The benefits of cycling

Unlocking their potential for Europe

ECF gratefully acknowledges financial support from the LIFE Programme of the European Union

ECF gratefully acknowledges financial support from the cycling industry via Cycling Industries Europe

ECF

Global benefits of 150 billion EUR

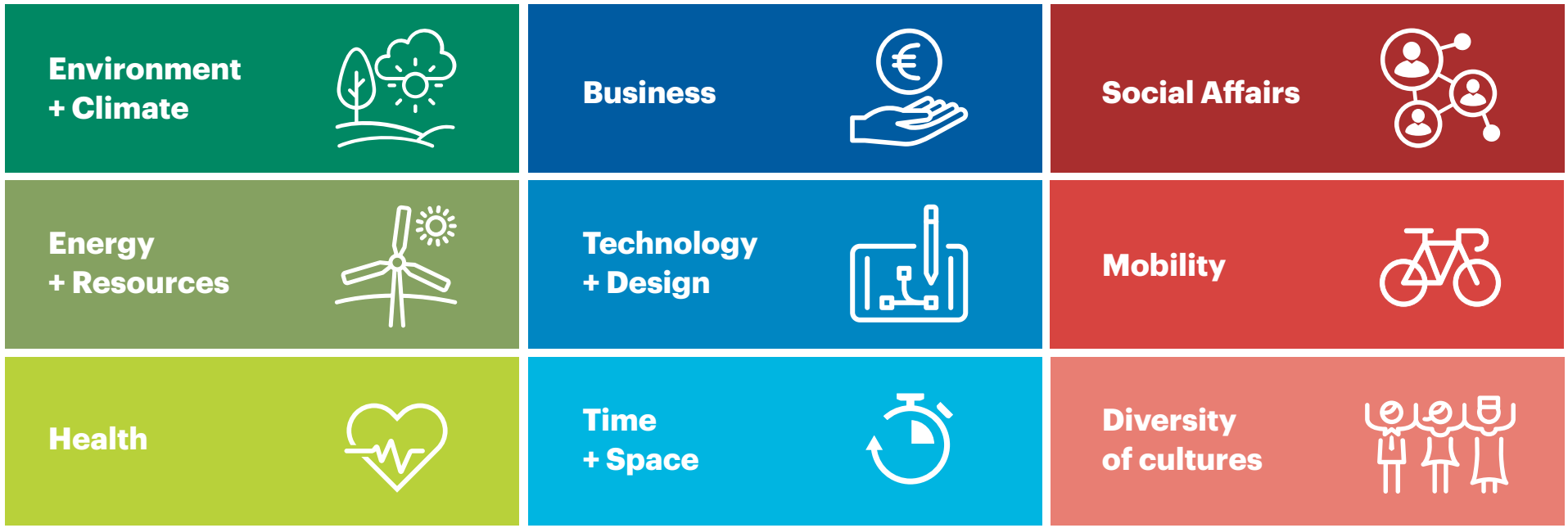
This tool shows how much Europe gains from cycling. It provides comprehensive evidence on the different benefits in all relevant fields, and quantifies them at the level of the EU-28 wherever possible.

The results are striking: Already at current levels, cycling produces global benefits of 150 billion euros per year. More than 90 billion euros of these are positive externalities for the environment, public health and the mobility system. In comparison, a recent study by the European Commission estimated the negative externalities, i.e. the costs for the environment, health and mobility, of motorised road transport at 800 billion euros per year.

The benefits of cycling appear not only in specific, isolated fields like transport or environmental policy, but in many other areas where the EU has competences as well, like industrial policy, employment, health and social policy. This makes the case for an integrated EU Cycling Strategy that includes these fields and considers cycling in all relevant policy areas and will therefore enable the whole EU to reap the benefits of cycling.

A large number of European countries still have a lot of potential to reach higher levels of cycling. To increase the number of cyclists and decrease the negative externalities of motorised road transport, not only an integrated European policy framework, but also adequate funding is needed. With the next Multiannual Financial Framework coming up, the EU now has an excellent opportunity to increase the financial means available for promoting cycling in all relevant funding streams, including amongst others regional funding, research programmes, and support for SMEs. As detailed in this tool, the benefits for all European citizens will be substantial.

The systematic classification of the benefits of cycling is based on the "Active Mobility Agenda", which has helped us to identify nine 'key issues' where the benefits of cycling become tangible. As shown in the matrix below, these key issues are based on the three dimensions of sustainable development: the environment, the economy and social affairs.



Source: Neun, M. 2015. Preface, in: Gerike, R. and Parkin, J. 2015 (Eds.). Cycling Futures – From Research into Practice. Ashgate, Surrey (UK) and Burlington (US), p. xxiii-xxxiii.

Which benefits can we measure today?

Benefit	Estimated Value (billion euros)
CO2 emissions savings	0.6 – 5.6
Reduction of air pollution	0.435
Reduction of noise pollution	0.3
Fuel savings	4.0
Longer and healthier lives	73
Less sickness absence at the workplace	5
Bicycle market	13,2
Cycle tourism	44
Easing of road congestion	6,8
Saving on construction and maintenance costs for road infrastructure for motorised vehicles	2,9
Total annual benefits	**150 - 155 bn euros**

Source: Steenberghen T. et al. 2017. Support study on data collection and analysis of active modes use and infrastructure in Europe

Which benefits can we measure today?

The calculation of benefits is based on an annual cycled distance of 146 billion kilometres for the EU-28, as estimated in a study on active modes data carried out for the European Commission. For this tool, only benefits where enough data is available have been quantified. We know that the total amount would be much higher if we were also able to quantify all the other the benefits of cycling that we have identified. In our 2016 report "The EU Cycling Economy" we estimated the value of these benefits at 182.5 billion euros per year. Further research would be needed to develop methodologies for estimating the actual monetary value of these other benefits. Another 111 billion euros is linked to the consumption volume of people going shopping by bike in the 2016 report. This item has been taken out of the total amount of benefits to avoid confusion: While it represents retail turnover linked to cycling, it is is not a direct positive externality or a direct economic effect of cycling.

For calculating the health benefits of cycling, an updated version of the World Health Organisation's HEAT (Health Economic Assessment Tool for Walking and Cycling) with more detailed parameters has been used. While the estimate is lower than with the previous version (52 billion euros instead of 97 billion euros for yearly mortality benefits), the health benefits of cycling are still substantial and represent the spending on public health of a country like Spain.

Source: Steenberghen T. et al. 2017. Support study on data collection and analysis of active modes use and infrastructure in Europe

Environment and Climate

01

Environment and Climate

01

01 . 1

CO2 emissions savings

- Cycling saves emissions equaling **more than 16 million tons of CO2 equivalents** per year in the EU.
- **This corresponds to the total yearly CO2 emissions of a whole country like Croatia**
- Value of the savings: **600 to 5.630 million euros**, depending on the Social Cost of Carbon

Sources: www.heatwalkingcycling.org, Ricke et. al. (2018) : Country-level social cost of carbon, Nature Climate Change volume 8, pages 895–900

Environment and Climate

01

01 . 2

Reduction of air pollution

- Value of reduced air pollution through cycling: **435 million euros**

- Air pollution is the single largest environmental health risk in Europe, **causing around 400 000 premature deaths per year.**

Sources: European Environmental Agency, Air quality in Europe — 2018 report.

Environment and Climate

01

01 . 3

Reduction of noise pollution

- The value of reduced noise pollution through cycling is **300 million euros.**
- Noise pollution from road traffic is the cause **of around 8 900 premature deaths and almost 800 000 additional cases of hypertension per year** in Europe.

