SIKA Statistics
Communication patterns

2006:32

KOM
The national communications survey

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Swedish Institute for Transport and Communications Analysis

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Preface

The national communications survey (KOM) has been carried out on behalf of a group of clients consisting of the Swedish Road Administration, the Swedish National Rail Administration, the Swedish Civil Aviation Administration, the Swedish Maritime Administration, the National Public Transport Agency, the Swedish Institute for Transport and Communications Analysis (SIKA) and the Swedish Governmental Agency for Innovation Systems. SIKA has been the formal client and co-ordinator of the assignment.

Data was collected by RadioUndersökningar AB (RUAB) which was awarded this assignment after competitive tendering. Other components such as project management, database design and reporting have been performed within SIKA.

The report covers the period 18 November 2003 to 17 November 2004. It contains an overview of the main findings and a technical description of the survey. Other results are to be found in KOM's database.

The main author of the KOM report is Linnea Abramowski, SIKA.

KOM constitutes the first round of SIKA's current system for collection of data on travel and communication habits. Round two consists of a travel survey, where collection of data was completed in October 2006. The project manager of KOM and RES is Jan-Erik Tomth.

Stockholm, December 2006

Kjell Dahlström

Director-General

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Appendices in English

1. Summary

SIKA commissioned a national communications survey from autumn 2003 to autumn 2004. Approximately, 6,700 individuals (61 per cent of the sample) answered the questions by phone. The survey collected data on contacts and journeys. Questions were also included about data- and telecommunications equipment and the Internet and how individuals used these as well as questions about long-distance travel.

Many of the questions related to a particular day decided in advance, the measurement day. This measurement day was unique for every person in the sample and evenly distributed over all of the days in the year. The sample respondents were contacted before the measurement day to be informed about the survey and asked to make a note of how they used the Internet, the contacts they took and the journeys they made during the measurement day.

The survey produced the following results:

- 84 per cent of the population had experience of computers, 77 per cent had used the Internet and 71 per cent had sent e-mail.
- 55 per cent of the population used the Internet on an average day and then spent almost 40 minutes on the Internet on average.
- The proportion of the population who had sent a text message at some time was 68 per cent.
- 85 per cent of the households had a mobile telephone, 72 per cent had a computer, 28 per cent had a telephone answering machine, 26 per cent had digital TV and 14 per cent a fax.
- 71 per cent of the population had access to the Internet at home, 72 per cent of those in employment had access to the Internet at their workplace and 84 per cent of those in education had access to Internet at school. Just over a fifth of the population did not have access to the Internet.
- On an ordinary day, a person took on average five contacts by telephone, e-mail, letter, fax or other means of communication. Altogether, approximately 35.8 million contacts were made by these means of communication. Approximately half of these took place on business, about the same proportion took place privately, a very small percentage were made as part of studies.
- The most common means of communication were ordinary telephone, mobile telephone and e-mail.
- With the starting and finishing point at home, workplace/school or temporary place of overnight stay, the Swedish population made 13.4 journeys during a day. These journeys lasted for 42 minutes on average.
- Altogether, the Swedish population travelled 328 million kilometres during a day.
- Cars were used as the main means of transport in approximately 70 per cent of the journeys.

- An average journey to work was 15 kilometres long.
- Eleven per cent of the employed population carried out distance work and 16 per cent worked while travelling.
- During an average month, seven per cent of the population took part in a telephone conference and only two per cent in a video conference.
- During a day, 234,000 journeys were made that exceeded 100 kilometres. Of these long-distance journeys 8 per cent were to destinations outside Sweden and 60 per cent of the population had been abroad at least once during the past year.

2. Background and aim

Data on travel and communication habits is an important basis when formulating national and regional transport policy, for development of the infrastructure and transport services provided, for traffic safety work and for research and development on travel and communications.

Travel surveys have been carried out on a number of occasions since the 1970s. SIKA has been responsible for these surveys since 1994, initially as Riks-RVU 1994 – 1998, and subsequently as RES 1999 – 2001.

With the development of various media for communication and the importance of this development for travel, the need arose for surveys, which could provide a basis for analyses of the correlation between travel and other communication. This is in brief the background to why SIKA started work on developing a communications survey (KOM) based on what was then the National Travel Survey, Riks-RVU. This survey was expanded with questions about access to computer and telecommunications equipment and about contacts during a day of survey. A communications survey was performed for the first time in autumn 1996 and has since then taken place every autumn, with annual adjustments to and improvements of methods and the questionnaire. Until and including 2002, the surveys were development projects with relatively small samples.

A common system for implementation of regular communications and travel surveys was produced when RES was concluded in 2001. The design of the system's surveys is largely based on development work that has taken place within the framework of the communications surveys and on experiences from implementation of these surveys and the travel surveys. The communications survey presented in this report is the first in this system.

This survey is to contribute a basis for answering many questions. For instance, is increased access to new communications technology leading to more people doing distance work? Is distance work changing travel patterns and, if so, how? Is e-commerce replacing traditional shopping trips? Is business travel being replaced by telephone and video conferences? The survey includes information from many areas in order to be able to answer these and other questions in this area. These concern how contact is made, daily travel and long-distance travel, how people schedule their working hours, telephone and video conferences and access to and experience of computer and telecommunications equipment. This is supplemented by information about individuals and households.

The survey findings will be further used to shed light on differences between regions or different groups of individuals' access to and use of telecommunications equipment. The material is to serve as a basis for describing changes and for forecasts of how access and use are developing.

3. Content and definitions

KOM surveys activities – movements, contacts, Internet activities, computer use and text messages – during a set day of survey for each respondent. The reference period for the day of survey extends from 4.00 am until 3.59 am the following day. To be included in the survey, the activity must start but not necessarily be completed during this reference period.

For certain activities, the day of survey collection is complemented with a survey for a longer period of time. This is the case for journeys of at least 100 km one-way (which are referred to as long-distance journeys), and for telephone and video conferences. The reference period for these sections of the interview is the 30-day period ending the day before the day of survey. In the same way as for the day of survey, data is being collected on activities that start during the reference period while they can be concluded after the end of the reference period.

*

Some of the basic definitions and a brief summary of the content of the survey are shown below.

The individual and the household

The survey includes questions about whether the individual respondent has a driving licence and about any disabilities which may restrict ability to travel or are associated with the ability to communicate in another way. Information about household members and household and individual incomes are also included in the survey. There are also some questions about access to a car, parking and discount cards for public transport. In addition to this, questions are included about access to holiday homes, recreational craft, caravans and camper vans, since this can affect travel. Although KOM is carried out as a telephone survey, some background variables are obtained from registers, such as sex, age, civil status, occupation, education, industry and country of birth. Similarly, the respondent's address is obtained from the population register, although this is checked with the respondent during the interview.

Internet

Questions are asked in the survey about experience of Internet from fixed and mobile equipment respectively. Information is also obtained about the respondent's experience of a number of common services on the Internet. The emphasis is on questions relating to searching for information or buying goods on the Internet. Moreover, the respondent's use of the Internet during the day of survey is also investigated, the services used and how long the person has been actively connected to the Internet.

Access to computer and telecommunications equipment

The respondent is asked to state the computer and telecommunications equipment which he or she has access to, such as landline and mobile telephone, stationary/laptop computers and connection to the Internet. There are also more specific questions for mobile telephone and the Internet on the type of telephone and connection that the person has.

Access to computer and communications equipment concerns the ability of the respondent to use the equipment, partly or fully, regardless of who pays for and owns the equipment or whether it is used on business or privately.

Access to equipment at work refers to access at work in general, i.e. it does not have to be linked to the workplace. If the respondent has a number of different jobs, access refers to any of these jobs.

Contacts on day of survey

In this survey we only count contacts initiated by the individual by making telephone or mobile telephone calls, sending e-mails, letters/postcards or fax messages, and taking part in telephone or video conferences. Direct face-to-face personal contacts are not included.

The survey does not either include contacts initiated with people who are at the same address as the respondent at the time of contact, e.g. telephone calls or internal mail to colleagues in the same building.

The survey only collects the contacts that the individual initiates. In the case of telephone and video conferences, however, participation is counted as contact regardless of who took the initiative.

In principle, the respondent shall report in detail on all contacts initiated on the day of survey. Information is collected for every contact about:

- the mode of contact used
- the place from which contact was taken
- the purpose of the contact
- whether the contact was private, on business/work matters or in the course of studies
- the time at which contact was made (except for letters/postcards)
- how long the contact lasted (except for letters/postcards, fax and e-mail messages)
- the location of the recipient/s.

Contacts are to be collected in as much detail as possible as above. However, if the respondent cannot report or remember all of the details about the contacts, information is instead collected in a more summary form (aggregated collection). Only information about the number, means of communication and whether the contact is initiated for work, studies or privately are then noted.

Movements on the day of survey

The survey shall collect all movements, regardless of length, that respondents make outside their own home/garden and workplace during the day of survey. Movements outside the traffic environment, such as walks in the forest and mountain walks, are also to be included.

Three journey concepts are used for movements on day of survey. They are hierarchically arranged: journey, trip and stage.

The definition of ***journey*** in the day of survey part is based on the concept of journey point.

These points consist of the following types of location:

- the place (home) where the respondent is registered in the population register, or another permanent dwelling (also a regiment for conscripts)
- the respondent's holiday home, including rented holiday homes
- the respondent's workplace
- the respondent's school or place of practical placement
- a place of temporary overnight stay.

A journey starts and ends at a main journey point.

The journey consists of one or more ***trips***. A new trip starts when some purpose is to be undertaken. If the place where the purpose is performed is not a main journey point, the point is a trip journey point. Simply changing mode of travel is not counted as a purpose. The trip in turn consists of ***stages*** when changing mode of transport.

All movements where the journey starts during the period 4 am to 3.59 am the following day (the reference period for day of survey journeys) are counted. The journey shall accordingly begin during the reference period but can be completed afterwards.

The following information is stated for every journey:

- the main purpose (according to the respondent)
- whether the purpose was performed privately, on business or in the course of studies
- the principal mode of transport, i.e. the mode of transport used for the major part of the journey. If the stated (main) mode of transport is a car driven by the respondent, a further question asks how many people were in the car.

The following information is included for trips:

- the purpose
- whether the purpose was performed privately, on business or in the course of studies
- start and finishing points including addresses
- start and finishing times
- group travelling together and their number
- number of children under the age of 6 travelling
- border crossing point for travel abroad.

For each stage:

- mode of transport
- journey length in km
- in the case of car travel, number of people beside the respondent in the car
- any contacts with mobile equipment during the journey.

Movements and contacts have in principle the same breakdown by purpose. Purposes which cannot occur during movements are, of course, not included. Likewise, travel purposes exist which are not included among the contact part's purposes.

Professional road transport is included in the day of survey journeys. Professional transport means that the main work task is driving. Fewer details are collected for professional transport than for other movements. Crew journeys, i.e. journeys made as crew such as air hostesses, conductors and store staff on ferries, are included and collected in the same way as for professional transport.

Flexible work – distance work and work while travelling

Distance work means work performed some time at another place than the ordinary place of work, for instance, working at home or another place certain days in the week. There may be an agreement – written or oral – with, for instance, the individual's immediate boss on distance work, although such agreements are not necessary for this to be regarded as distance work in KOM. The survey includes information about the extent of any distance work and the place at which it is then performed.

The survey also includes a section which is to survey work performed by the respondent while travelling. The journeys investigated are journeys to and from work and journeys on business. The extent and the equipment used for work are surveyed.

Telephone and video conferences in the past month

The number of telephone and video conferences is collected for the 30-day period prior to the day of survey, since these conferences are not so common that they can be captured in the day of survey contacts in a representative way.

A telephone conference is a telephone call with at least three participants. This may, for instance, be:

- a telephone call where a loudspeaker telephone is used (at least three participants)
- a group call
- a multi-party call.

A video conference/video meeting has two or three participants and there is to be a video camera at at least one place which other participants can see pictures from. All participants shall be able to communicate with one another during the conference.

The equipment which can be used is everything from a computer connected to the Internet with a web camera to special video conference equipment.

Long-distance journeys in the past month

A long-distance journey is defined in the survey as a journey of at least 100 km (one-way), which starts and finishes at one of the following main travel points:

- the address at which the respondent is registered in the population register or another permanent dwelling (also the regiment for conscripts)
- the respondent's (main) holiday home, including holiday homes which the respondent has rented for at least two weeks.

Only (at most) one trip point is collected in the survey. This point shall have had a determining influence over the journey. If the journey has had several important purposes and the respondent absolutely cannot specify which purpose was the main purpose, the purpose performed furthest from the starting point is to be specified.

To obtain a sufficient number of long-distance journeys of at least a one-way journey of one hundred kilometres, information is asked for about all journeys of at least 100 kilometres which have started during the 30-day period prior to the survey. A journey must have started during the reference period to be included in the survey. However, it can have been completed after the end of the reference period.

In the case of long-distance journeys, information is given for every journey about the place, country, the main purpose and the main mode of travel.

Professional traffic is not included in the long-distance part. However, crew journeys are included (journeys made by crew members when on duty as crew). These journeys are gathered in the same way as all other long-distance journeys.

The same categorisation of mode of transport and type of purpose as in the case of day of survey movements are used for long-distance journeys.

Travel abroad

Journeys abroad – journeys to and from Sweden – are included both in the day of survey journeys and in the long-distance journeys applying the same definition as for journeys within Sweden. The survey also contains the number of journeys abroad made during the past twelve months. Journeys made wholly outside Sweden are not included in the survey. This means that at least one point in the journey must be in Sweden and that trips wholly outside Sweden are not included.

4. Arrangement and implementation of the survey

KOM was carried out as a telephone interview survey with telephone introduction and diary support. The survey consisted of just over 11,000 randomly selected individuals aged between 15 and 84. The selected individuals were allocated day of surveys in advance, which could not be altered. The questions relating to the day of survey concerned specifically the day decided for the particular individual. The survey lasted for a year from autumn 2003 to autumn 2004. The data collection of the survey was procured by competitive tender and carried out by RadioUndersökningar AB (RUAB).

Personal introduction by telephone

The first contact with the respondents took place by a personal introduction by telephone around one to two weeks before the day of survey. The respondents were informed that they had been selected and how the survey was to take place. Furthermore, a few basic questions were asked and an agreement was reached on the best time to call for an interview and the telephone number/s where the respondent could be contacted.

Despatch of material

After the personal introduction, material, including instructions and information about the survey, was sent by post to the respondent. The material also included a diary, the intention being that the respondent was to note his or her contacts and movements during the day of survey. The diary contained information about what was meant by movements and initiating contacts and instructions on how the diary was to be completed. It also stated which day was the respondent's day of survey. As well as the diary, a sheet was included in some cases to note contacts and/or a sheet for Internet activities, depending on the answers to a couple of questions asked in the personal introduction, and on the age of the respondent.

Telephone interview

Attempts were made to reach the respondent for up to seven consecutive days, the first attempt being the day after the day of survey. The calling period was limited to one week so that the day of survey would not be too long ago. Calling took place on all days of the week. In the holiday period during the summer, there was an additional call period more than a week after the day of survey in some cases.

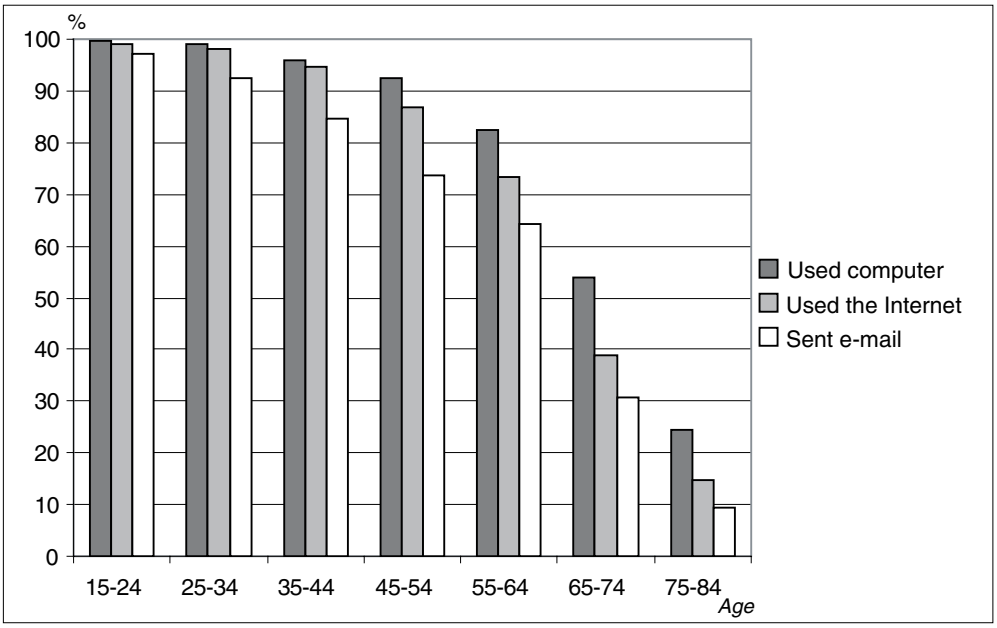
5. Communication habits 2003 – 2004

The results presented in the report have been produced with the aid of KOM's analysis database and apply to the Swedish population aged between 15 and 84.

Experience of Internet (in general and on the day of survey)

The great majority of the Swedish population had used a computer on some occasion (84 %). Many also had experience of Internet (77 %) and e-mail (71 %). There was a small difference between men and women in favour of men, although the difference was considerably greater between different age groups. Practically all younger persons had used a computer, used the Internet and sent e-mail, while this was less common among older people, in particular old age pensioners.

