

Car Dependency and Air Quality

Edward Casey

Introduction

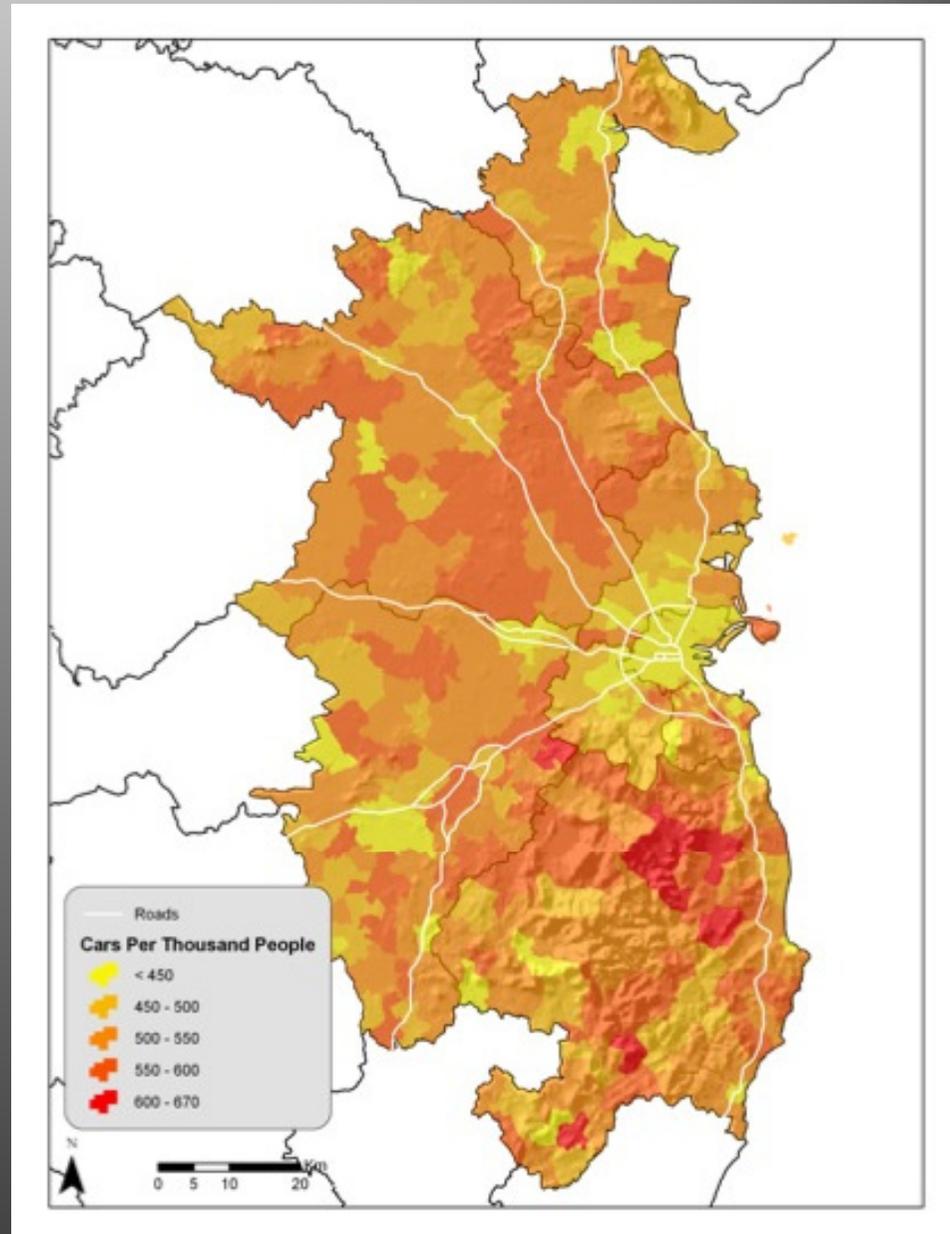
A large number of sources contribute to the degradation of air quality in the urban environment. Vehicular emissions are believed to be one of the most important contributors to poor air quality in any city. The combination of narrow streets (Berkowicz et al., 2006), high traffic volumes and large populations living and working in close proximity to major roads (Roorda-Knape et al., 1998) means that those living in urban areas are more likely to be affected by poor air quality.

