

Summary:

Motorist valuation of traffic information

Results of a stated-preference pilot study

Introduction

On the background of the Directorate of Public Roads' programme description of the department project "Better road utilisation with ITS (Intelligent Transport Systems)" the Institute of Transport Economics (ITE) outlined a project on how motorists value information on traffic conditions. The Directorate of Public Roads asked ITE to implement a pilot study based on this outline including the testing of surveys designed to reveal motorists' willingness to pay. Although this pilot study may be seen as a means of testing methods and surveys designed to ascertain motorists' willingness to pay for information, any general project will be a larger study the design of which will be based on the results of the pilot study.

On the basis of the methods we have chosen in the pilot study, it was crucial to test the following:

- i) how respondents may handle valuing reduced variation in travel time (and reduced unpleasantness from traffic jams)
- ii) how information measures (in part new service offerings) may be presented that may reduce inconveniences due to variances in travel time and traffic jams
- iii) how a value may be placed on such information measures

In the pilot study we have chosen to see valuing information in connection with travel to work. In any general study it will also be relevant to consider other types of travel. We wanted to interview motorists who often experience traffic jams en route to work. All together, 34 interviews were conducted of persons aged 18 or over who reside in Asker and who drive at least 5 km on E 18 in the direction of Oslo mornings between 6:00 and 9:00am. These persons were recruited by Norsk Gallup through a telephone survey. The interviews were conducted at the respondent's home, and the interviewer used a laptop PC. This enabled the interviewer to tailor the choice situations to the respondent's actual journeys during the interview.

Design of the pilot study and method selection

The questionnaire in the pilot study was divided into four main sections:

1. Introductory questions and questions on a specific journey to work and possible alternative means of transport
2. Using direct questions (transfer-price questions) and the stated choice method to ascertain valuation
3. Control questions
4. Background questions about the interview subjects

In the first part of the interview the respondent was asked a number of questions about a normal journey to work that he or she takes. This journey is used as the basis for the various valuation methods in which the subject would place a value on various journeys and information measures.

Furthermore we chose to use a combination of the two stated-preference methods, stated choice and transfer-price questions in this pilot study. Another possibility was to use the Frisch method instead of the transfer-price method, but the Frisch method was simultaneously being tried out in a similar project at ITE, and the findings from that were of great benefit to us in this project as well.

In the stated-preference sequences we first asked transfer-price questions to elicit a direct valuation of various characteristics of the journey to work. The respondents were asked how much they were willing to pay for journeys in which individual circumstances connected with the car journey such as travel time, variation in arrival time, traffic jams and traffic information were improved or made worse.

The respondents were then presented with the stated choice sequences, in which for each question they were presented with a choice between two journeys with different characteristics. There were three choice sequences with nine questions in each.

- The factors in sequence 1 were expected travel time, variation in arrival time and cost of the journey.
- The factors in sequence 2 were expected travel time, percentage of time in traffic jam and cost of the journey.
- The factors in sequence 3 were expected travel time, type of traffic information and cost of the journey.

In choice sequence 3 we outlined different types of information that may reduce the inconveniences connected with delays and traffic jams. The three information levels presented to the respondents were:

- Type A (level 3): Today you can obtain information on traffic conditions via radio or variable signs along the road. This will be information on unusual delays, the reason for them and detours, if any.
- Type B (level 2): Imagine that in addition to today's information you could receive up-to-the-minute information on the speed of traffic on a selected

stretch of road and whether the speed is decreasing (more of a jam) or increasing (less of a jam). This type of information may be given on variable signs along the road or with the aid of SMS messages to your mobile telephone.

- Type C (level 1): Imagine that in addition to current information you could receive up-to-the-minute information on the quickest route from A (home) to B (work) when traffic conditions on all alternative routes are taken into consideration. This type of information may be given e.g. via radio and a positioning/navigation system in the car.

The respondents were also asked a number of questions directly, which involved information sources before departure and on the way to work, which ones they use today and which they would prefer in the future with regard to more detailed information. They were also asked if they benefit from the information and how it was used. Questions were also asked about how they evaluate the reliability of the information and their perceptions on its effect on traffic safety.

The last part of the questionnaire contained control questions for those who did not state a willingness to pay for the goods reduced travel time, reduced variation in travel time, reduced driving in traffic jams or improved traffic information. The form concluded with questions on such background variables as age, sex, household composition and income.

