THE SWEDISH TRANSPORT SECTOR TODAY

Patterns of travel and transport

SIKA Rapport 1998:3

Preface

This report is previously published in Swedish as an attachment (Bilaga 3) to the proposition *Transportpolitik för en hållbar utveckling (Transport Policy for a Sustainable Development)* Prop 1997/98:56 by the Swedish Government.

The report gives an overview of travelling and transportation in the Swedish transport sector today as well as the devepoment until now. The report has been put together by Marika Engström at SIKA.

Stockholm in June 1998

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1 Passenger transport

Developments during the twentieth century have entailed a dramatic increase in geographical mobility. At the beginning of the century, an adult person travelled on average less than a kilometre per day. Mobility is now more than 40 km per adult and day, slightly more for men than women. On the other hand, the time we spend travelling every day is about the same as before, while transportation has become considerably swifter.

This has been made possible by the development of the transport system. There are strong links between our increased material welfare and the expansion of the transport sector. Demand for transport is not only related to economic development but also to a large degree to changes in patterns of life and values.

Since 1950 passenger transport performance in Sweden has increased by a factor of five. During the same period the population has increased by 24 %. This means that we travel four times as far per person and year today than we did in 1950. This increase has primarily taken place through the increase in car transport. The bulk of households have acquired a car during this period. In 1954 there were 75 cars per 1000 inhabitants. By 1994 this figure had increased to 410 cars per 1000 inhabitants.

Figure 1 shows the development of passenger transport since the beginning of the 1950s, measured in passenger-kilometres.

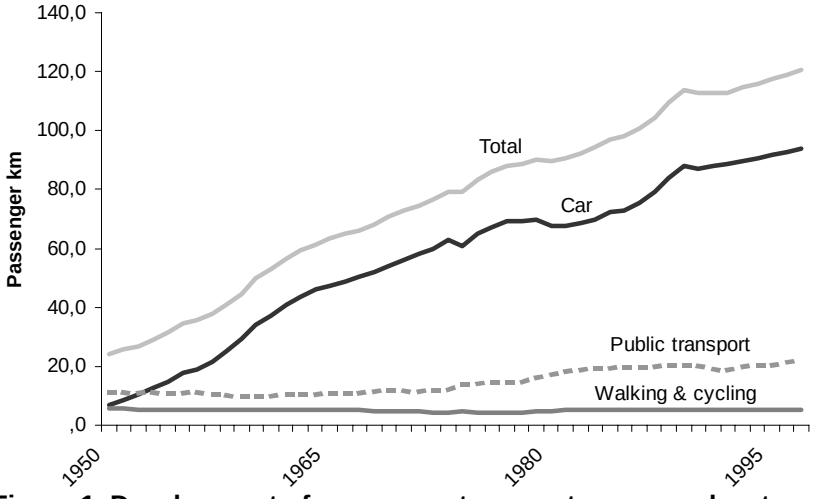


Figure 1. Development of passenger transport, measured as transport performance. Source: Swedish Institute for Transport and Communications Analysis (SIKA) (compiled from information from several sources).

The growth in car ownership is one of the factors that has had the greatest influence on the development of travel and its distribution over modes of transport. In 1950 cars accounted for 25 % of passenger transport. Today, the proportion has increased to almost 70 %. The large increase took place in the 1950s and 1960s, when car transport increased by 12 % per year. During the 1970s and 1980s the annual increase in car transport was 2.2 %. Total transport performance increased at the same rate for twenty years. After 1989, total passenger transport performance has stagnated.

One view of development is then that travelling has increased rapidly in society. The picture looks somewhat different if we study how much time we spend travelling and how many journeys we make each day. Table 1 shows the average journey length, travelling time and number of trips per person and day. Sources of data are the national travel surveys that were carried out in Sweden in 1978 and 1984, and the present travel survey, Riks-RVU.

Table 1 Development of travel according to three national travel surveys. Information per person (16–64) and day.

	Travel length km/day	*Travelling time min/day*	*No.of journeys/day*
Average for all inhabitants			
1978	41,3	75	3,5
1984	41,7	79	3,5
1994–96	41,0	59	2,8
Average for those who travel			
1978	49	90	4,2
1984	50	94	4,1
1994–96	51	76	3,5

There are certain differences in the survey method between Riks-RVU and the two previous surveys from 1978 and 1984 and the results should therefore be interpreted with some care.

1.1 Transport costs and household budgets

From repeated household surveys (HUT), it can be established that we use a larger and larger share of our income for travel, see Figure 2. Expenditure on transport is the household's third largest item of expenditure, exceeded only by expenditure on housing and food.

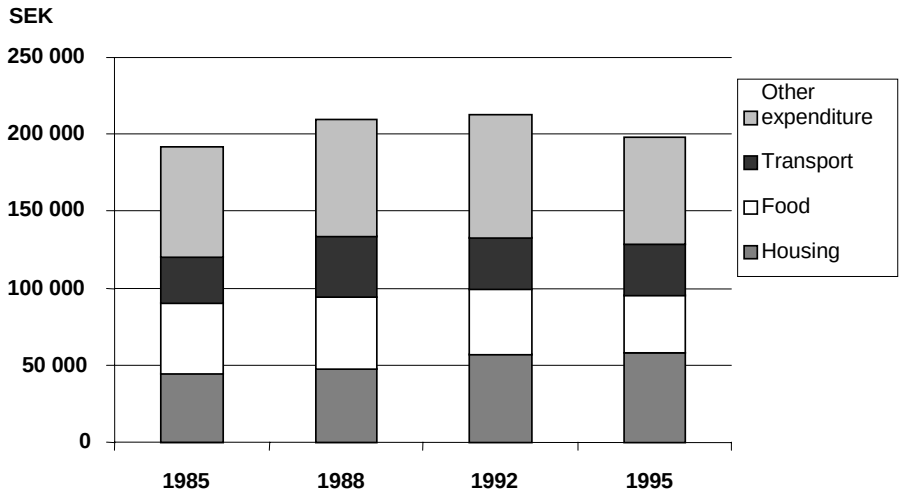


Figure 2. Normal household's expenditure on housing, food and transport and other expenditure during the period 1985–95. 1995 prices. (Source: HUT85, HUT88. HUT92, Utb95[1]).

