

Summary:

Everyday travel and use of information and telecommunication technology at home: an analysis of Norwegian data

Will use of information-and communication technology reduce travel activities?

When everyone has an Internet connection the need for travelling in everyday life will be reduced. We can work at home, groceries can be ordered on the net, we can get all the information we need, be entertained in different ways and there is no need to visit banks or travel bureaus. As a result there will be no problems with rush hour traffic, and the environmental problems related to the increasing car traffic will be significantly reduced. Or – will the reality be that the information- and communication technology are additional to other ways of communication, and for that reason only to a minor degree will replace everyday travel?

In this report we will give a review of research related to telecommuting and travel and present results from a national survey about use of information- and telecommunication technology at home. This survey is carried out in connection to the national personal travel survey from 1997/98. Together these surveys give an indication on the potential of the substitution of travelling by stationary communication.

A brief review of earlier research

Within the field of transport, the discussion of substitution of travel by electronic communication has been going on for more than twenty years. The energy crises at the beginning of the 1970s was the start of it all (Mokhtarian 1990). One of the first studies on telecommuting takes this as its point of departure (Nilles et al. 1976). In the debate on how to reduce environmental problems generated by road traffic, great hope has been placed on stationary means of communication bringing about reduced daily travel (Batten 1989, Capello et al. 1993, Engström et al. 1996).

Research on the substitution of travel has been concentrated on telecommuting and often in pilot and demonstration projects (Nilles 1991, Hamer et al. 1991, Henderson et al. 1996, Balepur et al. 1998). The results are not unambiguous. Although some projects have not resulted in reduced travel in total, car-use was reduced to a certain degree (Nilles 1991). In others, an increase in car-use was found due to more travel outside rush-time hours, but a reduction in the total length of car travel (Balepur et al. 1998). An experiment with 30 employees at the

Ministry of Transport in The Netherlands resulted in a reduction in daily trips for telecommuters (Hamer et al. 1991). In a review of eight telecommuting programs, Mokhtarian et al. (1995) claim that the effect of telecommuting has to be analysed in relation to the total amount of daily travel, i.e. not just the journey to work. For instance, when travelling to work is eliminated, efficient travel chains can be broken and new patterns established. This might also change the travel patterns in the family or the household. What these researchers also found important was that the first telecommuters were different from employees in general. The first telecommuters had further to travel to work than employees on average, and for them the effect of telecommuting was greater than for people with shorter distances to work. This of course depends on the actual distance to travel of different occupational status groups in specific countries. In Norway, the average variation in length of travel between people in relation to lower and higher education and to occupational status is small (unpublished results from the national personal travel survey 1997/98).

Mokhtarian's (1998) conclusion based on the state-of-the-art of the relation between telecommuting and travel activity is that one cannot expect any significant reduction in travel activity by substituting telecommuting for work trips. She believes that information and communication technology will result in more flexibility in relation to everyday travel. A reduction in time travelling to work may for instance lead to more leisure travelling or shopping trips. Reduced car-use for one member of the family can lead to increased use for another.

In the long run, telecommuting and use of information and communication technology for organising everyday activities can have an impact on land-use. For example, a reduction in the number of trips to work per week can make acceptance of a long journey to work more palatable, and people may buy houses in more distant (and attractive) areas where prices are lower than in more central areas in towns and cities.

The ownership of home computers

The results from our surveys show that there are significant differences between those who own home computers and those who do not in relation to gender, age, place of abode, education, income, employment and socio-economic status. More men than women own a computer, and the majority of all computer owners are between 25 and 55 years of age. People in older age groups are seldom owners. Education is an important variable that distinguishes computer-owners from non-owners. The proportion of people with higher education is greater among owners than among non-owners. The analysis also shows that among owners there is a greater proportion of people with high socio-economic status than among non-owners, and more cars and better access to cars in the households with computers than without.

Private use of the home computer

Men use the computer for private purposes more than women do, and young people more than the elderly. For tasks carried out without an Internet connection there is also a significant difference between educational groups and after employment.

