Cycling and the climate agenda

November 2010

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interface for cycling expertise

1 The potential of walking and cycling for mitigating climate change

The Partnership on Sustainable Low Carbon Transport recommends an integrated and comprehensive approach to reduce GHG emissions from the transport sector, which avoids the need for travel, shifts travel to the most efficient mode and improves vehicle and fuel technologies[1].

The *shift* regards e.g. public transport and non-motorized transport instead of passenger transport by motorized vehicles. A combined approach of public transport and cycling and walking is needed. Cycling and even walking can take over a substantial share of motorized trips, since the majority of urban trips is within cycling distance, even in metro pole cities in developing countries[2] and public transport cannot adequately compete with a car on short distances[3]. Therefore cities better create a fine meshed network for cycling and walking in combination with a coherent network of bus lanes and rail primarily for the longer distances, with feeder routes for walking and cycling[4].

Data from the Netherlands and Germany, countries that combine a high car ownership with a substantial share of cycling, show that cycling can reduce transport related CO2 emissions by 10-15% (see part 2). Walking might add to a lesser extent. Every significant contribution represents a serious interest, given the fact that transport is the fastest growing sector with regard to GHG emissions[5]. The potential growth of car use cannot be accommodated by our roads anyway. It is important to defend walking and cycling in countries such as India and China and to promote an optimal use of walking and cycling world-wide.

To promote cycling and walking is a challenge for both developed and developing countries. Only a long term strategy and planning will result in conditions that make people to choose for walking and cycling instead of a car or motorized two-wheeler. The potential share of walking and cycling in any urban environment is 30-60% of all trips[6]. This demands substantial investments in facilities, which are however very cost effective and cost beneficial. The investments for accessibility are significantly less than for motorized transport. The economic value of the many benefits of cycling is at least 5 times as high as the costs for the facilities, since cycling not only avoids emissions but also has

[1] www.slocat.net

[2] Average trip length excluding walk in medium and large Indian cities varies from 4.2 – 6.9 km; 56-72% of all trips are below 5 km. Tiwari,G. and Jain,H.; Bicycles in urban India, IUT Journal, dec 2008

[3] Up to 6 km a bicycle takes less time than a combined walking-metro trip, according to Dinesh Mohan, in: Chaotic India does have an urban edge; Civil Society, sep-oct 2008

[4] 36% of users of the Dutch OV Fiets (public transport bike) take more often the train instead the car because of this public bike: Klantenonderzoek (Marketing research), Fietsersbond (Cyclists Union) 2005. Of all train passengers in the Netherlands, 40% arrive by bike and 15% leave by bike.

[5] Transport emissions have increased by 32.1 percent from 1990 to 2005 (European Commission, DG Energy and Transport, EU energy and transport in figures, Statistical Pocketbook 2007/2008, Brussels

[6] See 2; In the Netherlands, 45% of all trips are by walking and cycling; 70% of all trips are within a distance of 7,5 km: Cycling in the Netherlands, Fietsberaad, 2008; www.fietsberaad.nl;

other environmental, health and societal benefits compared to motorized transport (see part 3).

The time is now. Global vehicle ownership will increase from 800m to 3.200 in 2050[7], infrastructure built today will determine the way people and goods travel in the next 10-40 years. The time is now the more because there is a widespread interest in walking and cycling. If people feel free and safe, as is the case on car free Sundays in Latin America, they do it. Bogota set a great example after European cities in reclaiming the city for people with a substantial role by a transformation of the transport policy, creating high quality provisions for the bus, cycling and walking. Mayors of capital cities Mexico City, New York, London, Copenhagen, Amsterdam joining the mayoral conference during the climate summit in Copenhagen, December 2009, were challenging each other with respect to their ambition on cycling. Part 4 of this document provides some examples of cycling policy developments. Civil society organizations on cycling, exchanging and applying expertise, include nowadays networks of cycling organizations in Latin America, Africa and India[8]. A Cycling Academic Network started with 6 PhD studies in Brasil, Southern Africa and India[9].

The Partnership on Sustainable Low Carbon Transport recommends "to increase the sector focus of the climate negotiations and the discussions on new instruments such as National Appropriate Mitigation Action's (NAMA's). Many of the mitigation solutions in the transport sector have medium to long term negative incremental costs, especially when non climate related benefits are taken into consideration. Yet, there are considerable up-front costs linked to the transition of existing transport systems to more sustainable low carbon transport solutions. It will be important to undertake pilot transport NAMAs and there is a broad need for capacity building in support of sustainable, low carbon transport".[10]

Since the Netherlands is the first and foremost reference for a cycling-inclusive sustainable urban transport system, and due to the track record of Dutch experts on application of cycling expertise in a different context, the Dutch are considering how they can support projects and programs in other countries that include cycling in sustainable low carbon transport strategies and mobility plans.

