

## Summary

# City size and travel behaviour

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*Urban structure and land use plays an important role in how daily travel is conducted in Norway. Which transport modes are used, how far we travel and how often we conduct a trip varies in different urban areas. However, the relationship between urban structure and travel behaviour is not the same in all of Norway. The findings in this report show that high densities have a stronger relationship with transport mode use in large cities than in smaller cities and towns. This can indicate that densification as a mean to reduce car use will be less efficient in smaller places. The analyses in this report also show that other factors influence people's travel behaviour: Access to work places, the public transport service, and whether one conducts different chores, such as shopping and chauffeuring children.*

## Background

In Norway, there is a large variation in where and in which urban environment people live, work and travel. Some live in large cities, with work places, shops and other services within bicycle and walking distance. The large cities often also include a good public transport service. Other live in smaller cities and towns, with less dense land use and longer distances to work and other services. In the “zero growth goal” for Norwegian cities, it is stated that an efficient urban structure (high density) is an important mean to reduce climate gas emissions, congestion, air pollution and noise. However, this goal only applies to the largest city regions. At the same time, more than half of the Norwegian population live in smaller cities and towns. Therefore, it is interesting to study travel behaviour, and the relationship with urban structure, also in the smaller places in Norway. In this report, we utilize data from the National Travel Survey (2016-2018), with additional data on urban structure from Statistics Norway.

## Oslo is the most densely populated urban area in Norway

Urban structure and density vary quite much between different urban settlements in Norway. The figure below shows the share of the population living in census tracts with different population densities, in different categories of urban settlements. We see that almost three quarters of the population in Oslo live in census tracts with more than 3000 people per square kilometre. In the other large cities, the share is 44 percent, while it is 21 percent in medium sized cities.

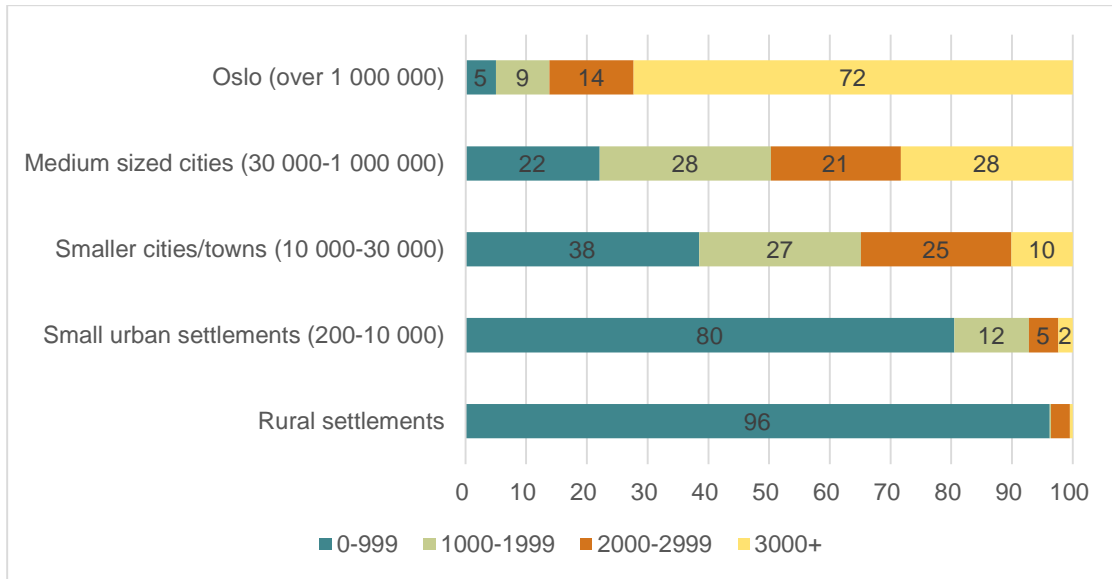


Figure S.1: Population density in census tracts, divided by categories of urban settlements, weighted by population (SSB, 2018). Percent.

## The relationship between density and travel behaviour

In our analyses, we find that both city size and urban structure have a strong connection with travel behaviour. The larger cities or towns people live in, the less they choose a car on their daily journeys, and the more they choose public transport, cycling and walking. The same applies to urban structure (population density): In densely populated areas, the car share is lower, and the public transport, walking and cycling shares are higher than in more dispersed areas. At the same time, we also find that the connection between population density and means of transport varies in different city sizes. The figure below shows how the car share varies with increased density, for each category of urban settlement size.