Source: D.J.M. Houthuijs et al., 2014 : Health implication of road, railway and aircraft noise in the European Union

Environment and Climate

01

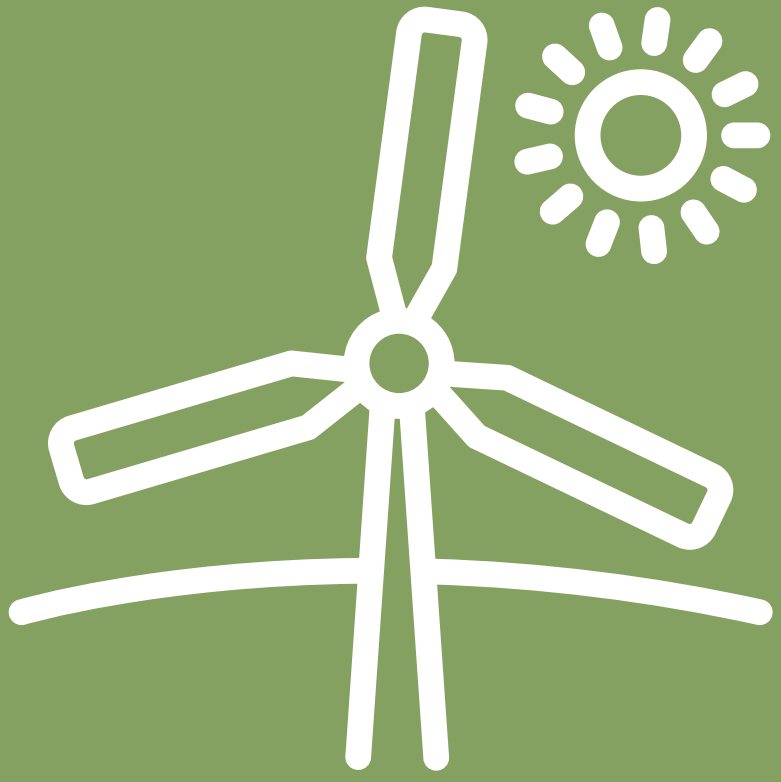
01 . 4

Less soil and water pollution

• Cycling infrastructure needs less space than infrastructure for cars. If less infrastructure is needed, this means **less sealed soils, less soil pollution and less water pollution.**

Energy + Resources

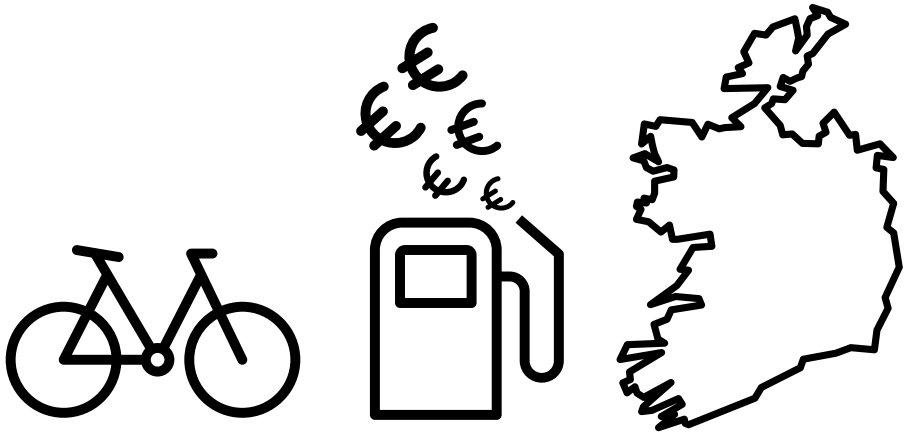
02



Energy and Resources

02

02 . 1



Fuel Savings

- The current levels of cycling in the EU correspond to fuel savings of more than **3 billion litres** per year, **which corresponds to the fuel consumption for road transport of a country like Ireland.**

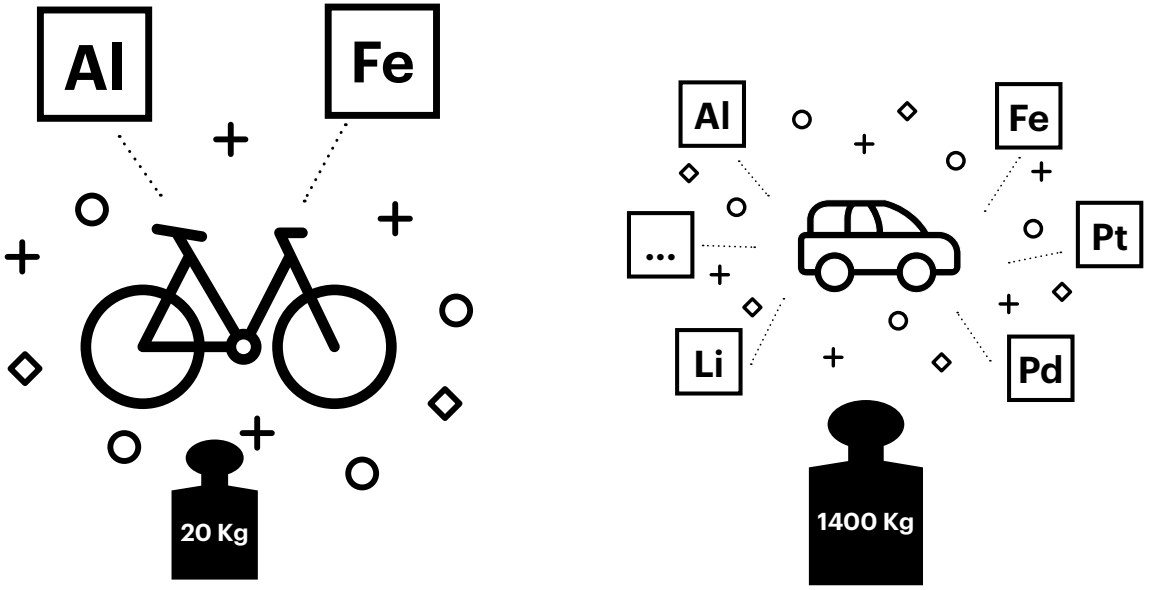
- The value of these fuel savings is almost **4 billion euros.**

Sources: ICCT (2017): From Laboratory to Road; Central Statistics Office Ireland

Energy and Resources

02

02 . 2



Vehicle Production

• The average weight of a car in the EU in 2017 was almost **1400 kg**, a bike rarely weighs more than **20 kg**, or **1.5% of the weight of a car.** This means that much less resources are needed for its construction. Some of the resources are the same, but used in much less quantities (e.g. steel, aluminium, different polymers), others, like platinum or palladium for catalytic converters which cause significant emissions and environmental damage during their extraction, are not used at all for the manufacturing of bicycles.

Source: European Environmental Agency

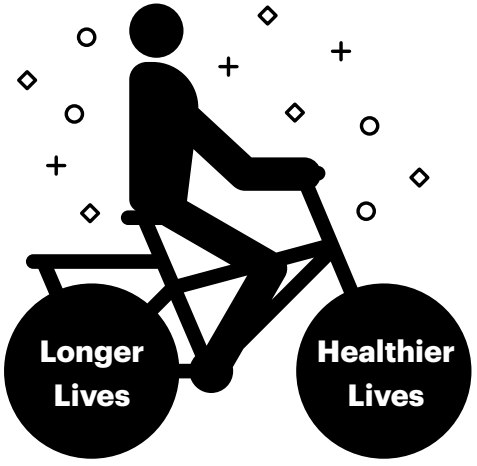
Health

03

Public Health

03

03 . 1



Longer + healthier lives: Reduced mortality + morbidity

• Cycling prevents **18 110 premature deaths** per year in the EU-28. This corresponds to an economic value of **EUR 52 bn** per year.