The Central Statistics Office (CSO) Place of Work Census Anonymised Records (POWCAR) provides information about the travelling habits of more than 1.8 million people and their commute to work each day in Ireland (CSO, 2007). Information relating to the number of trips by personal (bicycle or walking), private (car, scooter or motorcycle or a passenger) and public (bus, coach, train, LUAS and DART) are presented in the following images. It is clear that there is a distinct reliance on private means of transport in areas outside the metropolitan area of Dublin. Car occupancy is low for the region, averaging just 1.1 people per car. Car ownership levels, based on a combination of CSO and Vehicle Registration Unit data (VRU, 2006), are significantly higher outside Dublin city.

Car Ownership

To examine the dependency of people on the private car as a means of transport the total number of vehicles in each Electoral Division (ED) within the region, is divided by the total population.

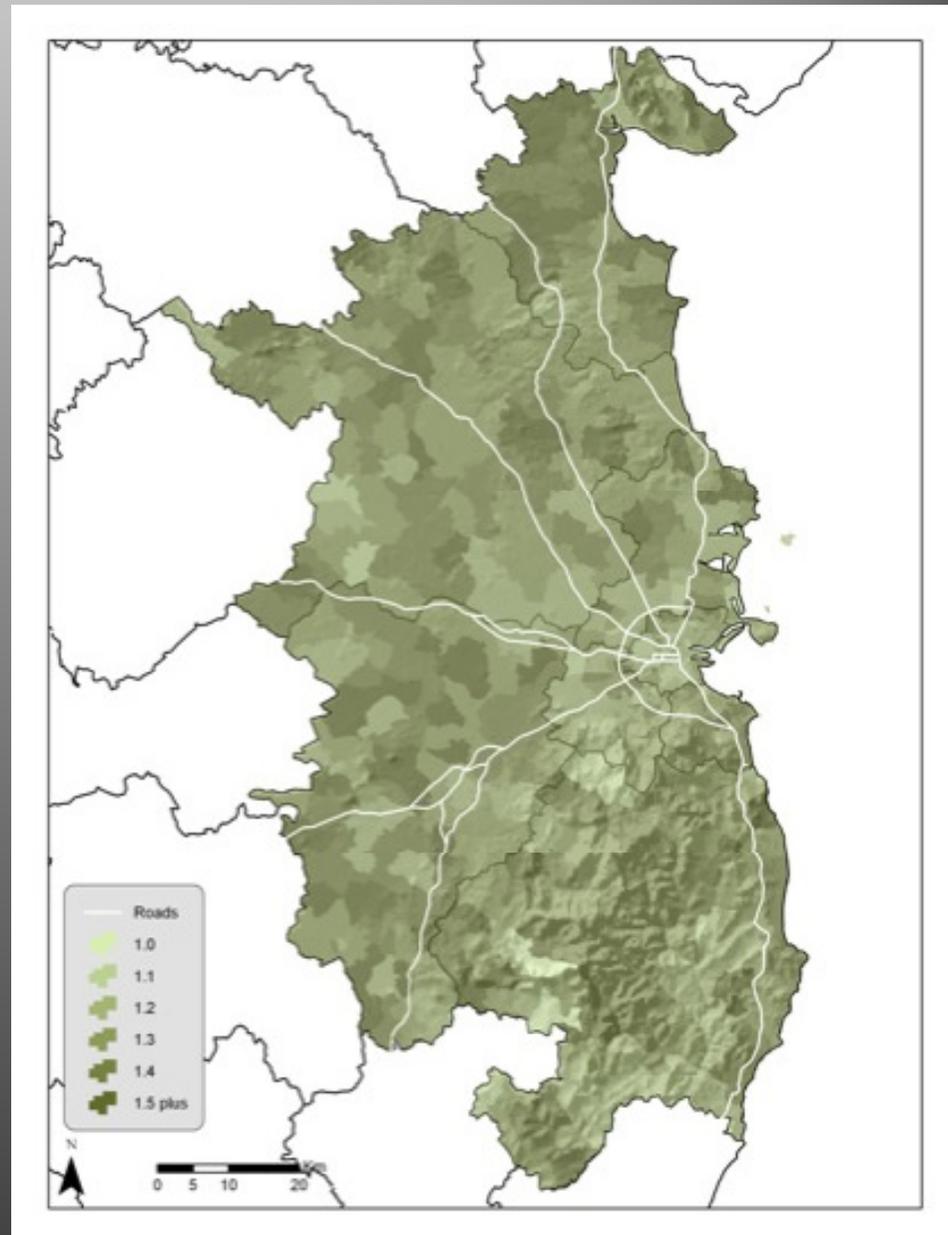
This gives a spatial distribution of car ownership per thousand population. It shows that in more isolated areas ownership of private vehicles is higher than that in core urban areas.