Findings from the pilot study that may aid in any general study

Since we interviewed only 34 persons in this study, we did not obtain a representative sample of the population. We have thus consciously chosen not to present any of the results in this summary. More interesting than its specific results is whether the pilot study can provide answers to the issues we are interested in and whether the methods function as intended. The analyses in this report have been done with this in mind. This survey has given us useful insights into how a general study should be designed. The design of the actual questionnaire appears to have functioned very well, and only small adjustments need to be made before doing any general study.

There also appears to be proper consistency between the stated-preference methods in the pilot study, stated-choice and transfer-price questions. The willingness to pay we find for changed travel time, changed percentage of driving in traffic jams and changes in the variation of arrival times were almost identical when using the two stated-preference methods, and the results are in line with findings from similar earlier surveys.

In respect of the stated-choice sequence in which we included information as a separate factor, we were unsuccessful in uncovering willingness to pay for improved information in the manner designed for. The likely reason is that the respondents perceived the variation in travel time and price as dominant in the choice situation, so that they did not value the information factor to any particular degree and so that we thereby were unable to capture willingness to pay for improved information. The results from the transfer-price questions indicate that

the respondents *are* willing to pay for improved information. We therefore believe that by balancing the stated choices better in relation to travel time, information and price, we will be able to uncover a positive willingness to pay from stated-choice analyses as well. The findings from the transfer-price questions will be an important tool in designing stated-choice sequences in any general survey, giving us better balance among the factors.

It turned out that around 50 per cent of the respondents stated zero willingness to pay for reduced travel time, reduced variation in arrival time and improved information. For a reduced percentage of time in traffic jams the share stating zero willingness to pay was approx. 15 per cent. These figures seem high, and a review of the control questions shows that a large percentage of those stating zero willingness to pay gave protest responses. These persons may in reality be willing to pay, but will not admit it. It turns out in general that many state zero willingness to pay because they are protesting against being asked the question, the context, the method of payment or for strategic reasons and not because they cannot afford to pay or would not benefit from improvements in the goods a value is being placed on.

Findings from the ITE study that has tried out the Frisch method gave clear indications that compared with the transfer-price questions, the Frisch method yields a considerable reduction in the percentage stating zero willingness to pay. Therefore, to a greater extent than when using transfer-price questions, a statement of zero willingness to pay using the Frisch method appears to yield a real estimate of the percentage that *really* have zero willingness to pay.

In the pilot study, the respondents were also asked introductory and background questions. These proved very useful and we wish to include these in any general study as well. In addition we will need to ask the respondents a number of direct questions about information, as we have done in the pilot study, in which it will be important to elicit the kind of information they prefer, how it benefits them and how they will use the information. The questionnaire may become rather extensive and therefore resource-intensive. To reduce the costs, in any general study we would like to explore the possibility to gathering data with the aid of the Internet, for those respondents who have access to it and home interviews for the remaining respondents.

Conclusion

With the aid of findings from the pilot study we have arrived at a recommendation for the methods that should be used, the questions that are important for inclusions and how to formulate them. We can briefly sum up that in any general survey to ascertain motorists' valuing of traffic information, we would recommend:

- Implementing a survey for journeys to work, long trips during leisure time and trips to the airport (in connection with their own journeys by air) . Other groups of motorists can also be considered, e.g. professional drivers. This should be done because the willingness to pay for information may vary widely and will depend, for example, on purpose of the journey, various time constraints and frequency of travel.

- That the design of the survey may largely be quite similar to that of the pilot study. These will be the background questions and control questions. We wish to expand and improve somewhat the questions about information and behavioural changes. We also wish to change somewhat the questions in connection with time in traffic jams and average delays, to give clearer definitions of the terms included.
- Using stated-choice sequences in which factors connected with valuing traffic information are better balanced than in the pilot study.
- Combining stated-choice with the Frisch method instead of the transfer-price questions, since studies indicate that the Frisch method reduces the percentage of protest responses.
- Considering data collection using the Internet for those who have access to it, and home interviews with remaining respondents. This will reduce the costs.

It is our objective for the results from the general study to help to increase our knowledge about motorists' preferences and valuation of traffic information. Such knowledge can be used in planning and designing future traffic information systems. Such knowledge can also be used in socio-economic analyses of information measures in transport, and enable us better to evaluate how the usefulness of information may be included in the analyses.