[7] World Energy Outlook 2008, IEA, Paris

[8] www.sustranlac.org; www.africanbicyclenetwork.org

[9] www.cycling-research.nl

[10] Transport in developing countries: Recommendations to the climate negotiations in Cancun, Mexico. www.slocat.org

2 The CO2 Value

Calculations of CO2 reductions by cycling in the Netherlands, Germany and Bogota present an indication of the carbon value of cycling. The contribution by walking has not been taken into account. We recommend an integrated approach in the future, in terms of transport strategy, planning and design and impact assessment.

The carbon value of walking and cycling will be different in every other context. However we can take as a more or less general fact that half of all trips in cities are short and within cycling distance. Transport policies tend to focus on interventions for long distances which might overlook this substantial share of short trips. In smaller cities most trips are within cycling distance and the demand for public transport is low. Larger cities cannot do without an efficient public transport system, but still bus and train cannot easily compete with the door-to-door service by cars, in particular regarding short distances. Walking and cycling are important feeders if safe access to stations and efficient bicycle parking is guaranteed. To prospect future mobility trends, we also have to take into account that currently a substantial need for transport is not fulfilled since people without a car do not have the opportunity to travel. Safe cycling can fulfill this latent demand by particularly children, youngsters, women and elderly people, which is an important contribution to their development.

The optimum of cycling van walking depends most of all of facilities: quality bikes and quality provisions will invite people to do it and escape from the current poverty status cycling has in developing countries. Designers and planners, the bicycle industry, civil society organizations and governments all have their role to play in creating status to walking and cycling. Temperature and geography do have an influence but not substantial: from up north to the south of Europe there are cities with a 30% share of cycling and world-wide, built-up areas are concentrated on flat terrains.

A dedicated strategy to make cities walking and cycling friendly and to create and sustain the best balance in facilities for the different modes of transport, will take 15 – 20 years. But significant results are feasible in a short term. The city of Bogota showed us that implementation of a first network of 240 km routes for walking and cycling was feasible in 3 years time and increased the level of cycling from 0.5 to more than 3 percent. The costs of the Bicycle Master Plan in Bogotá were US$ 178m[11].

Netherlands

The Netherlands are famous for the substantial role of the bicycle in satisfying the daily transport needs of the population. The Dutch use a bicycle for 27% of all trips. Notwithstanding the high car occupancy, most Dutch people opt for the bicycle for many trips as cycling is convenient and attractive. These trips make up 9% of all kilometers travelled with private vehicles and these bicycle kilometers travelled are equal to the total number of kilometers travelled using the highly compact and efficient Dutch railway system..

[11] The results of four cost-benefit calculations: Amsterdam, Bogotá, Delhi and Morogoro; appendix to the Economic benefits of Cycling, I-CE/VNG/St.Habitat 2000

The share of cycling in the Netherlands with 16.7 million inhabitants in trips up to 7.5 km, represents a value of 3 Mton CO2. It is estimated that the share is 3.6 Mton for all trips. This represents 9% of the transport related CO2 emissions in the Netherlands and 2% of the total CO2 emissions[12]. The value is even higher since cycling as a feeder makes people to choose for the train instead of the car.

If Dutch cities would raise the cycling standards of their best cities, another 0.9 Mton CO2 would be avoided. That represents more than 20% of the current CO2 emissions by cars in the Netherlands.

The high modal share of cycling is a result of firm policies by the local, regional and national government. Dutch cycling inclusive planning and design of road infrastructure makes congestion in urban areas relatively marginal and results in one of the highest standards of road safety in the world. Nowadays, the country still invests 400 million euro per year in cycling policies. Of that amount, the national government contributes 50 million euro.

Germany

The share of cycling in Germany is 10% of all trips. The German National Cycling Plan 2002-2012 supports local governments in realizing cycling facilities. The Federal Ministry of Transport, referringto the best practices in the country, concludes that cities could increase their bicycle usage by a third combined with a reduction in the number of car trips of 10 %, over a period of eight years.