Figure 1. Proportion of persons with experience of computers, Internet and e-mail.



At the time of the survey, it was standard in Sweden to use a stationary computer when sending e-mail and being on the Internet. Almost everyone who had sent e-mail or been on the Internet had used stationary equipment. Only a small percentage of the population had made use of Hotspots, connection through a mobile telephone or used the mobile telephone itself to access the Internet or send mail.

Over half of all those who had experience of the Internet had used the Internet on an average day (55 %).

Table 1. Equipment used to send e-mail. Distribution (%) by sex for resp. equipment. Base: individuals who have sent e-mails.

	Equipment for e-mail			
	Fixed connection	Computer/handheld device connected by mobile phone	Laptop/ handheld device via hotspots	Mobile phone direct
Men	98.7	17.9	14.5	14.3
Women	98.3	8.3	5.5	5.5
All	98.5	13.2	10.1	10.1

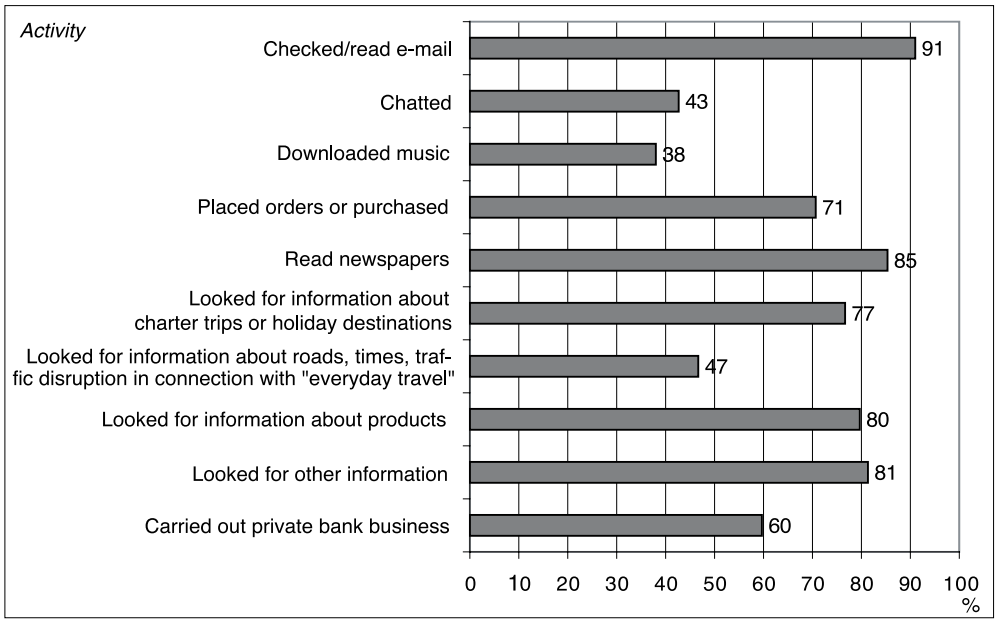
Table 2. Equipment used to access the Internet. Distribution (%) by sex for resp. equipment. Base: persons who have been on the Internet.

	Equipment for e-mail			
	Fixed connection	Computer/handheld device connected by mobile phone	Laptop/ handheld device via hotspots	Mobile phone direct
Men	97.9	15.4	12.7	24.8
Women	97.7	7.0	5.5	9.7
All	97.8	11.3	9.2	17.6

Internet was very often used privately. More than half of the population used the Internet at least one day a week for private purposes. On the other hand, a fifth of the men and a third of the women never used the Internet privately. Among those in paid employment, 41 % used the Internet daily or almost daily, while a third had never used the Internet at work. Among students, 73 % used the Internet at least once a week in their school work. Only 12 % never used the Internet for studies. More men than women used the Internet in every area of use – private, work and studies.

A typical Internet user spent almost 40 minutes daily on the Internet and approximately the same time for private and work-related activities but less time for study purposes. However, there was a marked difference between

Figure 2. Proportion of persons with experience of different Internet activities. Persons with experience of Internet.

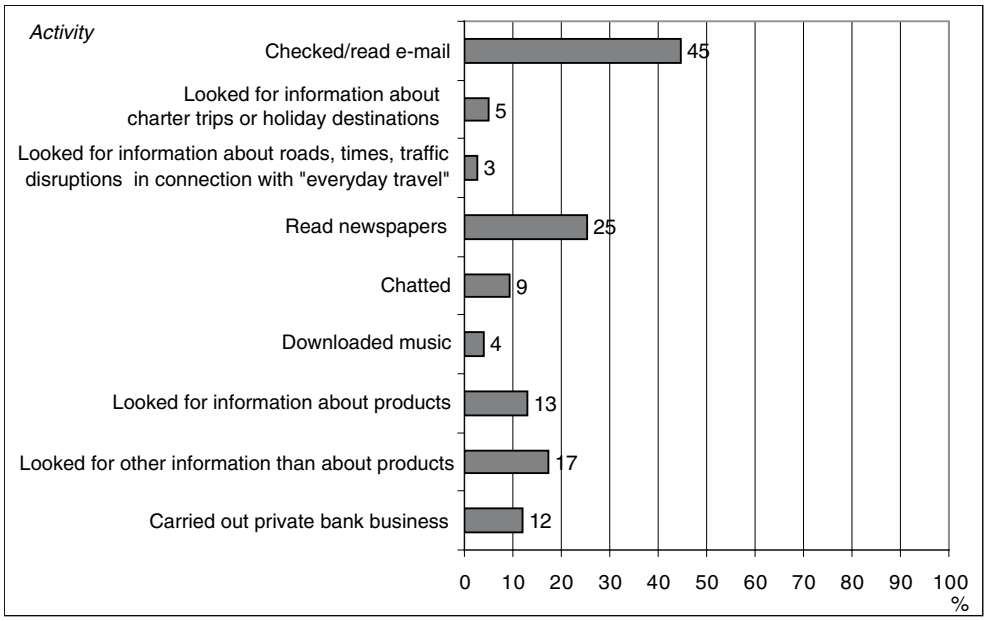


different groups. Men aged between 15 and 24, spent on average 90 minutes on the Internet per day. Women aged over 75 almost never used the Internet. Age was more important than sex.

What did people do on the Internet? Almost everyone had read their e-mail and read newspapers/news on the net on some occasion. It was also very common to look for different kinds of information although less than half of those with Internet experience had looked for information about travel times, travel routes and traffic disturbances. 60 % had carried out private bank business. Downloading music and chatting were very common among 15 – 24 year olds (more than 90 % had chatted and almost 80 % downloaded music). Since these activities were not especially popular among older people, the average for chatting and downloading music was only around 40 % of all those with experience of Internet. See Figure 2.

A similar pattern as for general Internet experience emerges when looking at Internet activities on the day of survey. It was most common there to read e-mail and newspapers and to look for information (although not about charter travel or holiday destinations to any great extent).

Figure 3. Proportion of persons using the Internet for different purposes during the day of survey. Persons with experience of Internet.

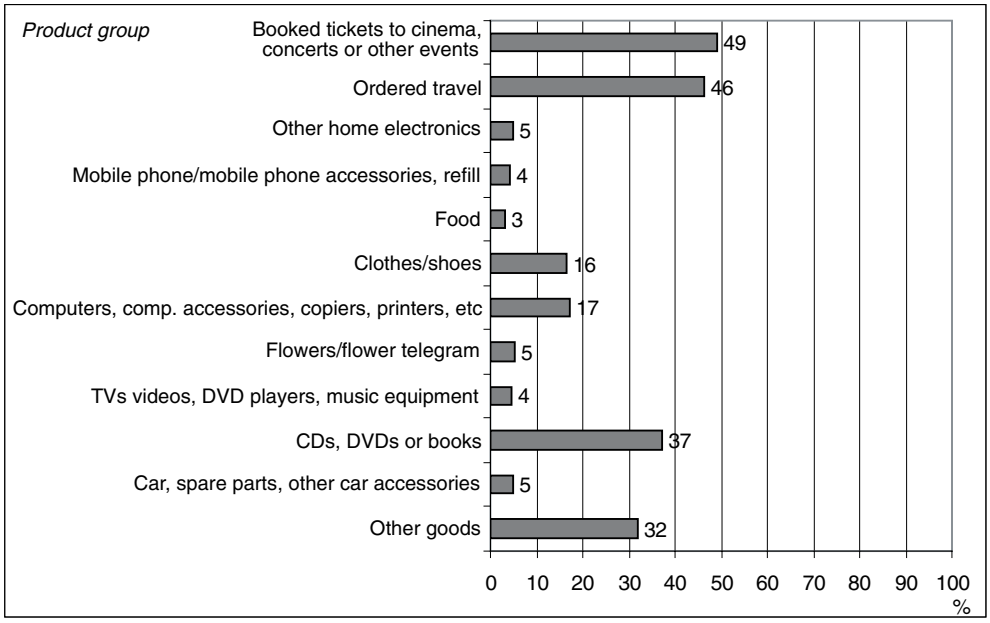


Of those with Internet experience, 71 % had ordered or purchased something on the Internet. As shown in Figure 4, it was very common to use the Internet to order tickets for various events and for travel bookings. It was almost as common to purchase CDs and DVDs and books.

Experience of text messages and MMS

Many had experience of sending text messages from a mobile phone (68 %). Just as in the case of Internet and e-mail usage, younger people were very used to sending text messages and had more experience of sending MMS than older people. More men than women used these functions. The difference between men and women was greater for MMS messages than for text messages. For both text and MMS messages, the difference between men and

Figure 4. Proportion of persons who sent orders or purchased on the Internet. Persons with experience of Internet.



women was greater among older than young people. To obtain information about the traffic situation by text messages was rather uncommon, only about 3 % of the population made use of this possibility.

Women aged between 15 and 24 sent most text messages. They sent on average three text messages a day. Men of these ages also sent a lot of text messages, although not as many. Older persons did not sent at all as many text messages. Text messages were mainly sent for private purposes.

Table 3. Experience of sending text messages by mobile phone.

	Age							
	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All
Has sent text message, %	99	94	86	70	53	25	6	68

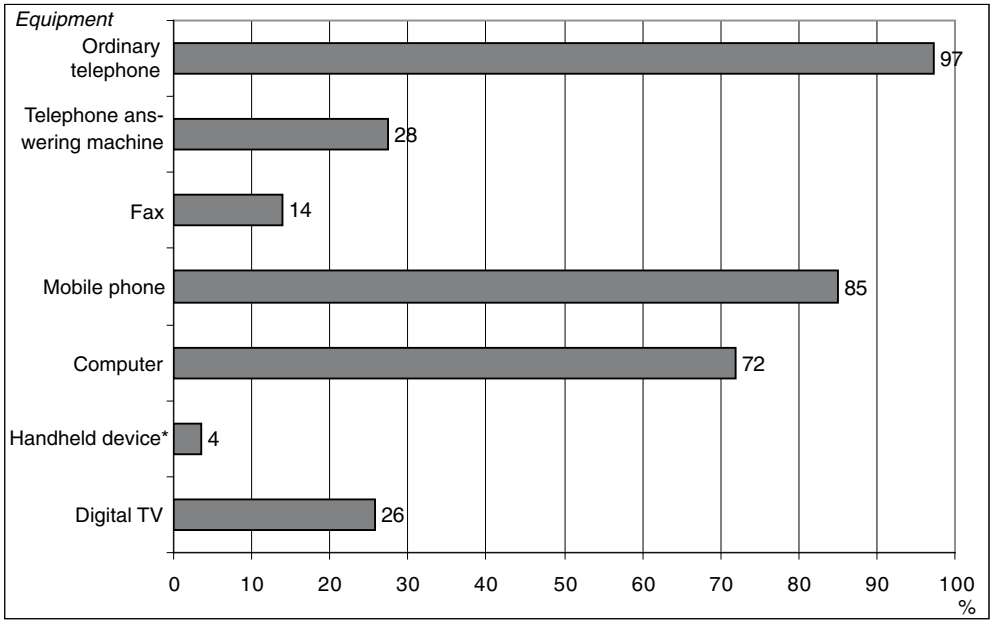
It was not common for text messages to be sent by computer. This applied both to the percentage of individuals who had tested sending messages this way and the number of messages sent. Of those who had used a computer, 33 % have sent text messages in this way. Even if one disregards those who never send text messages, the number of those sending text messages by computer per day is very low. Less than 2 % of the population had sent text messages via computer but never by mobile telephone.

Access to computer or telecommunications equipment

Not wholly unexpectedly – in particular bearing in mind that KOM was carried out as a telephone survey – almost all households surveyed had a landline telephone. A very large proportion of households had a mobile telephone. Of the 6.2 million mobile telephones in Swedish households, almost 2 % were 3G-mobiles and about 16 % GPRS-mobiles. Fax and telephone answering machines were not especially popular.

There were 4.4 million computers in Swedish households, of which 19% were laptops. More than 20 % of households owned more than one com-

Figure 5. Computer and telecommunications equipment in Swedish households.



* Those living alone have incorrectly not been asked.

puter. Many of the computers were connected to the Internet (90 %) – over half of them via modem and 36 % by broadband. Other connections were not especially common. About a third of handheld devices had an Internet connection, often through a mobile.

Of the population, 71 % had access to Internet at home. A somewhat larger proportion had access to a computer at home (76 %). Around 60 % had access to a stationary computer, 12 % to both a stationary computer and a laptop and 5 % only to a laptop. Very few people did not have access to a computer when there was one in the household. In households with a mobile telephone, 7 % of the residents did not have access to a mobile telephone.

Access to computer and telecom equipment appeared to some extent to differ at workplaces than in households. 89 % of the working population had access to an ordinary telephone and 42 % used a mobile telephone. Women had an ordinary telephone at work rather more often than men, while men more often had their mobile telephone paid for by their employer. Men also had their private mobile telephone calls paid for by their employer to a greater extent and lived in households where their employer paid for their landline line rental more often than women.

Access to a fax was considerably more common at the workplace than in the home. Only 6 % had access to a handheld device at work.

Of those who were able to use a computer at their workplace, most had access to stationary computers. It was least common to have access only to a laptop computer. The great majority of computers (94 %) had an Internet connection. Thus 72 % of those in employment had access to Internet at their work.

For students, it was common to have access to a computer, Internet and e-mail at school. Almost 90 % had access to a computer, 86 % to Internet and more than 80 % could send e-mail from school. Connection at school gave 73 % of the students an opportunity to download educational material and communicate with their teachers. Moreover, 64 % could handle e-mails, connected to the school through Internet.

Figure 6. Proportion of employed persons with access to data and telecommunications equipment at workplace, by sex.

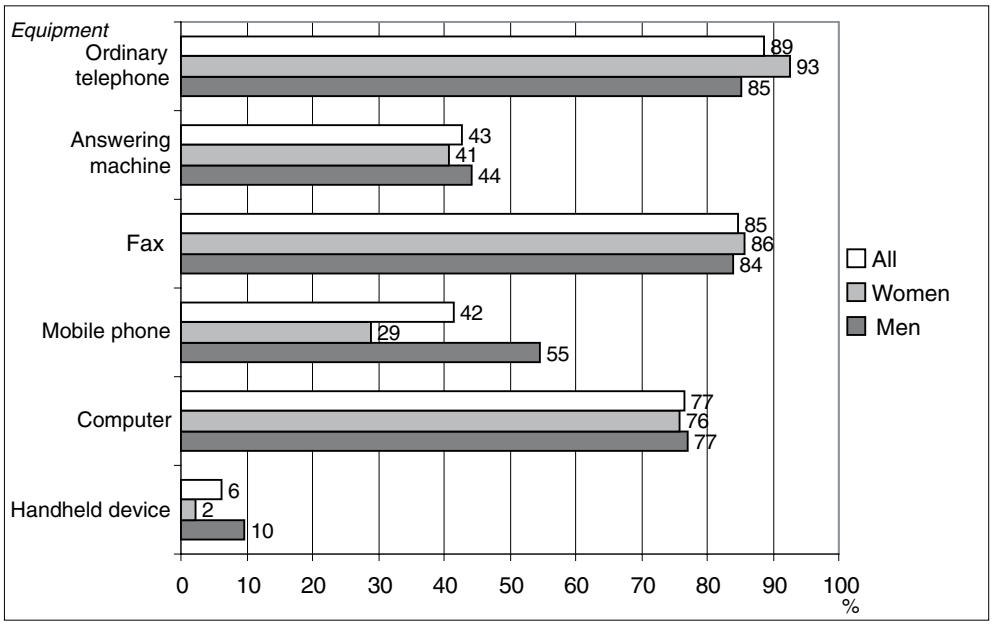
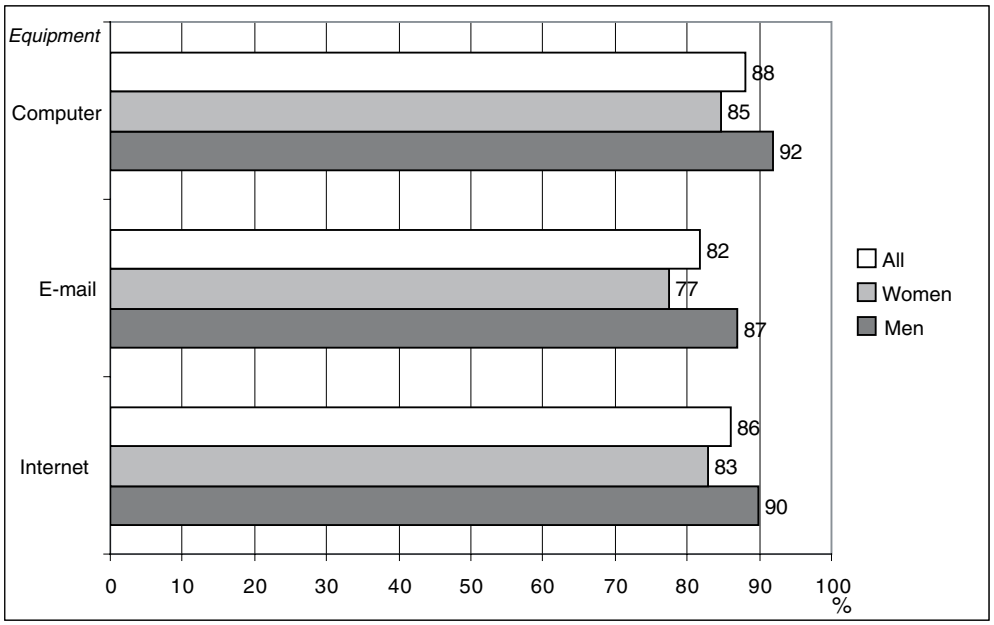


Figure 7. Proportion of students with access to computer and telecommunications equipment at Swedish schools/universities, by sex.