Those with low education and not gainfully employed use the home computer more for writing documents, correspondence, playing games etc than those with high education and within the work force. Education and employment are strongly related to age, and this is the main explanation behind the frequent use among these groups. Young men are the most frequent users of the computer for these purposes, and playing games is the most decisive activity.

Use of the home computer for private purposes, either with or without an Internet connection, bears little relation to mobility. Some of these activities can be considered analogous to trips related to various leisure activities and shopping. A correlation analysis, however, shows no significant negative relations between this type of use of the home computer and travelling, as we would have expected if stationary communication was substituted for travelling.

The correlation analysis shows that there is no relation between car-use, measured as trips as a driver and distance in kilometres per day, and use of the computer for private purposes (without an Internet connection). The correlation analysis between use of the computer for private tasks, the number of trips related to leisure and number of trips in total per day is not significant either. However, there is a positive relation between use of the computer for these purposes and number of trips related to private visits of friends and relatives for those who have an Internet connection. High frequency on one activity is correlated with high activity on the other. Use of stationary technology for private purposes is either additional to travelling or it is not related at all.

Use of the home computer for paid work

The most significant differences in application of the home computer for work purposes are found between men and women and between those with long weekly working hours and those with part-time work or those with “normal” working hours. Men’s use is about twice that of women’s use, and people who work 40 hours or more per week also use it twice as much as people with shorter working hours. Men are in the majority when it comes to working long hours, so those characteristics reinforce each other. It seems that work at home for these men comes in addition to their regular work at the workplace.

A correlation analysis shows, that there is no substitution of mobile communication, travelling, by use of stationary communication devices. People who use the computer at home in relation to their paid work have more car trips and total trips than people who do not use the computer for such tasks. Rather than being a substitute for mobile communication, stationary communication seems to be additional when the computer is used for tasks related to paid work.

The travel patterns for groups with different access to a home computer and possibility to work at home

We have compared daily travel patterns of employed groups with an annual income of NOK 200.000 or higher (to get the groups more homogeneous) with different access to home computers and possibilities for working at home. The results indicate that variations in travel patterns are fairly small. There is no significant difference in the total number of kilometres driven by car per day, even if there is a tendency for people who work mostly at home to travel a little shorter by car as a

driver. The same group has fewer work trips, but the total number of trips per day is the same as for the other groups with a home computer who do not work permanently at home, and even more than those without a home computer. This supports the hypothesis that a reduction in one type of journey or trip will be replaced by other kinds; for instance, work trips can be replaced by trips related to leisure or shopping. In this case we see that those who work at home have more chauffeuring trips than those without home computers, which could indicate that working at home might be an adjustment to a family situation with children.

Discussion

Considering the limitations related to the data sets, the results of our analyses show only to a very little extent any relation between ownership and use of a home computer and people's travel patterns. On the basis of these results we cannot see any substitutionary effects of the use of stationary technology at people's home on the use of mobile technology. Access to and use of information technology seems not to have a significant impact on travel activities in everyday life. Stationary communication seems to be a supplement to activities based on mobile technology.

For people who work more than "normal" weekly working hours, stationary technology seems to give them greater flexibility in regard to where to work, but it does not necessarily reduce their travel activity. The spatial flexibility will also give a temporal flexibility, which means that work trips and other trips can be more dispersed over the day than is the situation today. The positive consequence can be a reduction in the rush-hour traffic; the negative is that it is more difficult to offer a good public transport service when travel needs are more spread in time.

What these analyses also reveal is a strong relationship between the ownership of cars and the ownership of computers, and, as such, to a very high degree the same social groups who use the car and the computer. Men and high-income groups are more frequent users of the car than women and people with lower income. Men, high-income groups and people with high education more often own a home computer and have the possibility to work at home than people with low income and education.

If the possibility to flexibility regarding where and when to work continues to be a good for the privileged (high education/high income) in the future, it will be of great interest to know more about their preferences for living and also their daily activities in order to foresee the consequences for their travel patterns.