In a comparison with previous surveys of household expenditure (the 1985 and 1988 surveys), it can be seen that the relationships between the three large items of expenditure has changed. In 1985 expenditure on food was the household's largest item. Thereafter, the share of expenditure used for food has fallen and housing expenditure increased.

In 1950 transport expenditure accounted for approximately 8 % of the total private consumption according to the national accounts. In 1988 the equivalent proportion was 19 %. After 1988, the proportion of expenditure on transport has fallen to the same level as in 1985, approximately 16 % of the household budget. Expenditure for transport for the average household was SEK 32,700 in 1995.

Despite our income having greatly increased, we have accordingly not been content to use an unchanged proportion of our income on transport but have instead increased it sharply, even though the downturn of recent years has led to the proportion falling slightly.

Household expenditure on transport is dominated by three items – running a car, purchasing a car and foreign travel, which together account for 90 %of transport expenditure.

1.2 Most journeys take place by car

When studying journeys according to purpose, it is found that leisure travel is the largest category. A third of all journeys are for leisure purposes and visits to relatives and friends in turn account for a third of this category. Shopping and service trips are about the same amount as journeys to work and school – about a

[1] Expenditure for housing and transport from the Expenditure barometer for 1995 is not fully comparable with previous surveys.

quarter each. Business travel only accounts for 6 % of travel. Figure 1.3 shows the breakdown of journeys according to different purposes.

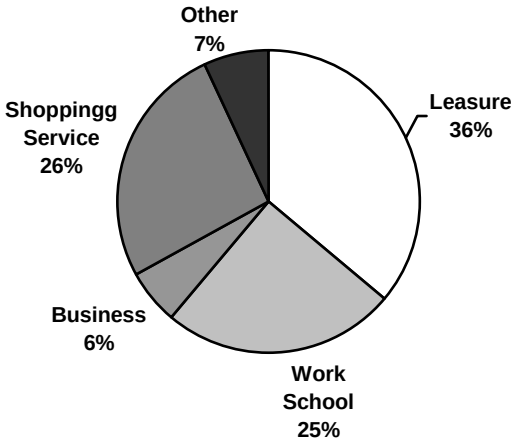


Figure 3. Journeys by purpose. Source: Riks-RVU 1997 (SIKA Rapport 1997:7)

The breakdown by mode of travel looks quite different when we study the *number of journeys* compared with when we study *transport performance*, see Figure 4. It can be noted straight away that walking and cycling account for almost a third of all journeys ("public transport" in the figures includes long-distance air and train travel) and more than half of the journeys take place by car (60 %), Public transport accounts for over 10 % of journeys – local public transport accounts for 7 % and the remaining 4 % consists of air and train travel among others.

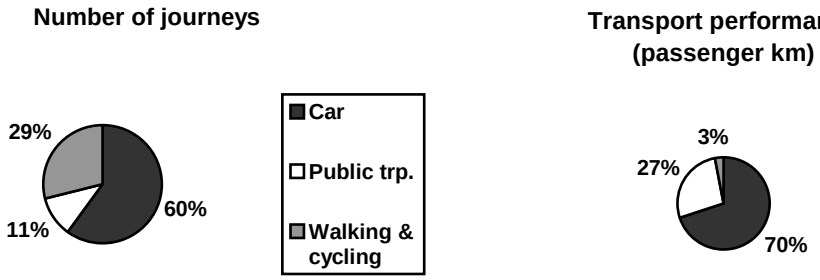


Figure 4. Proportion of journeys by different modes of transport (journey here means journey segment), and transport performance broken down by mode of transport. Source: Riks-RVU 1997 (SIKA Rapport 1997:7).

If, on the other hand, we study transport performance, it can be seen that car transport dominates to a greater extent – 70 % takes place by car. Only a small part of transport performance consists of walking and cycling. This depends of course on us mostly walking and cycling very short distances, while we use other means of transport for longer journeys. Local public transport accounts for 7 % of

transport performance and other public transport (including train and plane) for 20 %.

1.3 Short and long journeys

It may be worth noting that more than half of all journeys are shorter than 5 km and that 70 % of all journeys are shorter than 10 kilometres[2]. About half of journeys less than 5 km take place by car and almost half of these journeys take place by walking and cycling. Only 4 % of short journeys take place by public transport.

The short journeys are made by all social groups and for a great variety of purposes. Women, especially the youngest and oldest, make more really short journeys than men.

The proportion of short journeys (less than 5 km) is surprisingly stable throughout the country - the highest proportion is in Kalmar County with 70 % and the lowest in Kristianstad County with 57 %. Even in sparsely-populated counties such as Västerbotten and Norrbotten, the proportion of short journeys is as high as 64 % and 69 % respectively.

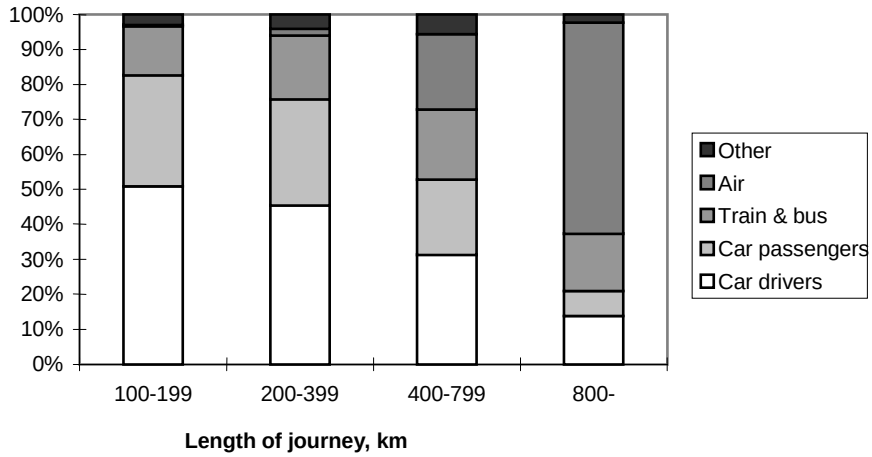


Figure 5. Breakdown by mode of transport for long journeys (over 100 km) at different distances. Source: Riks-RVU 1995 (SAMPLAN rapport 1995:11).