Despite access to computers and the Internet being so great both in households and at workplaces/schools, there were parts of the population that had not been reached by technological development. Just over a fifth of the population did not have access to the Internet and 18 % did not have access to a computer. More women than men and considerably more older than younger people belonged to this group. The difference between different age groups was due to pensioners not having access to a computer and the Internet at home which younger people often had. The reason was thus not that pensioners lacked access to a computer and the Internet at a workplace.

Contacts on day of survey[1]

The intention was to collect day of survey contacts in as much detail as possible. Unfortunately, it is difficult to remember everything and detailed information is therefore available for about half of the contacts, with time, place, purpose, etc. The other half were collected aggregated and for these respondents only information about modes of contact, the number of contacts and whether contacts were initiated privately, at work or in the course of study are reported.

Detailed and aggregated contacts collected are composed differently due to certain types of contacts being easier to remember than others. For instance, the distribution of mode of contact differs between detailed and aggregated contacts. Among the detailed contacts, telephone calls from landlines are in large majority. This mode of contact and also conversations by mobile telephone had more often been collected in detailed than aggregated contacts while the opposite applied for other modes of contact such as e-mails, letters and fax messages.

Table 4. Number of contacts initiated per day by mode of contact, in detail, aggregated and total.

	Detailed		Aggregated		Total	
	Number	%	Number	%	Number	%
Modes of contact						
Ordinary telephone	10 448	60.2	8 040	43.6	18 488	51.6
Mobile phone	4 086	23.5	3 101	16.8	7 187	20.1
E-mail	1 854	10.7	4 547	24.7	6 401	17.9
Letter	529	3.0	1 529	8.3	2 058	5.7
Fax	180	1.0	797	4.3	977	2.7
Other mode of communication	147	0.8	418	2.3	565	1.6
All	17 365	100.0	18 431	100.0	35 796	100.0

In the years 2003 – 2004, a typical inhabitant of Sweden made five contacts a day by telephone, mobile telephone, e-mail, letter/card, fax, telephone or video conference. Men made rather more contacts than women. Individuals with higher education and those with higher income as well as those living in metropolitan areas took considerably more contacts than the less well-educated and those on low incomes and people not living in metropolitan areas. Most contacts were made by men aged between 25 and 34 who had on average eight contacts, while men aged between 35 and 44 were not far behind. Men aged between 75 and 84 took least contacts. The difference between the sexes was largest among parents with small children – a woman with children up to six years of age took on average five contacts a day, a man eight. Age is consistently more important than sex.

Table 5. Average values per day for the number of contacts initiated

	Age							
	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All
Men	4.0	7.9	7.1	6.1	4.8	1.8	1.3	5.3
Women	3.8	6.7	6.7	6.2	4.1	2.0	2.2	4.8
All	3.9	7.3	6.9	6.1	4.4	1.9	1.8	5.0

[1]In this section, persons who have stated that they initiated more than 200 contacts a day have been excluded from the presentation.

Approximately as many contacts were made privately as for work, a smaller proportion were made for study purposes. Even looking only at the number of contacts initiated by students, the number of contacts for study purposes was least. They are markedly less than the private contacts. For those in employment, the largest proportion of contacts were made at work and the proportion of private contacts was less.

The most common means of contact was by landline telephone, the next common mobile telephone and thereafter e-mail. For private purposes, the landline telephone was very clearly predominant. It was also much more common privately to use a mobile telephone than at work or for studies. There was a greater spread of methods of contact at work, even if the ordinary telephone was the most common way here as well to contact somebody. E-mail was most common for study purposes, not the ordinary telephone.

Table 6. Contacts taken broken down by whether they were made at work, for purpose of study or privately and means of contact (detailed and aggregated information).

	Number of contacts via						
	Ordinary telephone	Mobil phone	E-mail	Letter	Fax	Other means	All
On business/work	8 036	2 859	4 702	1 309	940	242	18 087
Private	10 285	4 256	1 559	744	32	317	17 209
In school work/studies	114	44	127	4	4	4	296
All	18 488	7 187	6 401	2 058	977	565	35 796

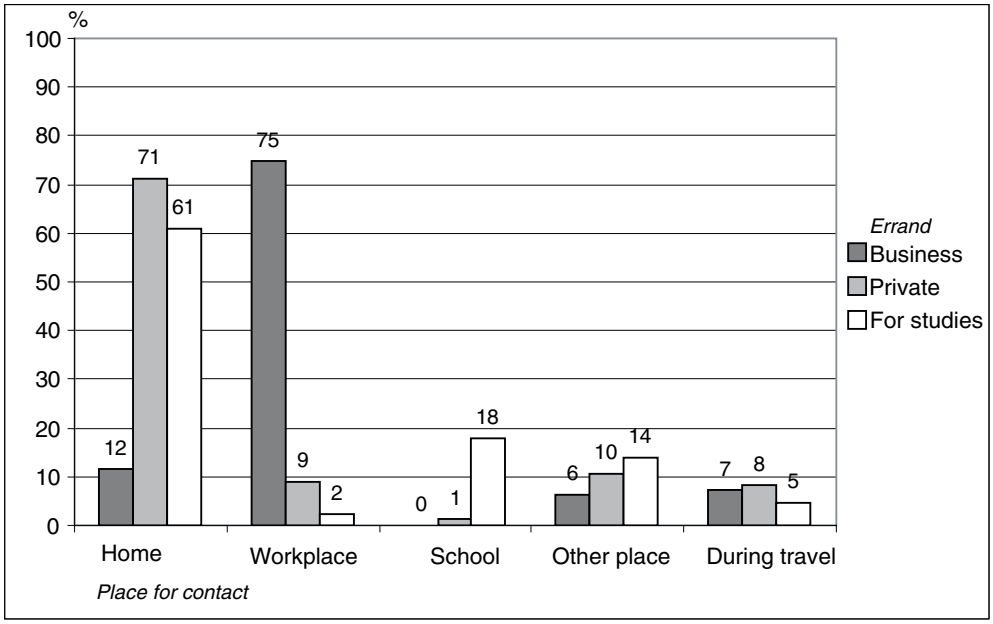
A more careful categorisation of purposes can only be reported for the contacts gathered in detail. For these, contacts on business are greatly underrepresented since a large part of them were collected in the aggregate, without detailed information about the purpose.

The next table shows private contacts in more detail. Evidently, the largest proportion of private contacts was with relatives and friends. The least private contacts were made for purchase of everyday goods. All types of private contacts were mainly made by ordinary telephone. Fax was not commonly used privately and, in particular, not for contacting relatives and friends. For other purchases and postal and bank business, ordinary letters were used relatively often to make contact.

Table 7. Contacts made by purpose and means of contact (detailed information).

	Number of contacts via						
	Ordinary telephone	Mobil phone	E-mail	Letter	Fax	Other means	All
Purpose							
Business	2 064	1 057	124	158	881	19	4 303
Study related	63	32	3	1	70	4	173
Purchase of everyday goods (private)	9	3	0	2	0	0	14
Other purchases (private)	57	5	18	0	8	0	87
Post or bank business (private)	84	5	31	1	7	1	128
Booking of tickets/appointments (private)	229	54	1	2	16	0	302
Relatives and friends	7 144	2 732	259	0	654	116	10 904
Looking for information (private)	374	81	12	4	55	3	530
Other purpose (private)	341	80	64	12	143	3	644
All	10 448	4 086	529	180	1 854	147	17 365

Figure 8. Percentage proportion of contacts for business, private or study purposes, broken down by location from which contact was initiated (detailed information).

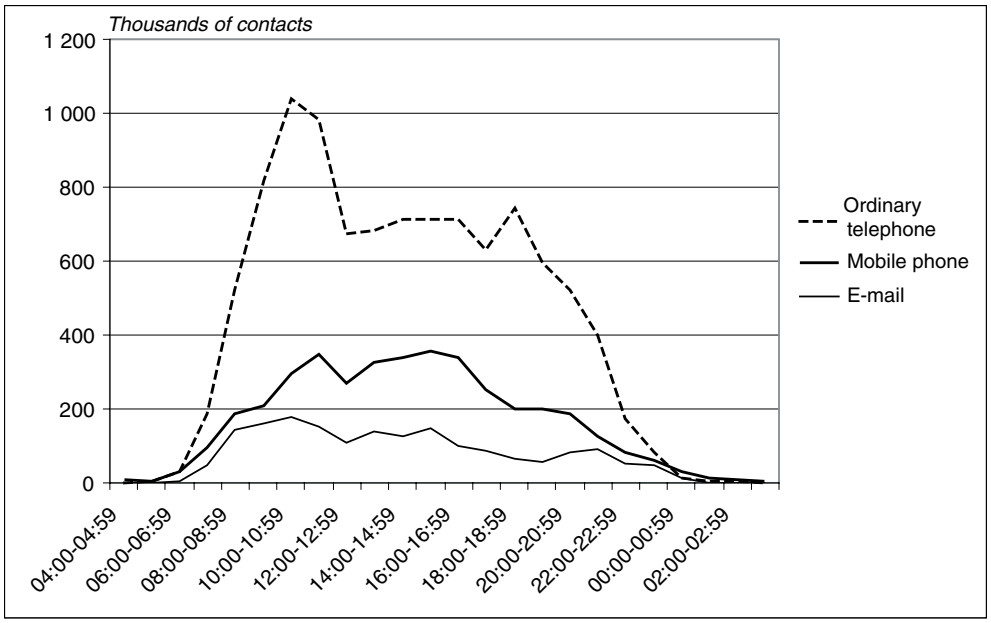


The major part (55 %) of the contacts were initiated from the home (detailed contacts), a quarter were made from the workplace. It was less common to initiate contacts while travelling or from another place.

In contacts initiated by ordinary telephone, mobile phone, fax, letter and e-mail, the recipient was in the same municipality in 48 % of the cases. For contacts initiated by those who were in another municipality, the average distance was around 150 km. Of these contacts, 3 % were to places outside Sweden.

Contacts were made around the clock, although very few contacts were initiated during the night between 1 am and 6 am. Most telephone calls on

Figure 9. Number of contacts in thousands for ordinary telephone, mobile phone and e-mail over a 24-hour period (detailed information).



landlines took place in the mornings up until 12 noon with a peak between 10 am and 11 am. Another peak, although lower, was between 6 pm and 7 pm. The distribution of e-mails was similar to ordinary telephone calls although at a lower level and with the exception that there was no evening peak. However, the pattern for mobile phone calls was different. Most calls took place between 11 am and 12 noon and between 3 pm and 4 pm. Mobile phone calls did not ebb out as much during the night as the other two modes of communication.

As shown in Table 8, calls were made in 56 % of all cases from an ordinary telephone to another ordinary phone. Calls from mobile phones were made more often to another mobile phone, while calls from ordinary phones to mobile phones were relatively infrequent.

Table 8. Calls between different kinds of telephones (detailed and aggregated information).

	Proportion, %	
	To an ordinary telephone	To a mobile phone
From mobile phone	16	18
From ordinary telephone	56	10

The next table shows the usual duration of contacts when the recipient was called on an ordinary telephone or a mobile phone.

Table 9. Average values for length of telephone calls (detailed information).

	Number of minutes		
	On business/ Study purposes	Private	All
Ordinary telephone	7	11	11
Mobile phone	6	5	5
All	7	10	9

The table shows that private calls by mobile phone are kept short while private calls on landlines are on average longer than other kinds of calls. Those who talked on the phone on business (or for study purposes) did not make such a great difference between mobile calls and ordinary telephone calls. Calls on business and studies were on average shorter than private calls.

During the day of survey, 22 % of the population did not make any contact via any mode of communication. Pensioners belonged to this group to a greater extent and more men than women were included. Among men aged from 74 to 84, almost half had not made any contact by telephone, letter, e-mail etc.

Movements on day of survey[1]

On an average day in 2003 – 2004, the Swedish population made a total of 13.4 million journeys. The great majority of these journeys were made by car, almost 60 %, most of them as driver. Quite a large number of movements also took place on foot. See Table 10.

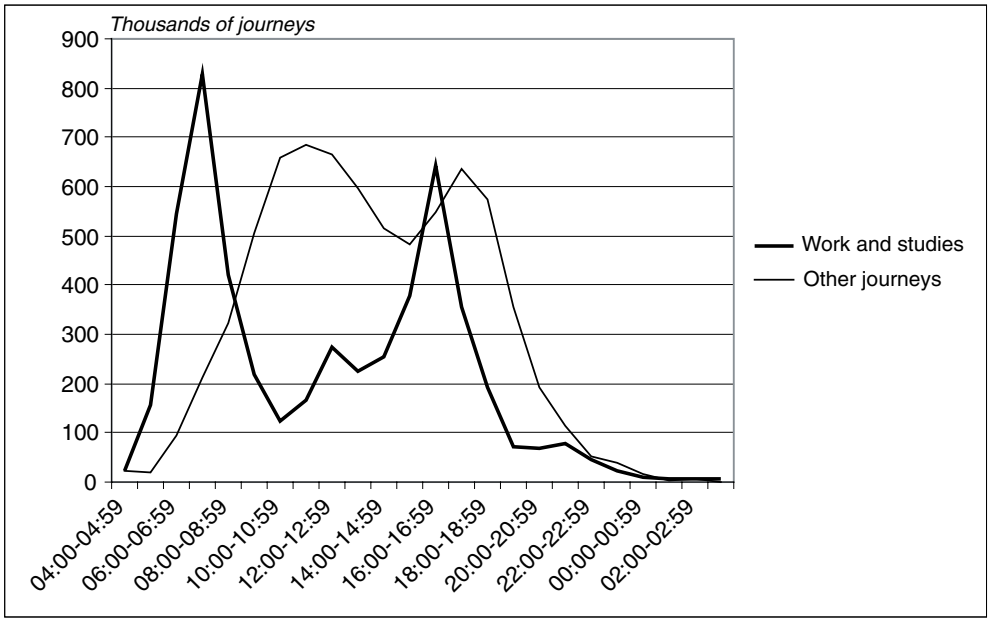
[1]Professional traffic and travel outside the traffic environment are not included in the presentation in this section.

Table 10. Main mode of travel for journeys.

	Proportion, % among		
	Men	Women	All
Main mode of travel			
Walking	17.0	24.5	20.6
Cycle	8.5	8.0	8.2
Moped, MC	0.8	0.1	0.4
Metro, tram	1.8	2.0	1.9
Bus/coach, school travel, mobility service	4.7	7.6	6.1
Ship	0.1	0.1	0.1
Tractor, work tool	0.3	0.0	0.2
Taxi	0.3	0.3	0.3
Lorry	0.7	0.0	0.4
Train	0.9	1.2	1.1
Plane	0.2	0.1	0.1
Car, driver	57.6	36.9	47.5
Car, passenger	6.2	18.4	12.1
Other mode of travel	0.4	0.5	0.4
All	100	100	100

The population travelled at all times of the day (24-hour period), even though less travel was undertaken during the early morning hours. The absolutely largest proportion of journeys started between seven and eight in the morning and were to a very large extent travel to work. Another peak occurred between four and five in the afternoon, when people travelled home from work. All other types of journeys often started later in the day. Most service and shopping trips started at around lunch time. The peak for leisure travel was in the early evening.

Figure 10. Starting time for all journeys made in a day, broken down according to journeys which are work or study-related and other journeys.



An average journey took 42 minutes. As seen in Table 11, work and studies journeys were of shorter duration (31 minutes) than other journeys, in particular compared with travel for leisure purposes. These journeys were on average twice as long (61 minutes). Comparing mode of travel, cycle journeys

Table 11. Average values for effective travel time[1] in minutes by mode of travel and purpose for journeys.

	Mode of transport								
(Minutes)	Walk-ing	Cycle	Metro, tram	Bus/coach, school travel, mobility service, taxi	Train	Car, driver	Car, pass-enger	Other mode of travel	All
Purpose									
Work, studies	19	16	37	47	68	29	41	68	31
Service, shopping	25	25	73	65	113	36	50	44	36
Leisure	45	43	93	102	150	61	75	171	61
Other	32	28	79	81	134	48	58	78	48
All	33	23	54	58	91	39	58	96	42

took the shortest time and walking the next shortest time. All other modes of transport took at least twice as long as travel by cycle. An exemption, however, is car travel as a driver, which is due to car drivers also using a car for shorter distances. This is also the reason why there is such a marked difference in time between car travel as a driver and as a passenger.

See the appendix ”KOM Categorisations” for information about categorisation of modes of travel and what is included in the categories.

On average, a journey was 23 km long, but, of course, the average length varied from one mode of transport to another – a distance walked was considerably shorter (3 km) than a journey by train (64 km). The average length also varies from purpose to purpose. In particular, travel for leisure pursuits took longer time and meant that people travelled longer distances than for other purposes. Almost 80 % of journeys were made in the same municipality[2].