• Cycling also contributes to healthier lives by helping to prevent a large number of severe and chronical diseases, for example:

+ cardio-vascular diseases
+ diabetes (type 2)
+ breast cancer
+ colon cancer
+ osteoporosis.

Public Health

03

03 . 1

74 bn euros per year

* more than the total spending on public health in Spain

18440 premature deaths

* prevented per year in Europe

Cycling helps to prevent...

- type 2 diabetes
- breast cancer
- cardio-vascular diseases
- colon cancer
- osteoporosis

• Conservative estimates situate the value of these benefits at **EUR 21 bn** per year for the EU-28.

• The value of the mortality and morbidity benefits of cycling together is **higher than the total spending on public health in a country like Spain.**

Sources: + WHO HEAT tool (www.heatwalkingcycling.org) + Zeebroeck
+ Charles, 2014 : Impact et potentiel de l'usage du vélo sur l'économie et l'emploi en Région de Bruxelles-Capitale

Public Health

03

03 . 2

Mental health benefits

- Engaging in moderate physical activity **reduces the risk for Alzheimer's disease by 29% and for cognitive decline by about 26%.**

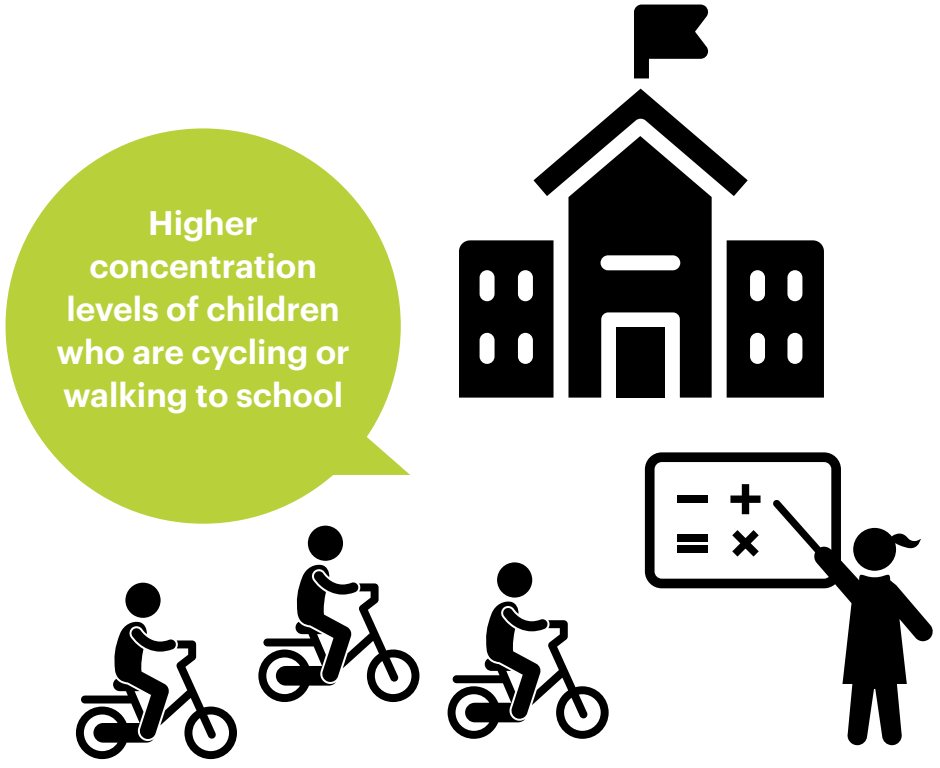
- Physical activity was also linked to **17% lower odds for developing depression** in a large meta-analysis of relevant studies.

- Sources: + Guure et. al. 2017: Impact of Physical Activity on Cognitive Decline, Dementia, and Its Subtypes: Meta-Analysis of Prospective Studies
+ Schuch et. al. 2018: Physical Activity and Incident Depression: A Meta-Analysis of Prospective Cohort Studies

Public Health

03

03 . 3



Health benefits for children

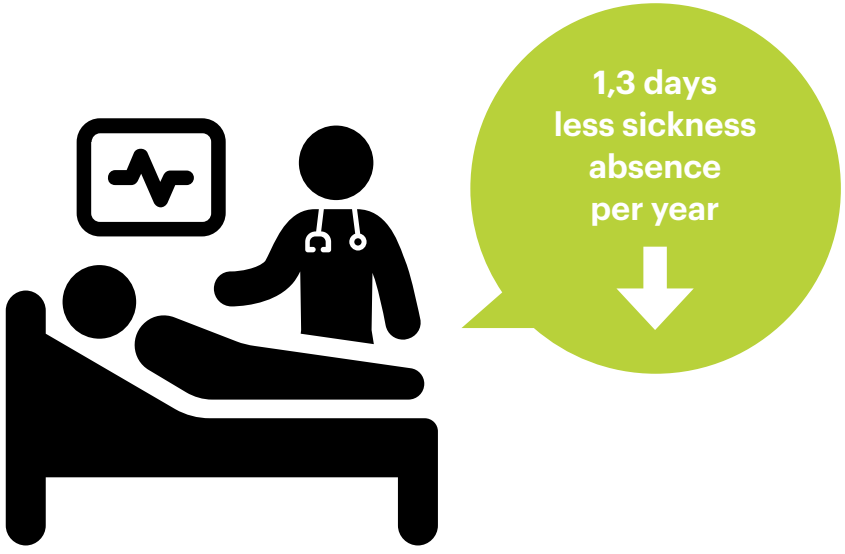
• 4 hours after arriving in the classroom, **concentration levels of children who are cycling or walking to school are 8% higher** than for those who are getting a lift by car.

Source: Masseeksperiment 2012, Denmark.

Public Health

03

03 . 4



Reduced absenteeism from work

- Employees that cycle to work regularly have on average **1.3 days less sickness absence** per year.
- This means a gain of **almost 5 bn EUR per year** for employers around the EU.
- This amount roughly corresponds to the direct and indirect cost of sickness absence **to the Austrian economy.**

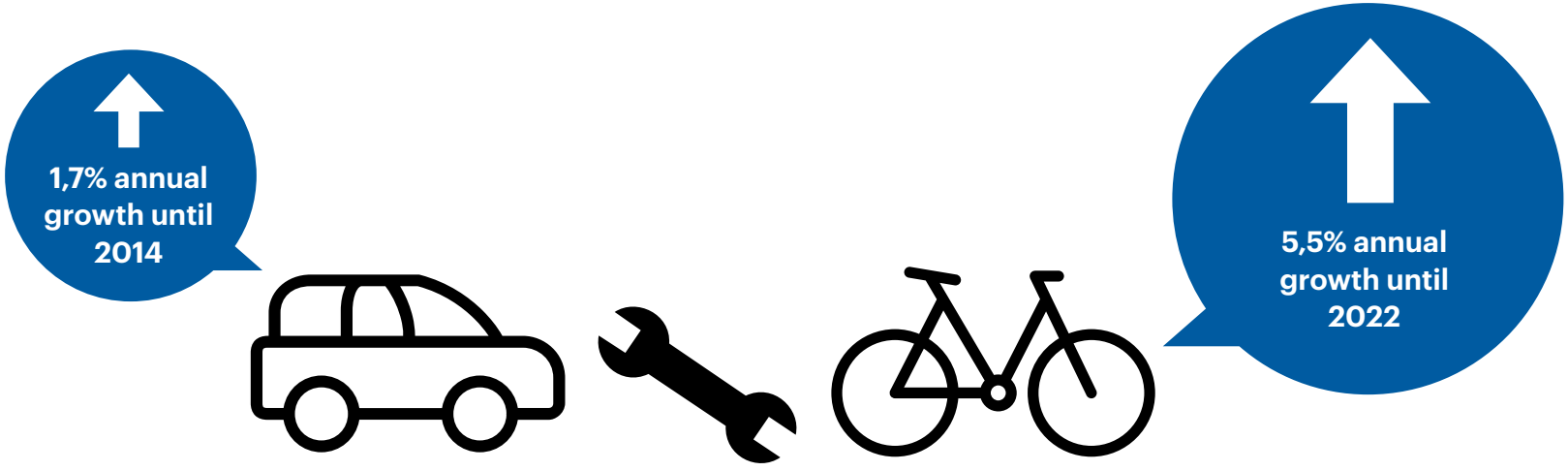
Source: Hendriksen et. al. 2010: The association between commuter cycling and sickness absence.

