

Active streets: Walking and cycling to cut carbon emissions

Streets that are safe for walking and cycling are vital in the fight against climate change. Safe and healthy streets encourage people to shift away from using private vehicles, reducing carbon emissions and helping to improve air quality in urban areas. Strategic investments that create a network of accessible walking and cycling connections have multiple environmental and social benefits, particularly when combined with integrated public transport infrastructure and policy frameworks that put people first with streets that are liveable.

Cities around the world have shown that increasing rates of walking and cycling is possible with sustained investment. Over two decades Bogota has established a 500km NMT network which has contributed to a nine fold increase in cycling, from 0.6% of all daily trips in 1995 to 6.0% in 2015.¹ A study found the carbon value of cycling in the city to be the equivalent of 55,000 tonnes of CO₂, with an economic value of \$1.1-1.3m when traded on the carbon markets.²

In New York, the number of daily cycling trips more than doubled in the decade between 2007 and 2017 (from 210,000 to 490,000), with significant increases linked to improvements in infrastructure (66 additional miles of bike lanes were installed in 2018, taking the total to 1,340 miles).³ Copenhagen has an ambitious plan to increase the mode share of cycling to 50% of trips by 2025 – and by 2016, it was only 9 percentage points from this level, with 1.4 million km cycled every weekday.⁴ It is estimated that cycling saves Copenhagen around 90,000 tonnes of CO₂ every year.⁵

In some Dutch cities up to 70% of journeys are made by bike.⁶ However, there is a massive gap between the streets in these cities and the roads where the majority of people live, which are still dominated by motor vehicles. This gap, however, illustrates the potential to reduce emissions if streets were designed differently everywhere. In London, rates of cycling have more than doubled in a decade to around 2% of trips, during which time nearly a billion pounds has been invested in cycling infrastructure.⁷ It is estimated that two-thirds of car trips are less than 5km, and could be cycled in less than 20 minutes.⁸

A study by ITDP that explored a ‘high shift scenario’ found that if all cities took steps to increase cycling towards the levels of the best, urban carbon emissions could fall by 7% by 2030 and 11% by 2050 – saving 300 megatonnes of global CO₂ emissions. This would save \$6 trillion between 2015

¹ C40 Cities Finance Facility (2018). “Cycling Infrastructure in Cities: Bogotá’s Quinto Centenario Cycle Avenue – Creating the Enabling Environment”

https://use.metropolis.org/system/images/2137/original/Cycling_Infrastructure_in_Cities-Bogota%CC%81.pdf

² Massink, R. et al (2011). The climate value of cycling. In Natural Resources Forum. V. 35. Wiley Online Library. 100–111.

³ New York Department of Transport (2019) ‘Cycling in the City: Cycling Trends in NYC’ May 2019
<https://www1.nyc.gov/html/dot/downloads/pdf/cycling-in-the-city.pdf>

⁴ City of Copenhagen (2017) ‘Copenhagen City of Cyclists’ The Bicycle Account 2016
https://kk.sites.itera.dk/apps/kk_pub2/index.asp?mode=detalje&id=1698

⁵ Dalhoff (2015) ‘Our daily bike rides benefit the climate immensely’ Cycling Embassy of Denmark
<http://www.cycling-embassy.dk/2015/10/20/our-daily-bike-rides-benefit-the-climate-immensely/>

⁶ BBC News (2013) Why is cycling so popular in the Netherlands? BBC News website, Magazine 8 August 2013
Accessed September 2019 <https://www.bbc.co.uk/news/magazine-23587916>

⁷ London Assembly Transport Committee (2018) London’s cycling infrastructure
https://www.london.gov.uk/sites/default/files/londons_cycling_infrastructure.pdf

⁸ TfL (2017) Healthy Streets for London <http://content.tfl.gov.uk/healthy-streets-for-london.pdf>

and 2030, and \$24 trillion between 2015 and 2050.⁹ The measures proposed include a range of improvements, such as retrofitting cycling infrastructure onto existing roads, bike share programmes, improved enforcement to protect cyclists and pedestrians, land use planning changes as well as wider policy changes that would eliminate subsidies for private vehicles, including free parking, and increase funding for sustainable transport. Combined with other measures to shift travel away from vehicles, these measures contribute to a total potential to cut urban passenger transport CO₂ by 24 percent in 2030 and 47 percent in 2050.

Improving cycling infrastructure and policies in every city towards matching the best could help reduce urban carbon emissions by 7% by 2030, and 11% by 2050 – saving around 300 megatonnes of global CO₂ emissions [ITDP/ UC Davis ‘High Shift Scenario’]

These findings are similar to a study by the European Cyclists Federation (ECF) which found that if the cycling modal share across the EU was to reach in the same levels seen in Denmark in 2000 by 2020, it would save between 55 and 120 million tonnes of CO₂e each year. If the whole of the EU matched the cycling rates in Denmark by 2050, it could cut overall transport emissions by a quarter (12 to 26%).¹⁰

If all EU countries achieved the same rate of cycling as Denmark by 2050, it could potentially cut transport emissions by a quarter (12-26%) [ECF, Cycle more often 2Cool down the planet!]