Table 12. Average values for the length of journeys (kilometres) according to the mode of transport and purpose of the journey.

	Mode of transport								
(Kilometres)	Walk-ing	Cycle	Metro, tram	Bus/coach, school travel, mobility service, taxi	Train	Car, driver	Car, pass-enger	Other mode of travel	All
Purpose									
Work, studies	3	3	9	20	40	22	32	85	19
Service, shopping	2	3	13	17	83	21	32	39	17
Leisure	3	7	12	39	80	45	63	137	31
Other	3	6	18	37	197	34	40	75	29
All	3	4	11	23	64	28	44	89	23

More details on the length of journeys between homes and workplaces are shown in the next table. The average distance to the workplace was 15 kilometres. The distance to work was longer for those who lived in a metropolitan area, 18 km compared with 14 km for people outside the metropolitan areas.

It was common to travel by car or cycle to work if one did not live in the metropolitan areas. In the metropolitan areas, people travelled less by car and more by public transport than in other areas.

[1]Effective travel time is the total of the travel times for trips included in the journey.

[2]Started, finished and had destinations within the same municipality.

Table 13. Average values for the length of journeys (kilometres) between home and workplace (work journeys), by area[1] and mode of transport (air travel has been excluded).

	Metropolitan areas	Outside metropolitan areas	All
Walking	4	3	3
Cycle	4	3	3
Metro, tram	9	5	9
Bus/coach, school travel, mobility service, taxi	17	19	18
Train	23	49	31
Car, driver	23	17	19
Car, passenger	19	16	17
Other mode of travel	14	23	19
All	18	14	15

Table 14. Journeys by mode of transport and area (air travel has been excluded).

	Proportion (%)								
	Walk-ing	Cycle	Metro, tram	Bus/coach, school travel, mobility ser-vice, taxi	Train	Car, driver	Car, pass-enger	Other mode of travel	All
Metro-politan areas	9.3	7.9	7.2	12.3	2.9	52.4	6.4	1.6	100.0
Outside metro-politan areas	9.3	14.2	0.1	4.8	0.9	63.5	6.2	1.0	100.0
All	9.3	11.9	2.7	7.6	1.6	59.4	6.2	1.2	100.0

On average, a journey consisted of 1.9 trips and 2.2 stages. This means that some purpose is performed on the way in almost every journey and on average people changed mode of transport rather more often during the journey.

It is difficult to say how many journeys were performed for different purposes. This is partly due to the definition of when a new journey begins with a new purpose. This becomes clear when the distribution of the main purposes of journeys is compared with the purposes of trips, as shown by the following two tables.

Table 15. Journeys by main purposes.

Main purpose of journey	%	Main purpose of journey	%
Home – work	33.2	Other service	0.8
Home – school	5.3	Relatives and friends	6.3
Business journey/work journey	2.3	Restaurant, café	1.8
Study journey/ travel as part of studies	0.3	Exercise and outdoor life	8.2
Shopping for everyday goods	7.5	Entertainment and culture, party,	
Other purchases	4.3	concert, cinema etc	2.0
Health and medical care	1.2	Taking part in organisations,	
Post and bank business	0.8	religious activity	0.8
Booking tickets/appointments	0.0	Hobbies, playing music,	
Childcare (collection/leaving)	0.6	study circle, course	0.5
Take part in or accompany		(Other) holiday trip	0.4
to child's leisure activity	0.2	Other leisure activity	2.5
Give a lift to, accompany or collect			
another person	3.0	Other purpose	18.0

[1]See appendix "KOM Categorisations".

Table 16. Trips according to purpose.

Purpose of trip	%	Purpose of trip	%
Home – work	17.1	Other service	1.9
Home – school	2.7	Relatives and friends	9.1
Business journey/work journey	4.4	Restaurant, café	3.5
Study journey/ travel as part of studies	0.4	Exercise and outdoor life	6.7
Shopping for everyday goods	11.8	Entertainment and culture, party,	
Other purchases	8.3	concert, cinema etc	2.5
Health and medical care	1.7	Taking part in organisations,	
Post and bank business	1.4	religious activity	1.1
Booking tickets/appointments	0.0	Hobbies, playing music,	
Childcare (collection/leaving)	1.7	study circle, course	0.6
Take part in or accompany		(Other) holiday trip	0.3
to child's leisure activity	0.3	Other leisure activity	2.5
Give a lift to, accompany or collect			
another person	6.1	Other purpose	15.6

The definition of the concept of journey means that travel between home and work/school or place of study respectively is always regarded as a main purpose for the journey, even if other purposes are performed during the journey. At the same time, travel from the home to a shop is considered as one journey while travel from home to work and back is considered as two journeys.

With this definition, 40 % of journeys are considered to be work journeys and journeys on business or for the purpose of studies.

A third of the trips were for service and shopping, mainly buying everyday goods. Just over a quarter were leisure occupations such as visiting relatives and friends. Another quarter of the trips were included in the travel that took place for work and studies.

As many trips were made by men as by women. Women undertook rather more service and shopping journeys and men travelled rather more on business, otherwise journeys are evenly distributed between the sexes.

The distance travelled by the same mode of transport (stage) was on average 12 km. However, there were great differences depending on the mode of travel. A stage distance walked was, of course, much shorter than one by train.

Table 17. Total and average length (kilometres) for stages by mode of transport.

	Mode of transport								
(Kilometres)	Walk-ing	Cycle	Metro, tram	Bus/coach, school travel, mobility service, taxi	Train	Car, driver	Car, passenger	Other mode of travel	All
Average	1	3	6	17	60	14	19	60	12
Total per day (million km)	8.5	5.3	3.7	25	17	175	66	28	328

The Swedish population travelled for a total of 328 million kilometres on an average day. More than half of these kilometres took place by car as a driver. Together with journeys by car passengers, this makes 73 % of the total distance of all journeys.

On average, a person made 2.0 journeys, 3.9 trips and travelled by 4.3 stages each day. Men made longer journeys while women changed mode of trans-

Table 18. Average length of travelled distance (kilometre per day) by area.

	Men	Women	All
Metropolitan area/Stockholm	54	45	49
Metropolitan area/Gothenburg	52	38	45
Metropolitan area/Malmö	40	43	41
Non-metropolitan area	57	40	49
All	55	41	48

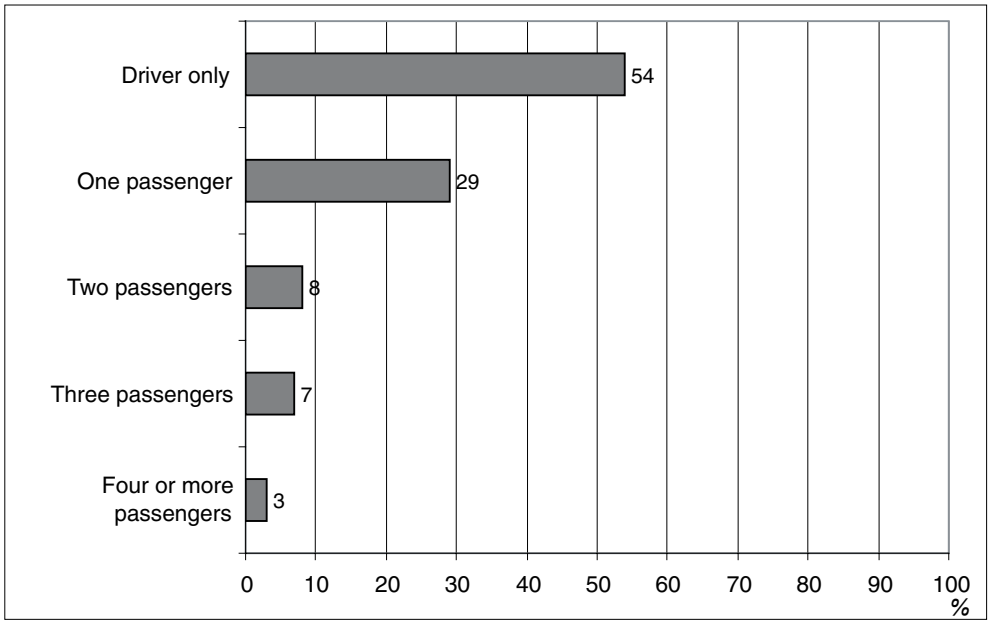
Table 19. Average number of trips per day according to access to car and holding of a driving licence.

	Men	Women	All
No car, no driving licence	3.5	3.1	3.2
No car, driving licence	3.8	3.4	3.6
Car, no driving licence	3.1	3.3	3.2
Car, driving licence	4.0	4.1	4.0
All	3.9	3.8	3.9

port somewhat more often. Persons aged from 35 to 44 made most journeys and changed mode of transport most often. Together with 45 to 54 year olds, they also travelled the longest distances. Education also played a role. Both among men and women, those with post-secondary education shorter than two years travelled the longest distance of all per day. Persons with a shorter education than upper secondary education travelled the shortest distances. The family situation exerted most influence. The absolutely longest journeys per day were made by men who had cohabiting partners and children aged between zero and six. They travelled 70 kilometres per day on average. Women over the age of 75 travelled the shortest distances. Women in metropolitan areas travelled on average a slightly longer distance per day than women who lived outside the metropolitan areas. For men, it was the case that those in the metropolitan areas travelled shorter distances than at other places. However, those living in Stockholm travelled for a longer time than others.

Persons with driving licences travelled almost twice as far every day as those without driving licences. Naturally, access to a car affected how mobile a person was.

Figure 11. Proportion of kilometres travelled with car according to number of passengers.



The driver was alone in the car for the majority of all kilometres travelled by car. This proportion was particularly large for travel to and from work/school and for business and study journeys. Lone drivers account here for 83 % of the total distance travelled. It is considerably more common for people to travel together on other types of journeys, in particular leisure travel, where the share of lone drivers was only 34 %. (Figure 11.)

10 % of the population did not make any journeys at all in an average day. These were mainly pensioners and people working in their own households who stayed at home the whole day. In particular, persons who had difficulties moving travelled less than the average for the population. Around a third of person with access to the mobility service did not travel at all on a normal day. The proportion of persons who needed aids when travelling was about as large.

Contacts were made by mobile telephone only in a few journeys. Respondents called someone only in about 5 % of trips. Most mobile telephone calls took place during work or study-related journeys, while it was less common to make contact during journeys (trips) for shopping and service purposes.

Table 20. Contacts initiated by mobile phone during a trip, by purpose of trip.

(Proportion, %)	Errand for trip				
	Work, Study	Service, Shopping	Leisure	Other purpose	All
Contact initiated	7	4	5	4	5

Initiating contact by mobile phone was most common when travelling by train, by other public transport or driving a car. It was least common, perhaps for practical reasons, to call someone when cycling.

Table 21. Contacts initiated by mobile phone according to mode of transport for stage.

(Proportion, %)	Mode of transport								
	Walk-ing	Cycle	Metro, tram	Bus/coach, school travel, mobility service, taxi	Train	Car, driver	Car, passenger	Other mode of travel	All
Contact initiated	3	1	6	5	8	6	3	10	4

Flexible work

Of those employed, 11% did distance work. In particular, the groups men, persons aged between 35 and 44 and the self-employed tended to do distance work. As a rule, people then worked at home and over half only did distance work for a part of the day. On average, people worked six days a month at another place than their regular workplace.

Only 3 % did not use any computer or telecommunications equipment at all while doing distance work. Computers were used by 86 %. Many also used the Internet and telephone, while fax was not particularly popular for distance work.

Of those employed 16 % worked while travelling. A third each worked on work journeys, during business travel or on both journeys or during business journeys. Typical characteristics for people who worked while travelling were that they were men, full-time employees and aged between 35 and 44. On average, one worked 10 days per month while travelling.

Figure 12. Computer and telecommunications equipment used for persons doing distance work, per cent.

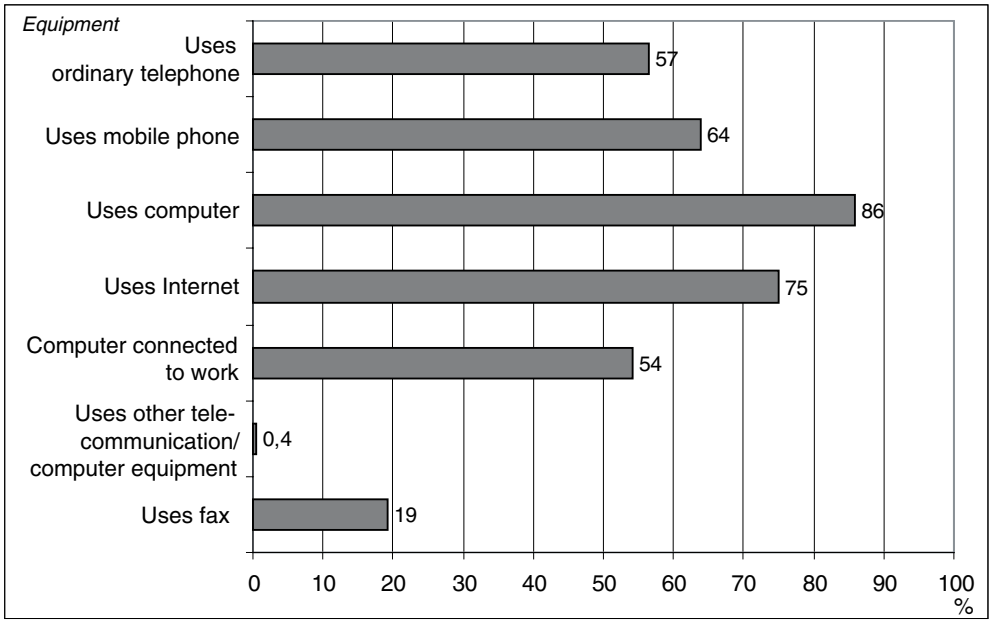
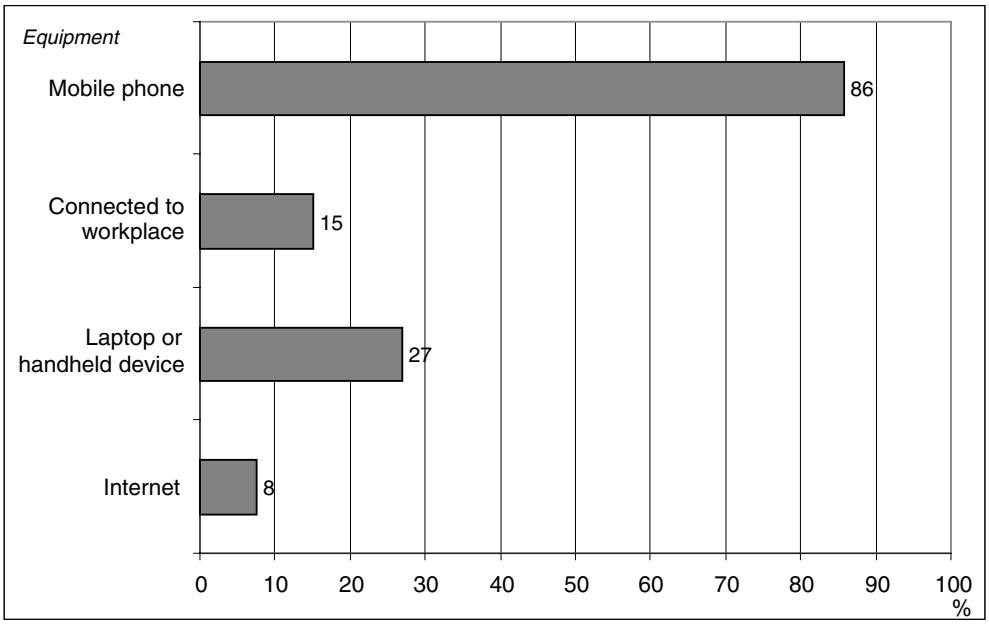


Figure 13. Used computer and telecommunications equipment for persons working while travelling, per cent.



Persons who worked while travelling often used mobile phones and sometimes handheld devices. In some cases, they could connect to the Internet, although connection to the workplace was more common than connection to Internet.

Telephone and video conferences in the past month

Telephone and video conferences were not particularly common. During an average month, 7 % of the population had taken part in a telephone conference and only 2 % in a video conference. (Table 22 and 23).

Table 22. Persons who took part in one or more telephone conferences during a month.

(Proportion, %)	Age							
	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All
Participated in telephone conference	5	9	11	8	7	1	1	7

Table 23. Persons who took part in one or more video conferences during a month.

(Proportion, %)	Age							
	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All
Participated in video conference	4	3	3	1	2	0	0	2

Both telephone conferences and video conferences were uncommon for all ages, and very uncommon among older people, over 65 years of age. Young people were most used to taking part in video meetings. Telephone contacts often took place among people aged between 35 and 44. Significantly more men than women took part in telephone and video conferences.

Of those who took part in telephone and video conferences, only a small proportion did so daily, the great majority took part less frequently. Those who participated in telephone conferences did so on average four times a month. Respondents who took part in video conferences participated on average six times a month.

Telephone conferences were most common at work. The largest proportion of video conferences took place for private purposes, (according to the definition of video conference in KOM no special video conference equipment was needed but a web camera was sufficient).

Long-distance journeys and foreign travel

A somewhat smaller proportion of women (43 %) than men (51 %) travelled at least once a month further than a hundred kilometres from their house or second home. Every day, 234,000 journeys were made which were longer than a hundred kilometres, which was equivalent to 7 million long-distance journeys a month.

Table 24. Long-distance journeys during a year by mode of transport and purpose.

