

DATELINE

Design and Application of a Travel Survey for Long-distance Trips Based on an International Network of Expertise

—

Concept and Methodology

Werner Brög, Erhard Erl & Brian Schulze

Socialdata – Institute for Transport and Infrastructure Research
Hans-Grässel-Weg 1, 81375 Munich, Germany / E-mail: socialdata@socialdata.de

1. Introduction

Conceived in April 2000 as part of the European Commission's *Competitive and Sustainable Growth* program embedded in the 5th Framework Program, *DATELINE* (Design and Application of a Travel Survey for European Long-distance Trips Based on an International Network of Expertise) is concerned with European long-distance travel. A specifically designed survey was carried out in the 15 Member States of the European Union (EU) and in Switzerland, following a carefully devised methodology that had the aim to create one single harmonized long-distance travel database covering all 16 countries. The project was funded by the European Commission (EC) and executed by an interdisciplinary research team of twelve experienced consortium partners from various parts of Europe. Within the consortium, a combination of competencies from the field of theoretical and applied transportation and social market research came together to meet the challenge.

This paper sets out to describe concepts, methodology and the survey design developed during the first year of the project. It also includes a sketch concerning implementation. Information on sampling¹, weighting² and analysis³ are available through the project web site at: <http://cgi.fg.uni-mb.si/elmis>. General long-distance mobility results derived from the analysis are currently being reviewed. Once the EC gives its official seal of approval, they will also be accessible through the site, including the possibility to download the complete database for personal use, free of charge.⁴

2. Methodology

Before going into the details of the methodological aspects behind the survey, it is necessary to say something about the objectives of *DATELINE* so as to be able to better understand the choices made by the consortium.⁵

2.1 Objectives and Principles

The overriding goal of the project was to systematically survey long-distance journeys made mainly within the EU, but also beyond. Four main objectives formed the framework, which helped the project reach its goal. These were,

¹ The total net sample size of the survey was about 85,000 persons. Full documentation of the sampling methodology can be found in Deliverable 3 "Sampling Methodology". It is available for download on the project web site.

² Full documentation of the weighting process can be found in Deliverable 10b "Weighting and Grossing-Up". It is available for download on the project web site.

³ Full documentation of the analysis process can be found in Deliverable 7 "Data Analysis and Macro Results". It is available for download on the project web site.

⁴ The web site not only contains project reports and the database, it also offers the possibility to conduct online analyses. A tool specifically designed for this task was developed by NESSTAR and modified by the *DATELINE* Consortium to meet its needs.

⁵ Full documentation of the *DATELINE* methodology can be found in Deliverable 2 "Final Survey Design". It is available for download on the project web site.

- (1) to design a complete survey for European long-distance travel;
- (2) to implement this survey in all 15 EU Member States;
- (3) to build up a valid long-distance mobility database;
- (4) to integrate this database into the EUROSTAT statistical program.

These objectives did not stand by themselves. They came with four guiding principles, which guaranteed a survey of high quality. These principles were,

- (1) to develop a respondent friendly questionnaire;
- (2) to devise a flexible methodology;
- (3) to create a valid database;
- (4) to harmonize all the collected data.

The first principle aimed at the design of a questionnaire that does not inundate the respondent with unnecessary information and confusing definitions. It was made a priority by the consortium to meet the respondent not only half way, but to actively unburden him as much as possible.

The second principle related to the fact that the survey involved many different countries with distinctive cultures and needs. Survey traditions differ across Europe, so that precautions had to be taken that would allow the use of survey methods and procedures appropriate to the country or region concerned.

The third principle ensured that collected data was checked for consistency, completeness and plausibility. An additional validation survey searching for any travel information that may have been missed was carried out to verify and enhance data quality.

And finally the fourth principle; one may say that it formed the pinnacle of the project work in that all collected and analyzed data, regardless of its origin, had to be comparable in order to be of use to future European planning efforts.