Figure 5 shows the breakdown by modes of transport for long journeys (over 100 km) for different journey distances. Of all journeys longer than 100 km the greatest number (70 %) take place by car. The breakdown by other modes of

[2] In reality the group short journeys includes a larger number of journeys, since loss of response (the so-called forgetting effect) is largest there. People tend to forget short journeys (often on foot) more easily compared with longer journeys.

transport is on average quite similar – train 9 %, bus 7 % and air 7 %. The longer the journey is, the fewer journeys are made totally.

The proportion of journeys taking place by car falls, however, for longer journey distances. The proportion of train journeys increases slightly for journey distances over 200 km.

For journeys between 400 and 800 km, rail and air account for about the same proportion, approximately 20 %. The great majority of journeys over 800 km take place by air.

The number of persons per car is on average 1.6 on long journeys, compared with 1.3 for short journeys. The car is the most common means of transport on long journeys for both women and men. More than every other man travels by car when going on a long journey. Women are more often car passengers and only every fifth women drives. Only 12 % of men travel by train and bus on long journeys while 20 % of women do so.

Car journeys make up 70 % of long journeys but not more than 47 % of the equivalent transport performance. Air travel accounts for 35 % and bus/train travel for 15 % of transport performance for long journeys.

1.4 Car ownership and holding driving licences

There has been a very considerable increase in the number of cars on the road since the mid-1940s as shown in Figure 6. Between 1990 and 1994 a slight reduction of the number of cars per person has taken place. From the statistics from the household survey HUT, it can be seen that expenditure on car purchases dropped between 1988 and 1992. Only the future will tell whether this is a new trend or only a temporary reduction due to the recession.

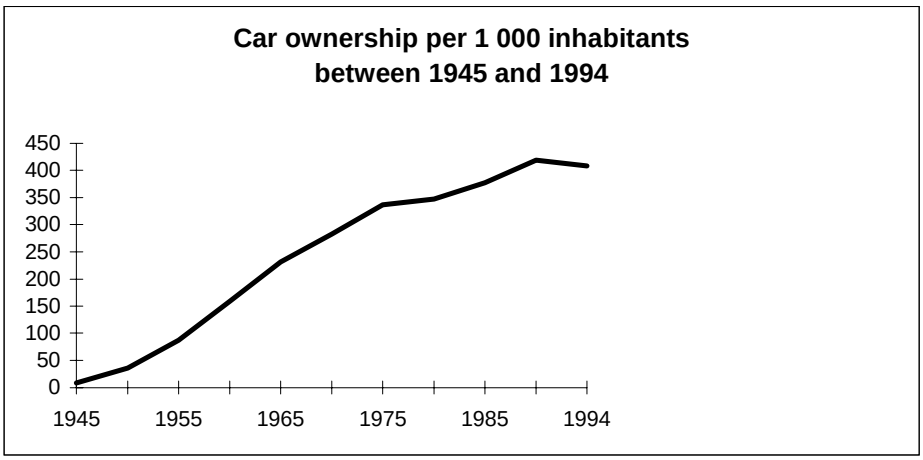


Figure 6. Car ownership per thousand inhabitants from 1945 until 1994. Source: Riks-RVU 1995 (SAMPLAN rapport 1997:11).

Women and the elderly are large groups in which there has been a considerable increase in the proportion holding driving licences, a trend, which is expected to continue. In 1978 only half of all women over 18 years old had a driving licence. Figure 7 shows the proportion of women and men over 18 with access to both driving licences and cars. The proportion of women holding driving licences in 1994 was almost as large as the proportion of men holding driving licences in 1978. 15–20 years ago, it was uncommon for women over 65 years of age to hold a driving licence. It was also less common for men over 65 years old to hold a licence. Today, over half of all women aged between 65 and 74 have a driving licence and almost 90 % of men in the same age group.

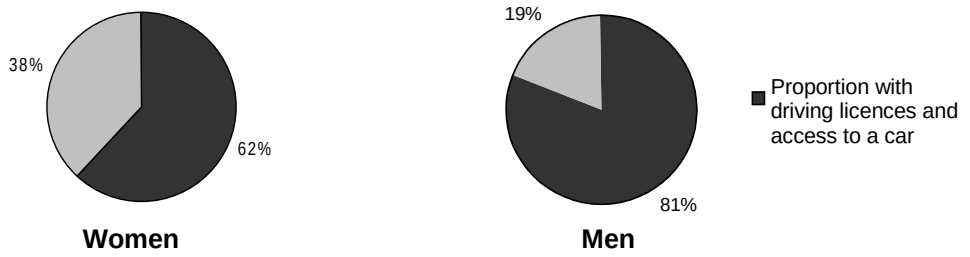


Figure 7. Proportion of women and men over 18 years of age with a driving licence and access to a car. Source: Riks-RVU 1997 (SIKA Rapport 1997:7).

The growing proportion of women with driving licences has led to households acquiring more than one car. In 1978 only 11 % of all households had two or more cars. According to the travel survey now taking place, 18 % of all households have more than two cars.

