



# Factsheet: Commuter Traffic

Commuting is a part of everyday life for students and staff at UZH. In this factsheet, we show how the mode of transportation you choose for your daily commute influences your personal environmental balance.

Traffic is responsible for 14% of greenhouse gas emissions worldwide [1]. In Switzerland the figure is even higher: Around 32% of domestic greenhouse gas emissions<sup>1</sup> are caused by traffic [2]. Some 74% of passenger journeys in Switzerland are made using motorized personal transportation [3].

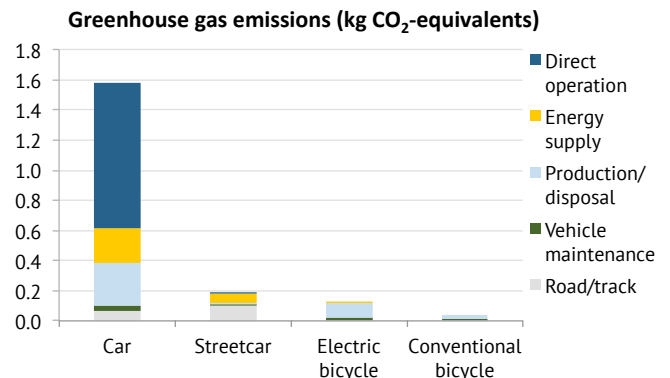
## Commuting to and from UZH

Studies investigating the various modes of transportation used for traveling to and from UZH paint a positive picture compared to the average for Switzerland. A 2015 study carried out at the Irchel campus found that 75% of those questioned predominantly used public transit, 12% traveled by bicycle, 8% used motorized personal transportation, and 5% walked [4]. Although the study did not consider the actual distances traveled, it is probable that public transit remains the dominant form of transportation used. A study at the Zentrum campus produced comparable findings [5].

## Greenhouse gas emissions by mode of transportation

A single, one-way journey by car from Schwamendingerplatz to the Zentrum campus of UZH produces almost 1.6 kg CO<sub>2</sub> equivalents<sup>2</sup> [6]. Making the same journey by streetcar reduces these emissions by a factor of 8 if the streetcar has an average number of passengers,<sup>3</sup> and by a factor of 26 if it is full [6]. Making the same trip by bicycle reduces the emissions even further, by a factor of 40 compared to going by car [6]. These figures take the vehicle lifecycle into account on a proportional basis.

We can estimate the total greenhouse gas emissions created on a weekday for the Irchel campus, for



## Example: Journey from Schwamendingerplatz to UZH Zentrum campus

Greenhouse gas emissions in CO<sub>2</sub> equivalents for the journey from Schwamendingerplatz to the UZH Zentrum campus (5 km). Occupancy: car: 1 person; streetcar: 29% full [6].

example. Taking into account the breakdown into different modes of transportation given above and average commuting distances<sup>4</sup> [7], the total emissions are 6-7 tonnes of CO<sub>2</sub> equivalents a day. This equals about half of the annual greenhouse gas emissions emitted by a person living in Switzerland<sup>2</sup> [8]. Of those 6-7 tonnes, around 40% relate to motorized personal transportation, although this is used by just 8% of the people. If everyone were to use motorized personal transportation, emissions would rise to approximately 35 tonnes of CO<sub>2</sub> equivalents a day.

## Land-take by traffic infrastructure

The amount of land used for traffic infrastructure – its «land-take» – is critical for traffic flow. But it also has an impact on the environment, for example through land sealing. In the city of Zurich, 19% of the total land area (excluding forests and rivers/lakes) is dedicated to traffic [9]. This is more than the amount used for buildings, which occupy just 17% of the total land area [9]. Motorized personal transportation is particularly responsible for this land-take: A commuter driving a vehicle with no other passengers in the city requires on average three times more space than someone taking the trolleybus, five times more than someone on a bicycle, and nine times more than someone riding a streetcar<sup>5</sup>. If everyone who travels regularly to the

Irchel campus had to get to or from the campus at the same time via a 3.5-meter wide road, they would need around nine hours if traveling in a car with no other passengers, compared to just one hour on a single streetcar track.<sup>5</sup>

### Impact on health

The choice of mode of transportation for commuting also has an impact on human health. Road traffic accounts for 46% of nitrogen oxide emissions in Switzerland, 20% of particulate emissions, and 15% of hydrocarbon emissions [11]. Hydrocarbons form the basis for the creation of ozone. Together with particulates and nitrogen oxides, this led to more than 6,000 premature deaths in Switzerland in

2013 [12]. Switching from car to bike or walking can bring about direct improvements in health, such as a reduction in cardiovascular diseases and diabetes [13]. Just 20 minutes movement a day, whether by bike or on foot, can reduce the general mortality risk by approximately 10% [14].

#### Further information

You can compare the greenhouse gas emissions for different modes of transportation and specific commuting distances using the Comparison Calculator on Mobitool (select «local»): [www.mobitool.ch/de/tools/vergleichsrechner-15.html](http://www.mobitool.ch/de/tools/vergleichsrechner-15.html)

The Sustainability Team at UZH is happy to advise you on sustainability issues affecting your day-to-day work: [www.sustainability.uzh.ch/en/tips.html](http://www.sustainability.uzh.ch/en/tips.html)

## Recommendations

- Consider living near your place of work, or at least somewhere with a good public transit connection to your workplace.
- Do not use your car to commute – go by bicycle or use public transit.
- If a conventional bicycle is not an option for you, look at whether you could use an electric bicycle rather than your car or public transit for your journey. (Zurich also has sharing systems for electric bicycles, where you locate a bike using your smartphone and drop it off wherever you like.)
- If you have flexible working hours, avoid traveling during peak times.
- Do your health a favor and go by bike or on foot.

### Notes

- 1 Excluding international flights. Lifecycles not taken into account.
- 2 Taking into account total lifecycle. Data in [6, 8] are based on environmental data from ecoinvent and emission factors.
- 3 Occupancy: 29% full.
- 4 Car: 18.8 km; bicycle: 4.5 km; public transit: 24.4 km; walking: 0.7 km [6].
- 5 Own calculation based on [10]: occupancy of car reduced from 1.3 persons to 1 person.

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