Extrapolating these CO2 reductions to the entire population of Germany (82 million) this shift from current car use to cycling amounts to a potential reduction of around 3 Mton of CO2 per year. In 2002, when the national cycling plan was launched, this would equate to 15-20 % of the traffic-related CO2 reduction required by the German national climate protection program.

Germany also invests substantially in cycling and cycling is increasingly popular in Germany. In 2002 the budget for building and maintaining cycle lanes within the federal remit was € 100 million. As in other countries, the diversity of bicycle provisions increases, including public bike systems. Still the cycling standards lack behind the Dutch. The Dutch urban transport policies distinguishes in the combined approach of car control interventions with cycling facilities. When travel time on the bike becomes shorter than by car through e.g. traffic circulation and the costs for car parking become influential enough, the share of cycling increases at the expense of car use.

[12] In 2008 the total CO2 emissions in the Netherlands was 175.6 of which 39. 6 was transport related. The total of GHG emissions was 209.4 (see www.energie.nl and for forecasts: http://www.ecn.nl/docs/library/report/2010/e10004.pdf

Bogotá

Application of the Shadow Traffic Model in a case study on Bogotá, Colombia, a city with a bicycle modal share of 3.3 % on a total of 10 million daily trips, results in a Climate Value of Bicycling of 55.000-62.000 tCO2 per year[13]

[13] Estimating the climate value of cycling in Bogota, Colombia, using a Shadow Pricing Methodology, Massink, 2009, UTwente http://essay.utwente.nl/59405/1/scriptie_R_Massink.pdf

3 Co-benefits

Cycling has a wide range of benefits. First of all, to facilitate cycling asks less investments than to facilitate motorized vehicles. Cycling demands less space and is very effective in reduction of congestion. Also bicycle parking demands up to 10 times less space than parking a car. Cycling further enables mobility for many more people. In particular for all people not driving a car, cycling is a way to go. Cycling can contribute significantly to poverty alleviation. It makes locations for income generation, schools, health care centers more within reach and it supports all kind of participation to society. Cycling results in mass employment, directly in the retail and maintenance and indirectly to support professions. Captive pedestrians who can shift to the bicycle, safe lots of time. Health care workers in Cape Town could double the number of patients by cycling instead of walking, house cleaning women in India could also double their work and income[14]

Cycling and walking is active transport. Daily half an hour on the move walking or cycling already has a dramatic impact on prevention of diseases and is savings lives. A shift from motorized transport to cycling and walking saves emissions and improves road safety, adding to the health benefits.

Health

In the UK substantial research on the health benefits of cycling has been performed.[15] Some conclusions are:

- Cycling has the potential to be one of the most healthy and accessible forms of physical activity as it can so often be integrated into daily life. Coronary Heart Disease is the single most common cause of death in both men and women and lack of physical activity is one of the most important risk factors for CHD. It is estimated that 36% of all CHD can be attributed to lack of physical activity such as cycling.
- Type 2 diabetes is the most common metabolic disorder worldwide. Physical inactivity can increase the risk of developing this condition by up to 50%.
- Physical activity has a protective effect on colon cancer with an average risk reduction of 40-50%.
- Physical activity appears to be associated with a reduced risk of breast cancer.
- Physical activity is associated with improved subjective well-being, mood and emotions, and enhanced levels of self esteem.
- More than 50% of adults in the UK are overweight, putting them at increased risk of hypertension, coronary heart disease, Type 2 Diabetes, and osteoarthritis.
- Cyclists are as fit as non cyclists who are 5 year younger.

[14] Projects supported in the Bicycle Partnership Program by I-CE, www.cycling.nl

[15] Nick Cavill e.a.; Review of economic analyses of transport infrastructure and policies including health effects related to physical activity, 2007

Cost-benefit ratio's

In Norway substantial research has been performed on the cost benefit ratio's of cycling policies. The results are based on data from Norway and might be more context dependent than data regarding health benefits, but the health benefits were responsible for more than 50% of the total benefits. [16].