	Mode of transport						
	Bus/ coach	Train	Plane	Car, driver	Car, passenger	Other mode	All
Purpose							
Work, studies	1 110	5 540	2 871	16 099	1 286	1 035	27 988
Service, shopping	211	231	51	3 297	1 614	171	5 575
Leisure	3 839	4 508	3 083	21 180	12 824	1 730	47 224
Other purpose	320	356	167	1 790	868	230	3 742
All	5 480	10 636	6 171	42 398	16 619	3 167	85 611

The car dominated for long-distance journeys, 70 % were made by car. More than half of the journeys took place during leisure hours, of which the greatest

proportion were visits to relatives and friends. Only a third of journeys were made in work (or studies). The longest journeys took place at work by air.

Of all journeys longer than 100 km, 8 % were journeys out of Sweden. Most journeys were to Denmark, Finland, Germany and Norway. Respondents travelled by car to Denmark, Germany and Norway most often, and by ferry to Finland. Holiday trips made up a greater proportion of long-distance travel abroad than the long-distance journeys in Sweden.

Almost 60 % of the population had travelled abroad in the past year. A quarter had travelled abroad once a year and a third twice or more. Men travelled abroad more often than women, 3 % of the men had travelled abroad more than ten times, the proportion among women being half as large.

Cars and public transport

It was much more common to travel by car than by public transport. Half of the population never or seldom travelled by public transport while 60 % usually travelled by car daily or almost every day (as driver and/or passenger). During the day of survey, 65 % travelled by car, 9 % by public transport and 5 % both by public transport and by car (of the persons who undertook journeys).

In 2003 – 2004, the Swedish population owned a total of 4.5 million cars, of which 4.3 million were on the road. This means that there was on average slightly over one car per household. A fifth of households did not have a car. Every fourth household owned more than one car and 4 % more than three cars. Most cars were parked on their own land or in their own garage. At the workplace, 77 % of those in employment were able to park their car on a parking space provided by their employer. 16 % had their own reserved personal space at work.

Table 25. Parking facilities (the question was only asked for car 1 – 3).

Parking facility	*%*
Own land/own garage/carport or similar (i.e. parking which respondent does not pay for)	70.7
Multi-storey car park, other garage (incl. rented parking space or garage space adjacent to house)	17.9
Street, square, public car park or similar	10.3
Other places	1.1

Men had a driving licence to a greater extent than women and access to a car. Of men aged 18 to 84, 85 % had a driving licence and access to a car, which is almost 15 % more than for women of the same age. Almost 5 % of the men did not have a driving licence and lived in households without a car. The corresponding proportion among women was 9 %.

Table 26. Holding driving licence and/or access to car among persons aged 18 or older.

	No car + no driving licence,%	No car + driving licence,%	Car + no driving licence,%	Car + driving licence,%
Men	4.5	6.6	4.0	5.0
Women	9.1	9.2	10.3	71.3
All	6.8	7.9	7.1	78.1

Around 30 % of all those aged between 15 and 84 in Sweden had some kind of discount card or season ticket for public transport. This was most common among younger people where 65 % of those aged between 15 and 18 had

Table 27. Access to discount cards for local/regional public transport.

	Proportion (%) among		
	Men	Women	All
No discount or season ticket	74.6	65.0	69.8
Discount card or season ticket	25.4	34.9	30.2
Total	100.0	100.0	100.0
Of which:			
Refillable card (only)	19.2	25.8	23.1
Discount coupons/strip/punch card	25.4	26.8	26.2
Season ticket/discount card (for instance, monthly or annual tickets)	49.8	42.2	45.3
Other card	5.6	5.2	5.4
Total	100.0	100.0	100.0

purchased a card for local public transport. Those without a driving licence more often had a discount card or season ticket than people with a driving licence (55 % compared with 25 %). Women were overall more likely than men to obtain a discount card or season ticket for public transport.

The most used alternative among all card types was the season ticket (for instance, monthly or annual ticket). Almost half of all those who used cards in public transport made use of a card of this kind. About a quarter each used discount tickets or cards that could be refilled.

Among male students, about half had a student card which gave a discount on train or plane journeys. The proportion was somewhat lower for female students.

6. Technical description

The sample

The target populations for the survey were as follows:

- all persons registered in the Population Register in Sweden aged between 15 and 84
- all journeys made by the above-mentioned persons
- all contacts via media initiated by the persons defined above
- all Internet activities carried out by the persons defined above
- all long-distance journeys, including travel abroad, longer than 100 kilometres one way made by the persons defined above
- all telephone and video conferences which the persons defined above have participated in.

The sample consisted of 11,346 people, 31 individuals for every day during a whole year. Of these 84 persons were over-coverage, i.e. they did not belong to the sample since they no longer lived in Sweden or were deceased. The net sample was thus at most 11,262 persons.

The sample was selected as normal random selection, but was subsequently stratified taking into consideration sex, age and housing region.

Non-response

In all 6,826 interviews were carried out corresponding to 60.6 % of the net sample. The number of telephone introductions was slightly higher, 7,016 persons.

Just over half of the non-response consisted of people who could not be contacted, 21.4 % of the net sample. In addition, 3.8 % were unable to take part. 14.2 % refused. During the introduction, the proportion who could not be contacted was somewhat higher while the proportion who did not participate because they were unable to do so was slightly lower than during the interview part.

The group ”No contact” was large since telephone numbers could not be found to all people. The telephone number of the sample persons were sought after in three steps. In the first place, and primarily, the addresses were matched with the telephone number in the PAR address register. Since this required names and addresses to be written in exactly the same way, the next method was to look for telephone numbers manually. If it was not possible at this stage either to find a telephone number, a letter was sent to the respondent’s address with a request to notify a telephone number where he/she could be contacted. This procedure made it possible to obtain telephone numbers to 88.5 % of the gross sample. See Table 28.

Table 28. Sample by result codes in introduction and interview.

	Introduction		Interview	
Result code	Number	%	Number	%
Participated in interview/introduction	*7 016*	*62.2*	*6 826*	*60.6*
No contact	*2 513*	*22.3*	*2 409*	*21.4*
Moved, address unknown	16	0.1	4	0.0
Temporarily away	120	1.1	102	0.9
Secret telephone number	8	0.1	2	0.0
No information on telephone number	1 305	11.6	1 371	12.2
No contact, other	1 064	9.4	930	8.3
Unable to participate	*329*	*2.9*	*426*	*3.8*
Resident in institution	23	0.2	13	0.1
Physical or mental impediment	152	1.3	257	2.3
Language problems	83	0.7	85	0.8
Prevented, other	41	0.4	37	0.3
Illness (temporary)	30	0.3	34	0.3
Refusal	*1 416*	*12.6*	*1 601*	*14.2*
Lack of time	158	1.4	184	1.6
Secrecy - integrity - register	4	0.0	12	0.1
Never takes part in surveys	201	1.8	202	1.8
Voluntariness	86	0.8	233	2.1
The purpose of the survey	24	0.2	15	0.1
Have taken part previously	10	0.1	4	0.0
Demands payment	11	0.1	9	0.1
Refuse to participate, other	891	7.9	902	8,0
No contact at agreed time	10	0.1	14	0.1
Not OK for parent	21	0.2	26	0.2
Net sample	*11 274*	*100.0*	*11 262*	*100.0*
Living abroad/emigrated	58		66	
Deceased	14		18	
Gross sample	*11 346*		*11 346*	

Approximately as many women as men took part in the interviews. The most willing groups were those aged between 45 and 74, born in Sweden, married persons, those living in the counties of Jämtland or Gotland and persons with post-secondary education. Participation was lowest among persons aged between 75 and 84, persons born outside the EU and the Nordic countries, widows and widowers and persons who lived in the counties of Stockholm or Blekinge. Participation was also lowest for those for whom no information was available on education (with some exceptions, information on education is lacking for the youngest and, above all, among older people). See Table 29.

There are special factors in KOM, compared to other surveys, which give rise to non-response. One factor is the short interview period, only a week, which contributes to the number of ”no contact” being high. The fact that the survey takes place during holiday periods and weekends and that the upper age limit for participation is higher than in many other surveys has the same effect.

If the interview is discontinued during the initial questions, before questions about experience of computers, it is coded as ”non-response”, otherwise as ”interview”. During the interview, 58 people decided to discontinue it before

completion, although after the initial questions, and these interviews were accordingly coded as interviews.

Table 29. Response frequencies according to different background variables.

Background variable	Net sample	Respondents (%)
Sex		
Woman	5 666	61
Man	5 596	60
Age		
15-24	1 553	59
25-34	1 849	59
35-44	2 030	60
45-54	1 875	64
55-64	1 867	65
65-74	1 191	63
75-84	897	50
Country of birth		
Sweden	9 736	64
The Nordic countries	400	54
EU 25 outside the Nordic countries	251	47
Other countries	875	36
Civil status		
Married or registered partnership	4 865	67
Single	4 553	57
Divorced	1 277	54
Widow/widower	566	52
County		
County of Stockholm	2 319	54
County of Uppsala	383	66
County of Södermanland	298	63
County of Östergötland	550	65
County of Jönköping	383	62
County of Kronoberg	212	64
County of Kalmar	271	67
County of Gotland	81	73
County of Blekinge	193	57
County of Skåne	1 461	60
County of Halland	373	64
County of Västra Götaland	1 857	60
County of Värmland	348	63
County of Örebro	333	62
County of Västmanland	288	66
County of Dalarna	357	62
County of Gävleborg	366	63
County of Västernorrland	309	65
County of Jämtland	144	74
County of Västerbotten	346	64
County of Norrbotten	306	64
Level of education		
Postgraduate	75	63
Post-secondary school, two years or longer	2 239	70
Post-secondary shorter than two years	548	66
Upper secondary education	4 680	62
Pre-upper secondary education 9 (10) years	1 549	56
Pre-upper secondary education shorter than 9 years	1 007	53
No information	1 164	46

Partial non-response

Partial non-response means that answers are missing to a particular question for a person who was to have answered the question. The partial non-response (the categories ”Don’t know”, ”Don’t want to answer” and ”No information”) are generally low. The proportion of ”Don’t know” is lower than 1 % for almost every question. Refusal to reply to individual questions is even less common.

Exceptionally, there are some questions which a rather larger group of respondents did not know the answer to. In particular, questions about the type of Internet connection were difficult to answer and the partial non-response is over 10 % for these questions. An approximately as large group of people did not know whether their mobile phones had GPRS. An even larger group could not state the total household income.

Questions about household income and individual income were those with the largest group of respondents refusing to reply. The partial non-response for household income totalled 16.7 % and 6.7 % for individual income.

The partial non-response to questions about journeys and contacts did not exceed 3 % in any case. The partial non-response for day of survey movements was highest on questions about journey length (2.2 % of the stages) and travel time (1.3 % of trips).

Random errors and confidence interval

Random errors arise when a sample survey is carried out instead of a total survey. The random errors are known since the sampling probabilities are known. The sample size states the exactness which it is possible to achieve in the estimates. Many observations and homogenous responses give good exactness, while estimates that are based on few responses and heterogeneous answers provide poor exactness.

Random errors can be expressed as confidence intervals. The confidence interval includes with a specified certainty, the true value. The confidence interval is calculated on the basis of the design of the survey (poststratification, see below in the section ”Upward adjustment”). The calculations are made using the CLAN programme developed by Statistics Sweden, which is also integrated with the menu system belonging to the database.

Confidence intervals are shown below for some selected tables.

Table 30. Average value and confidence interval for the number of contacts initiated per person and day.

Age	Men			Women			All		
15-24	4.0	±	0.7	3.8	±	0.6	3.9	±	0.5
25-34	7.9	±	1.1	6.7	±	1.3	7.3	±	0.9
35-44	7.1	±	0.9	6.7	±	2.1	6.9	±	1.1
45-54	6.1	±	0.7	6.2	±	2.0	6.1	±	1.1
55-64	4.8	±	0.6	4.1	±	0.7	4.4	±	0.5
65-74	1.8	±	0.3	2.0	±	0.3	1.9	±	0.2
75-84	1.3	±	0.2	2.2	±	1.2	1.8	±	0.7
All	5.3	±	0.3	4.8	±	0.6	5.0	±	0.3

Table 31. Average values and confidence intervals for the length (km) of the journey by main purpose and mode of travel.

	Work, study	Service, shopping	Leisure	Other purpose	All
Mode of travel					
Walking	3.2 ± 1.4	1.7 ± 0.2	3.2 ± 0.2	2.6 ± 0.5	2.8 ± 0.3
Cycle	3.1 ± 0.3	3.4 ± 0.8	6.7 ± 1.8	6.1 ± 3.1	4.0 ± 0.5
Metro, Tram	8.8 ± 1.8	13.4 ± 5.6	12.0 ± 3.8	18.4 ± 7.8	11.0 ± 1.9
Bus/coach, school travel, mobility service, taxi	19.5 ± 2.6	17.3 ± 7.2	38.3 ± 14.6	36.9 ± 16.8	23.3 ± 3.1
Train	40.4 ± 15.1	83.0 ± -[1]	79.5 ± 53.2	19.4 ± 385.2	63.7 ± 39.8
Car, driver	22.3 ± 3.1	21.4 ± 2.3	45.0 ± 4.9	3.2 ± 4.5	27.7 ± 1.9
Car, passenger	31.7 ± 7.7	31.6 ± 7.4	62.8 ± 11.5	3.8 ± 8.8	43.4 ± 4.9
Other mode of travel	84.7 ± 52.0	39.1 ± 86.4	13.3 ± 133.3	75.0 ± 104.2	89.1 ± 46.5
All	19,3 ± 2.1	17.4 ± 1.8	3.9 ± 3.6	28.5 ± 3.9	23.2 ± 1.4

[1]Confidence interval cannot be calculated, only one observation.

Upward adjustment

When calculating KOM's weights, the sample is poststratified on strata consisting of eight geographical regions (national areas based on counties), age (15 – 24, 25 – 44, 45 – 64 and 65 – 84) and sex.

Four different weights are used for upward adjustment of the population:

- For upward adjustment of individuals, the compensation weight (VIKT_K) is used, calculated as the ratio between the population and the respondents in the respective strata.
- For upward adjustment of households, the household weight (VIKT_H) is used, calculated as the ratio between the compensation weight (VIKT_K) and the number of persons with a sample probability in the household (i.e. the number of person aged between 15 and 84).
- For upward adjustment of journeys and contacts during the day of survey, an adjusted compensation weight, VIKT is used. In the calculation, consideration has been taken to the variation of non-response over time, so that the response for a particular day adjusted upwards will have the same importance as every other day's responses.
- For upward adjustment of long-distance journeys, the day of survey weight divided by 30 is used, i.e. the number of days for which long-distance journeys are to be registered.
- For upward adjustment to years, the annual weight VIKT_AR is used, which is a day of survey weight VIKT multiplied by 366 to include the whole measurement period, which covered a year (in this case a leap year).

Both journeys and contacts during the day of survey as well as long-distance journeys provide a weighted picture of conditions for an average day during the measurement period. It is possible instead to use annual weights to obtain the situation for the whole year.

Quality-increasing measures

Measurement errors mean the total effect of errors arising in connection with measurement and collection. This may be due to the respondent misunder-

standing questions, not wishing to provide information, or the interviewer registering an incorrect value.

Previous sample investigations for KOM and RES surveys have shown how demanding this type of survey is for respondents. KOM takes a longer time than many other surveys and can therefore be tiring for respondents – in particular for those with many day of survey activities. Besides the fact that this might affect the ability to remember details, there is a risk that the respondent chooses not to mention certain activities.

Certain measures have been undertaken to facilitate the interviews in order to obtain as few negative consequences as possible for the quality of the data. This concerns mainly introduction by telephone, adaptation of material sent out, methods for registration and geo-coding of addresses in the interview but also the methods used in the interview form. The improvements in the form made it possible to automatically code purposes for work journeys and to simplify collecting identical long-distance journeys. Other measures are briefly described below.

The survey is carried out as an interview survey with a personal introduction by telephone. In the introduction, which is the respondent's first contact with the survey, she/he is prepared for how the survey takes place.

The introduction is to motivate the person in the sample to participate in the survey and to use the material sent out, although it may in certain cases have a negative effect on willingness to respond. This shall be weighed against the introduction leading to the respondent being better prepared at the interview and thus being more easily able to remember what he or she did during the day of survey. This reduces the risk of memory mistakes and makes the result more reliable.

After the personal introduction, the material is sent by post to the respondent containing the instructions with information about the survey and a diary where the respondent is to note down his or her contacts and movements during the day of survey. A pen is sent as an "advance reward". The diary is complemented in certain cases by sheets to note down contacts and/or sheets for Internet activities depending on the respondent's answers in the personal introduction and the respondent's age. The material sent out informs about the day of survey that applies for the interview person and the day on which the telephone call is to take place.

The material sent out has been tested in earlier smaller communication surveys, both by qualitative tests and by sub-groups having received different material sent out. The result of these tests has shown that the design of the material has an important impact on the quality of the survey. The material used in the survey has been designed taking these tests into consideration.

The diary use is shown by Tables 32 and 33. Approximately 70 % of those who travelled used the diary to note down their movements during the day of survey. Almost 65 % of those who initiated contacts during the day of survey noted these in the diary.

With the aid of so-called jump instructions included in the computerised interview system used, the interviewers are guided through the questionnaire without needing to think about the next questions to be asked. Both the interviews and the responses contain varied text, which is automatically adapted to earlier responses. This means, among other things, that certain impossible answers cannot be entered.

Table 32. Diary used to note down movements during the day of survey.