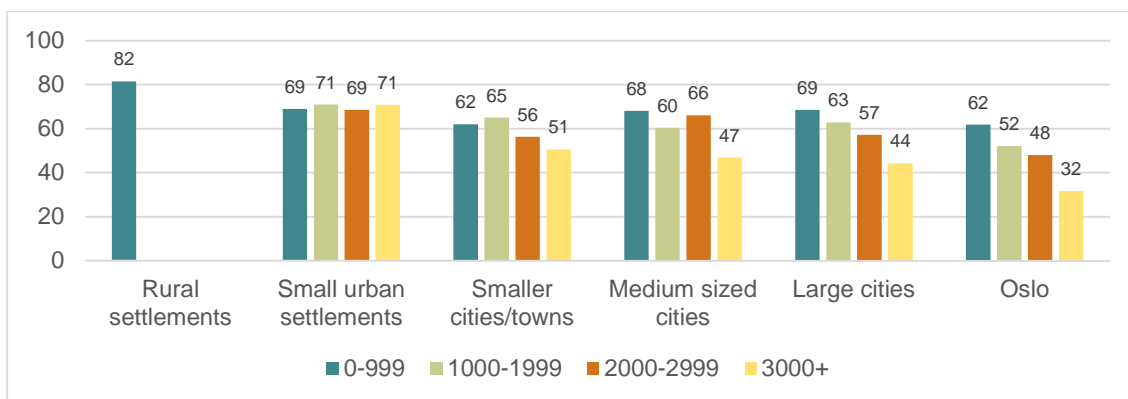


Figure S.2: Car share, by urban settlement category and population density (persons per square kilometre). Percent.

In the large cities (including Oslo) we see that there is a clear connection between density and car use. With increased density, the car share decreases. Also in the medium sized cities we see a certain tendency for coherence, although this is smaller than in the large cities.

In smaller places, however, there is a weaker relationship between density and car use. The car share decreases somewhat with increased density in smaller cities, but in small urban settlements the car share is almost unchanged. Public transport also follow a similar context. In Oslo, we find a doubling of the public transport share from the least dense to the most densely populated basic districts, while the increase is considerably smaller in other cities and towns.

## In Viken, distance to Oslo is important

In addition to the nationwide analyses, we have also made our separate analyses for Viken county. Viken is Norway's largest county, and Oslo and Viken together include more than 35 percent of Norway's population.

The findings from Viken are largely in line with those we find for the whole country. The connection between city size, urban structure and travel behaviour is strong, but the effect of density is also stronger here in the largest cities. At the same time, we also find that proximity to Oslo city centre has a lot to say for travel behaviour in Viken. Those who live less than 25 km from central Oslo drive considerably less than those who live further away, as the figure below shows.

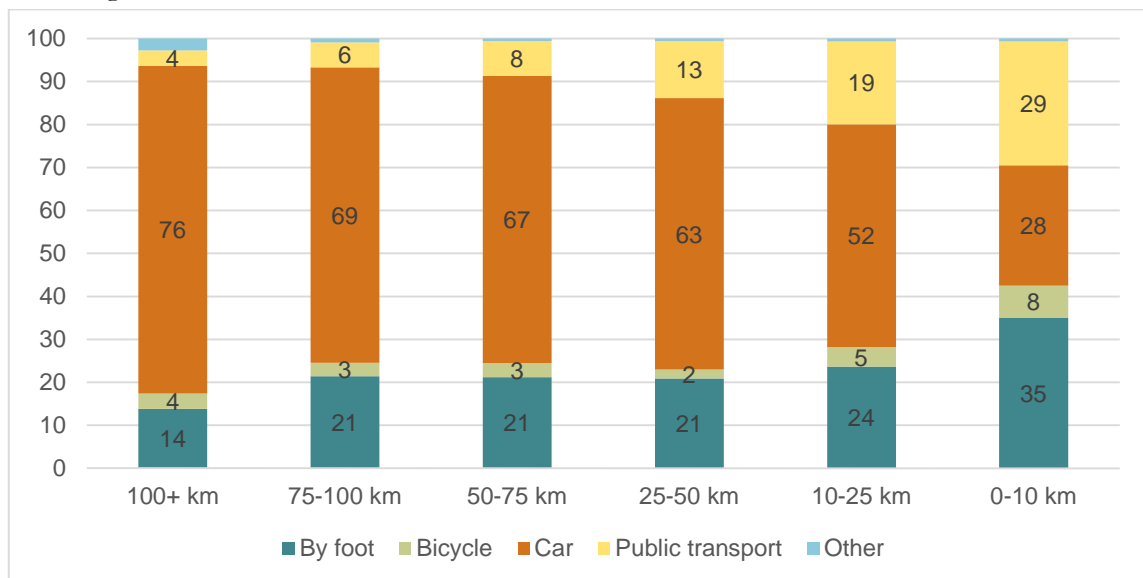


Figure S.3: Transport mode split on trips in Viken under 100 km, starting in respondent's residence, by distance to Oslo city centre. Percent.