Business

04

04 Business

04.1



Bicycle manufacturing and related industries

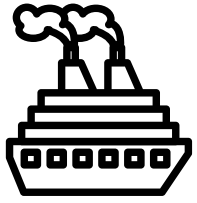
- The **value of the bicycle market in Europe** was estimated at **13.2 bn EUR** in 2016.
- It is expected to grow with **an annual rate of 5.5% until 2022.**
- In comparison, the **European car market** is expected to grow **by only 1.7%** until 2024.

Sources: + GAI Global Bicycle market study 2016 + Global Automotive Outlook 2017

Business

04

04 . 2



cruise tourism

cycle tourism

	cruise tourism	cycle tourism
economic value	38bn euros	44bn euros
jobs	326.000	525.000

Cycle tourism

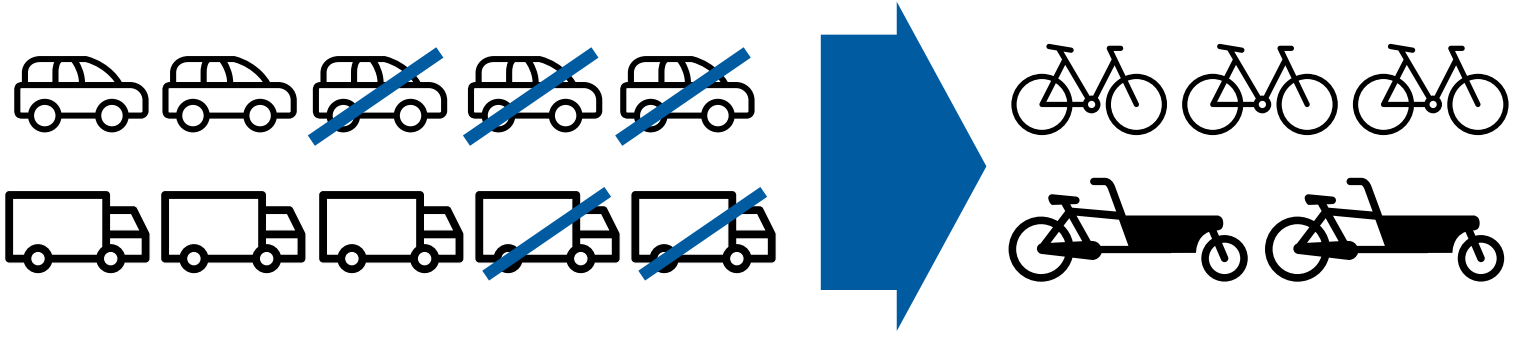
- There is an estimated number of **2.3 billion cycle tourism trips per year** in the EU, which stand for **a total economic value of 44 bn EUR.**
- Cycle tourism is linked to ca. **525 000 jobs in the EU.**
- In France, cycle tourists spend **almost 20% more** than the average for all tourists.
- In comparison, the cruise tourism industry stood for an **economic value of 38 bn EUR and 326 000 jobs** in 2012.

Sources: + European Parliament, Directorate General for Internal Policies, 2012: The European Cycle Route Network EuroVelo. Study.
+ ATOUT FRANCE, 2009: Spécial économie du vélo + CLIA Europe Economic Contribution Report (2013 edition)

Business

04

04 . 3



Cyclelogistics

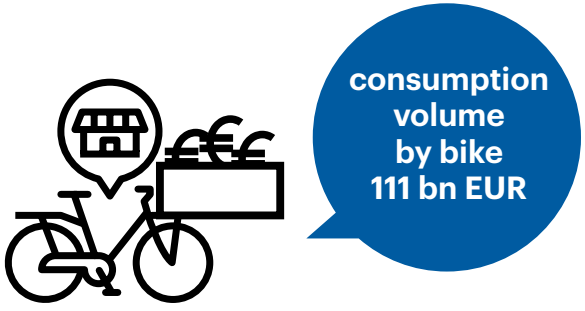
- Cargo bikes have the **potential to replace the following share of motorised trips** in urban areas:
  - + **23-25"% of the commercial deliveries** in cities
  - + **50"% of the commercial service and maintenance** trips
  - + **77% of private logistics trips** (shopping, leisure, child transport)

Sources: + CycleLogistics Baseline Study, 2014 + DLR- Study, 2016

Business

04

04 . 4



Shopping by bike

• Customers using their bike to go shopping account for **a total volume of consumption of 111 bn EUR** in the EU.

• **Clients coming by bike spend more than those coming by car,** be it during a certain time period or related to the parking space that has to be provided for them: Per square metre, **cycle parking delivers 5 times higher retail spend** than the same area of car parking. Cyclists do their shopping **locally,** and are more **loyal customers.**

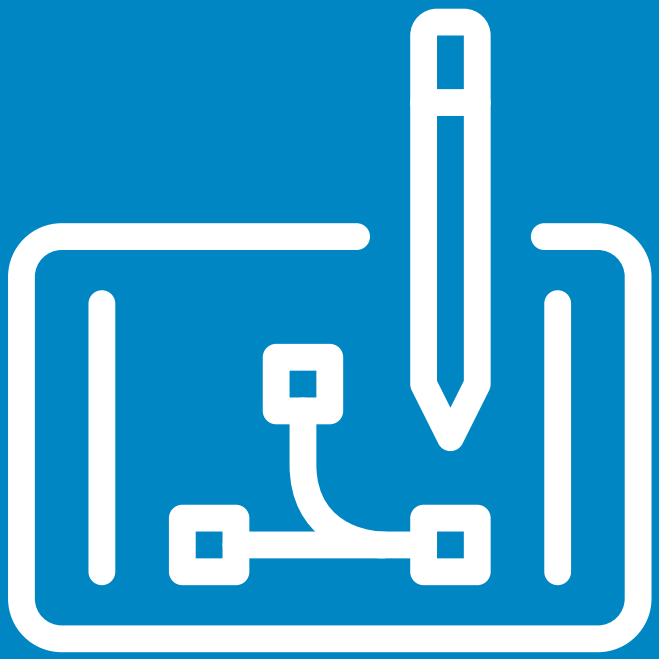
• Retailers **often under-estimate the share of clients that go shopping by bike,** and over-estimate the share of car users among their customers.

• If a street is transformed in a way that gives more space to cyclists and pedestrians and less to cars, the absence of clients that came by car before is **more than compensated for by the clients that come by foot or by bike** afterward. In London, **retail vacancy was 17% lower and retail rental values 7.5% higher** after active mobility improvements in shopping streets and town centres.