	Men		Women		All	
	Number	%	Number	%	Number	%
Don't know	1	0	2	0.1	3	0
Don't want to answer	1	0	1	0	2	0
No information	50	1.5	55	1.6	105	1.5
Not travelled on day of survey	301	8.9	344	9.9	645	9.4
Yes, completely	1 836	54.4	2 098	60.6	3 934	57.6
Yes, partly	124	3.7	111	3.2	235	3.4
No, not at all	1 060	31.4	850	24.6	1 910	27.9
All	3 373	100	3 461	100	6 834	100

Table 33. Diary used to note contacts during the day of survey.

	Men		Women		All	
	Number	%	Number	%	Number	%
Don't know	5	0.1	0	0.0	5	0.1
Don't want to answer	1	0	0	0	1	0
No information	47	1.4	49	1.4	96	1.4
No contact on day of survey	828	24.5	657	19	1 485	21.7
Yes, completely	11 290	38.2	1 634	47.2	2 924	42.8
Yes, partly	202	6	252	7.3	454	6.6
No, not at all	1 000	29.6	869	25.1	1 869	27.3
All	3 373	100	3 461	100	6 834	100

Addresses are registered and geo-coded in a dynamic geo-question integrated with the interview system. Registers with geo-coded Swedish street addresses and known places and foreign places are linked to the question. In this way, support is provided to the interviewer on registration, since the register contains practically every conceivable address in Sweden and many relevant places for travel to other countries. The interviewer is also provided with sufficient information for geo-coding of the registered address (see appendix "KOM Geo-question" about how the geo-question works). This is a great advantage compared with, as in previous surveys, coding the addresses afterwards, when it is no longer possible to obtain more detailed information

Table 34. Geo-coding of trips at start and finishing point.

	Trips: Final destination					
	SAMS-coded	SAMS-coded (street no. randomised)	SAMS-coded (manual)	Not SAMS-coded	Don't know/ don't want to answer/ no information	All
Trips: Starting point						
SAMS-coded	16 454	1 156	1 888	1 059	22	20 579
SAMS-coded (street no. randomised)	1 137	150	73	45	0	1 405
SAMS-coded (manual)	1 894	57	375	88	0	2 414
Not SAMS-coded	1 069	46	89	173	2	1 379
Don't know/don't want to answer/no information	22	0	1	2	5	30
All	20 576	1 409	2 426	1 367	29	25 807

if required and it is too late to remove any misunderstandings. If it is not possible in KOM to find a unique SAMS code to an address during the interview, an attempt is made to code the address manually after the interview. The method means a considerably higher quality than before. The results are shown in Table 34.

As shown in the table 64 % of all start and finishing points are in Sweden for trips in the survey coded directly during the interview. An additional 26 % could be given a unique SAMS code subsequently, either by coding the address manually or by randomising a street number if this was all that was missing. Altogether, 90 % of the Swedish addresses were coded.

For contacts and long-distance journeys, only the place and municipality were registered. There were very few of these which could not be coded at the correct level (municipal level). The appendix ”KOM geo-coding” explains how SAMS codes have been added.

Interview time

The interviews took 27 minutes on average, a bit longer when the survey started in autumn 2003 and a bit shorter towards the end of the survey. Interviews which took more than an hour were very probably interviews where the respondent was called up again and are therefore not included in the calculation. The 58 interviews interrupted before completion have also been excluded.

As seen in Table 35, it is primarily the part on movements during the day of survey that took a long time to carry out, although this also applies to the part on experience of computers, Internet, e-mail and text messages. Respondents

Table 35. Use of time (minutes and seconds) for the different parts in the interview (with the condition that the interview took less than an hour and was not interrupted before completion). Average value, median and percentiles.

Part area	Average	Median	P 10	P 90
The individual	01:45	01:37	00:38	02:57
Household members	00:45	00:37	00:06	01:27
The household's cars	01:07	00:59	00:06	02:08
Access to mobility service permit for public transport	00:18	00:10	00:06	00:42
Access to holiday home	00:25	00:11	00:06	01:02
Entitled to mobility service	00:06	00:04	00:02	00:09
Experience of computers, e-mail, Internet and text messages	03:34	03:50	00:31	05:50
Access to computer and telecommunications equipment	03:05	02:57	01:04	05:02
Use of telecommunications and data communications on day of survey	01:19	00:41	00:00	03:22
Contacts on day of survey	02:56	02:25	00:16	06:04
Movements on day of survey	05:48	05:01	00:43	11:22
Work performed on day of survey	00:06	00:04	00:00	00:16
Distance work	00:21	00:10	00:00	00:59
Work during travel	00:10	00:05	00:00	00:27
Car or public transport user	00:26	00:23	00:12	00:43
Telephone and video conferences in past month	00:17	00:14	00:05	00:32
Long-distance journeys and journeys abroad	01:29	01:04	00:22	03:08
Mobility	00:39	00:32	00:21	01:05
Income	01:18	00:56	00:26	02:14
Conclusion of the interview	00:43	00:08	00:03	01:45
The whole interview	26:29	25:18	13:37	40:53

also took a comparatively long time to report their access to computer and telecommunications equipment and the contacts that they had initiated on day of survey. All these parts took a long time since they contain more questions than other parts. However, no part took more than a few seconds if the respondent had nothing to report.

Appendices in English

KOM Content of questions

KOM Categorisations

KOM Geo-coding

KOM Geo-question

KOM Content of questions

Area	***Description***
The individual	Sex, age, education, housing, employment, industry, type and address of workplace, driving and the household licence, individual income, access to holiday cottage, boat, caravan/camper car, functional disability, mobility service. Travel by car or public transport.
	Composition of household: relation to respondent, sex, age. Occupation of and driving licences held by members of household. Household's income.
Cars and parking	Household's car ownership: temporary de-registered, year, fuel, form of ownership, payment for petrol, company car. Parking and parking cost at home and at workplace. Use of car on business. Deduction for car travel in income tax return.
Discount card	Discount card/season ticket for regional/local public transport. Card held, type and cost. Student card.
Experience of computers, Internet, text and MMS messages.	Experience of computers. Experience of Internet in general and experience of specific Internet activities. Experience of sending text and MMS messages.
Access to computer and telecommunications equipment	Computer and telecommunications equipment in the household, at place of study or work. Ability to connect to Internet workplace/school.
Internet use, text and MMS messages, day of survey	Activities on Internet during day of survey – bank business carried out, purchases/orders or looked for information about travel, products, etc, downloaded music, etc. No. of text messages sent. Sent MMS messages.
Contacts on day of survey	For *every contact* made by respondent via media: mode of contact (telephone ordinary/mobile, letter, e-mail, fax, telephone/video conferences), time, duration, purpose, from where and to where.
	Exceptionally, contacts collected aggregated.
Movements on day of survey	Mode of travel, distance, purpose, starting and finishing addresses and destination, starting and finishing time, traffic environment or not, people travelling with, accompanying children, Swedish border crossing point for travel abroad. Contact by mobile equipment taken by respondent while travelling (trip).
Flexible work	Where has work been performed on day of survey, if another workplace than the ordinary place of work.
	Distance work: No. of days per month, place where distance work carried out, computer and telecommunications equipment.
	Work while travelling: No. of days per month, computer and telecommunications equipment.
Telephone/video-conferences	Participation in telephone and video conferences, number, purpose.
Long-distance journeys	Addresses of starting and finishing point, main purpose, main mode of travel.
	Number of journeys abroad in the past 12 months.

KOM Categorisations

Municipalities in metropolitan regions (according to Statistics Sweden 2005)

Stockholm
Upplands Väsby
Vallentuna
Österåker
Värmdö
Järfälla
Ekerö
Huddinge
Botkyrka
Salem
Haninge
Tyresö
Upplands-Bro
Nykvarn
Täby
Danderyd
Sollentuna
Stockholm
Södertälje
Nacka
Sundbyberg
Solna
Lidingö
Vaxholm
Norrtälje
Sigtuna
Nynäshamn

Gothenburg
Kungsbacka
Härryda
Partille
Öckerö
Stenungsund
Tjörn
Ale
Lerum
Lilla Edet
Göteborg
Mölndal
Kungälv
Alingsås

Malmö
Staffanstorp
Burlöv
Vellinge
Kävlinge
Lomma
Svedala
Skurup
Höör
Malmö
Lund
Eslöv
Trelleborg

Mode of communication

"Ordinary telephone"
Ordinary telephone

"Mobile telephone"
Mobile telephone

"Letter"
Letter

"Fax"
Fax

"E-mail"
E-mail

"Other mode of communication"
Telephone conference
Video conference
Other mode of communication

Mode of travel for travel on day of survey

"Walking"
Walking

"Cycle"
Cycle

"Metro, tram"
Metro
Tram

"Bus, Coach, School bus, Mobility service, taxi"
School bus
Mobility service, taxi, passenger
Taxi (not mobility service), driver
Taxi (not mobility service), passenger
Local bus, regional coach
Long-distance coach
Charter coach
Other bus/coach
Bus/coach, type not known

"Train"
Train, business ticket or similar
Train, normal ticket
Train, low-price (advance purchase, weekend ticket or other reduction)
Train, card (annual card, monthly card)
Train, payment not known

"Car, driver"
Car, driver
Borrowed car, driver
Hire car, driver
Co-passenger's car, driver
Other car, driver
Employer's car, driver
Car, driver. Ownership not known

"Car, passenger"
Car, passenger
Borrowed car, passenger
Hire car, passenger
Co-passenger's car, passenger
Other car, passenger
Employer's car, passenger
Car, passenger. Ownership not known

"Other mode of travel"
Plane, charter
Leisure craft
Ship
Snow scooter
Tractor, work tool
Mobility service with special vehicle, driver
Lorry, driver
Lorry, passenger
Plane, business class, 1st class
Plane, tourist class, economy class
Plane, other
Plane, class not known
Other mode of travel
Moped
Motorcycle

Mode of travel for long-distance journeys

"Bus/coach"
Local bus, regional coach
Long-distance coach
Charter coach
Other bus/coach
Bus/coach, type not known

"Train"
Train, business ticket or similar
Train, normal ticket
Train, low-price (advance purchase, weekend ticket or other reduction)
Train, card (annual card, monthly card)
Train, payment not known

"Plane"
Plane, business class, 1st class
Plane, tourist class, economy class
Plane, other
Plane, class not known
Plane, charter

"Car, driver"
Car, driver
Borrowed car, driver
Hire car, driver
Co-passenger's car, driver
Other car, passenger
Employer's car, passenger
Car, driver. Ownership not known

"Car, passenger"
Car, passenger
Borrowed car, passenger
Hire car, passenger
Co-passenger's car, passenger
Other car, passenger
Employer's car, passenger
Car, passenger. Ownership not known

"Other mode of travel"
Walking
Cycle
Moped
Motorcycle
Metro
Tram
School bus
Leisure craft
Ship
Snow scooter
Tractor, work tool
Mobility service, taxi, passenger
Mobility service, special vehicle, passenger
Mobility service, special vehicle, driver
Taxi (not mobility service), driver
Taxi (not mobility service), passenger
Lorry, driver
Lorry, passenger
Other mode of travel

Purpose

"Work, study"
Home-work
Home-school
Business travel/travel as part of work
Study trip/travelling as part of studies
Work (respondent's permanent place of work)
Work (not respondent's permanent place of work
Work, respondent does not have
Studies (respondent's permanent place of study)
Studies (not respondent's permanent place of study)
Studies, respondent does not have a permanent place of study

"Service, shopping"
Daily shopping
Other shopping
Health and medical care
Post or bank business
Booking tickets/appointments
Childcare (collecting/leaving)
Other service
Giving a lift (accompanying)/ collecting another person
Taking part in or accompanying to children's leisure activity

"Leisure"
Visiting relatives and friends
Hobbies, playing music, study circle, course
Restaurant, café
Physical exercise and outdoor activities, e.g. sports, walking, etc.
Entertainment and culture, party, concert, cinema, etc.
Participating in organisations, religious activity
(Other) holiday trip
Other leisure activity

"Other purpose"
Professional traffic
Crew travel
Other purpose

KOM Geo-coding

Specification

Geographical data at a particular level is very important for the usefulness of the study. Journeys start and finish and contacts take place between people at defined places.

It is to be possible to relate places in Sweden to a SAMS area, municipality and county. Foreign places shall be assigned to a country and NUTS for countries with this classification, for other countries an approximate longitude and latitude are stated.

SAMS codes are mainly used in the passenger transport models that SIKA is responsible for. They are not included in the database distributed to users. Users have access to SAMS codes only after special consideration.

Addresses in Sweden

Two levels of geographical information are collected in the study. Only the location/place is registered in the contact section and in the section on long-distance journeys. In the other sections, the complete address is registered including the street address. The two types of addresses are coded in different ways:

Geo-coding when the complete address is registered

The complete address is registered for the respondent's home address, workplace, school, holiday home and for the starting and finishing point of trips.

The addresses are coded to "SAMS areas" (Small Area Market Statistics). Sweden is divided into around 9,000 areas of this kind. Every SAMS area is completely within the boundaries of a municipality.

The main rule is that SAMS is coded for the addresses which can be reliably coded to a unique SAMS area. In addition, SAMS is coded in some cases even when it has not been possible to allocate a unique SAMS code. This is the case when there is a street address, the street can be assigned to several SAMS areas and it has not been possible to register the street number or not been possible to locate a unique SAMS area on the map or in another way. In this case, the SAMS code is set for a randomly generated street number in the street.

Other addresses are coded, when there is a sufficient basis, to a municipality and country without information on SAMS.

The coding is supplemented with SAMS coordinates for all addresses where a SAMS code could be produced. The coordinates of the SAMS areas specify the median point for buildings. If buildings are not available, the coordinates are set for the property's central point in terms of area.

The following codes this exist in these cases:

- County code
- Municipality code
- SAMS code
- Coordinates for SAMS area
- Codes which specify the quality of SAMS coding.

Geo-coding in cases where only the location/place is to be collected

For addresses in Sweden in the form's contact section and the section on long-distance travel, the street and number are not registered but only the location/ place and municipality.

This address information is geo-coded according to the same principles reported above with the following exceptions:

In cases where the address information was of such a kind that it included several SAMS areas, wholly or in part, the SAMS area which was largest in terms of population was selected.

The following information is available for these places:

- County code
- Municipality code
- SAMS code
- Coordinates for SAMS area
- Codes that state the quality of SAMS coding. Addresses abroad

Places abroad

The country or area is registered for places abroad but not street addresses or the like.

NUTS-3 is coded for Norway, Denmark and Finland NUTS-2[1] is coded for other countries with a NUTS classification.

An approximate longitude/latitude is given for countries without NUTS classification.

Destinations abroad are also stated in full. In cases where the destination could be coded, the correctly spelt name of the location is given.

Countries are stated with alphabetic designation according to ISO 3166.

The following codes were produced for places abroad:

- Registered destinations in full (two variants – as registered and correctly spelt)
- Names of countries in full and coded
- For Norway, Denmark and Finland, code and name for NUTS level 3
- For other countries in Europe, code for NUTS level 2 where such classification exists
- For all other countries, the approximate longitude and latitude of the location.

Description of the various components of geo-coding

A brief and simplified description is given below of the principles and components of geo-coding.

[1] NUTS (Nomenclature des Unités Territoriales Statistiques) is the official EU geographical classification for planning purposes.

Geo-coding in the interview

For the majority of the addresses collected, geo-coding was made with a unique SAMS/NUTS directly during the interview.

Otherwise, geo-coding took place as follows.

Geo-coding after the interview

1. Automatic coding

A run took place where geo-codes were set either with a unique or a randomly generated code.

A randomly generated code was set if the municipality (from the list) and the "street" (from the list) were registered at the same time but this information was not sufficient to classify the place to a single SAMS area. For instance, Drottninggatan in Stockholm, where information about the street number is lacking in a registered address. In this case, the address has at least two "street numbers" (or post box numbers). One of these "street" numbers is generated randomly and the SAMS code that applies for the address with this number is stated for the registered address.

2. Manual coding

In the cases where no SAMS code has been obtained by the methods mentioned above, the addresses collected were manually coded. Coding through a map is also included in this manual coding. The cases where SAMS was obtained randomly as above and where information had been registered in the street field were also examined manually. In certain cases, it was possible to find a unique SAMS, which then replaced the coded randomly generated SAMS.

There could be several reasons for the address collected not generating a unique SAMS code. The commonest were:

I. The address was incomplete, incorrectly spelt, or contained additional information in the street field, which prevented automatic matching.

A unique SAMS is often found by adjustment of the search criteria.

II. Information in the street field was lacking in the linked register, for instance, shops, petrol stations, sports facilities, health care centres, churches, restaurants, and other public facilities. In certain cases, the information was a geographical description, for example, "at the crossroads between streets X and Y", "The southern tip of X island"

In these cases, a search for a correct address was made through a number of sources:

– eniro.se i.e. the telephone directory on the net which also enables a web search through various search words. Searching also took place via their map search (the map was provided by the National Land Survey).
– hitta.se. Directory enquiries on the net, the database in provided by TA Teleadress Information AB.
– municipalities' websites, mainly for addresses of health care and social service facilities and schools.
– shop websites, ICA, Konsum, Statoil etc.
– through a special map application for geo-coding.