Map 4.1 Number of private cars per thousand head of population in each ED.

Car Occupancy

The average occupancy of private cars in the morning stands at 1.1 people per vehicle, based on analysis of Census of Population data from the CSO. In general, higher occupancies are observed in more rural areas, with actual occupancy rates being as low as 1 person, the driver, in Dublin. An interesting metric is also to examine the percentage of trips that are made by various modes of transport.



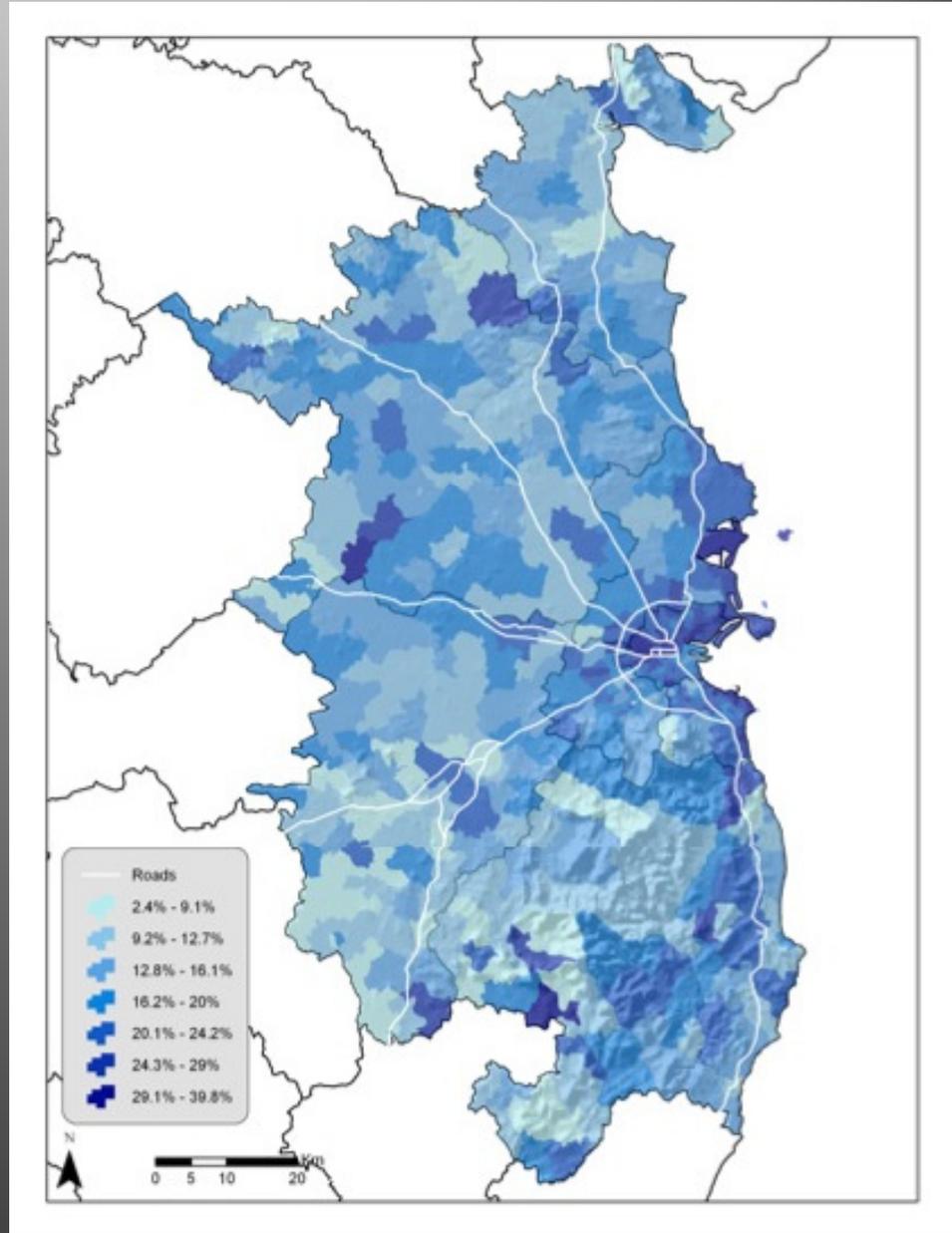
Map 4.2 Number of occupants per car travelling to work

Percentage Population Walking or Cycling

The Wicklow mountains, with limited access to public transport, shows significantly higher numbers of vehicles per thousand people than Dublin city centre. This discrepancy may well be to do with the higher level of infrastructural access in the city.