Sources: + ECF, 2015. Shopping by bike: Best friend of your city centre. + Carmona et. al. 2018. Street appeal. The value of street improvements
+ Rajé, Fiona and Saffrey, Andrew. 2016. The value of cycling.

Technology + Design

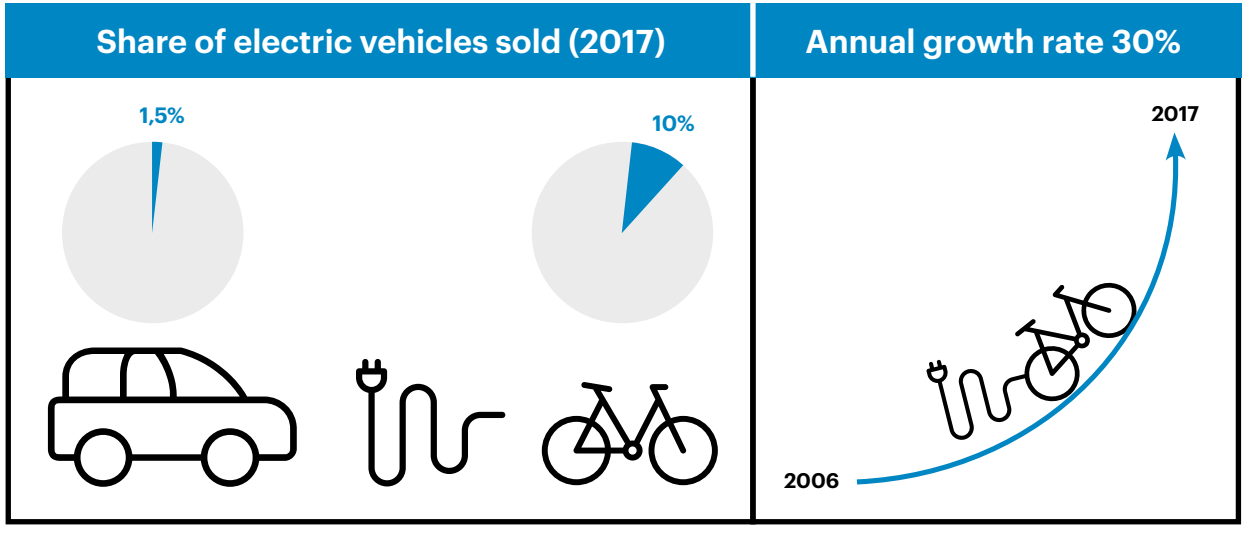
05



Technology and Design

05

05 . 1



Electromobility

- In 2017, **more than 10% of the bikes sold in Europe were electric,** compared to **only 1.5% of cars**

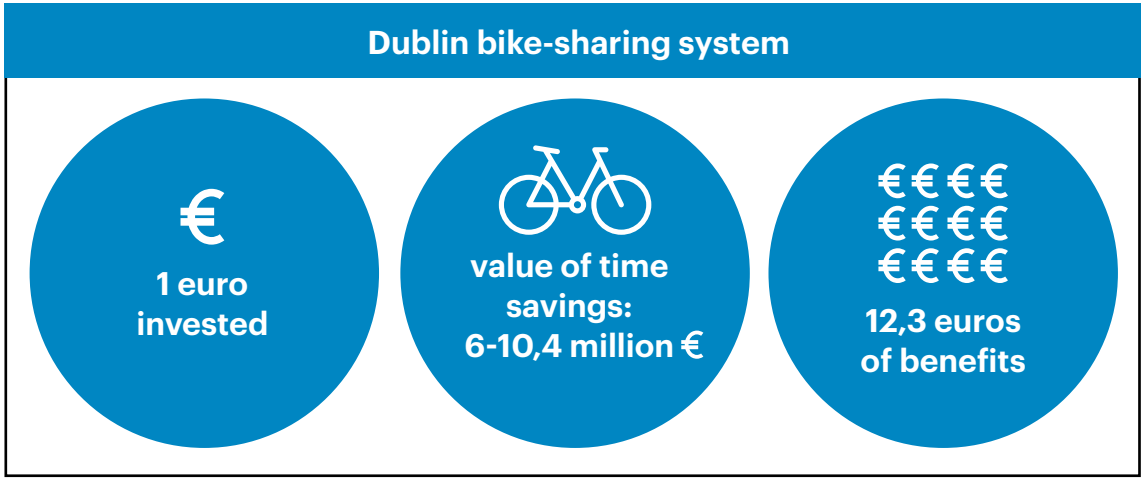
  + Since 2006, **sales of electric bikes have multiplied by 20,** with an average annual growth rate **of almost 30%.**
  + When France introduced a national purchase incentive scheme for electric bicycles in 2017, **61% of beneficiaries stated in a survey that they used electric bicycles to replace car journeys.**

Sources: + CONEBI Bicycle Market Report 2018 (with 2017 data)
+ CEREMA evaluation of French purchase incentive scheme for electric bicycles

Technology and Design

05

05 . 2



Bike-sharing

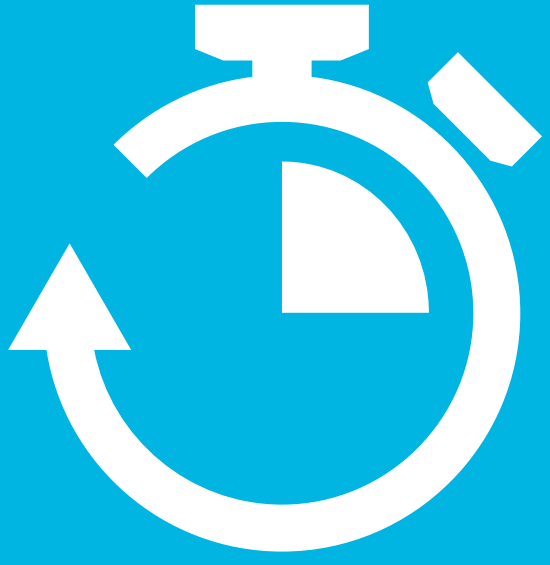
• Bike-sharing **makes work commutes and in-work trips more efficient** and **increases connectivity** in a city by providing e**asy and fast first-mile/last-mile access, enhancing productivity** in the urban economy.

• For the Dublin bike-sharing system, every **1 euro invested** created 12.3 euros of time benefits, wider economic benefits and health benefits. The **value of the time savings alone is in a range of 6 – 10.4 million euros.**

Source: Bullock et.al. 2017: The economic contribution of public bike-share to the sustainability and efficient functioning of cities

Time + Space

06



Time and Space

06

06 . 1

Quality of Time Spent Cycling

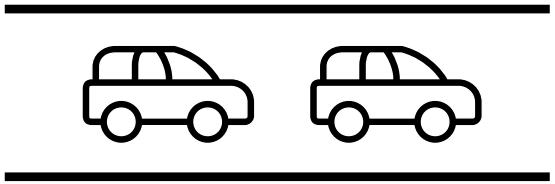
• Studies from London, Montreal, the US and Colombia show that **cyclist commuters are the most or among the most satisfied with their trips to work.**

Source: + St Louis, E., Manaugh, K., van Lierop, D., & El Geneidy, A. (2014). The happy commuter: A comparison of commuter satisfaction across modes. + Morris, E. & Guerra, E. (2015). Mood and mode: Does how we travel affect how we feel? + Sutton, Mark (2018): Cyclists are the happiest commuters, says new YouGov poll + Hidalgo, Dario (2018): Siembra infraestructura bici, cosecha felicidad.