KOM Geo-question

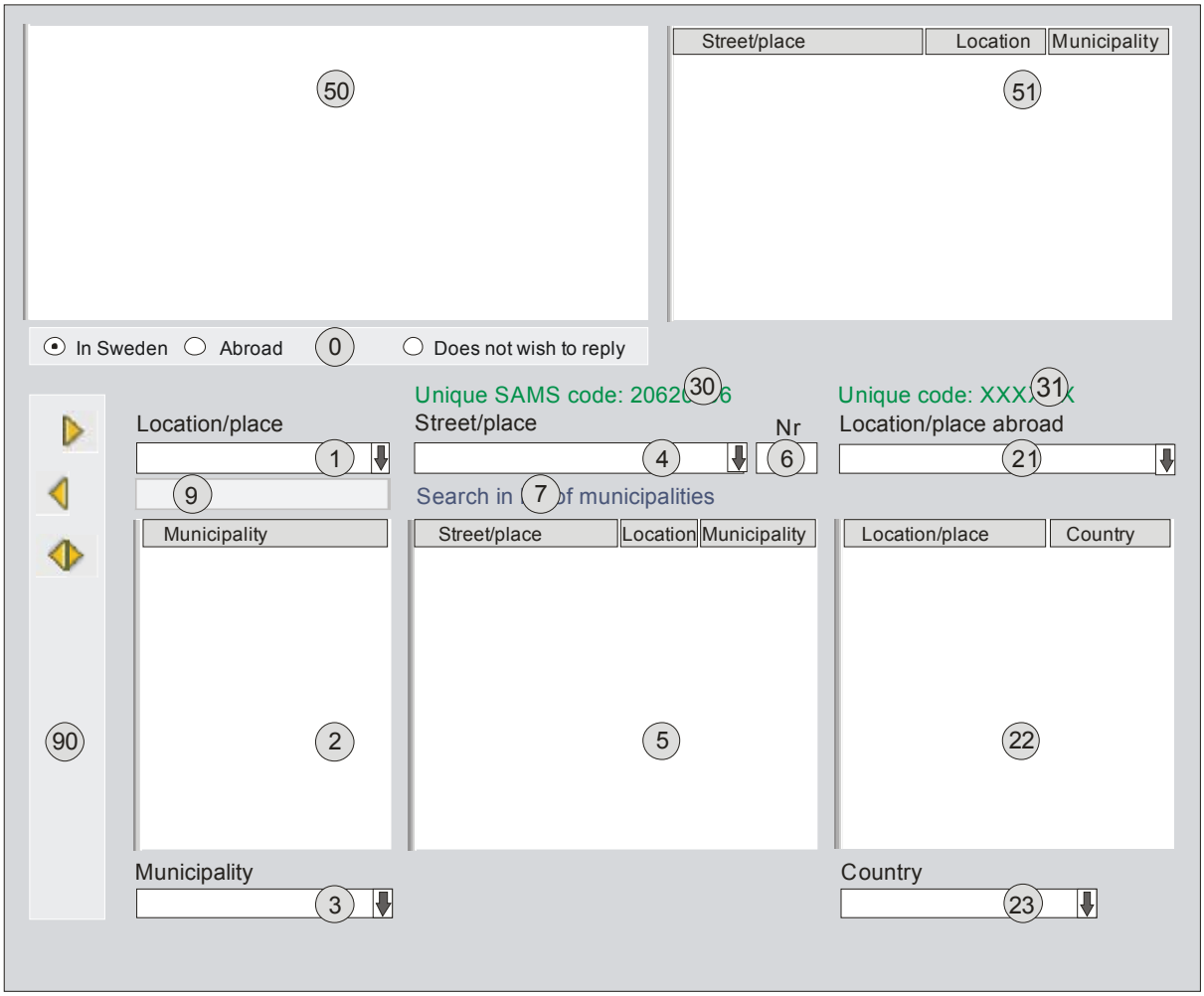
Collection of address and geo-coding with linked registers

Address information was collected in KOM through a special question on the questionnaire. Registers with geo-coded street addresses and known locations in Sweden and locations abroad were linked to this question.

The question had a dynamic design. Guidance was provided to the interviewer during registration through the question and information texts, activity buttons and display of the different components of the question being adapted to activity.

Registration is introduced by a schematic picture of the design and logic of the question, with a brief description of the content of and link between the components of the question. It is then shown by examples how address collection worked with this method.

The components of the geo-question



"Next guestion" "Previous question" "Cancel"

Information about the components

0 Choice. In Sweden or abroad.

1 Registration field. Successive search from two letters in list of towns/cities. “Location” here means municipalities, postal addresses, built-up areas, neighbourhoods, shopping centres, schools, known places, etc.
Automatic completed on registration. Pressing the arrow shows a list with Don’t know/Don’t wish to answer and previous responses in the interview registered in the field.

2 List of names of municipalities to select from. The list contains the municipalities where “location” is registered in the location field (1) appears in the address.

3 List with all municipalities to select from and Don’t know/Don’t wish to answer. Shows name of municipality when municipality has been selected in (2) or (5).

4 Registration field. Successive search for addressed from two letters written. Addresses here refers to streets, places, schools, etc. Pressing the arrow shows Don’t know/Don’t wish to answer. Shows the “street” selected in (5).

5 List of addresses to choose from. Contains the addresses that meet the condition found in the combination of location (1) and municipality (3). When writing in the street field (2), a successive reduction takes place when at least two letters have been written. If the entries made in the street field (2) cannot be found in the combination of location and municipality, all addresses in the municipality are shown (and searched for). If the entries made are not contained there either, all addresses in the register are shown (and searched for).

6 A list with street numbers, post box numbers to choose from. Pressing the arrow shows the street numbers/post box numbers included in the register for the street.

7 Dynamic text. On registration in (4), a search is first made for the registered location (”Search in list of locations” is shown), then in the registered municipality (”Search in list of municipalities” and finally in Sweden as a whole (”Search in the whole of Sweden”).

9 Storage of information on location after indication in the address list (5).

21 Registration field. Successive search of foreign locations/places from a letter written in. Pressing the arrow shows Don’t know/Don’t wish to answer and earlier foreign locations registered during the interview. Shows foreign location/place selected in (22).

22 List with foreign locations/places and country to choose from. Contains the foreign locations/places included in the combination of country (23) and registrations made in (21).

23 List of all countries to choose from and Don’t know/Don’t wish to answer. Shows country when location/place has been chosen in (22).

30 Dynamic information on registration of Swedish addresses. States whether registered address is geo-coded or not.

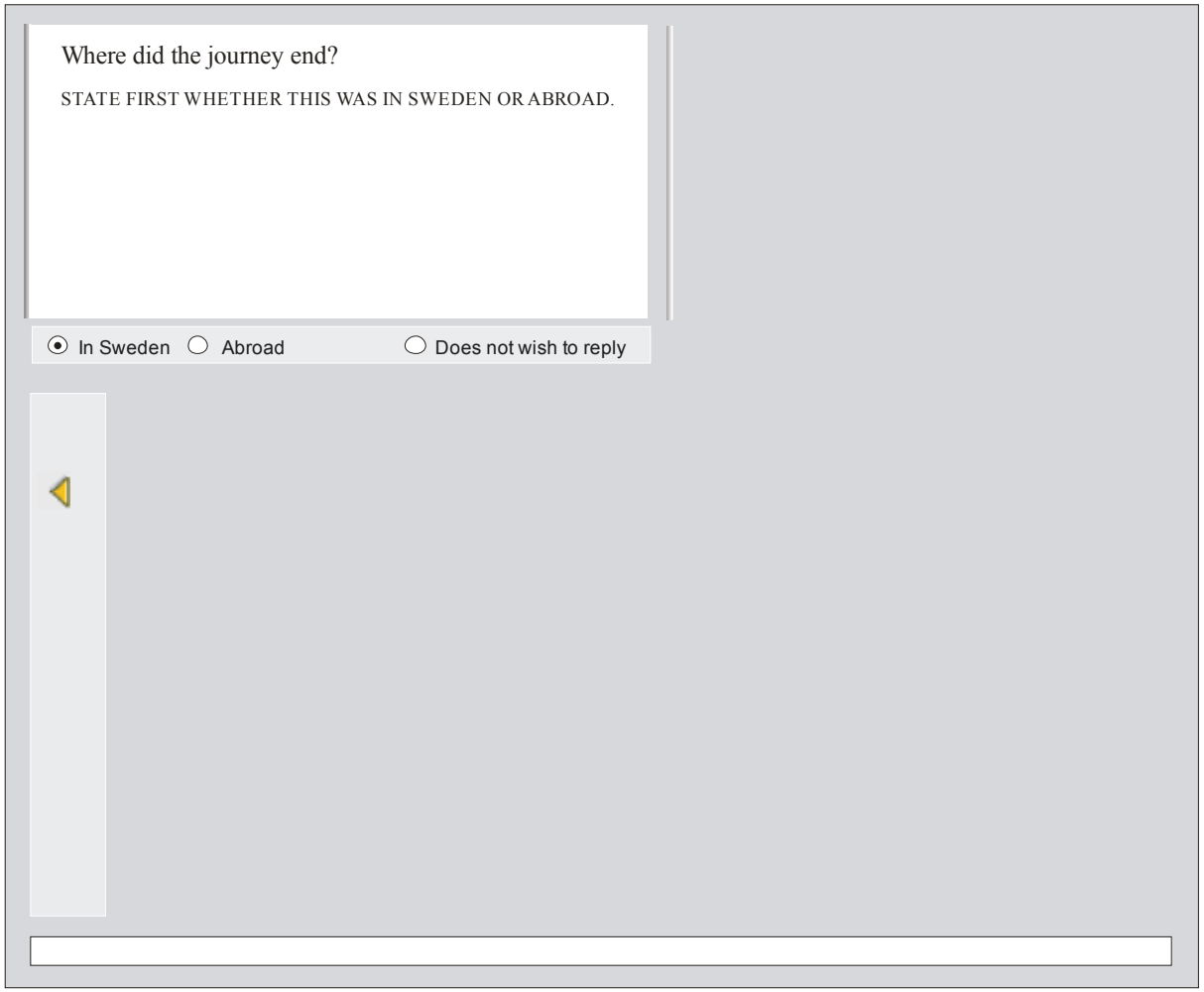
31 Dynamic information on registration of foreign addresses. States whether registered address is geo-coded or not.

50 Dynamic wording of questions and instructions.

51 List with Swedish address information registered during the interview (street/location, place and municipality).

90 Activity buttons. Dynamic display.

Appearance when interviewer asks the question for the first time

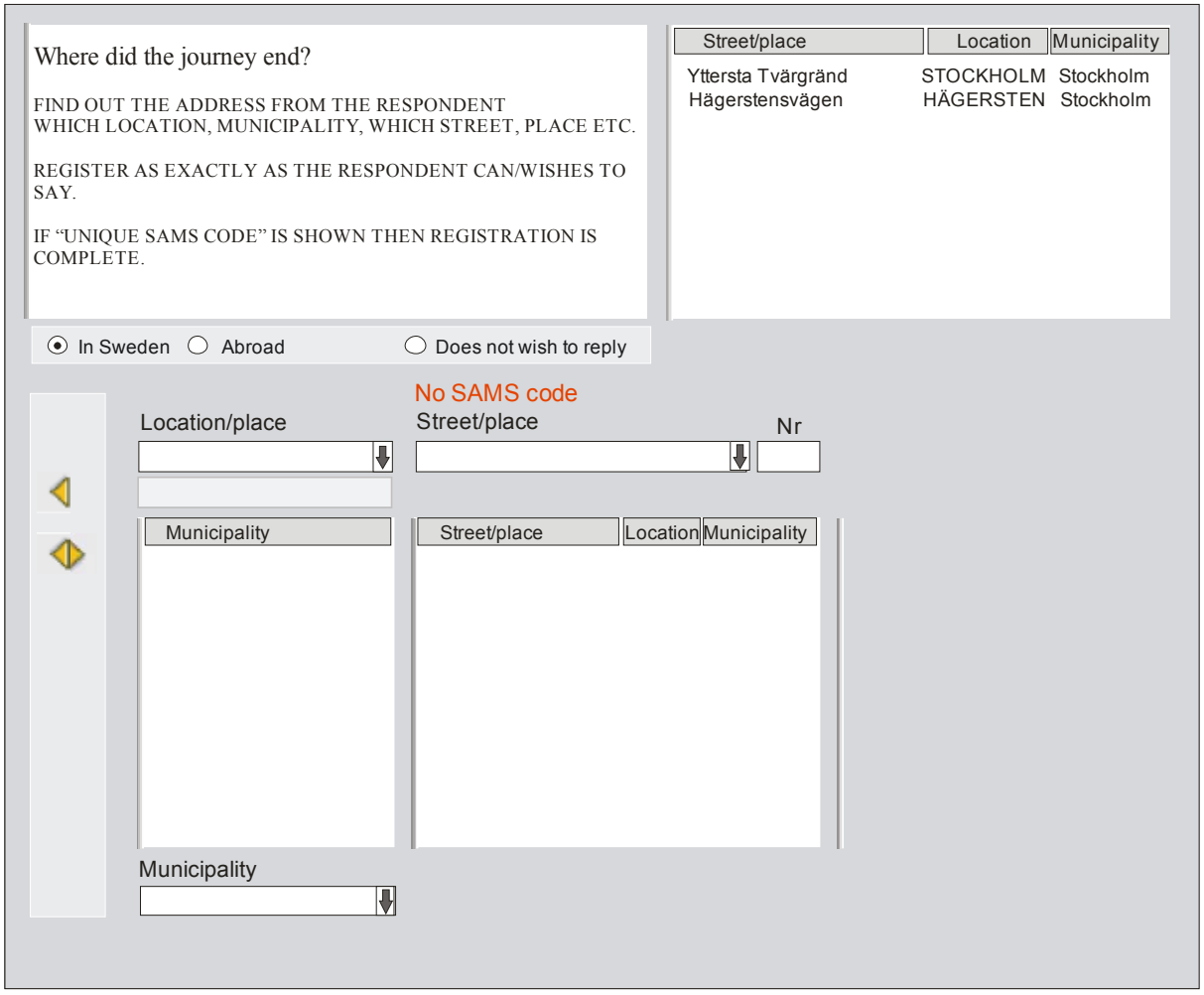


The interviewer indicates whether it was in Sweden or abroad.

Only the button for “Previous question” may be selected from the list on the left.

Example

It is evident from the respondent's answer to the question "Where did the journey end?" that the journey ended in Sweden, which the interviewer indicates first. The following picture is then shown.



Address field for registration of Swedish addresses is shown.

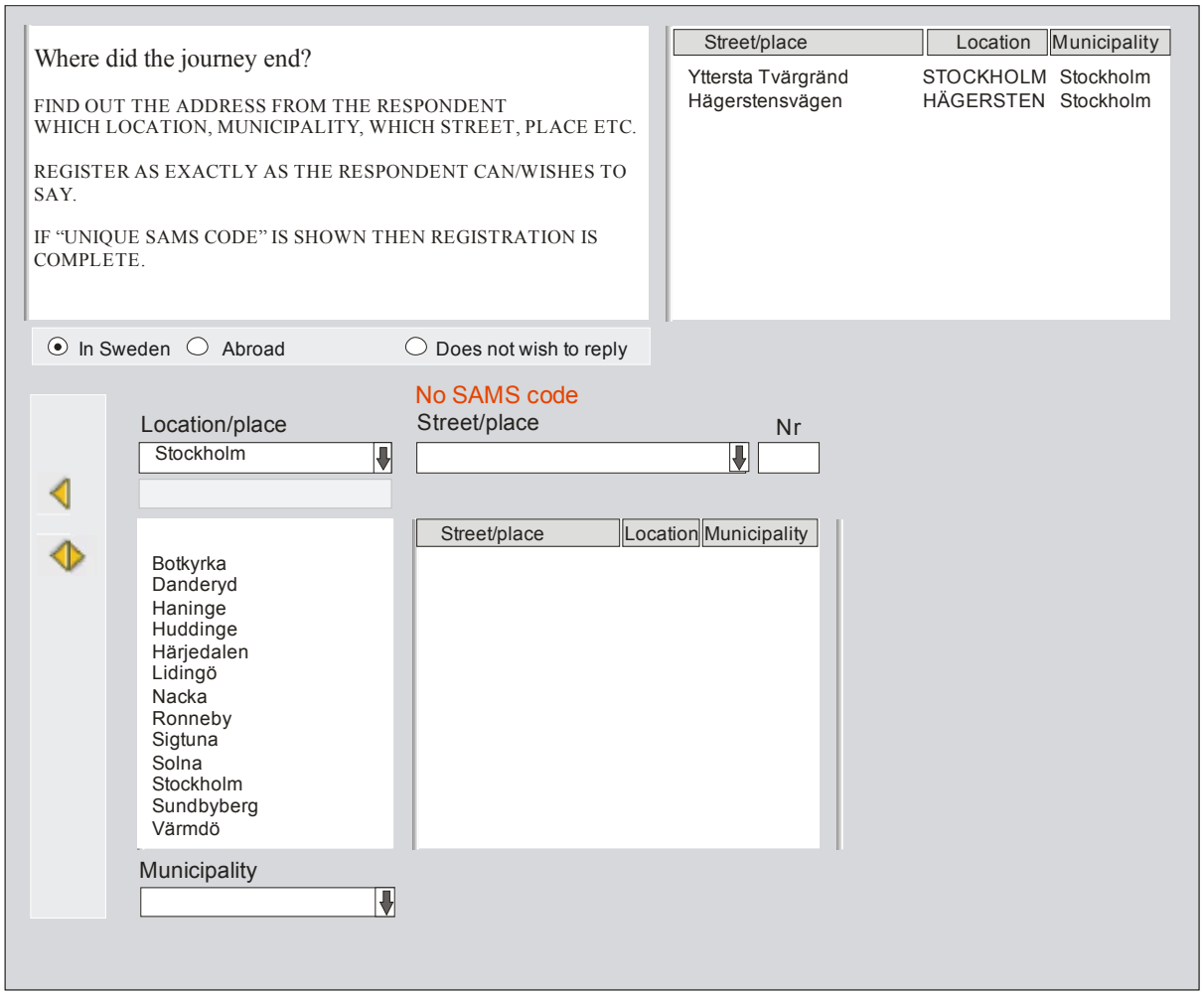
The above list on the right contains addresses collected earlier during the interview.
In this example,
"Yttersta Tvärgränd 3 STOCKHOLM Stockholm" and
"Hägerstensvägen 301 HÄGERSTEN Stockholm"
had been registered as the starting or finishing address for earlier journeys.