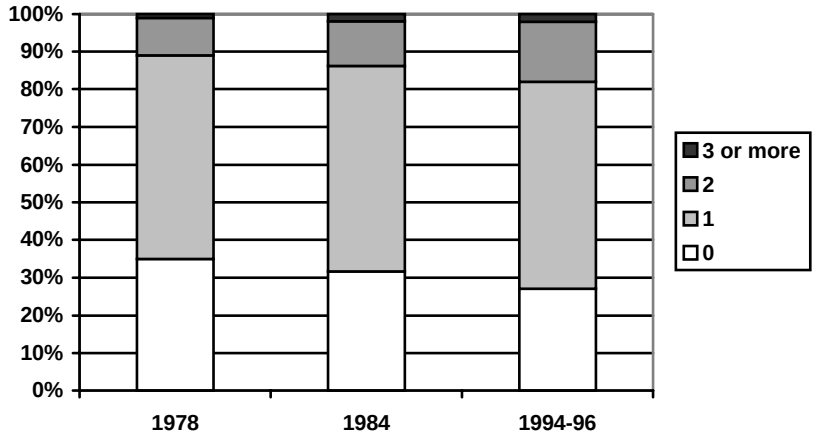


Figure 8. Number of cars per household. Source: Riks-RVU 1997.

1.5 Regional differences in travel

The average number of journeys and the average travelling time and length are relatively the same throughout the country. Some differences are shown below between different parts of the country divided into so-called "H" regions. This

categorisation is based on population density. The "H" region categorisation is very approximate, however, and it is important to stress that there are differences among households within the regions.

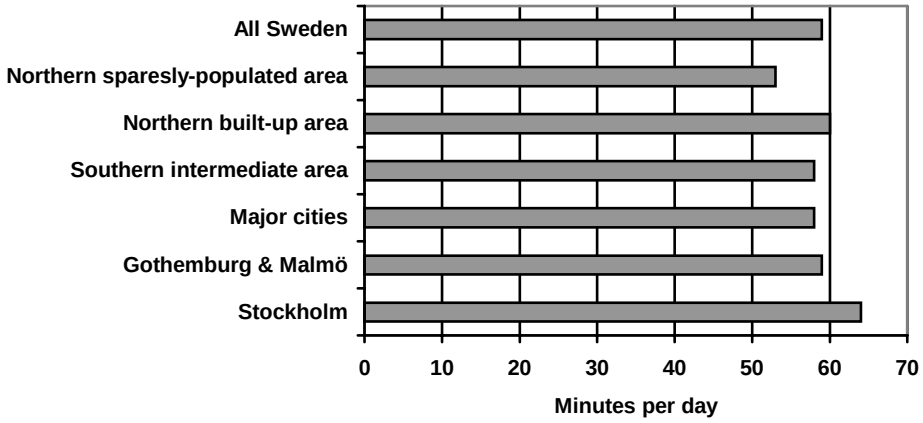


Figure 9. Average travel time between "H" regions. Refers to travel time per individual and day by all modes of transport. Source Riks-RVU 1997 (SIKA Rapport 1997:7)

Travelling time per day and person is on average 59 minutes throughout the whole country, see Figure 9. Inhabitants in the northern sparsely populated area have the shortest travelling time at 53 minutes per day while inhabitants in the County of Stockholm have the longest at 64 minutes per day.

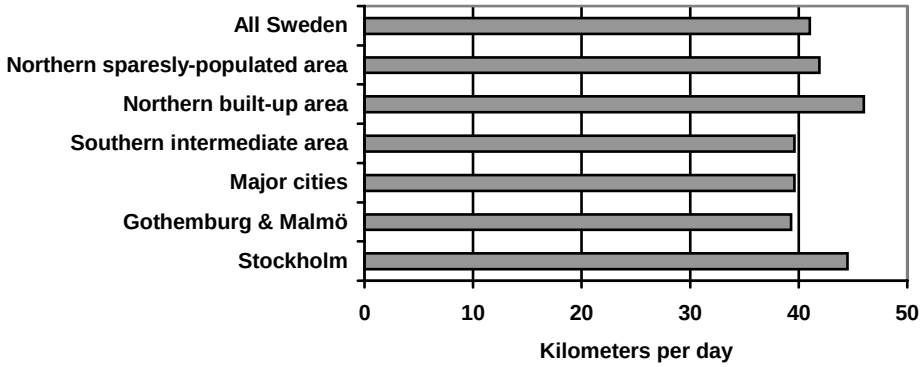


Figure 10. Average travel time for different "H" regions. Refers to journey times per individual and day with different forms of transport. Source Riks-RVU 1997 (SIKA Rapport 1997:7).

Figure 10 shows that the differences between different regions with respect to the *distance travelled* daily are very small. Not even a distinction is made between sparsely-populated and built-up areas is there any difference with the exception of the northern built-up area and Stockholm where inhabitants travel longer distances – 46 and 45 km respectively compared with the average for the whole country of 41 km.

The major regional differences lie in the choice of *mode of transport*, see Figure 11. The highest proportion of public transport is found in the major cities as would be expected – 18 % in Stockholm compared with the average for the whole country of 7 %. The northern built-up area and sparsely-populated area are the "H" regions with the lowest proportion of public transport (2–3 %). The proportion of walkers and cyclists is on average 28–30 % for all "H" regions except in the northern sparsely-populated area where the equivalent proportion is 22 %. The lowest proportion of car journeys is in Stockholm (50 %) and the highest, as expected, in the northern sparsely-populated area (70 %). The average of the proportion of car journeys for the whole country is 60 %.