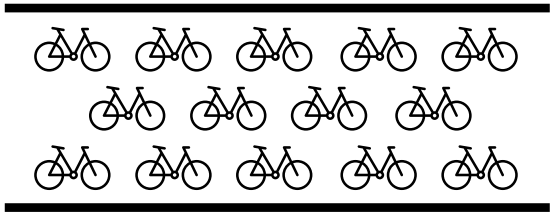
Time and Space

06

06 . 2



Vehicles passing a 3,5 m wide space in a city during 1 hour



Public Space

- The bicycle is very space-efficient: During 1 hour, **7 times more bikes than cars** can cross a 3.5m-wide space in an urban environment.

- The place that is needed for a single car-parking spot **can fit up to 15 bicycles.**

Source: + European Commission. 1999. Cycling: The Way Ahead for Towns And Cities
+ Bruun and Vuchic.1995. The Time-Area Concept: Development, Meaning and Applications. Transportation Research Record 1499

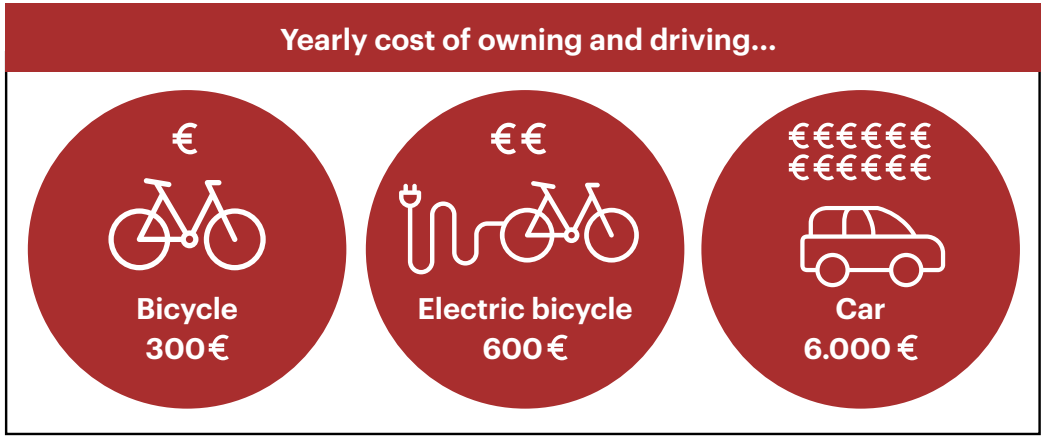
Social Affairs

07

Social Benefits

07

07 . 1



Equality

• The yearly costs for owning and using a bike **only amount to around 5% or 10% (for electric bicycles) to the costs for owning and using a car.** By providing a cheap transport option, cycling can help to make jobs and participation in social life better accessible to disadvantaged population groups.

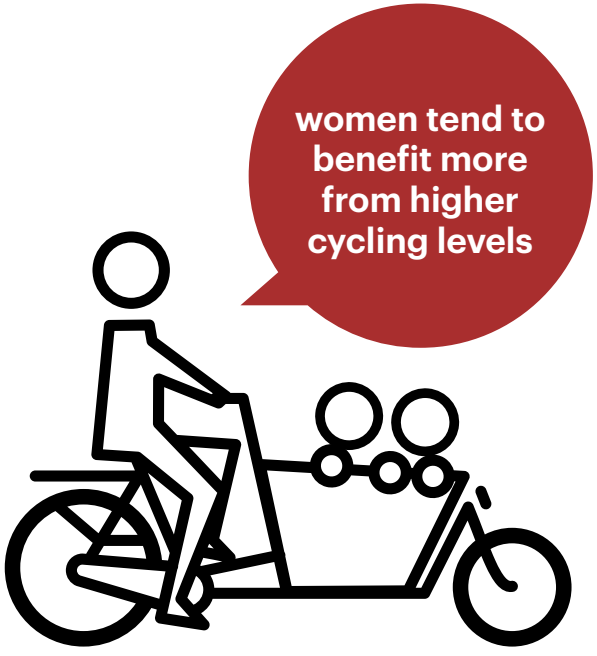
• In the United States, **the lowest-income households** — Americans making less than $20,000 per year — **are twice as likely as the rest of the population to rely on bikes for basic transportation** needs like getting to work.

Source: + Intelligent Energy Europe/Together on the move project, 2012: Costs of owning and driving a car; own calculations
+ Andersen, Michael/People for Bikes. 2015. Assumption Busters: 12 Facts About Race, Ethnicity, Income & Bicycling

Social Benefits

07

07 . 2



Gender Equality

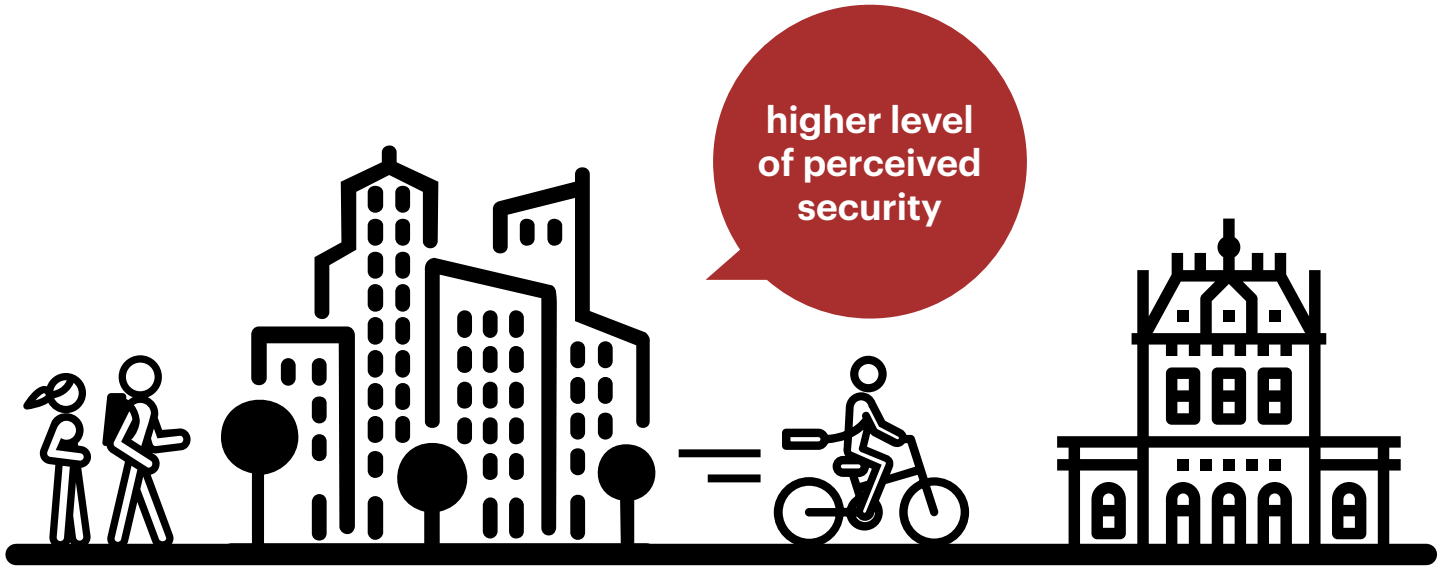
• Research shows that **women tend to benefit more from higher cycling levels.** For example, since they are still taking care of most of childrens' and older adults' mobility in families, they gain more free time if the children and elderly can undertake journeys by bike independently and do not need a lift by car.

