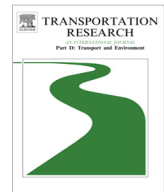




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Volume and GHG emissions of long-distance travelling by Western Europeans

Kees van Goeverden*, Bart van Arem, Rob van Nes

Delft University of Technology, Transport and Planning Department, Stevinweg 1, 2628 CN Delft, Netherlands

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ABSTRACT

It is generally recognised that long distance travelling accounts for a significant part of the mileage of person travel. However, estimates have been hardly made. The paper estimates volume and GHG emissions of long-distance travel by Western Europeans. The analysis is predominantly based on data of the DATELINE project, the only EU-wide survey on long-distance travelling, conducted in 2001 and 2002. Some studies demonstrate that DATELINE suffers from serious underreporting of journeys. We analysed the causes for underreporting and developed expansion factors that correct for that. These gave the opportunity to estimate long-distance travel volumes and related GHG emissions in 2001/2002. Next an update to 2013 is made using statistics on the development of tourist travel and patronage of long-distance modes. Defining long distance ≥ 100 km crow-fly, the estimates per capita in the Western European countries in 2013 are 7.5 journeys (defined as round-trips), 8600 km, and 1300 kg greenhouse gasses. The estimated total GHG emissions of long-distance travelling is 520 megaton. In the Netherlands and Flanders, countries where data on short-distance travelling were available, long-distance travelling accounts for 45% of the mileage and nearly 50% of the GHG emissions of all person transport. Long-distance travelling is growing and is expected to continue to grow, particularly by air. The GHG emissions are expected to grow as well, though to a smaller extent. Because short-distance travelling is stagnating, the shares of long distance travelling in both mileage and GHG emissions are likely to increase.

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Introduction

The long-distance travel segment is unimportant in terms of trip numbers but significant in terms of trip kilometres and, consequently, in terms of GHG emissions. Many people might intuitively agree with this general statement. However, research on long-distance travelling is not well developed and studies that can confirm or disaffirm the statement are rare. [Nicolas and David \(2009\)](#) who analysed data of the French travel survey of 1994, report a share of long distance travel of 40%; they defined long distance as more than 80 km as the crow flies. [Frick and Grimm \(2014\)](#) analysed recent German data and estimated a share of 45% of long distance trips, defining these as trips over 100 km. They also observe that long-distance travelling is growing while short-distance travelling stagnates. Therefore, the share will increase.

The aim of the paper is to make an estimate of travel volume and GHG emissions in long-distance travelling by residents of Western-European countries, both in absolute terms and in percentages of total person mobility. Available data regarding

* Corresponding author.

E-mail addresses: c.d.vangoeverden@tudelft.nl (K. van Goeverden), b.vanarem@tudelft.nl (B. van Arem), r.vannes@tudelft.nl (R. van Nes).

long-distance travelling are rare. In fact, there has been so far just one research project that produced the required data on a European scale: the DATELINE project. DATELINE was a survey on long-distance travelling, carried out in 2001 and 2002 in the 5th Framework Programme of the EU. The survey covered all 15 EU-countries at that time and Switzerland. Long-distance journeys were defined as journeys to destinations ≥ 100 km away as the crow flies; the 100 km limit is in Europe a generally accepted standard (DATELINE, 2001). DATELINE data are the major source for the analyses of this paper. We adopt the DATELINE definition of long distance (≥ 100 km as the crow flies) in the paper.

For estimating the current volumes of travelling and emissions using DATELINE data, two problems have to be solved. The first is the finding that DATELINE underestimates long-distance travelling significantly (Hautzinger et al., 2005; Kuhnimhof et al., 2009). The second is that the data are rather outdated. The paper includes both an expansion of the DATELINE data for describing more accurate volumes in 2001/2002, and an update to 2013. Fig. 1 gives an overview of the analyses in the paper.

The underestimation is mainly the result of excluding some types of long-distance journeys from the survey and underreporting by respondents. An additional reason for a not accurate presentation of real volumes is the rather rough weighting procedure that was used when the original factors for grossing up DATELINE respondents were developed. In order to get a better description of 2001/2002 volumes, we developed expansion factors that should correct for excluded journeys and underreporting, and refined the weighting. Comparison of the expanded volumes with those observed in other studies proved that still a significant underestimation remains. Probably, the initial expansion for underreporting, that was fully based on information in the DATELINE data, was insufficient. Additional expansion factors were developed for raising the volumes to those observed by other studies.

After implementing the expansion and correction two problems remain for calculating volumes in 2001/2002. First, DATELINE includes no information on travelled distances, but only on crow-fly distances that were calculated from the coordinates of the origin and destination locations. These have to be converted into actual distances which requires assumptions on detours. Second, if more transport modes are used for one journey, DATELINE gives no information about the extent each mode is used. The kilometres of the whole journey have to be partitioned in kilometres by mode.

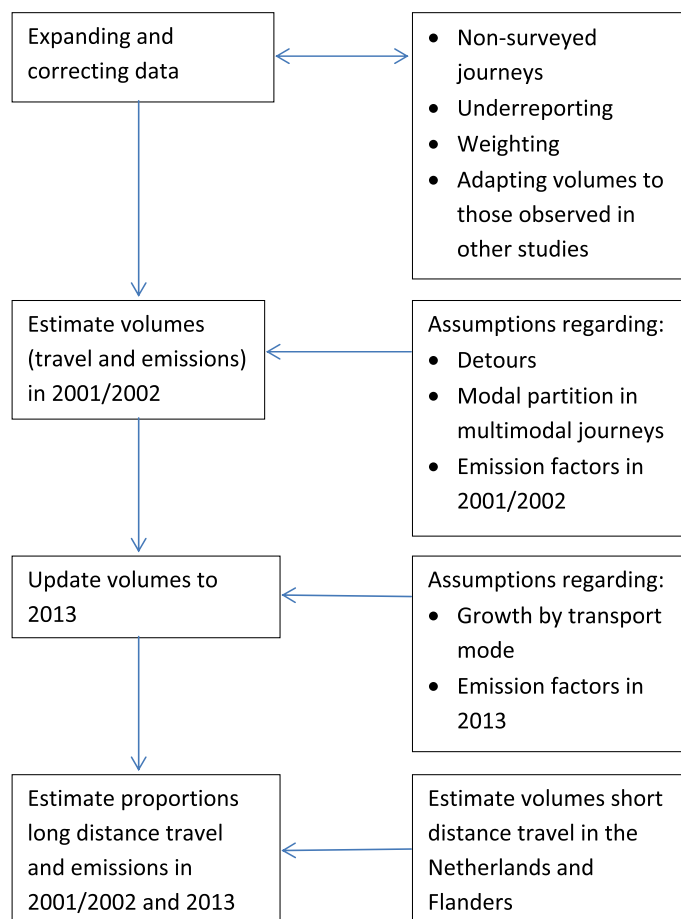


Fig. 1. Analyses discussed in the paper.

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