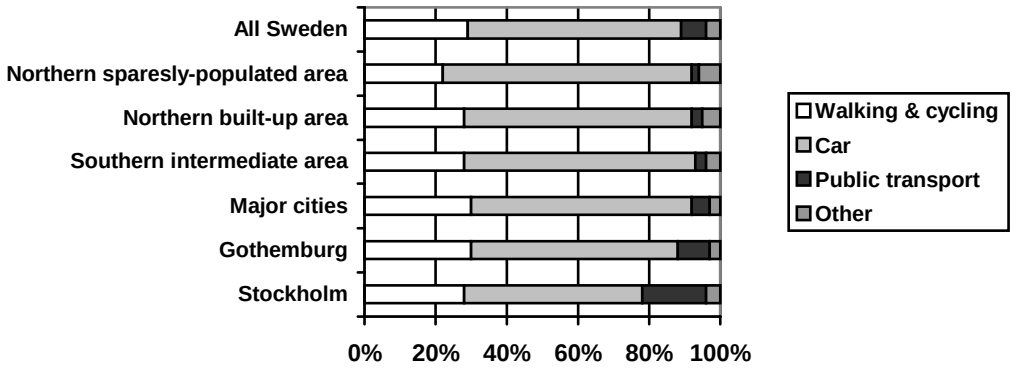


Figure 11. Average means of transport for different "H" regions. Refers to journey segments. Source: Riks-RVU 1997 (SIKA Rapport 1997:7)

1.6 International travel

Relatively few analyses and surveys have been made of foreign travel compared to domestic travel. While it is true that foreign travel accounts for a very small share of total passenger transport, it is still important from a number of aspects.

Foreign travel has increased continually during the past fifty years. The greatest reason for this increase is the general improvement in living standards in Sweden during the latter half of the twentieth century. A better financial situation and leisure has made it possible for a larger portion of the population to travel abroad.

The expanding international exchange of goods and services has led to more international personal contacts and travel. Faster, more frequent communications, moderate price increases, reduced cultural differences between different countries and increased knowledge of languages have also contributed to increased foreign travel.

The number of air passengers has increased considerably during recent decades from just over 1 million per year in 1960 to almost 10 million in 1994, see Figure 12. The equivalent statistic for 1996 is 11.5 million. Scheduled services have historically had a relatively stable growth curve while charter traffic has undergone greater variation.

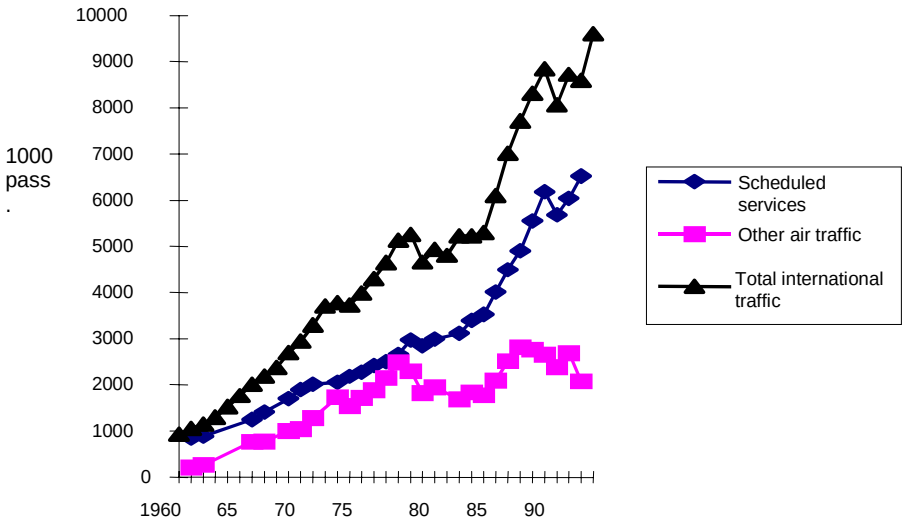


Figure 12. Number of arriving and departing passengers, international traffic at all publicly-owned civilian airports. Source: Civil Aviation Administration airport statistics

Every fifth international journey is on business. Almost 70 % of international business travel takes place by scheduled services while only just over 10 % of all private travel.

Leisure travel is on average longer than business travel, both in terms of time and distance. In 1970 just over every twentieth Swede took part in a charter trip by air compared with every eighth Swede ten years later. The most common way of travelling abroad for a private traveller is by car, however. Figure 13 shows the breakdown for international business and private travel by means of transport.

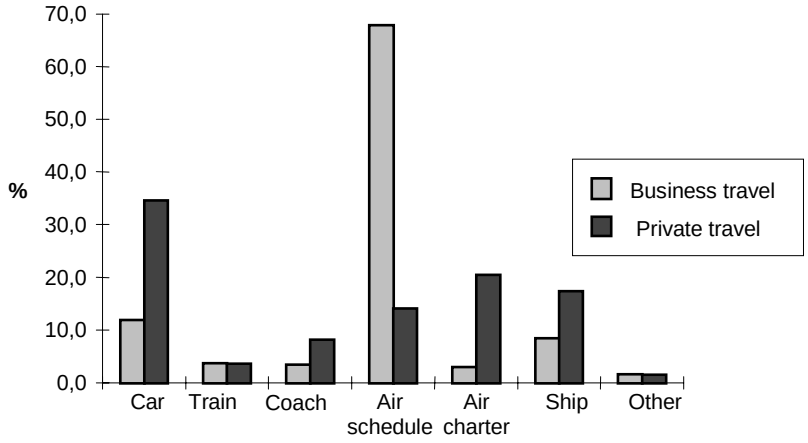


Figure 13. Means of transport for international travel, Source Riks-RVU.

Travel to Nordic countries accounted for over 40 % of all international travel. More than five of six journeys is to a European country. Figure 14 shows the most common destinations for international travel compared with the most common destinations twenty years ago.

