
Summary:

Determinants of Urban Transport Development in Norway

Car use accounts for most of growth in urban transport

The development of the largest urban areas during the last 10 – 15 years is characterized by changes in a number of important factors relevant to passenger transport: Population growth, changes in land use and localization, changes in employment and enterprise, growth in total amount of local traveling, growth in car fleet and license holders, a significant number of road construction projects and changes in framework conditions for public transport.

From 1987 to 2002 car use accounts for 73 per cent of all growth in motorized passenger transport on a national level. During the same period the population growth was 10 per cent, of which 87 per cent came in the ten largest urban areas. Most of the growth in car use can be related to the cities and to the residents of the urban areas.

The population growth in the urban areas should mean an expansion of the market and a growing demand for public transport. This is the case in the Oslo-region, while most of the other urban regions have experienced a decrease in the demand for public transport, in share of travels as well as in number of passengers.

Population size and density

Population size as well as density are of vital importance for the demand for public transport. Norwegian cities in general have a low population density when compared to European cities. A significant growth in population is expected for the largest urban areas. In nine of ten urban areas there have been growth in the population density during the last years. This may make it easier to offer compatible public transport services.

The increase in prices for transport services and petrol have been stronger than the general increase in prices for consumer goods and costs of living since 1990. Bus fares have increased by 85 per cent since 1990.

Driver's license holdership

There has been a decrease in the gender difference of driver's license holdership over the years. In 1985 54 per cent of the women had a licence, compared to 74 per cent in 2003. For men the change has been much smaller, from 82 to 90 per cent. The change is due to a growth in number of licence holders among men 65 years and older and women over 50 years of age. Among the young there has been a continuous reduction in the number of license holders since 1994, but this tendency seems now to have halted. An increase in the number of students, more youth moving to the cities and changes in life style and

The report can be ordered from:

Institute of Transport Economics, PO Box 6110 Etterstad, N-0602 Oslo, Norway

Telephone: +47 22 57 38 00 Telefax: +47 22 57 02 90

attitudes may be explanations for the decrease in the number of young license holders. Despite this tendency, a growth in the total number of licenses is expected for the coming years due to a significant growth in the number of old license holders.

Car density

During the first half of the 90ies, there was a very modest growth in the car fleet, while the growth in number of license holders was considerable. This meant more competition over the car within the families. From 1996 the growth in the car fleet has greatly outnumbered the growth in license holders, and the ratio between cars and licenses is back to the level of 1990.

The level of car density is not high in Norwegian cities compared to what is found in other European cities. In 1995 the car density in the Oslo-region was about 80 per cent of cities of comparable size, like Stuttgart, Düsseldorf, Geneva and Zürich. Further growth in car density should therefore be expected.

The significance of the urban structure

For various reasons densely populated cities may have a low rate of car use. A concentration of a large population within a limited area gives a good market potential for public transport, limited access to parking and shorter distances, which reduces the need for motorized transport. Car use will also vary with place of residence within the city, especially in larger cities. In the central part of Oslo less than a third of all travels starting at home are by car, while the share is 60 per cent in suburban municipalities. The average distance of daily traveling is 15 km for those living in the inner city and more than 30 km for those who live 15 km or more from the city centre.

The share of public transport travels increases when the destination is in or near the city centre. Oslo has a greater volume of public transport, when it comes to the public transport's share of travels in general, as well as the extension of the area with a high public transport share.

In the 1980ies there was a general tendency to higher population growth in within areas with a high level of car use as compared to areas with a more frequent use of public transport. The trend continued during the 90ies, although in a somewhat weaker degree due to reurbanisation of the inner city.

The dynamics of business development in the cities have implied a higher concentration of activities to areas with an inferior supply of public transport, a city development acting as a driving force towards more car use.

