall mode share.

TABLE 4 Mode share for long distance travel (Journeys > 100 km) by survey and country [%]

	Kuhnimhof et al.		KITE		
	Germany	Switzerland	Switzerland	Portugal	Czech Republic
Main modes of travel					
Car	70	67	75	51	60
Bus	4	11	3	4	4
Train	12	5	10	28	22
Air	10	16	12	14	12
Ship	1	2	0	0	0
Other	3	-	-	-	3
Airport access mode					
Interurban Rail	12	6	7	38	40
Urban Public Transport	21	23	25	6	6
Taxi	18	13	12	3	6
Car	48	58	56	53	48
Bike	0	0	0	0	0
Other (incl. walk)	1	0	0	0	1

CONCLUSIONS

This paper presented basic figure on European long distance travel demand based on the new survey approach and protocol piloted by the KITE project. The survey resulted in credible estimates of the number of long distance journeys, especially after a correction involving the information about the last long distance journey and the information about regular journeys. The response rates were in the expected range for a survey of this complexity.

With respect to long distance travel surveying the methodology used is very important as well as the correction of the data with suitable methods. Use of the response of persons which have undertaken a long distance journey during the reporting period along with inclusion of the not so frequent long distance traveler makes a difference, even though long distance travel demand is dominated by frequent travelers.

Although the initial results from the analysis show plausible results, there are still artifacts from the survey methodology, which need to be analyzed further. The first is the differences which are caused by the face-to-face interview compared to the CATI interview methodology. For future work, it would be very interesting to see results of a survey of the size of DATELINE, but with the methodology suggested here. It would also be important to extend the survey period over a whole year to correct any seasonal variations.

As pointed out in the beginning of the paper, currently significant data gaps with respect to long distance travel exist in Europe. There is demand for such data from transportation planners as well as from the tourism sector. With National Travel Surveys with focus on everyday travel on the one hand as well as tourism surveys concentrating on journeys with overnight stays on the other the two sectors have managed in the past to cover most of their data needs. However, there is increasing need for long distance travel data by transportation planners. Large parts of what transportation planners need are covered by tourism surveys. Vice versa, the tourism sector increasingly calls for data covering long distance travel without overnight stays. This again is covered in large parts in NTS surveys. It seems likely that synergies with benefits for both sides can arise if transportation and tourism joined forces and combined their existing instruments NTS and tourism surveys.

However, experiences with long distance travel surveys in the past have illustrated that specifically reliable data on travel which is not anymore quotidian but not yet typical tourism is difficult to obtain. The survey methodology presented in this paper offers a perspective here: A Europe-wide uniform survey in the suggested format would not help to obtain important data to support transportation policy making at all levels. In

addition, it would serve as an important hinge in bringing together the transportation and tourism sector by closing existing data gaps between both.

