Institute of Transport Economics
Norwegian Centre for Transport Research

Summary:

Environmental effects of locating housing and workplaces in close proximity to train stations

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ROM Eiendom AS administrates large, central areas close to public transport nodes in several Norwegian cities. As part of their work with urban development in and near nodal points, ROM Eiendom wanted a knowledge basis, examining the effects such developments might have on passenger transport. This report is aimed at transport-related effects of central nodal point development in suburbs and cities outside Oslo, but within the InterCity-triangle. To investigate the effects of central nodal point development, we have compared travel patterns to and from central areas with travel patterns to and from non-central areas. The transport-related effects are calculated for three different city typologies: Oslo suburbs (data from Lysaker, Sandvika, Asker, Ski and Lillestrom), cities relatively near Oslo (data from Drammen and Moss) and cities further out (data from Fredrikstad, Sarpsborg, Tønsberg and Hamar). The analyses show that central nodal point development does have effects.

Important findings

In Oslo suburbs (e.g. Ski) residential and workplace development near central nodal points gives 13 percentage points lower car shares on commuter trips and 5 percentage points lower car shares on residential trips, compared to those who live or work outside the city. By developing near central nodal points, the average number of vehicle kilometres (vkm) by car is reduced by 0,5 % per resident and 17 % per employee, compared to development in a non-central location.

In cities relatively near Oslo (e.g. Moss) residential and workplace development near central nodal points gives 21 percentage points lower car shares on commuter trips and 17 percentage points lower car shares on residential trips, compared to those who live or work outside the city. By developing near central nodal points, the average number of vehicle kilometres (vkm) by car is reduced by 21 % per resident and 35 % per employee, compared to a non-central development.

In cities further out (e.g. Hamar) residential and workplace development near central nodal points gives 12 percentage points lower car shares on commuter trips and 6 percentage points lower car shares on residential trips, compared to those who live or work outside the city. By developing near central nodal points, the average number of vehicle kilometres (vkm) by car is reduced by 21 % per resident and 14 % per employee, compared to a non-central development.

Calculations

Analyses of data from the National Travel Survey shows that developing housing and workplaces in central locations leads to an increase in number of trips by public transport, fewer car trips and fewer vehicle kilometres (vkm) by car, compared to a less central development (see Figure E1 and E2).

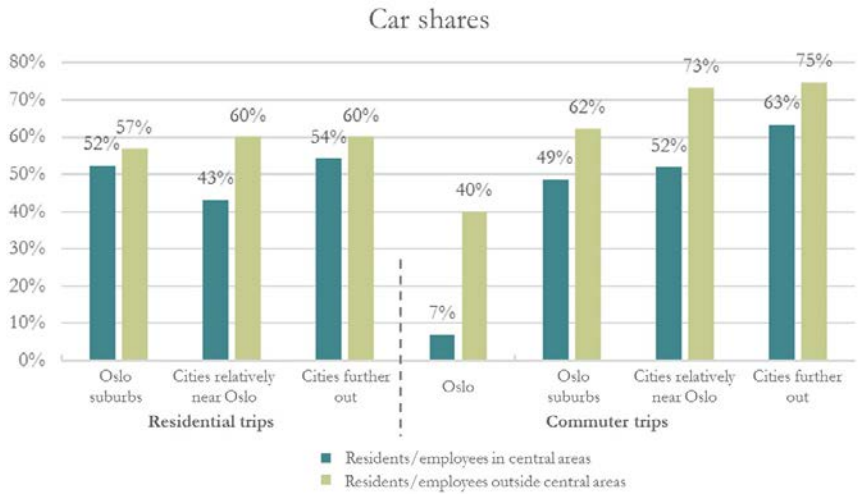

Figure E1: Car shares on residential trips and on commuter trips, for the three city typologies.

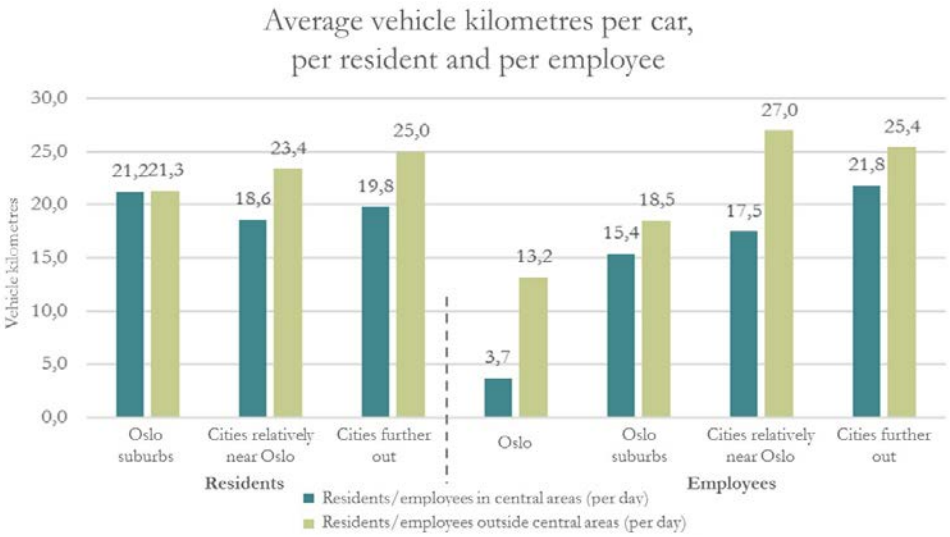

Figure E2: Average number of vehicle kilometres by car per resident and per employee, for the three city typologies.

The effects varies based on whether we look at residents, employees or the grand total, and from place to place. In two of the three city typologies, developing central workplaces leads to higher savings in vehicle kilometres than central residential development (see Table E1).

Table E1: Vehicle kilometres (vkm) saved per resident and employee, by development near central nodal points instead of outside central areas.

Oslo suburbs		**Cities relatively near Oslo**		**Cities further out**	
Resident	Employee	Resident	Employee	Resident	Employee
- 0,5 %	- 17 %	- 21 %	- 35 %	- 21 %	- 14 %

By focusing on development and densification near central nodal points, city qualities and a better local public transport can emerge over time, and there will likely be changes in travel patterns compared with the current situation. The positive effects of development near central nodal points could be even greater. Given the objectives of zero growth in car traffic and the potential for densification in central parts of the cities, we also illustrated how a hypothetical reduction in car shares (to 30 and 40%) can affect the number of vehicle kilometres generated by new residential and workplace development (ceteris paribus).