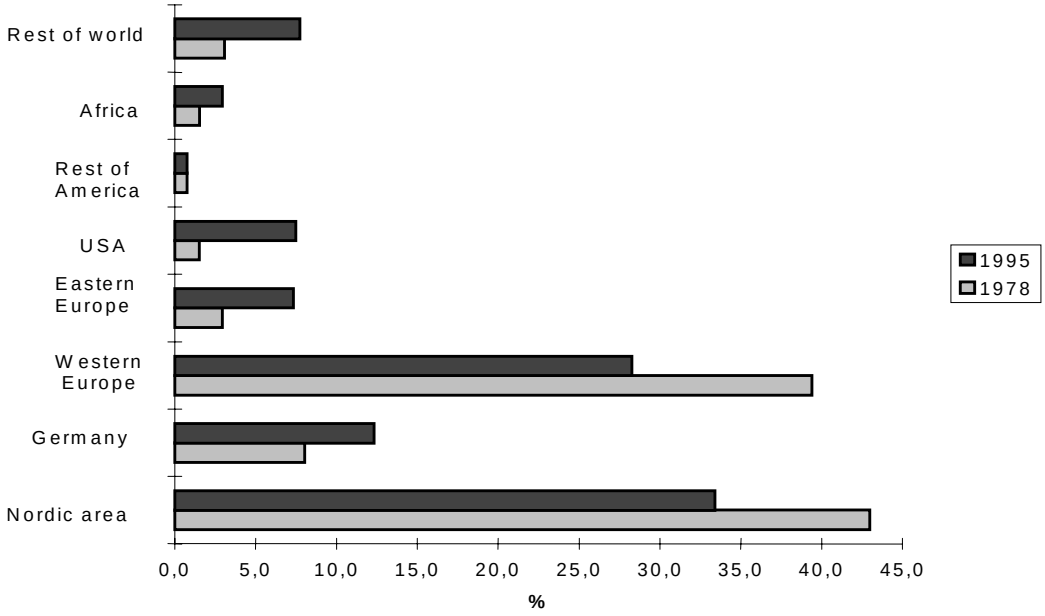


Figure 14. Foreign destinations 1978 and 1995. Source: RVU78 and Riks-RVU (SIKA Rapport 1997:3).

1.7 Difference between men's and women's travelling habits

Women and men choose different forms of transport to some extent, see Figure 15. Regardless of sex, the car is the most common means of transport, however, and approximately 60 % of all journeys take place by car. Men opts for car travel on average for more than every other journey while women travel by car every third time they travel.

Men predominate as car drivers and drive 75 % of the total distance travelled by car. Women travel as passengers – two-thirds of all passengers in cars are women.

Men also fly twice as much as women – over seven air journeys per year for men and over three for women. However, men and women travel approximately the same amount by cycle and on foot.

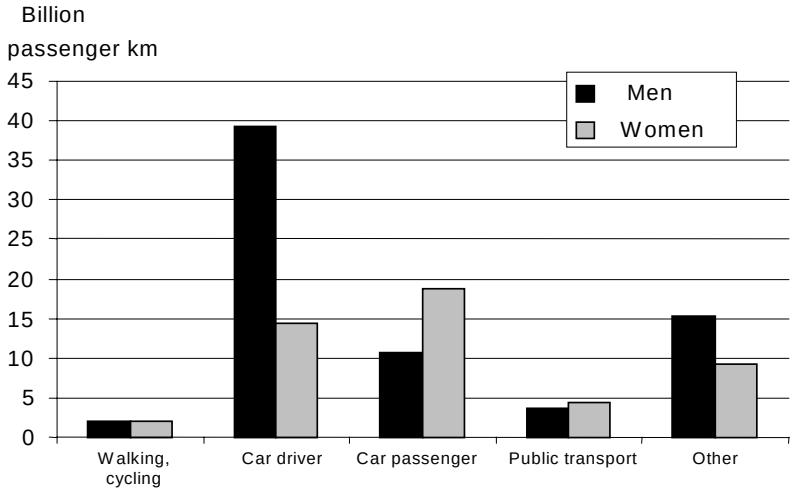


Figure 15. Differences in choice of mode of transport between women and men. Source: Riks-RVU 1997 (SIKA Rapport 1997:7).

Men make longer journeys than women. However, since women on average have lower wages than men, there is a risk of confusing sex differences with wage differences in the statistic. It can be seen from Figure 16 that the distance a person travels depends rather on their income than gender. In some income brackets, there is almost no sex difference as to length or travel or time.

The travel category with the greatest difference between men and women is business travel. Men account for almost three-quarters of all business travel.

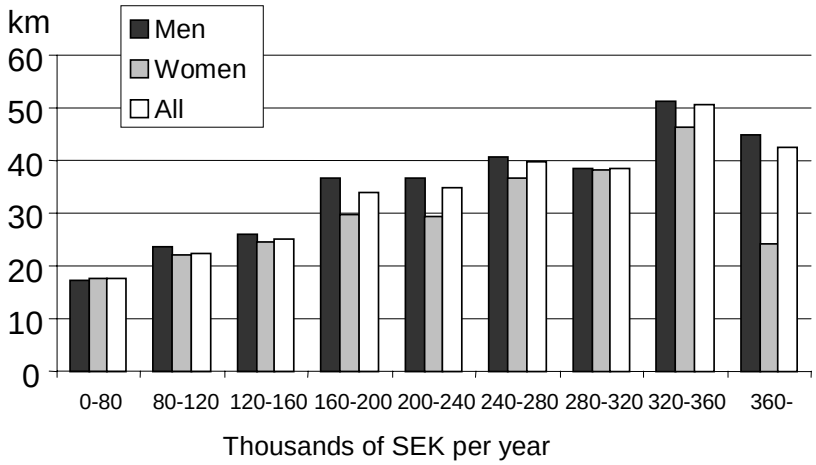


Figure 16. Average distance travelled by car by men and women in different income brackets. Source: Riks-RVU 1997 (SIKA Rapport 1997:7)

2 Freight transport

The total domestic freight transport (measured by tonne-kilometer) has almost quadrupled since the 1950s, se Figure 17. During the period 1975–93, transport performance increased by 1.2 % per year.