All eight items – objectives and principles – were critical to the success of the project and had to be acknowledged and strictly adhered to by all members of the consortium and their affiliates, i.e., subcontractors.

But not only that. A number of definitions, some of which had already been used by EUROSTAT in previous long-distance surveys, were formulated to contribute to the building of a solid foundation for the survey design. These definitions are discussed in the next section.

2.2 Concept and Definitions

It is impossible to construct a harmonized database without maintaining consistency in the empirical phase of a project. To obtain consistency, it is imperative for project participants to reach consensus on the main issues during the conceptual phase. Notions about basic mobility concepts such as *journey* and *trip* often differ between survey organizations and their experts, depending on the traditions and philosophies advocated. So for *DATELINE* a minimal set of definitions had to be found to which all participants could agree.

The first step was to find the appropriate cut-off distance separating the shorter from the longer journeys. A minimum distance of 100 km (crow-fly) to the farthest destination was imposed by the European Commission. This means that all journeys of 100 or more kilometers (one-way) qualified as long-distance travel. Compared to other common definitions for long-distance travel, the crow-fly distance applied in *DATELINE* was quite rigid.

The next step was to be clear on concepts of long-distance *journeys* and *trips*. The following definitions were used:

- (1) A journey is a series of trips starting and ending at home or a temporary location. Journeys that include a destination more than 100 km (crow-fly) away from the reference location are long-distance journeys. Journeys can consist of many trips.
- (2) A trip connects two activities. Trips can begin and end at any location (home city, overnight location, temporary stop).

Thirdly, a working classification of journey types had to be found, as people travel for many different reasons and thus behave in a certain way. In order to facilitate subsequent analysis and also to reduce the burden on the respondent, four journey types were distinguished.

- (1) Holiday Journey: a journey that lasts for four or more days and is made for holiday purposes.
- (2) Other Private Journey: a journey made for any reason but holiday or business, the exception being a short holiday lasting for up to three days.
- (3) Business Journey: a journey made for business purposes. Professional travel undertaken by pilots, truck drivers and the like are excluded.
- (4) Commuter Journey: a journey regularly made to or from work / school / university. It includes daily and weekend commuters.

But a classification into journey types alone was not enough. It is a well-known fact among travel specialists that people behave differently depending on not only the distance of a journey but also its duration. For this reason a second classification was needed. For *DATELINE* journeys were broken down into *one-day* and *multi-day* journeys (see Figures 2.1 and 2.2).

- (1) A one-day journey is defined by the trip to and from the farthest destination, including main stops on the way and major changes of transport modes. The return trip may end at any location.
- (2) With respect to multi-day journeys, a trip begins at a reference location (home city, overnight stay or temporary location) and ends with the next overnight stay. It includes main stops on the way and major changes of transport modes. Each overnight stay of a multi-day journey can mark the beginning of a one-day excursion, which is defined by the trip to the farthest destination from an overnight stay and back, including any intermediate stops on the way.