"STOCKHOLM" and "HÄGERSTEN" in capitals are the place name for the addresses while "Stockholm" indicates the municipality.

The street number is not included in the listed addresses.

Example

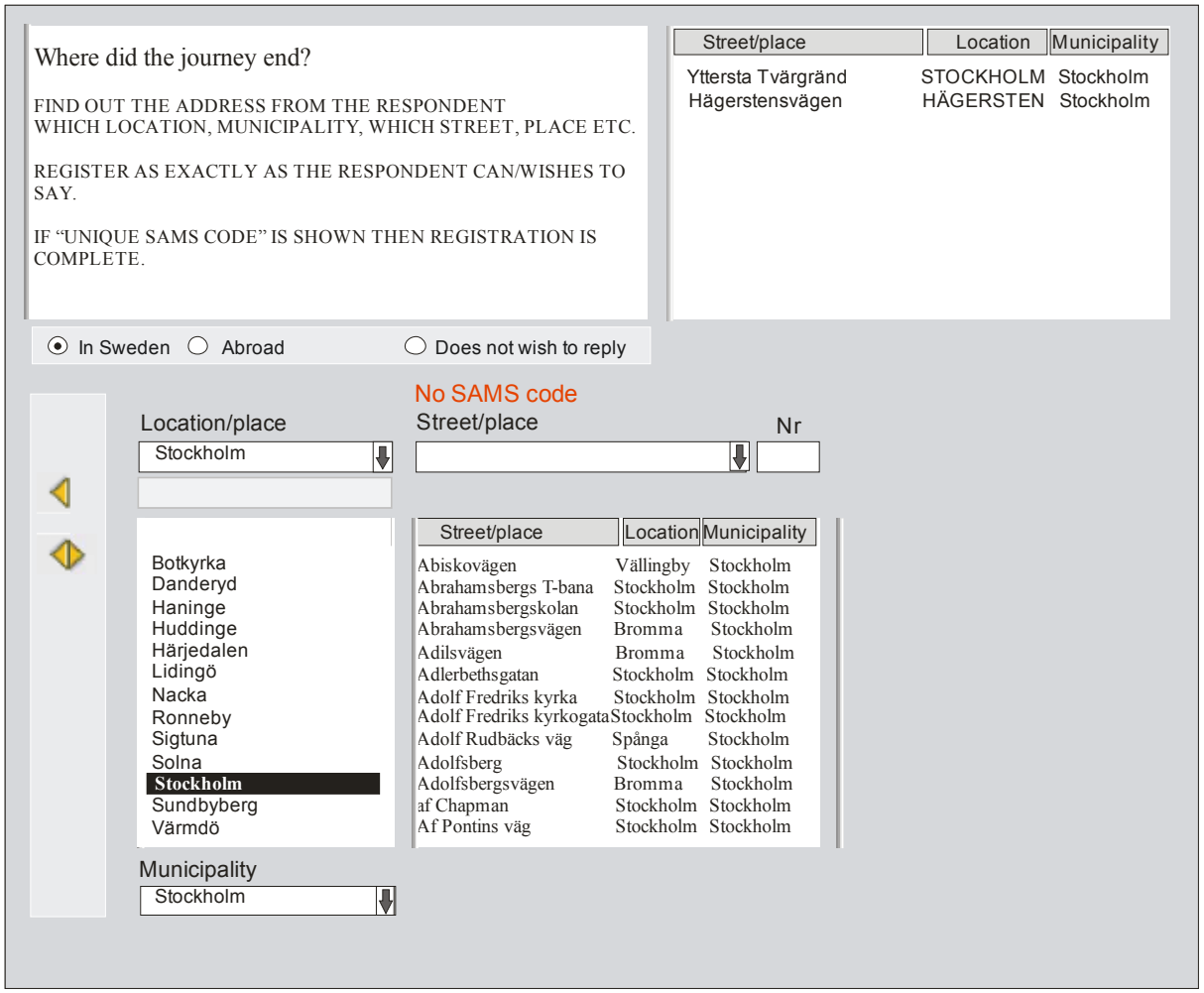
The respondent states Stockholm as location, which the interviewer registers in the location field. The municipalities where "Stockholm" exists as street, location or place are shown in the list of municipalities.



If the interviewer presses the cancel button, everything registered in the field and the lists will be erased. In addition, the list on the left will change so that only the button "Previous question" is visible.

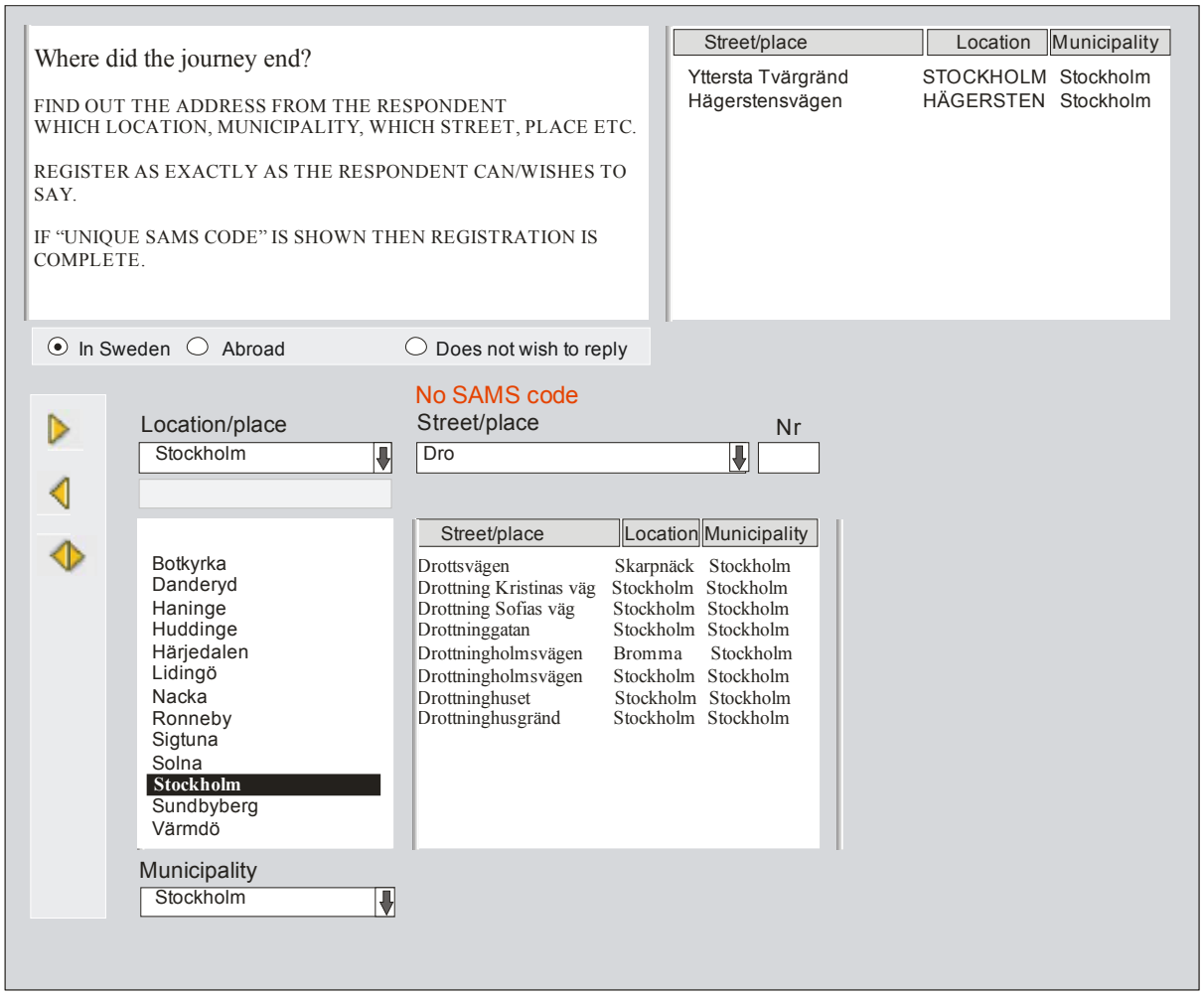
Example

The respondent states that it is the municipality of Stockholm. When the interviewer indicates Stockholm in the list of municipalities, Stockholm is shown in the municipality field and the addresses field is completed with all addresses in the municipality of Stockholm.



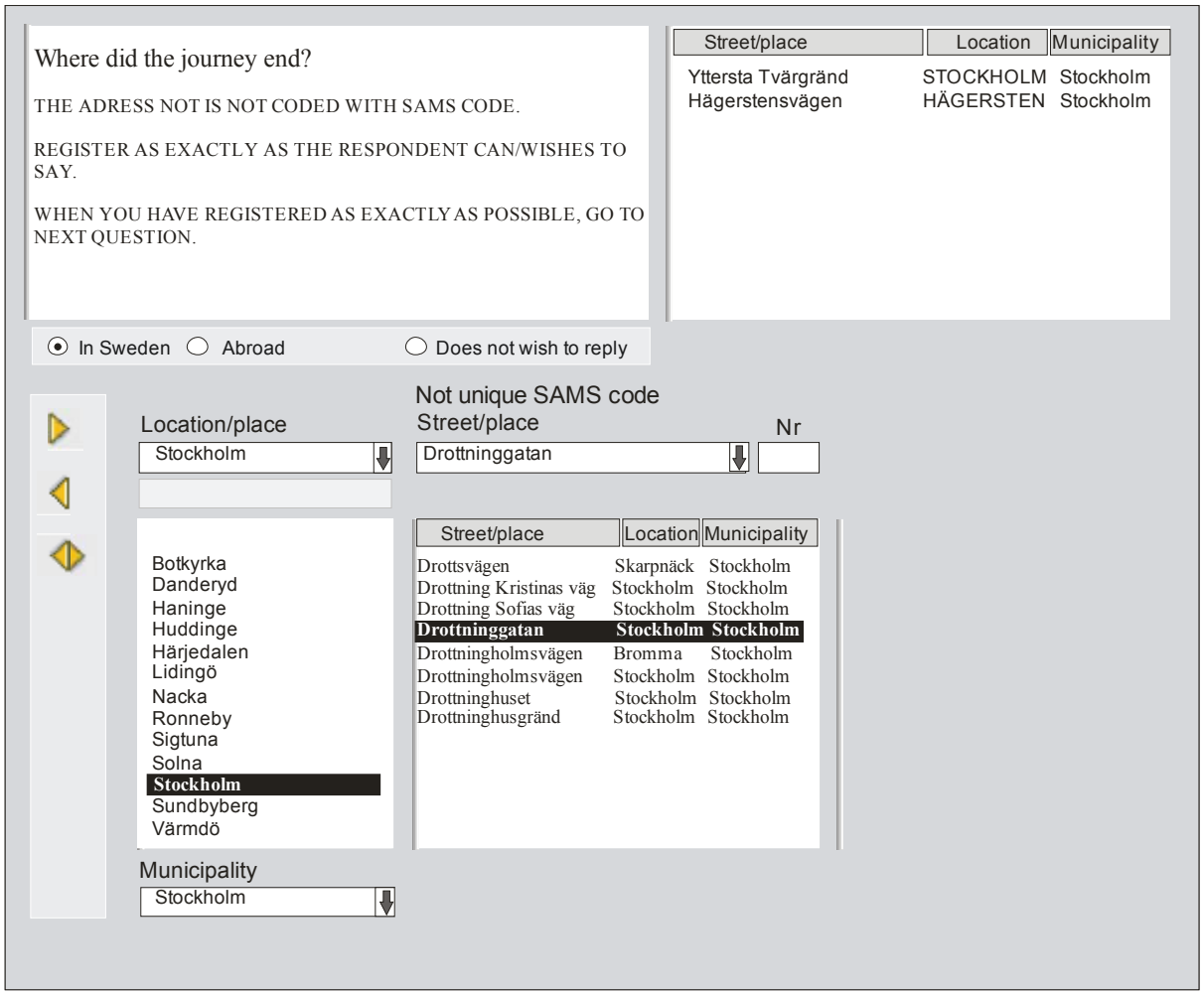
Example

The respondent knows that it was Drottninggatan in the municipality of Stockholm. The interviewer starts to register Drottninggatan in the street field. When "Dro" has been written, the address list is reduced to eight addresses.



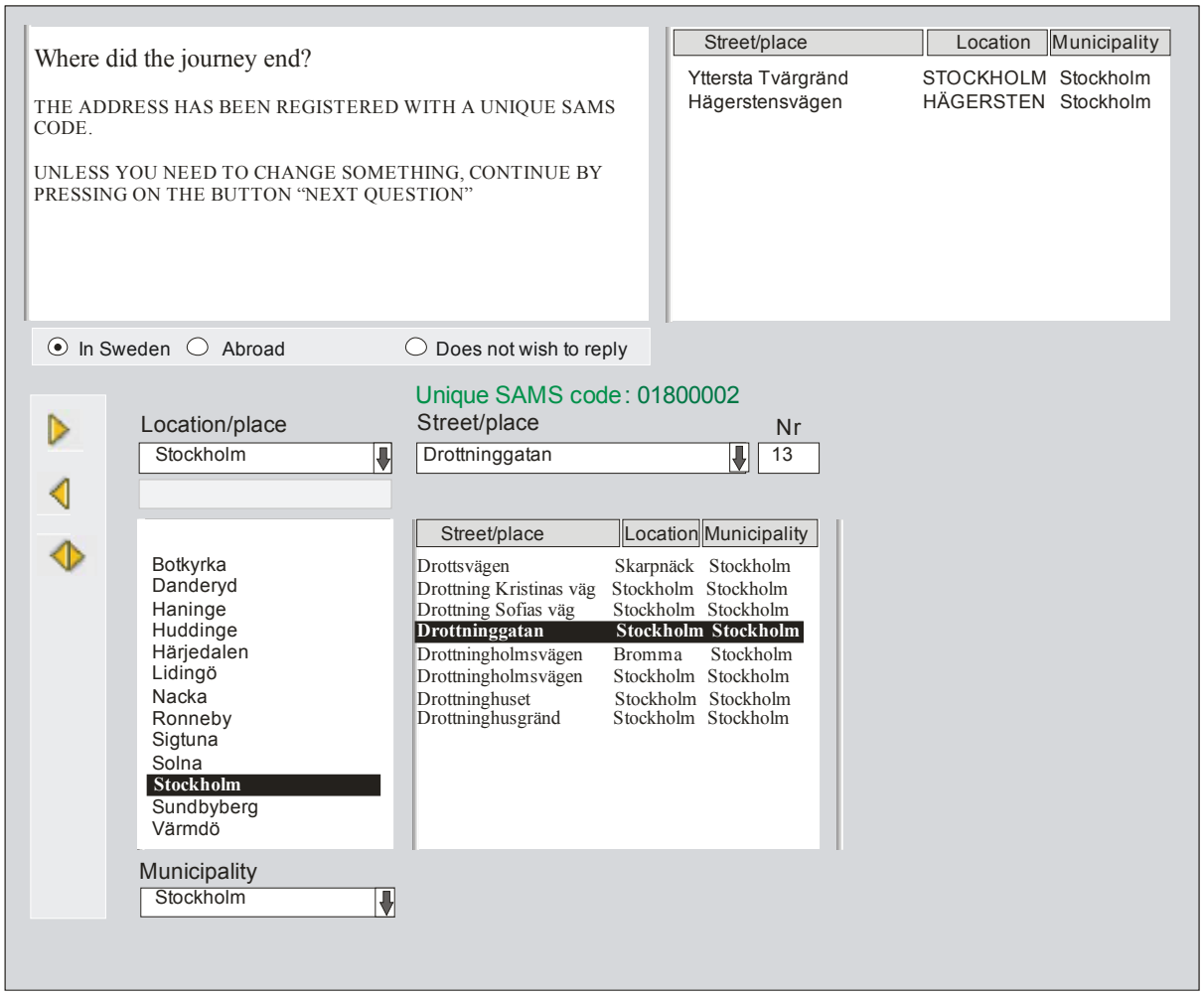
Example

When the interviewer registers “Drottninggatan Stockholm Stockholm” in the address list, “Drottninggatan” is shown in the street field and “Stockholm” in the field where the place is registered from the address list (the grey field below). Since Drottninggatan extends over several SAMS, “No unique SAMS code” is shown. More information is needed to enter a unique SAMS code, see following pages.



Example

The respondent knows that it was Drottninggatan 13. The interviewer registers 13 as the number. The address has now been coded with a unique SAMS and registration is completed by the interviewer pressing the button “Next question”.



On the next question during the interview that an address in Sweden is registered, the following addresses will be shown in the top right-hand corner:

Yttersta Tvärgränd	STOCKHOLM	Stockholm
Hägerstensvägen	HÄGERSTEN	Stockholm
Drottninggatan	STOCKHOLM	Stockholm

SIKA is an agency working in the transport and communications sector. Our main tasks are to make analyses, descriptions of the current situation and other reports for the Government, to develop forecast and planning methods and to be responsible for the official statistics.

The reports are published in the series SIKA Rapport and SIKA PM. The statistics are published in the series SIKA Statistik, in the journal SIKA Kommunikationer and in the Transport and Communications yearbook. All publications are available on SIKA's website www.sika–institute.se.

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