The challenges of assessing the climate impact of walking and cycling

Putting a value on the climate impacts of cycling can help make the case for increased investment – but is challenging to do. Many transport appraisals fail to adequately value the climate impacts of walking and cycling. There are several reasons for this; in many cases, the low price of carbon in international trading schemes mean that the economic value often appears low compared with issues such as congestion which are valued according to time savings, which are often allocated a high monetary value. Another reason is that infrastructure schemes are often appraised individually, separate from the overall system that they are contributing to. Individual cycle lanes may only have a limited impact by themselves in increasing cycling levels, but when combined with a complete network, these benefits multiply once a range of destinations are connected. Also, there can be significant additional benefits by combining active travel infrastructure with other transport policies, which may create additional synergies that create more benefits than the sum of either project on its own.¹¹

A recent study for *Share the Road* by the University of Cape Town attempted to overcome these challenges by estimating the carbon savings of improving the pedestrian infrastructure and cycling

⁹ ITDP/ UC Davis (2015) A Global High Shift Cycling Scenario <https://www.itdp.org/2015/11/12/a-global-high-shift-cycling-scenario/>

¹⁰ ECF (2011) Cycle more often 2Cool down the planet! https://ecf.com/sites/ecf.com/files/ECF_CO2_WEB.pdf

¹¹ Litman, T. (2019) Evaluating Active Transport Benefits and Costs Guide to Valuing Walking and Cycling Improvements and Encouragement Programs Victoria Transport Policy Institute

networks in Nairobi and Cape Town by comparing them with Bogota's experience.¹² The study estimated the impact of creating a 370km NMT network, equivalent to that of Bogota, by asking experts for their views on the potential impact on cycling levels of such a network. The experts estimated that in Cape Town they could potentially expect an increase in cycling from such a scheme which would lead to a shift from a 1% mode share for cycling to 8%. In Nairobi, the experts estimated a 3% increase in NMT usage by 2030 compared with current levels. However, as they predicted that without any action walking and cycling rates would reduce by 7% due to increasing motorisation, this is equivalent to a 10% total shift. In Nairobi, the estimated savings were equivalent to 312 kilotonnes of CO₂ over 15 years, whereas in Cape Town the expected savings of 3 260 kilotonnes (3.3 megatonnes) of CO₂. This highlights how in some developing countries, there is also an important climate benefit of preventing a shift onto more polluting forms of transport as incomes increase and there are demands for greater mobility.

If Nairobi and Cape Town created cycle networks equivalent to Bogota, experts predict that by 2030 cycling rates could increase from 1% to 8% in Cape Town, and increase by 3% in Nairobi (preventing a possible 7% reduction, making a 10% total shift). This is the equivalent of 312 kilotonnes of CO₂ saved in Nairobi, and 3260 kilotonnes saved in Cape Town. [UN Environment, Calculating the potential climate value of NMT projects in African Cities

Wider impacts

As well as directly reducing climate emissions, walking and cycling have multiple benefits, including:

- Reducing congestion, by removing motorised vehicles from the road
- Improving health – both by increased physical activity, but also by reducing harmful emissions
- Other social benefits such as meeting neighbours and potentially spending more in shops (particularly pedestrianised areas)

Often health and social benefits are valued more in monetary terms than the carbon savings in economic appraisals, forming the bulk of benefits in cost-benefit analysis. The health impacts of small increases in levels of physical activity in particular can be significant, particularly as the WHO's HEAT tool provides a relatively easy way for these to be estimated, based on the value of a statistical life.¹³ People switching from motorised vehicles will also experience reduced fuel and parking costs, which result in actual financial savings. For governments and authorities appraising schemes, these 'savings' may also result in a loss in revenues from parking charges and fuel duty, which may negatively affect a business case. Combining investments in walking and cycling, with other measures, such as congestion or air pollution charges, provides a way of generating replacing these revenues.

It is clear, however, that the climate and social benefits are mutually re-enforcing. It makes sense to have healthy, low-carbon transport systems that do not pollute and streets which are enjoyable to

¹² UN Environment (2019) Calculating the potential climate value of Non-Motorised Transport projects in African Cities. UN Environment, Nairobi

¹³ WHO (2011) Scope for the use of HEAT Cycling World Health Organization, Regional Office for Europe, 2011 <http://www.heatwalkingcycling.org/index.php?pg=cycling&act=introduction>

spend time in. It is important that the full range of benefits are valued. In the case of London, this has meant emphasising the strategic case in appraisals, and recognising that ‘benefit cost ratios [are] not always the most important element’.¹⁴ Cultural activities are an important way of encouraging people to participate in walking and cycling activities as part of larger groups. ‘Car free’ days are now held in over 2,500 cities worldwide,¹⁵ and have been vital for engaging a range of people in the potential benefits of active travel, including giving an opportunity for children to play and ride safely on car-free streets.