Source: Garrard, J et.al. 2012. Women and Cycling. In: Pucher, J. and R. Buehler: City Cycling.

Social Benefits

07

07 . 3



Security

• More people cycling and walking in streets increases social control, which can help to deter criminals and **create a higher level of perceived security.**

Source: Litman, Todd. 2018. Evaluating Active Transport Benefits and Costs.

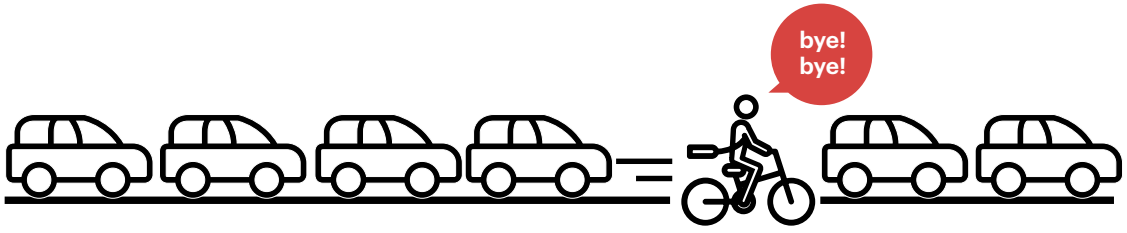
Mobility

08

Mobility Benefits

08

08 . 1



Congestion easing

• The **value of congestion easing through cycling** for the EU can be estimated at **6.8 bn EUR** per year.

• The **total costs of congestion** for the EU economy have been estimated at over **240 bn EUR per year or almost 2% of EU GDP.**

• A number of **local studies from Europe and the US** also show the benefits of cycling for reducing congestion:

+ Cycling improvements lead to 45% less car traffic and faster public transport (Copenhagen, Denmark).
+ Cycle highways reduce time spent in congestion by 3.8 million hours (The Netherlands).
+ Cycle highway network reduces the need for 50,000 car journeys daily (Ruhr area, Germany).
+ Bike share programme eases congestion during city works (Bordeaux, France).
+ Bike share programme reduces congestion by 4% (Washington DC, USA).

Source: + UK WebTAG database (2018) + European Commission, CE Delft (2018): Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities. First Results. + EU FLOW project (2018): Walking, Cycling and Congestion. 15 Quick Facts for Cities.

Mobility Benefits

08

08 . 2

Construction / Maintenance of Road Infrastructure

- The annual **costs for the construction and maintenance of infrastructure for motorised transport that are saved through cycling** amount to **2.9 bn EUR per year** in the EU.

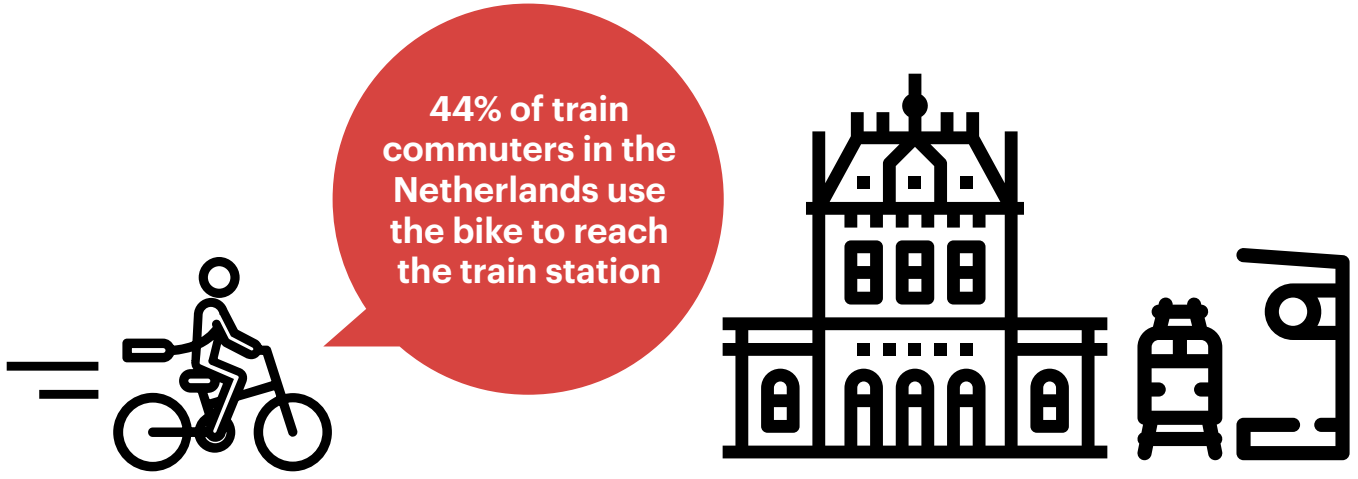
- In the United States, one mile of a high-quality protected bike-lane is estimated to cost 0.25 million USD, whereas an urban freeway costs 60 million USD per mile, or **240 times as much.**

Source: + ITF/OECD Database on Road Infrastructure Investment and Maintenance Costs (2018)
+ ETSC Annual Road Safety Performance Index Report (2018) + Blue, Elly (2013): Bikenomics: How Bicycling Can Save the Economy

Mobility Benefits

08

08 . 3



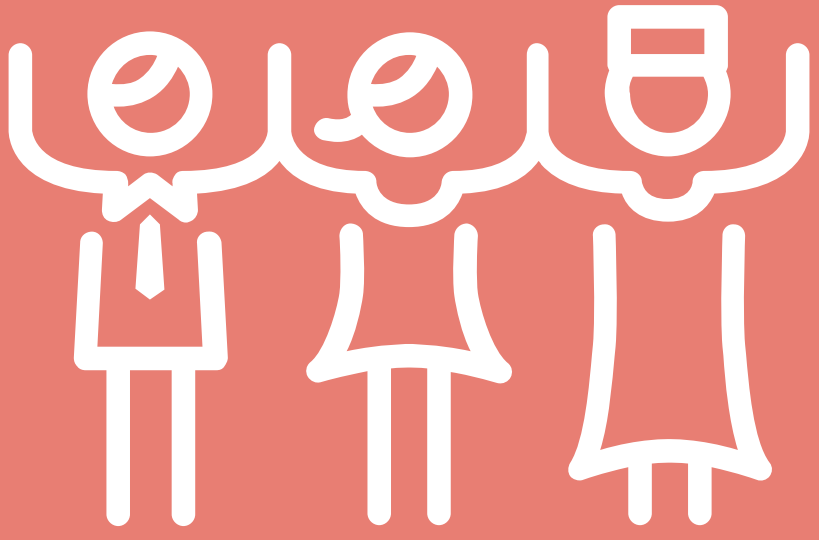
Multimodality and Connectivity

• Cycling helps to create **sustainable mobility chains.** Dutch research shows that **44% of train commuters in the Netherlands use the bike to reach the train station** from their home. **People combining bike and train also use their car less.**

Source: Kennisinstitut voor Mobiliteitsbeleid. 2018. Waar zouden we zijn zonder de fiets en de trein?

