

Science for Environment Policy

Urban planning could change driving behaviour

Car use could be reduced through careful urban planning, according to the results of a new German study. By combining data on driving behaviour and high-resolution satellite imagery, the researchers show how patterns of land and car use are connected.

Cars are a major source of [greenhouse gas](#) (GHG) emissions and are responsible for 12% of European CO₂ emissions. US studies have suggested that better urban design can reduce car use and emissions, but there is very little equivalent evidence from Europe.

For this study, the researchers focus on Germany because its planning policies have for decades promoted integration of different [land uses](#) in order to reduce car use. This may partly explain why Germany was able to reduce its GHG emissions between 1990 and 2009, despite high levels of car ownership.

The researchers gathered government survey data from between 1996 and 2009 regarding car use from Monday to Friday. They then plotted the locations of the surveyed households onto high-resolution satellite images of land use from the same period and used these two datasets to explore patterns of land and car use.

Overall, as diversity of the landscape increased – indicating an increase in the integration of different land uses – household mileage decreased, suggesting that people drive less when land use is more mixed. The probability of owning a car and the distance driven each week was higher in less built up areas. These results suggest that if more people lived in well-designed urban areas with mixed land use, emissions could be reduced.

The distance between the households and commercial activities or transport links also had an effect. Fewer households owned cars and weekly mileage was lower in areas where there were a higher number of businesses, suggesting that distance to work had an important influence on car use. Households located further from transport stops were more likely to own a car and households near rail services drove less than those that only had bus services. In addition, where fuel prices were higher, household mileage was lower.

Socioeconomic factors, as well as distance from local amenities and businesses, can influence driving behaviour and the researchers showed that people from wealthier households drove further. However, the researchers' model accounted for this, meaning that patterns of land use have an effect even when differences in household income are taken into consideration. Households with young children were less likely to own cars, but drove greater distances when they did. There were also differences in driving behaviour in east and west Germany, which the researchers think may relate to the relatively depressed economy and lower average income in the east. Household car ownership was lower in the east, but mileage was higher, perhaps due to longer commutes.

The researchers suggest that their method of combining high resolution satellite imagery with survey data can be useful not only in understanding driving behaviour but also in making decisions about [urban planning](#). Their results hint that combining different land uses in highly developed urban areas could reduce emissions through reduced car use. They also suggest that offering preferential tax rates on properties in urban areas could help lower emissions by reducing car driving. However, it is worth noting that the study focuses on car ownership and driving distances, and reductions in CO₂ emissions associated with decreased car use were inferred but not measured.



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