Climate Finance

Globally, large amounts of funding has been set aside for climate finance help countries mitigate emissions and adapt to the impacts of climate change. It is possible to use these funds to support investment in walking and cycling projects. There are a number of funds and systems which aim to support schemes that reduce carbon emissions, including from the transport sector which is responsible for nearly a quarter of global greenhouse gas emissions.¹⁶

The Clean Development Mechanism (CDM) aims to generate finance to reduce emissions by charging polluting industries who have to purchase credits from clean projects. So far there have been only 30 transport projects in the Clean Development Mechanism, out of nearly 8000. Most of these are projects for metro or bus rapid transport, with others relating to modal shift of freight or electric vehicles, but some include non-motorised transport components. The UNFCCC recently approved new guidance for measuring the benefits of cycling schemes, which is in addition to the previous guidance around valuing modal shift. This potentially gives an opportunity for more transport schemes to get an income from carbon credits equal to the value of the carbon emissions prevented through cycle improvements.¹⁷

So far there have been only 30 transport projects in the Clean Development Mechanism, out of nearly 8000. However, the UNFCCC recently approved new guidance for measuring the benefits of cycling schemes, in addition to the previous guidance around valuing modal shift.

The Global Environment Facility (GEF) has also provided funding to walking and cycling projects. Since it was established in 1998, the GEF has funded 1,330 completed projects in 136 cities in 49 countries for the sustainable transport sector. Overall, it assesses that 48% of projects include a non-motorized transport component. Evaluations indicate that 575 km of bike lanes have been

¹⁴ TfL (2017) The case for cycling investment: Using evidence to overcome the challenges TfL presentation to Hackney Cycling Conference 27 April 2017 https://www.hackney.gov.uk/media/8465/The-case-for-cycling-investment/pdf/05_Andy_Summers_Hackney_Cycling_Conference

¹⁵ Car-free day - and the other 364 days of the year World Economic Forum website 20 Sep 2019 Accessed September 2019 <https://www.weforum.org/agenda/2019/09/why-you-should-park-your-car-for-one-day/>

¹⁶ SLoCaT (2018). Transport and Climate Change Global Status Report 2018. Available at: <http://slocat.net/tcc-gsr>

¹⁷ UNFCCC (2018) Bicycle Projects Can Now Earn Saleable Credits under UN’s Clean Development Mechanism <https://unfccc.int/news/bicycle-projects-can-now-earn-saleable-credits-under-un-s-clean-development-mechanism>

constructed or repaired, as well as a range of other schemes covering bike parking, bike share, walkways, awareness raising and NMT plans.¹⁸

The Green Climate Fund, the UN's main fund for climate change mitigation in developing countries, also supports transport projects. Established in 2010, it has recently given \$49 million for a Bus Rapid Transit scheme in Karachi, which includes pavements and cycle share facilities around new stations. This includes a \$37.2 million loan and an \$11.8 million grant, which includes plans for promoting walking and cycling.¹⁹

The C40 Cities Finance Facility and the NAMA Facility are supporting Colombia to develop and expand its cycling projects.²⁰ C40's focus on both air quality and climate change means that it is particularly interested in supporting this scheme which will have multiple co-benefits. As part of Colombia's Nationally Appropriate Mitigation Actions (NAMA) plans, which set out how the country is planning to reduce emissions, there is a focus on Transit Orientated Development (ToD) and shifting away from motorised vehicles.²¹ In Bogota this includes plans for a 25-km 'cycle avenue' crossing the city from north to south, which aims to help double the proportion of people cycling within 4 years. The Inter-American Development Bank (IADB) and the World Resources Institute (WRI) support the delivery of technical and financial studies. Based on a preliminary forecast of 34,000 users per day, this is projected to save at least 67,000 tons of CO₂e between 2018 and 2030, while also improving air quality along the route.²² The Cities Finance Facility is also supporting the development of plans for bike share schemes in four other Colombian cities, which will deploy at least 3800 publicly accessible bicycles.²³

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¹⁸ GEF (2019) Annual Performance Report 2019 56th GEF Council Meeting June 11th -13, 2019 Washington, D.C. GEF/ME/C.56/Inf.01 http://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.ME_C56_Inf.01_Annual_Performance_Report_May_2019_0.pdf

¹⁹ Green Climate Fund project database PROJECT FP085 Green BRT Karachi <https://www.greenclimate.fund/projects/FP085>

²⁰ Global NDC Conference (2019) 'Scaling up climate action in cities to support national commitments Lessons from Colombia and Mexico' Presentation, Berlin <https://globalndcconference.org/giz/wp-content/uploads/2019/06/Scaling-up-climate-action-in-cities-to-support-national-commitments.pdf>

²¹ NAMA Facility website – concept and approach <https://www.nama-facility.org/concept-and-approach/>

²² Global NDC Conference (2019) 'Scaling up climate action in cities to support national commitments Lessons from Colombia and Mexico' Presentation, Berlin <https://globalndcconference.org/giz/wp-content/uploads/2019/06/Scaling-up-climate-action-in-cities-to-support-national-commitments.pdf>

²³ C40 Cities Finance Facility 'Colombia – Prioritising public access to cycling' <https://www.c40cff.org/projects/colombia-public-bike-sharing>