Diversity of cultures

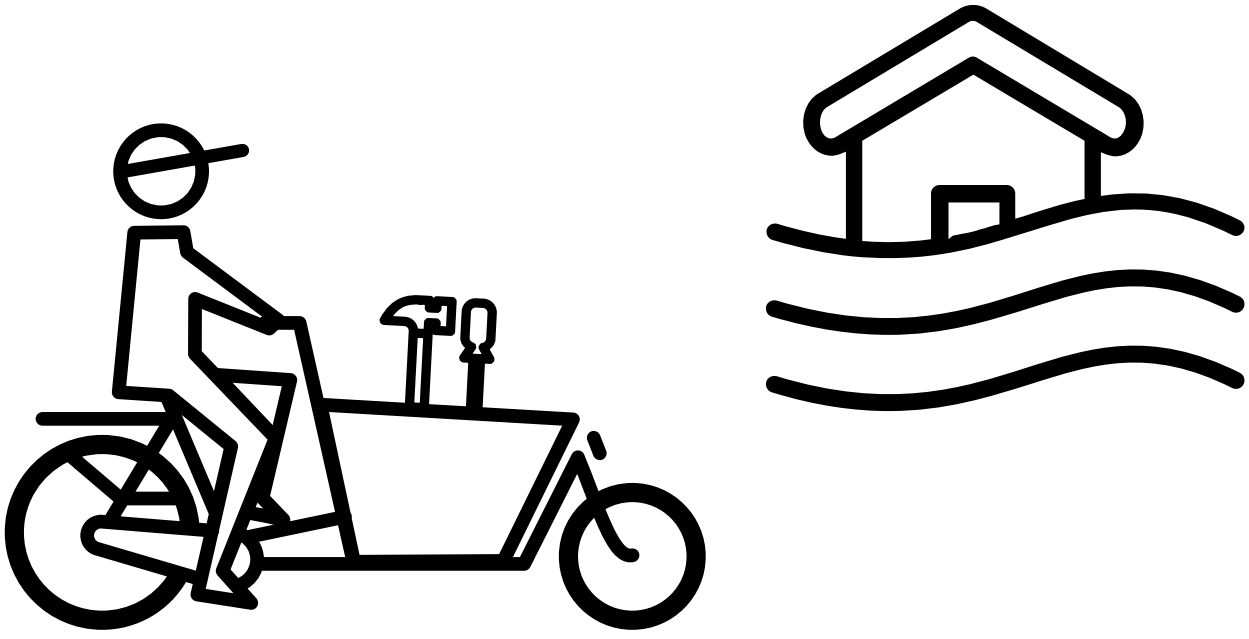
09



Cultural Diversity and Cohesion

09

09 . 1



Resilience

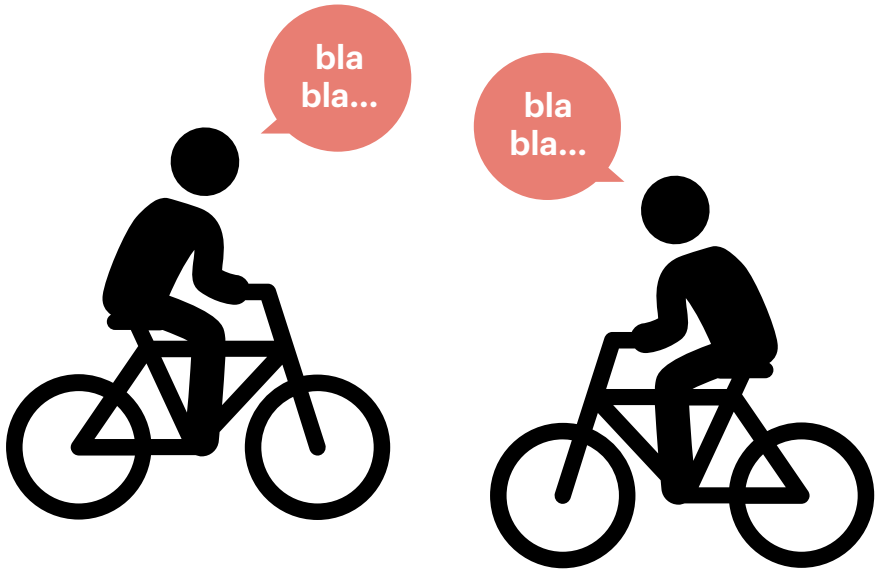
• Cycling, including cyclelogistics, makes cultures more **resilient** by **providing transport options also in cases of emergency** like natural catastrophes or terrorist attacks.

Source: Page, J. Alexander. 2014. The Role of Cargo Bicycles in Disaster Planning and Emergency Management. An Evaluation of the Disaster Relief Trials.

Cultural Diversity and Cohesion

09

09 . 2



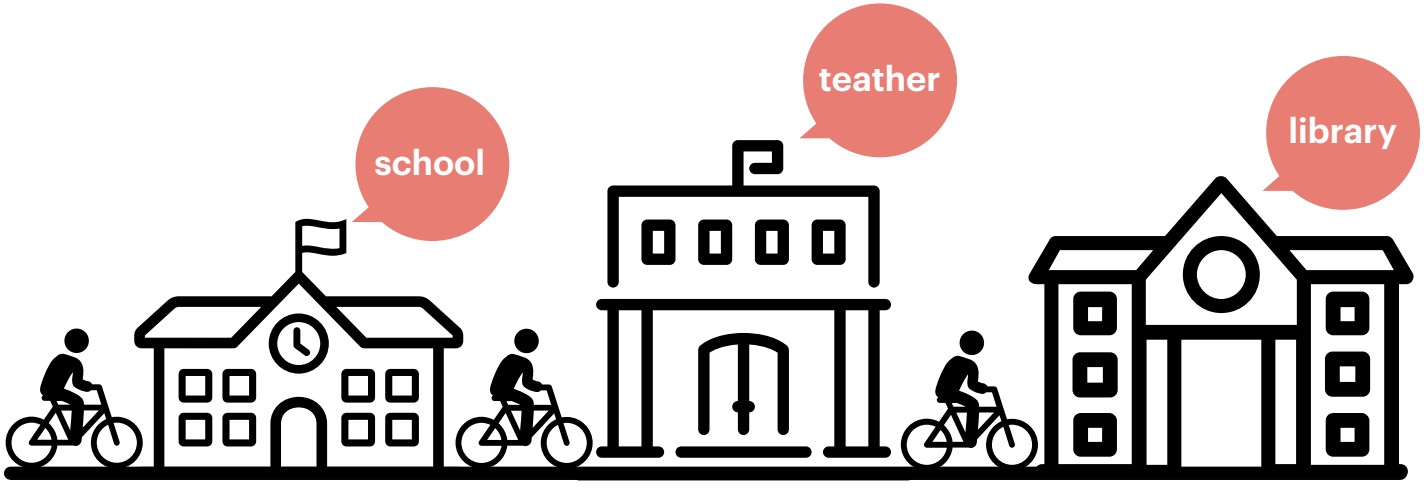
Connectivity between people

• Cycling is a **social activity.** By **bringing people together and connecting neighbourhoods,** it provides the potential for improved social interactions and **more exchange** between them. It can **connect people from different backgrounds and** social classes, thus improving the cohesion of society.

Cultural Diversity and Cohesion

09

09 . 3



Accessibility

• Cycling increases **accessibility,** not only to employment, but also **to places of social and cultural exchange.**

• During the last years, **cycling classes for refugees** have been a succ ess story in a number of EU countries, including Sweden, Germany, the Netherlands, or Finland. Often managed by ECF member organisations, these initiatives **give refugees, and in particular women, the possibility to participate more actively in society** by giving them **easy access to relevant facilities.**

Source: Leppänen, Satu. 2017. Cycling as a Tool to Improve Active Participation of Immigrants.

ECF gratefully acknowledges financial support from the LIFE Programme of the European Union

ECF gratefully acknowledges financial support from the cycling industry via Cycling Industries Europe

December 2018

ECF