Travel surveys as input data to travel demand models – problems potential and future needs in Sweden and Norway.

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Summary

Background and purpose

Under its mandate (Regulation 2010:186), Transport Analysis is tasked with continuously monitoring Swedish Transport Administration work on the development of models for cost–benefit analysis, as well as international developments in the field. The Administration is responsible for developing, administering, and applying methods and models of cost–benefit analysis in the transport field and for generating relevant transport forecasts (Regulation 2010:185).

In this study, Transport Analysis examines how the Swedish Transport Administration is approaching the ongoing development of personal transport models against the backdrop of falling response rates in travel behaviour surveys and of how a comparable country, Norway, is addressing similar issues. The study results are based on documented information about personal transport models and travel habit surveys in Sweden and Norway and on interviews with civil servants and experts in each country.

The study aims to shed light on the following issues:

- What input data regarding travel habits are needed and used to assess, validate, and calibrate personal transport forecasting models?

- Do challenges exist with respect to the supply of input data regarding travel habits for use in personal transport forecasting models? If so, how are they being handled?

- What can be expected in the future in terms of input data on travel behaviour for use in personal transport forecasting models?

- What will the personal transport forecasting models of the future be like, and what input data will they require?

Conclusions

Both Swedish and Norwegian forecasting models are estimated using data from travel habit surveys. Data from travel habit surveys are also used to validate and calibrate these models. One challenge faced in both Sweden and Norway is that the response rates in travel habit surveys have fallen over time, and reversing this trend appears to be difficult. When interviewed, most respondents also expressed the concern that the decreased response rate could lead to the data not being representative of the population, which means that the results may be biased.

The interviews indicate that attitudes towards the low response rates differ between Sweden and Norway. In Sweden, the Swedish Transport Administration left the cooperation on the Swedish travel habit survey in 2013. In an ongoing re-estimation of the model system they opted not to use the most recent travel habit surveys, but rather to use a travel habit survey from 2005/2006. The justification for this was that the response rates of 30–40% in the most recent Swedish travel habit surveys are too low, meaning that some of the results are not reliable. The supervising group of agencies in Norway chose to use the latest available travel habit survey, despite a response rate of roughly 20%.

Choosing between a new travel habit survey with a low response rate or an older survey with a higher response rate can be said to be related to the following issues:

- How stable are travel habits over time? Are there any problems associated with using older surveys?

- Are the changes noted in travel behaviour real, or the result of measurement errors in the latest surveys?

- Is it possible to build confidence in models in which key input data are 10–15 years old?

The models studied here are used in forecasts designed to explain people's travel choices using variables that can be extrapolated, such as population trends within various age groups in each region, the proportions of individuals in various income groups in each region, and the available jobs in each region. The models are predicated on the idea that people's travel behaviours can be explained by these factors, and that their preferences will not change notably by the end of the forecast year. This makes it desirable to have the most current travel habit data possible to serve as a basis for assessing the models. The views of the interviewees regarding the stability of travel habits over time vary a great deal, although there does seem to be a consensus that models that are estimated based on travel habit data more than 10–15 years old are outdated. The primary reasons cited for any changes in travel behaviour are the introduction of new technologies such as electric cars, more efficient exhaust systems, and improved public transport solutions. Autonomous vehicles are cited in connection with such forecasts as a factor that will have a major impact on travel behaviour.

An effort is underway to re-estimate Swedish regional models based on a travel habit survey from 2005/2006. This means that, when the scheduled implementation of the models occurs around 2020, it will have been based on data that reflect behaviour from 15 years in the past. This is the limit in terms of what the interviewed civil servants and experts consider suitable.

In Norway the latest travel habit survey was ordered for use in a re-estimation of the Norwegian model system, which is currently underway. Unlike in Sweden, the same group of agencies responsible for model development also funds and procures the travel habit surveys in Norway. The background of the re-estimation process in Norway is that the model system had been criticised for being based on old input data, and the model results had been called into question. That models assessed based on more recent travel habit surveys generally enjoy greater credibility and legitimacy was another factor cited in the interviews in both Sweden and Norway.

The experts and civil servants interviewed currently see no alternative to travel habit surveys as presently constituted, and believe that it would take a long time before alternative data-gathering methods could provide equivalent information about individual travel behaviour. New data-gathering methods, such as those gathering data from Bluetooth and mobile networks, are considered mainly capable of providing better data for validating and calibrating existing models. It is difficult to replace traditional travel habit surveys because it is currently so challenging, using any other data-gathering methods, to correlate trips made with socioeconomic information about the travellers. On the other hand, new data-gathering methods were deemed capable of supplementing travel habit surveys. Apps that can track the respondent's movement pattern were, in particular, considered capable of improving geocoding and minimising the risk of overlooking short trips.

One conclusion of this study is that it is important, from a model perspective, to continue to improve the choice-based travel habit surveys currently in use. The interviews revealed a

desire for more thorough non-response studies. One of the most important challenges is to develop better methods for ensuring that those who do respond to surveys are representative of the target population. Stratification and methods for extrapolating the selected individuals' responses to the population level are key tools in this context. According to some interviewees, there is a risk that the personal transport models will have to work with fewer traveller segments in cases in which the problems with the travel habit studies persist or worsen, and this is seen as a step back towards the models used several years ago, the results of which were of lower quality.

Using register data more extensively, shortening questionnaires, focusing on key issues, and dividing the surveys between long- and short-distance trips are viewed as other development tracks.

One difference that came to light in the interviews was that Sweden's experts are more interested in activity-based models than are their Norwegian colleagues, although such models make even heavier demands in terms of input data. In developing both new and existing models, it is important to consider the input data the models require and to have a plan for safeguarding the supply of input data in the future.

Trafikanalys är en kunskapsmyndighet för transportpolitiken. Vi analyserar och utvärderar föreslagna och genomförda åtgärder inom transportpolitiken. Vi ansvarar även för officiell statistik inom områdena transporter och kommunikationer. Trafikanalys bildades den 1 april 2010 och har huvudkontor i Stockholm samt kontor i Östersund.