

Climate Protection through Cycling

Everyday traffic

In recent years the problem of worsening climate change has become indelibly embedded in the public consciousness. Abnormal and extreme weather conditions will become dramatically more prevalent across the globe in the coming decades if we do not succeed in drastically reducing global emissions. What contribution can using bicycles – as zero-emissions vehicles (ZEVs) – for short-distance travel make towards achieving this aim?

When addressing climate protection, those responsible for transport policy like to point to other areas – such as industry, domestic fuel, agriculture, energy production – where they claim there is a greater need for action to reduce CO_2 emissions. In Germany the transport sector accounts for around 160 million tonnes, or about 20 %, of all annual CO_2 emissions.

While total CO₂ emissions in Germany have been sinking, those caused by vehicular traffic have long been on the rise. Only since the year 2000 they fall slightly for the first time. To reach the primary aim of the German federal government's Climate Protection Programme – the reduction of CO₂ emissions by 40 % from 1990 to 2020 – annual CO₂ emissions from transport must be reduced by 40 million tonnes by the year 2020. Approximately half of the CO₂ savings necessary to achieve this aim can be achieved by reducing the specific fuel consumption of motorized vehicles. In the long-term, however, restructuring (urban) transport is at least just as important – also with regard to the growing scarcity of fossil energy sources and the lack of space in urban areas.

The current balance of CO₂ emissions arising from everyday traffic in Germany (not including holiday travel and freight transport) clearly shows the carbon footprint it leaves:

- the largest share is created by travel for work and education (66 million tonnes);
- an appreciable share is created by recreational travel (40 million tonnes);
- a reasonable share is created by travel for shopping and accomodation (29 million tonnes).

Cover image: Blue sky with bike traffic light in Berlin

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Fig. 1: Breakdown of annual CO_2 emissions in everyday transport (MID 2008)

How polluting are certain types of travel to the climate?

On average, each German citizen pollutes the environment with 10 tonnes of CO_2 annually; vehicular traffic accounts for two tonnes of this pollution. The transport survey Mobility in Germany (MID 2008) provided a more precise account of just how much CO_2 emissions certain groups of travellers produce on an everyday basis. In the survey travellers were classified into characteristic user groups according to how often they use certain means of transport. These findings were used as a basis for the differentiated examination of how much CO_2 the various groups of users produce when using certain means of transport (Fig. 2).



daily CO₂ emissions as a car passeng

daily CO₂ emissions from driving car

Fig. 2: CO_2 emissions arising from everyday transport. Broken down into user groups (MID 2008)

- According to the statistics, how much CO₂ individuals generate in their everyday life depends on whether they own a car or not, as those who own vehicles tend to have different travel habits.
- Public transport usage accounts for a large share of the relatively low CO₂ emissions produced by cyclists. In general, cyclists tend to use environmentally friendly means of transport.
- People who bike every day cause the lowest transport-related CO₂ emissions after "scarcely mobile" people, e.g. people who are physically limited in their mobility. This is also due in part to their tendency to use public transport more often than personal vehicles in lieu of cycling.
- In total, the CO₂ emissions produced by "regular users of motorized transport" (car and motorcycle drivers) is quadruple that of people who typically travel by bike
- Compared to other criteria, such as place of residence, sex and utilization of public transport, car ownership is the most relevant when it comes to levels of individual transport-related emissions (fig. 3).



Fig 3: Daily CO₂ emissions, broken down according to everyday living conditions and means of travel (MID 2008)

Promoting cycling for short-distance travel – an excellent way to reduce emissions

Successful promotion of cycling when travelling distances of five kilometres or less can make a large contribution to climate protection. As a rule, the benefit to the climate grows the longer trips people make by bike rather than by car. In 2009 researchers at the German Federal Environmental Agency finally systematically illustrated the potential CO_2 savings such a shift in short-distance travel habits could achieve.¹

Approximately half of all car journeys are shorter than five kilometres, and a quarter three kilometres or less. Because car engines are most efficient once they have "warmed up", fuel consumption, and thus CO_2 emissions, are inordinately high during the first few kilometres of travel. In 2005 such short car trips alone generated over 14 million tonnes of CO_2 in Germany. In 2020 such travel will still produce 11 million tonnes, despite the fact that more cars with energy-efficient engines will be on the road.