Figure 2.1 One-Day Journey

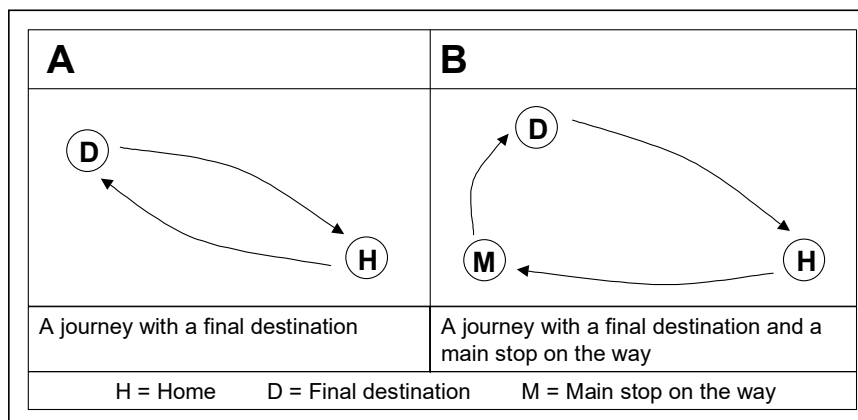
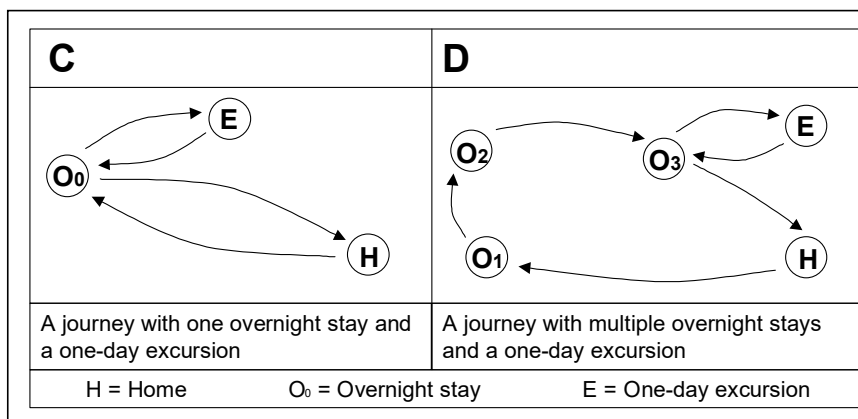


Figure 2.2 Multi-Day Journey



2.3 Survey Design

Concepts and definitions only formed the basis of the survey system. In order to make it complete, a survey design had to be developed that would take account of other important aspects such as survey method, unit, timeframe, reporting period, etc., all of which have an influence on the final mobility results.

2.3.1 Methodological Considerations. The first consideration related to the second principle – “flexibility”. National peculiarities and the prevailing cultural context called for concessions to individual survey organizations. Years of practical experience and intimate knowledge of their own country necessitated a flexibility concerning the choice of the most suitable survey method and unit. In the end, three different methods were employed in the survey – postal, telephone and face-to-face. The latter two methods mainly used “person” as the survey unit whereas the postal method always addressed the entire household.

The second consideration pertained to the length of time the survey should cover. In order to avoid any seasonal impact, the survey was carried out over a total of twelve consecutive months. This means that for each month a new sample was drawn.

Thirdly, a closely defined system of regular motivations and reminders was built into the survey design, bringing a number of advantages. It enabled the field personnel to offer additional advice to the respondent, clarify any misunderstandings that may exist or retrieve missing information. The effect was twofold; first, data quality improved and second, the response rate increased.

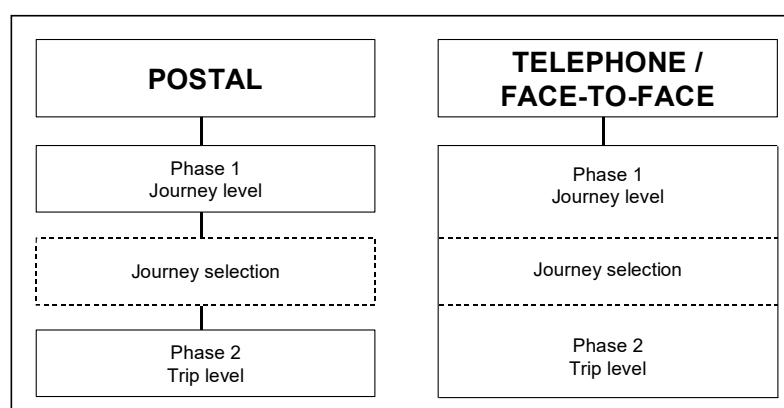
Finally, thought had to be given to the appropriate reference frame for journeys. Due to the fact that journey classification has to do with the character of a journey (some journeys tend to be forgotten more easily than others – “recall effect”), different reporting frames or periods were in order. Drawing from previous EU projects such as MEST (Mest Consortium, 1999), the following reporting periods were assigned retrospectively:

- (1) Holiday Journeys: *twelve* months
- (2) Other Private Journeys: *three* months
- (3) Business Journeys: *three* months

2.3.2 A Two-Phase-System. The idea goes back to the first *DATELINE* principle – respondent friendliness. One essential aspect often overlooked in surveys is that the respondent is the “customer” and that he needs to be treated accordingly. This means that the burden placed on him by the survey needs to be kept to a minimum level. It was predominantly this reason which led the project consortium to the decision to carry out the survey in two separate phases (see Figure 2.3). In Phase 1, respondents were asked to report general travel information. Phase 2 then proceeded concentrating only on journeys of special interest, so that the majority of respondents were spared from further contact. It should be noted, however, that in the telephone and face-to-face surveys both phases were made in just one phase with instantaneous journey selection and instantaneous geocoding (if CATI was used).

The split also brought other important advantages with it. In Phase 2, a person could be addressed personally, journeys could be selected using a predefined rule permitting an over-sampling of longer long-distance journeys, one could focus on rarer modes and the overall response rate increased.

Figure 2.3 Survey Concept



2.3.2.1 Phase 1: Journey Level. Phase 1 asked for socioeconomic background information about the household (e.g. number of persons in the household, age, gender, employment status). It then continued capturing basic travel data for the main three

journey types, including origin and destination, duration, number of participants, journey date etc.. At this point, commuter journeys were only registered with regard to their travel distance.

The number of journeys to be reported in the postal survey was limited to three in the case of holiday journeys and six if the journey fell into the other two main categories. For practical reasons, the limit for the latter two categories was lowered to five journeys in the telephone / face-to-face surveys.

2.3.2.2 Phase 2: Trip Level. Phase 2 was more complicated. The idea was to obtain additional information about the journeys reported in Phase 1 without overwhelming the respondent. Most journeys have a simple make-up (one destination, two trips) and were not worth being inspected further as no new information would be revealed. Thus, journeys that were more complex and interesting in terms of long-distance travel were selected using a special rule.

The rule clearly shows that journeys with specific characteristics took priority over others. The first priority was to make sure all journey types are covered. The second priority was given to “long journeys” (more than 500 km), and last but not least, the third priority went to time, i.e., journeys were selected in chronological order, beginning with the most recent.

Just as was done in Phase 1, an upper limit of journeys was fixed to reduce the burden on the respondent. In the postal survey the limit was set to six journeys, in the telephone and face-to-face survey it was four.

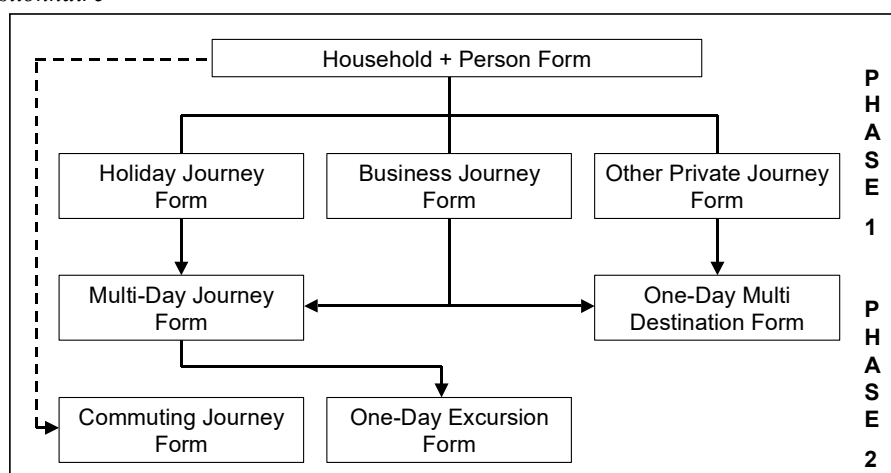
However, the rule by itself did not pay respect to the complexities of certain journeys. Therefore, a set of additional criteria had to be found and applied in combination with the rule. Using these criteria together with the established rule, it was possible to make the appropriate selection of journeys. These criteria are listed below:

- (1) To qualify for selection, a journey had to have been made within Europe.
- (2) It had to be a multi-day journey, or
- (3) If a one-day journey, it had to have been made with at least two different modes of transport or have one additional destination

2.4 The Questionnaire

In order to accommodate the methodological considerations, the questionnaire developed for the two-phase survey system was divided into individual forms (see Figure 2.5). The scheme below shows the relation between these forms and to which phase they belong. All forms of the questionnaire were translated into eleven different languages and were used with all three methods. Some minor adjustments had to be made in order to make the questionnaire suitable to the employed method as well as the surveyed country or region.

Figure 2.5 The Questionnaire



3. Survey Implementation

The survey was carried out by a number of different institutions. Not only private survey organizations, but also national statistical offices and transport ministries were involved.⁶

After twelve months of intensive fieldwork in each of the 16 countries, one can say that the implementation of the survey system was successful. The overview of response rates in Table 3.1 confirms this assertion. Both phases managed to produce an average rate exceeding 65%, which leads to two conclusions:

- (1) Respondents were interested in the subject matter; and
- (2) Respondents were receptive to the survey design and the questionnaire

The average response rate for Phase 1 across all 16 countries was 66%, which is higher than was expected at the beginning of the project. Even in countries such as Great Britain, where postal surveys are generally regarded as being ineffective, a highly satisfactory rate was reached.

Phase 2 fared even better. With an average response rate of 85%, the positive advantage of using a two-phase-system became more apparent.

Table 3.1 Survey Results

Country	Method	Net Sample (persons)	Response Rate Phase 1 (%)	Response Rate Phase 2 (%)
Austria	Postal	2,305	68	79
Belgium (Flanders)	Postal	1,023	80	87
Belgium (Wallonia + Brussels)	Telephone	1,255	41	100
Denmark	Telephone	1,595	73	100
Finland	Telephone	1,797	75	100
France	Telephone	7,379	55	100
Germany	Postal	18,613	70	82
Great Britain	Postal	8,465	63	84
Greece	Telephone	2,993	60	100
Ireland, Republic of	Telephone	794	77	99
Italy	Postal	11,183	46	44
Luxembourg	Telephone	549	82	100
Netherlands	Postal	7,460	69	82
Northern Ireland	Telephone	592	74	99
Portugal	Face-to-face	5,501	76	100
Spain	Telephone	12,320	81	100
Sweden	Postal	2,427	71	83
Switzerland	Telephone	718	65	100
TOTAL	-	86,969	66	85

4. Conclusion

After three years of preparation, co-ordination and implementation, the first collective attempt of a long-distance mobility survey for the whole EU has come to an end. The effectiveness of the survey system proved high as indicated by an overall response rate of 66% across all 16 countries. People showed much interest in the subject matter and were overwhelmingly satisfied with the survey.

The project has shown that it is possible to develop and implement a long-distance travel survey standard that satisfies distinct cultural and institutional needs of the different countries in Europe. Predicated on a critical project analysis, the rich reservoir of accumulated experience will allow to establish a permanent European monitoring system for high quality long-distance travel surveys.

⁶ Full documentation of the implementation process can be found in Deliverable 5 “Final Report on Data Collection”. It is available for download on the project web site.

Once the Commission approves the *DATELINE* mobility results, it is left to be seen how they compare to other long-distance surveys in Europe and the rest of the world. In particular, the EC and National Transport Ministries and Statistical Offices will be interested in the data, which will play its role in the formulation of future European transport policy.