Other rural areas, in particular Meath, also show high numbers of vehicles.

However, it should be noted that owning large numbers of vehicles does not automatically imply higher use of vehicles

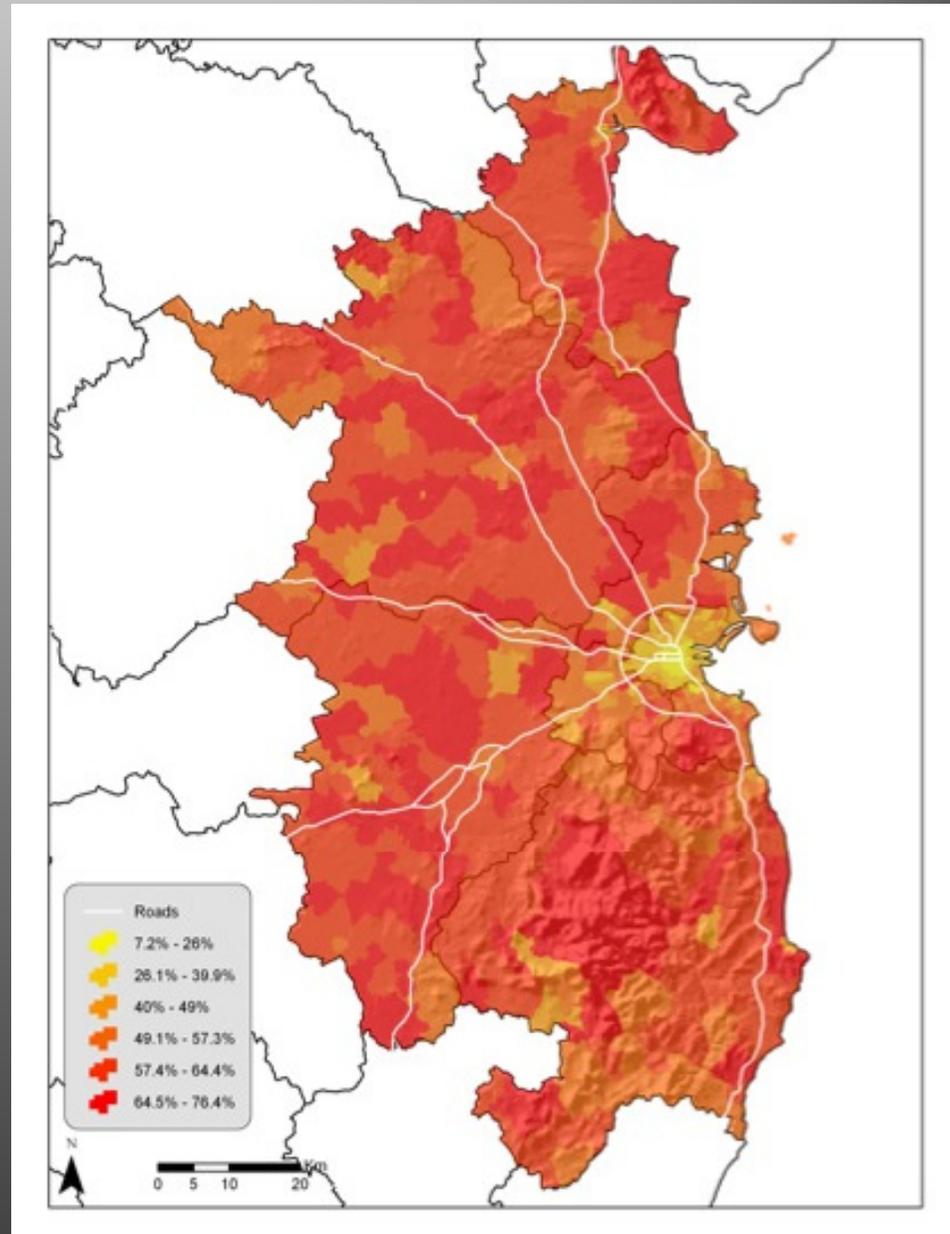


Map 4.3 Percentage population over age 15 walking or cycling to work

Travel to Work by Personal Means

Nearly 1.4 million trips are generated by people over the age of 5 in the region each morning in travelling to work, school or college.