Yet, in most cases, journeys of five kilometres can most often easily be travelled by bike (or on foot). In fact, for journeys shorter than three kilometres bicycles are also the fastest means of transport. This means that as a basic rule successfully shifting short-distance traffic from motorized traffic to cycling has a great potential to reduce emissions.

A look at the data from the Netherlands and Denmark indicates that the pursuit of a targeted policy should make it possible to raise the share of cycling and pedestrian traffic for all journeys in Germany by 10 %, i. e. from the current 33 % to 43 %.

This would be achieved if 36 % of short car journeys (5 km or less) were shifted to ZEVs. This would result (when pro-



Fig. 4: Potential emissions reductions on trips up to 5 kilometres for the year 2020 which can be achieved if people switch to cycling or walking instead of using private vehicles. Source: Verron/Erdmenger/ Malow 2009 jected for the year 2020) in CO_2 savings of 4.2 million tonnes.

In fact, if half of all short trips were successfully shifted to ZEVs, these savings would climb to 5.8 million tonnes of CO_2 . This is more than the annual CO_2 production of all of the private households in Berlin.

Additional savings potential through the promotion of electric bicycles

Using electrically-powered bikes, such as the ever more popular pedelecs, people can travel as far as 25 kilometres comfortably and with a much lower environmental impact than in a car. Pedelecs have an electric motor that helps the cyclist drive the pedals when travelling. The rider can use different settings to select a desired level of support. Then, when the bike reaches a speed of 25 km/h the motor shuts down. Pedelcs make it easier to climb hills, embark on long-distance journeys and ride into headwinds, and offer great potential for shifting car traffic to ZEVs. E-bikes use just over one kilowatt hour of electricity per 100 kilometres and it costs about 20 cents per kilowatt hour to charge the battery. An e-bike emits between four and 14 grams of CO₂, depending on the chosen electricity offer. In comparison, a car driver produces 140 grams of CO₂ per kilometre, on average.

More widespread use of pedelecs can significantly increase the share of bicycle travel, particularly for longer-distance journeys.



An electric bike, a so called Pedelec

¹The calculations of the Federal Environmental Agency were done using the transport emissions calculator TREMOD (Transport Emission Estimation Model). In Germany, TREMOD is the generally accepted baseline database for transport-related energy and emissions data.

Traffic-reducing urban development

The rediscovery and promotion of travel destinations close to home within attractive neighbourhoods is no longer solely a matter of transport planning; it has also become an aim of urban development. Due to the diversity of usages of local space and vibrant urban neighbourhoods, a certain settlement density and high-quality public spaces are a tradition in European cities.

Therefore, the integration of urban and transport development in Germany has been an explicit aim at all administrative levels for a number of years now. In 2007 all urban development ministers in the EU pledged their support for the pursuit of this very aim in the Leipzig Charta.



New "Französisches Viertel" in Tübingen

The realization of this aim is closely linked to the quality of local pedestrian mobility in urban districts and to cycling policy.

Conclusion

Figures/Images

Schachner

Promoting cycling has the chance to further climate protection in two ways and can thus contribute to sustainable mobility.

1. Cycling offers the opportunity of daily zero-emission mobility and replaces fossil fuel driven vehicles.

Thiemann-Linden, Pedelec image courtesy of Bikes and more!

2. As a facet of urban development, cycling enhances the attractiveness of urban areas, creates a new structure of local mobility and, in doing so, replaces traffic volumes. Hence, different strategies can contribute to the encouragement of bicycle use and climate friendly urban mobility.

- Traffic saving patterns of settlement, e.g. through the development of dense urban neighbourhoods and the avoidance of long distances.
- Comprehensive approaches to influence the mobility patterns of the population, which are bundled under the term ,mobility management'.
- Promotion of climate friendly modes of transport like the bicycle: A consistent support of cycling includes infrastructural and non-infrastructural measures, as well as the co-operation and coordination of various stakeholders.

Furthermore, the aspect of climate protection itself can legitimize the promotion of cycling and serve as the starting point for corresponding campaigns.

Further information

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