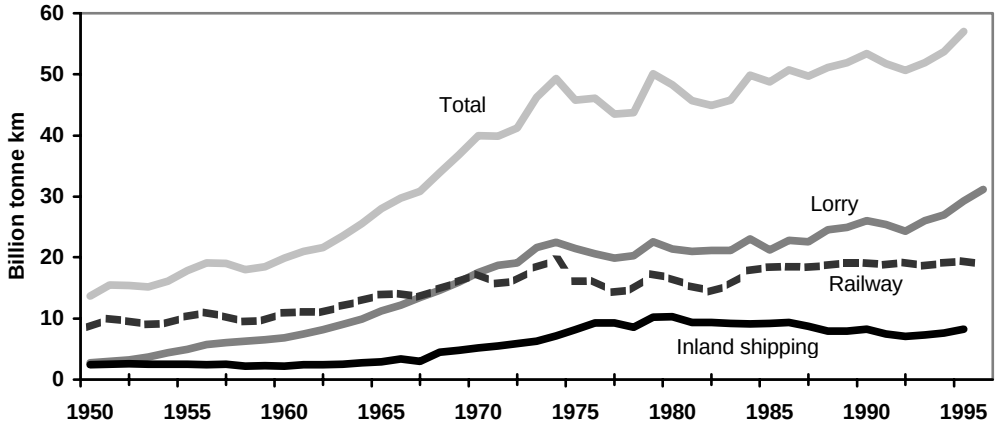


Figure 17. Growth of freight transport, total and by means of transport. Source: SAMPLAN 1995

Most characteristic for developments in recent decades of domestic freight transport is that the lorry has taken an increasing market share and is the dominating means of transport. Since the mid-1970s the rate of increase for lorry transport has slowed down, however. During the most recent years, transport performance by lorry has begun to increase more (by between 5 and 10 % per year) while freight transport by railway has stagnated. Inland shipping has stagnated or declined after an increase in the early 1970s.

Freight transport for shorter distances (up to 100 km) takes place almost exclusively by lorry, see Figure 18. Even for distances up to 300 km, lorry transport dominates (over 60 %). while freight transported by train accounts for 25 %. Over distances exceeding 300 km, shipping dominates, accounting for almost half of the transport performance, while the shares of lorry and railway transport are more equal.

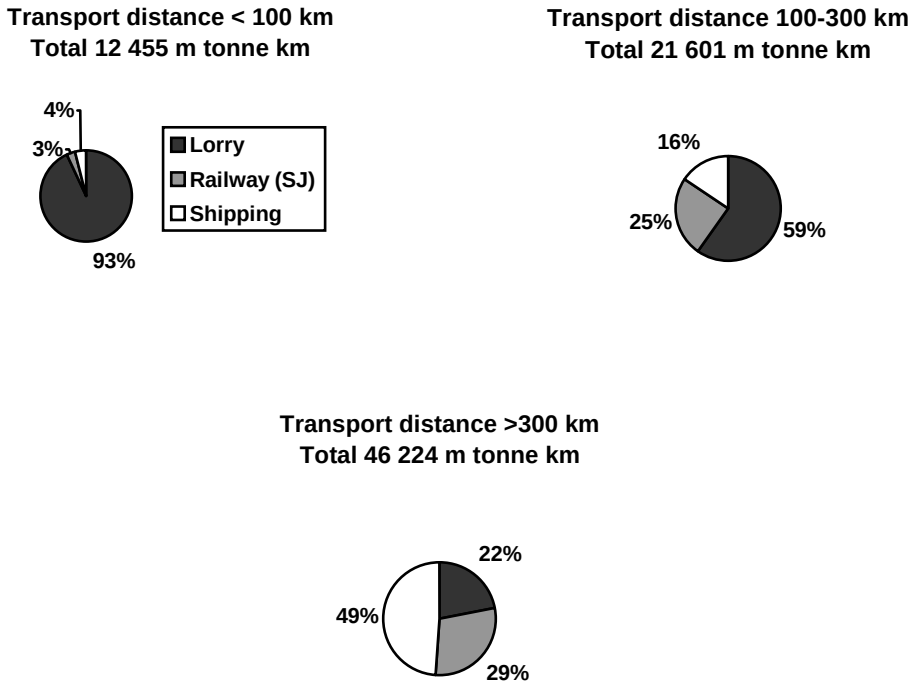
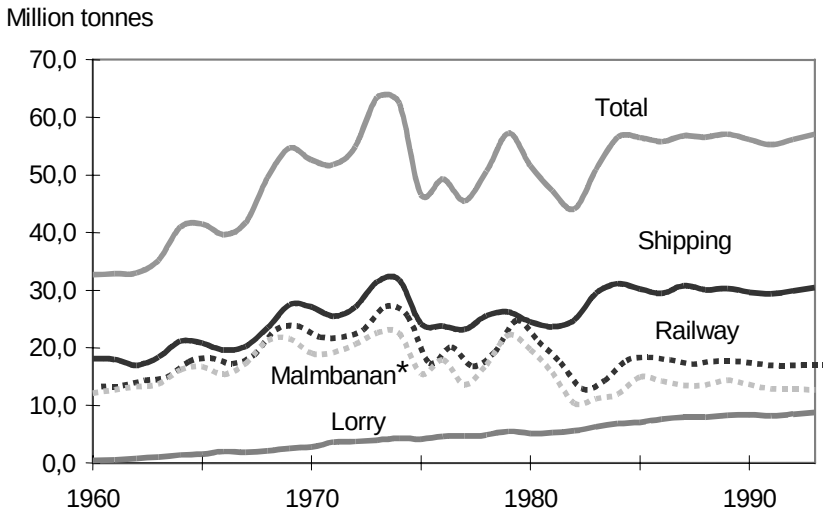


Figure 18. Transport performance in Sweden by different modes of transport according to transport distance in 1993. Source: T 30 SM 9403.

Shipping plays a considerably greater role for international transport than for domestic freight transport, which is also shown in Figures 19 and 20. These figures show the development and distribution by form of transport of exports and imports of goods over the last thirty years.



* Railway line on which iron ore is transported in northern Sweden

Figure 19. Growth and distribution by mode of transport of export of commodities 1960–93, million tonnes. Source: SAMPLAN 1995.