Even though *DATELINE* merely represents the beginning of a series of collaborative efforts to bring about harmonization, it has already contributed inevitably to the shaping of a sustainable future for Europe and possibly the world. Already in the making, ideas are being exchanged as to the possibility of a Euro-American collaboration on long-distance travel.

References

Dateline Consortium (2001) Deliverable 3: Sampling methodology, *Project Report*, Brussels, European Commission.

Dateline Consortium (2002) Deliverable 5: Final report on data collection, *Project Report*, Brussels: European Commission.

Dateline Consortium (2002) Deliverable 6: European coding book, *Project Report*, Brussels, European Commission.

Mest Consortium (1999) Methods for European surveys of travel behaviour, *Project Report*, Brussels, European Commission.

Socialdata und Tis.pt (2003) Long-distance travel in Europe: final results from surveys in the member states, handout paper, EUROSTAT Passenger Mobility Working Group Meeting, Luxembourg, April 2003.

Test Consortium (2000) Technologies for European surveys of travel behaviour, *Project Report*, Brussels, European Commission.

Keywords

Broeg, Erl, Schulze, Dateline, travel, long-distance, survey, design, data quality, behaviour, transport, passenger, mobility, Europe, FCSM, Research conference

Annex I The Consortium

Project Co-ordinator:

SOCIALDATA – Institut für
Verkehrs- und Infrastrukturforschung
GmbH
Postfach 70 16 29
D – 81316 München
GERMANY
E-mail: dateline@socialdata.de

Project Participants:

Universitaet für Bodenkultur, Wien
Institute for Transport Studies
Peter Jordan Str. 82
A – 1190 Wien
AUSTRIA
E-mail: dateline@mail.boku.ac.at

Peter Davidson Consultancy
Brownlow House
Raven's Lane
UK – Berkhamsted Herts.
HP4 2DX
UNITED KINGDOM
E-mail: mail@peter-davidson.com

TRIAS SA
39 G.Seferi Str.
GR – 54250 Thessaloniki
GREECE
E-mail: dateline@trias.gr

Statistics Netherlands
Kloosterweg 1, P.O. Box 4481
NL – 6401 CZ Heerlen
NETHERLANDS
E-mail: hbns@cbs.nl

POLIEDRA – Politecnico di Milano, Centre
in Environmental Economics and
Management
Via Fucini 2
I – 20133 Milano
ITALY
E-mail: diguardo@poliedra.polimi.it

University of Newcastle upon Tyne,
Transport Operations Research Group
Claremont Tower,
Claremont Road
Newcastle Upon Tyne, NE1 7RU
UNITED KINGDOM
E-mail: neil.thorpe@ncl.ac.uk

Helsinki University of Technology,
Transportation Engineering
Rakentajanaukio4a,
P.O. Box 2100
FIN – 02015 HUT, Espoo
FINLAND
E-mail: nina.karasmaa@hut.fi

Institut Socialdata i Sverige AB
Kungsgatan 47 A
S – 75321 Uppsala
SWEDEN
E-mail: christine@socialdata.se

University of Maribor, Civil
Engineering Informatics Centre
Smetanova 17
SLO – 2000 Maribor
SLOVENIA
E-mail: nenad@computer.org

Ministry of Transport, AVV
Transport Research Centre
Boompjes 200, P.O. Box 1031
NL – 3000 BA Rotterdam
THE NETHERLANDS
E-mail:
h.c.vevert@avv.rws.minvenw.nl

TIS.PT Transportes, Inovação e Sistemas
Av.5 de Outubro
Nº 75 – 7º
P – 1050 Lisboa
PORTUGAL
E-mail: faustino.gomes@tis.pt

Eidgenössische Technische
Hochschule Zürich, IVT
ETH (Hönggerberg)
CH – 8093 Zürich
SWITZERLAND
E-mail: axhausen@ivt.baug.ethz.ch