I-CE calculated the cost-benefit ratio's for cycling interventions in four cities. Amsterdam, with already a share of 28% by cycling in 2000, planned to invest in bicycle parking and infrastructure with a budget of 150 million euro. The benefits on less pollution, less use of space, improved health, road safety, time savings and theft prevention were 50% higher than the costs. In Bogota, the bicycle master plan resulted in high traffic safety benefits. In addition the savings on parking space, congestion, user costs and road maintenance resulted in a cost benefit ratio of 1:7.(see ref. xi)

[16] Saelensminde,K, cost- benefit analyses of walking and cycling track networks taking into account insecurity, health effects and external costs of motorized traffic, Transportation research Part A: Policy and Practice, volume 38, 2004

4 New city practices

Cape Town

The city of Cape Town started her cycling policy in 2003 with a strategy development. The vision behind was to create mobility for all and dignified urban space. Some cycling tracks were built. Most prominent is the route of 40 kilometres coming from the north towards the CBD, which will be completed in 2011 as an integrated part of a BRT corridor. In 2008 the city decided to develop plans and designs for cycling infrastructure in four parts of the city. The budget of 200 million Rand includes some further constructions.

In the CBD, some more routes are under construction and a start has been made with provisions for bicycling parking. The north of the city is a priority area since residents of the suburbs going to the city are confronted with serious traffic jams. In the east, cycling infrastructure is aimed to serve the poor communities of townships such as Khayelitsha, Guguletu and Crossroads, on roads within the townships and along corridors where they combine with public transport services. The south is another priority area. Here the infrastructure will serve higher economic groups who use the bicycle for recreational purposes.

The policy development is supported by consultations in an NMT forum, chaired by the city and with the province of the Western Cape, consultancy agencies, civil society organisations and the University of Cape Town amongst the participants. The UCT is providing courses on planning for cycling and member of the Cycling Academic Network with universities from the Netherlands, India and Brasil as co-founding members. The Bicycling Empowerment Network BEN[17] is a ngo that promotes cycling, offers affordable bicycles and advocates for cycling policies. BEN set in place 14 Bicycle Empowerment Centres that sell 5000 refurbished bicycles and distributes 7000 bicycles from a national Shova Kalula roll out to scholars with an education program.

Santiago de Chile

In Chile, governments at all level started to plan for cycling facilities in the last four years . To fulfil the need for capacity building, the ngo Ciudad Viva plays a key role, to advocate, to bring stakeholders together and to act as an intermediary for foreign expertise[18].

A major strategic success is the guideline for cycling planning and design that has been produced by the Active Transport Design Manual working group, using a Spanish translation of the Dutch cycling manual as key reference. The Planning Ministry started local transport management plans that integrate the requirements for walking, cycling, bus and car transport.

Implementation of facilities and of road reconstructions to facilitate cycling are on their way. E.g. the municipality of Providencia developed a plan for a network of routes with a mesh width of 400-500 mtrs and the municipality of Recoleta developed a plan for the construction of about 600km ‘ciclovias’. Both

[17] www.benbikes.org.za

[18] www.ciudadviva.gov.co

municipalities belong to the metro pole of Santiago. Special attention is devoted to the design of crossings, crucial for safety of routes. Bicycle parking facilities at metro stations expand and public bicycle services were introduced in 2008. The travel needs of cyclists are better documented and a citizens' monitoring commission has been set in place.

The new government adopted the Cycling Round Table for exchange with regional governments on planning, which also has been set up by Ciudad Viva, in 2008.

Rio de Janeiro

Since 2009 the vice-mayor and secretary of environment of Rio de Janeiro Muniz has given much more political priority to cycling which resulted in an enormous impulse of media attention and spontaneous requests for cycling infrastructure. The share of cycling trips is still only 2% and increasing slowly but steadily. Estimates by Transporte Ativo[19] is that cycling has doubled in 6 years time and also the delivery of products on the bicycle has increased significantly. The program Rio Capital de Bicicleta announced that in three years time the bicycle network would double of which half will be the result of interventions for feeder transport of the T5 BRT project and other BRT projects[20]. Cycling has become one of the 38 strategic plans of the city for 2012.

Cycling is considered as one of the important contributors to provide for accessibility during the World Cup Soccer in 2014 and the Olympic games in 2016. Good concepts for sustainable transport should be ready on a short term and can contribute significantly to the profile of Rio as a sustainable city at the RIO+20 conference in 2012. It was in preparation of the Rio Earth Summit in 1992 that the first 27 km of cycle paths were built. The number of people travel by bike to work has tripled since then, but the potential for cycling is much larger. Apart from road infrastructure, bicycle parking facilities have spread over the city, in particular near train and metro stations and the city began to implement 30k speed zones in the inner city.

The vice mayor expressed his desire for support to develop a mobility plan that will create a coherent network of facilities for sustainable transport.

[19] www.transporteativo.org.br

[20] http://www.ta.org.br/site/banco/1ciclorio/cicloviasrio10.pdf