Trends and driving forces for public transport

With few exceptions the supply of public transport in terms of frequency and number of vehicle kms per capita has been relatively stable since 1986. During the same period most Norwegian cities have experienced a decline in the number of passengers. The fare level of public transport shows a higher growth than the general growth in costs of living. Public funding of public transport varies greatly from city to city. The general tendency is still that public funds are being reduced. Especially the second largest cities Bergen and Trondheim have seen significant reductions in public funding.

An analysis of demand for public transport based on aggregate data is presented. A 10 per cent increase in vehicle km per capita causes a 4.4 per cent increase in public transport trips. A 10 per cent increase in fares gives a 3.3 per cent decrease in the demand. A 10 per cent increase in petrol prices causes a 1.2 per cent increase in the demand for public transport.

Not all travelers respond the same way to changes. Car ownership and place of residence and work are factors which tend to preserve travel habits. Analyses of short term as well as long term effects are undertaken and indicates that the long term effect of e.g. changes in fares is 2.2 times stronger than the short term effect.

Changes in travel behaviour

Since 1985 Akershus, the surrounding urban district of Oslo, has experienced a continuous growth in car use, a reduction in walking and cycling and a constant share of trips by public transport. In the city of Oslo the trends towards increased car use and a reduction in public transport seem to have stopped by the early 90ies. On the one hand the population growth and the revitalization of the inner city seem to have strengthened the market for public transport, while at the same time the urban sprawl has continued in Akershus with increased car use as a result.

During the 90-ies the increase in car use was even more significant in the second largest cities and in the medium-sized urban areas with 50.000 – 100.000 inhabitants. In most of these cities public transport has suffered a serious set-back.

While number of trips per person is unchanged over the years, there is a change in the purpose of the trips. We find an increase in shopping trips and accompanying others, which could be collecting children from kindergarten, driving family member to leisure activities etc. This is part of the explanation of the growth in car use.

Travel behaviour and everyday life

On the basis of travel survey data multivariate analyses have been undertaken in order to establish the most important factors of modal choice for work trips for persons with a driver's license and at least one car in the household. Binary as well as multinomial logistic regression analyses are applied.

Parking conditions at work and the household's number of cars show the strongest effects on increasing the probability of going by car, while we also find similar effects of the various kinds of tasks and obligations linked to the work the trip, like collecting children at school or kindergarten, shopping or work related errands on the way. Short trips tends to give more walking and cycling, while long trips increase the probability of a trip by public transport. Working in the inner city gives a higher use of public transport. There are also independent positive effects of the quality of the public transport supply.

Varying between modes of transport

From travel survey analysis we know what affects modal choice for a specific trip, while our knowledge of how we vary between modes over time for the same type of trips is much more limited. Data collected for an assessment study of a government program for stimulating the development of more rational and environment friendly transport are analyzed. Multinomial logistic regression is applied in order to establish what factors are of significance when car drivers occasionally, or on a more regular basis, vary between going by car and other transport modes for their work trips.

Free parking at work and no competition over the car in the household increases the probability of always going by car. The difference in travel time is also of great importance as is the knowledge of time use for the optional modes. Those who loose only a little time by choosing an optional mode will tend to vary more between the car and other modes than those who suffer a significant time loss. Those who know the details of the public transport option will have a greater probability of going by public transport.

For trips shorter than 5 kms the probability of varying between the car and walking or cycling increases, while few vary between the car and public transport for short trips.

Urban transport scenarios

Scenarios for the various determinants of urban transport development are being discussed, such as population growth, urban density, driver's license, car ownership, city structure, framework conditions for car use and public transport and the complexity of everyday life. From this three possible scenarios are discussed further, the first of them using a strong population growth as a driving force for a more environment friendly development. The growth will give opportunities for a more densely populated city which can offer more efficient public transport, shorter travel distances and reduced need for the car. Scenario 2 will be a continuation of the trends of the last decades. The toll road systems will be maintained and public transport will keep it's share of travels in the Oslo-region, but will experience problems in the second largest and smaller cities. In the most pessimistic of the scenarios there will be only moderate regulations on car use. This will give public transport a serious set-back, especially in the medium sized cities.