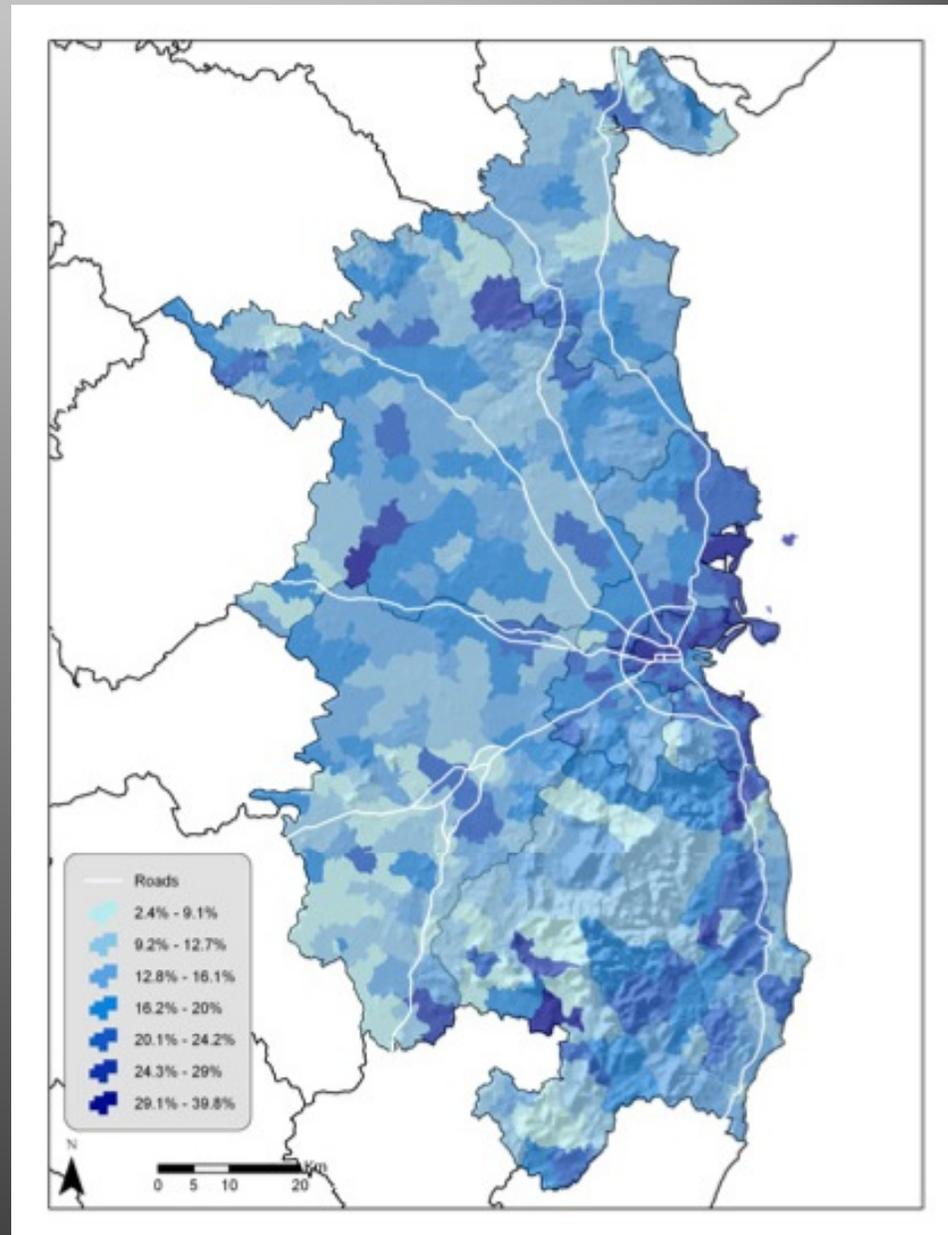
A very large number of these trips, more than 703,000, are generated by people using private transport.



Map 4.4 Percentage population travelling to work by private vehicle

People travelling to work by public transport

In all, three categorisations are considered, namely personal (walking or cycling), private (driving a car, being a passenger in a car, or using a motorcycle or scooter) or public (buses, coaches, trains, DART and LUAS). As expected, higher numbers of private trips exist in rural areas. In area close to urban centres, we can see higher proportions of personal mode trips. Public trips tend to be clustered around significant infrastructural links, such as LUAS and DART lines or quality bus corridors (QBC).



Map 4.5 percentage of population who travel to work using public transport