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Reshaping city traffic towards sustainability

Why transport policy should favor the bicycle instead of car traffic

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Abstract

Most cities suffer from congestion and various traffic problems. Faltering public budgets do not allow expenditures for costly transport infrastructure. A recently conducted study on Vienna's inner-city traffic compared resulting financial effects of bicycle and car traffic on the economy as a whole. Health, travel times, accidents, vehicle operation and maintenance, traffic noise, CO₂ and pollutants emissions were addressed. Per kilometer travelled, cyclists generate a surplus in external costs of 0.81 € whereas car traffic causes a loss of 0.04 €. Bicycling improves health and solves inner cities' transport and budget problems. Therefore bicycling should be promoted unconditionally.

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1. Current situation

Most cities suffer from congestion and various other traffic problems, especially caused by unsustainable transport conditions (Sammer et al. 2004). Solutions are still mostly seen in the development of new infrastructure for motorized modes of transport, which is very costly, especially in city centers where public spaces are already packed with high traffic volumes. Faltering budgets do not

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allow these high expenditures any more. Budget cuts often affect public transport, walking and bicycling (facilities), as they have the lowest priority in most municipalities. These environmentally friendly modes of transportation are often seen as modes used by people who do not contribute financially to the government budget, but who are supported by public expenses, so these transport modes do not seem to deserve even moderate investments. Transport infrastructure as part of the transport supply (infrastructure + vehicles + operating conditions) always influences the modal choice (means of transport used for individual trips) and in consequence determines our lifestyles, the appearances of our cities, traffic safety and finally costs for individuals and the overall economy.

1.1. Traffic implications in the living environment & lifestyle – consequences on health

When appropriate opportunities for walking and cycling are missing, the results are more sedentary lifestyles, less physical activity and higher obesity rates. Investments that encourage physical activity boost individual health and lower health care expenses (Robert Wood Johnson Foundation 2009). Active modes of transportation show many benefits for the user: *“Bicycling to work decreased the risk of mortality in approximately 40% ..., including leisure time physical activity. Benefit was found from moderate leisure time physical activity, with further benefit from sports activity and bicycling as transportation”* (Andersen et al. 2000).

A range of studies surveyed the correlation between diseases of modern society and active travel. For example Pucher et al (2010) determined *“... the relationship between active travel and rates of physical activity, obesity, and diabetes.”* They *“...found statistically significant negative relationships between active travel and self-reported obesity.”* and recommended: *“Policies on transport, land-use, and urban development should be designed to encourage walking and cycling for daily travel.”*

Frank et al. (2006) *“... evaluated the association between a single index of walkability that incorporated land use mix, street connectivity, net residential density, and retail floor area ratios, with health-related outcomes”* In their walkability model they calculated *“... a 5 % increase in walkability to be associated with a per capita 32.1 % increase in time spent in physically active travel, a 0.23-point reduction in body mass index, 6.5 % fewer vehicle miles traveled, 5.6 % fewer grams of oxides of nitrogen (NOx) emitted, and 5.5 % fewer grams of volatile organic compounds (VOC) emitted. These results connect development patterns with factors that affect several prevalent chronic diseases.”*

For people switching from car trips to cycling, *“the health benefits of cycling are 11 times larger than the risks relative to car driving”*, due to lower mortality, even when inhaled air pollution and the higher vulnerability of cyclists in traffic accidents is taken into account (de Hartog et al. 2010).

By measuring the mean number of steps per day of Swedish schoolchildren (9 to 10 years old) it could be shown that *“the children’s and parents attitudes to physical activities”* (traveling and playing) correlated positively with the daily number of steps. The authors reason deductively: *“Children’s independent mobility is crucial to the development of the child’s personal health as well as the possibilities to achieve sustainable urban environments.”* (Johansson et al 2011).

A three percent greater chance of being obese was found per every additional 30 minutes spent in a car every day, whereas *“people who live in neighborhoods with a mix of shops, businesses, and a range of services within easy walking distance are 7 percent less likely to be obese”* (Frank et al. 2004). Neighborhoods providing attractive facilities (*“from access to low-cost recreation facilities to sidewalks on most streets”*) for physical activity like walking or cycling have *“100 % higher rates of sufficient physical activity compared to those with no supportive attributes”* (Sallis et al. 2009).

A study in the Portland, Oregon metropolitan area *“demonstrated that bicycling for transportation can be used by adults to meet the recommendations for daily physical activity”*. A supportive environment *“... appears necessary to encourage bicycling for everyday travel ...”* Bicycle infrastructure is the first step

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