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REFERENCES

- 1 Kuhnimhof, T., R. Collet, J. Armoogum and Jean-Loup Madre. Generating Internationally Compareable Figures on Long Distance Travel for Europe. Paper presented at the *88th Annual Meeting of the Transportation Research Board*, Washington, D.C., January 2009.
- 2 UK Data Archive. *Online Description of the UK NTS*. <http://www.data-archive.ac.uk/findingData/snDescription.asp?sn=5340>. Accessed September 25, 2007.
- 3 *Website of the French National Travel Survey*. <http://www.cmh.acsdm2.ens.fr/enquetes/XML/lil-0081.xml>. Accessed January 20, 2008.
- 4 Bundesamt für Statistik BFS and Bundesamt für Raumentwicklung ARE. *Mobilität in der Schweiz - Ergebnisse des Mikrozensus 2005 zum Verkehrsverhalten*. Neuchatel, 2007.
- 5 Sika Institute. *Website of the Sika Institute*. <http://www.sika-institute.se>. Accessed April 15, 2008.
- 6 DATELINE Consortium. *DATELINE - Design and Application of a Travel Survey for European Long-Distance Trips Based on and International Network of Expertise*. Project funded by the European Union. Publication Project 2000-AM.10016, Socialdata, München, 2002.
- 7 KITE Consortium. *Kite project Web page*. www.kite-project.eu. Accessed July 15, 2008.
- 8 *Report of the Workshop B8 "Surveys of Tourists and Transients in Urban Areas" at the International Conference on Travel Survey Methods, Annecy, France, May 25-31, 2008*. www.isctsc.let.fr/2008Conf/workshops.html#B8. Accessed July 30, 2008.
- 9 Manz, W. *Mikroskopische längsschnittorientierte Abbildung des Personenfernverkehrs*. Schriftenreihe des Instituts für Verkehrswesen Vol. 62/05, Universität Karlsruhe, Karlsruhe, 2005.
- 10 Zumkeller, D.; Chlond, B.; Manz, W. and Last, J. Long-Distance Travel in a Longitudinal Perspective: The INVERMO Approach in Germany. Presented at the Transportation Research Board 85th Annual Meeting, Washington. Washington, January 2006.
- 11 Chlond, B. and Manz, W. *INVERMO das Mobilitätspanel für den Fernverkehr, Dynamische und statische Elemente des Verkehrsverhaltens*. Wissenschaftliches Kolloquium Karlsruhe 2000. Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft e. V., Bergisch Gladbach, 2005.
- 12 Kunert, U.; Kloas, J.; Kuhfeld, H.; Follmer, R.; Engelhardt, K.; Gilberg, R. and Smid, M. *Mobilität in Deutschland- KONTIV 2002. Kontinuierliche Erhebung zum Verkehrsverhalten*, Projektbericht. Project funded by the German Ministry for Transport. Final Report FE 70.0681/2001, Deutsches Institut für Wirtschaftsforschung, Berlin, 2003.
- 13 Axhausen, K. W. and Youssefzadeh, M. MEST, *Methods for European Survey of Travel Behavior*. Project funded by the European Union. Deliverable D2. Innsbruck, 1999.
- 14 Axhausen, K. W., J.-L. Madre, J.W. Polak, and Ph. L.Toint. *Capturing Long-Distance Travel*. Research Studies in Traffic Engineering, Hertfordshire, England, 2003.
- 15 Armoogum, J. and J.L. Madre. Accuracy of data and memory effects in home based surveys of travel behaviour. Presented at the Transportation Research Board 76th Annual Meeting, Washington. Washington, January 1997.
- 16 Chalasani, V.S., Ø. Engebretsen, J.M. Denstadli, and K.W. Axhausen. Precision of geocoded locations and network distance estimates. *Journal of Transportation and Statistics*, Vol. 8 (2). pp. 1-15.
- 17 Axhausen, K. W. Definition of movement and activity for transport modeling. In D.Hensher and K.Button (eds.) *Handbooks in Transport: Modelling*. Transportation paper. Elsevier, Oxford, 2000.
- 18 Denastadli, J.M. *Travel behaviour 1998: Journeys of 100 km and more*. Summary of TOI Report 466/1999, TOI, Oslo, 1999.

- 19 Axhausen, K. W., Lapparent, M. and Frei, A. Coice of mode for long distance travel: current SP-based models from three European countries. Paper submitted for presentation at the European Transport Conference. Leeuwenhorst, October 2009.
- 20 Allison, P. D. Survival analysis using the SAS system: A practical guide, SAS Institute Inc., Cary, 1995.
- 21 Cox, D. R. Regression models and life tables, *Journal of the Royal Statistical Society Series B*, **34** (2) 187-220, 1972.
- 22 Cox, D. R. Partial likelihood, *Biometrika*, **62** (2) 269-276, 1975.
- 23 Box-Steffensmeier, J. M. and B. S. Jones *Event history modeling: A guide for social scientists*, Cambridge University Press, Cambridge, 2004.