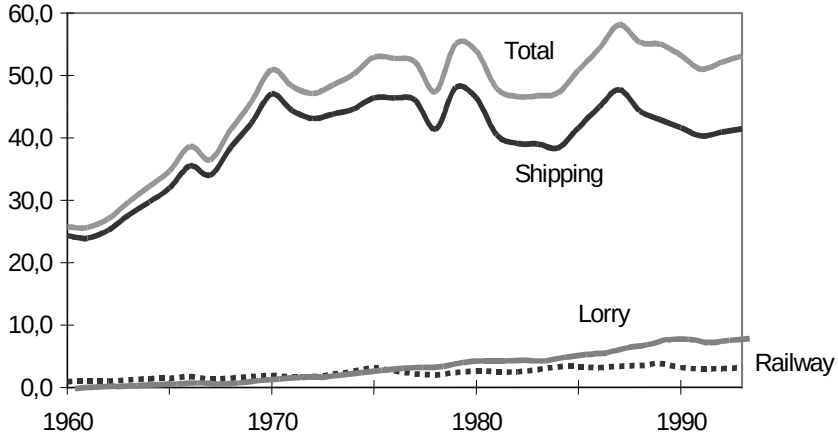


Figure 20. Growth and distribution by mode of transport of import of commodities 1960–93, million tonnes. SAMPLAN 1995.

2.1 The Swedish international commodity flows

Swedish foreign trade has grown substantially in value during the period after the Second World War. Between 1955 and 1995, the volume has grown from 84 to 402 billion Swedish crowns (SEK) per year in fixed prices, which is equivalent to an annual rate of increase of approximately 4 % per year. During largely the same period of time, from 1957 to 1995, GDP in fixed prices has grown by an average of 2.8 % per year. In 1957, exports accounted for 18 % of the demand side of the balance of resources' and in 1995, it had increased to 30 %.

Commodity quantities in international trade have also grown although not at the same rate as the volume (value) of trade. During the period 1955 to 1994, the quantity has grown from 47 million to 119 million tonnes per year, which is equivalent to an average rate of increase of over 2 % per year. The distribution of Swedish foreign trade by means of transport is shown in Table 2 and Figure 21. The picture of the importance of the mode of transport varies depending on whether goods are compared by volume or value.

Table 2. Distribution of Swedish international trade by mode of transport in 1994. Source: Foreign trade statistics, Statistics Sweden.

	Breakdown by million tonnes				*Breakdown by value of goods (SEK billion)*			
	Railway	*Lorry*	*Ship*	*Air*	*Railway*	*Lorry*	*Ship*	*Air*
Export	19,2	11,6	32,9	0,05	35	246	141	42
Import	2,5	9,0	43,9	0,06	16	215	102	33
Total	21,7	20,6	76,8	0,11	51	461	243	75
Proportion per cent	18	17	64	0	6	56	29	9

Note. Export of iron ore by Narvik is included in the quantities by rail at approximately 13 million tonnes per year.

For shipping, import and (re)export of oil and oil products amounting to 24 and 9 million tonnes per year are included.

Figure 21. Distribution of Swedish foreign trade by mode of transport in 1994 according to volume of goods and commodity values in per cent. Source: Foreign Trade statistics, Statistics Sweden

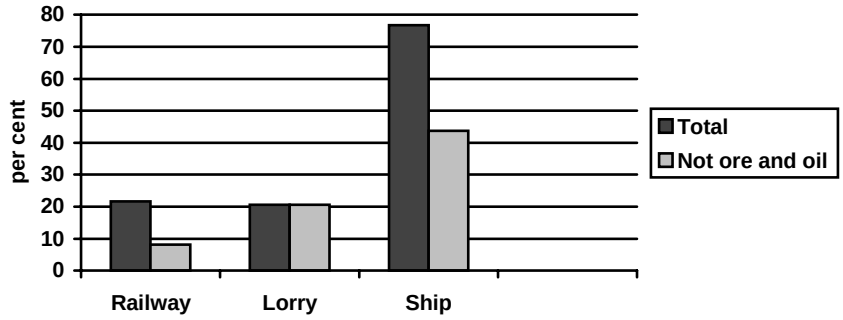


Figure 22, Breakdown of total quantity of foreign trade by means of transport totally respective equivalent distribution of ore and oil is disregarded (million tonnes/year). Source: SIKA Rapport 1997:3.

Due to the long transport distances, foreign trade gives rise to considerable transport performance. This transport performance takes place within Sweden's borders or along the coasts and internationally.

Of the total goods transport performance on Swedish infrastructure and in shipping lanes along Swedish coasts considerable parts relate to transport of foreign goods. This is shown in Figure 23.

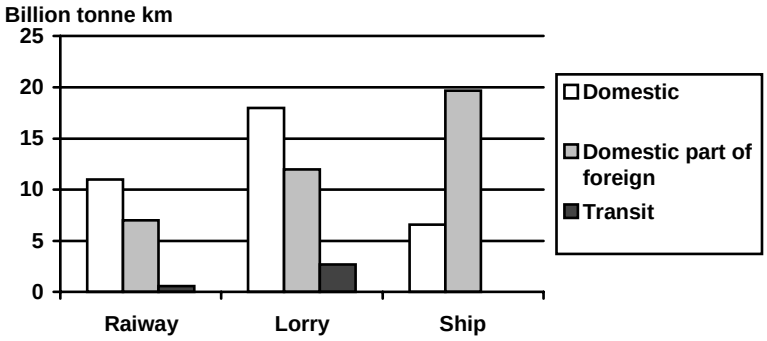


Figure 23. Domestic and international transport's contribution to transport performance in Sweden and along the coasts in 1993. The domestic part of foreign transport includes transport that takes place to/from harbours for reloading to /from a foreign location. Source: Statistics Sweden and SIKA model analyses. Information on transit traffic is not available for shipping.