

# Kosten des Verkehrs – richtig investiert?

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 Mike Now at Threads Levine @mrlevine · Aug 6

Yup. I'm driving my big Ford pickup truck all alone this morning to get a cup of coffee. Deflecting all the way for \$22K and 42 mpg.  
[twitter.com/DavidZipper/st...](https://twitter.com/DavidZipper/st...)



 64  543  5.9K  538K 

 JuliaKrohmer  
@JuliaKrohmer

Frankfurter #Bicibus mit Grundschulkindern eben durchs Nordend - kurz, aber schön!

Kleiner Junge so: "Wir fahren auf der Straße, yeah!!"

Aber eigentlich traurig, dass es Polizeischutz braucht, damit kleine Kinder mit dem Rad sicher zur Schule fahren können.

[Translate post](#)



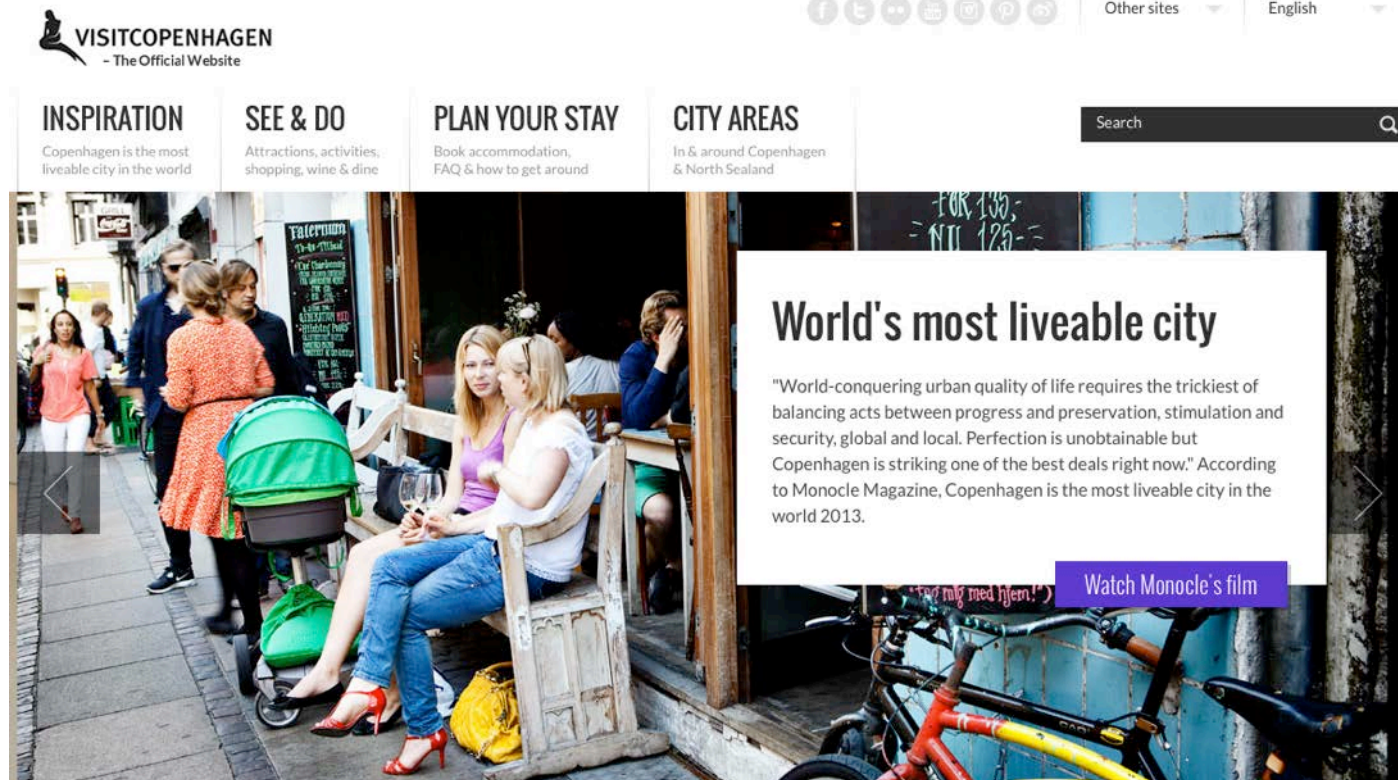
8:55 AM · May 5, 2023 · 3,819 Views

# Von der emotionalen zur sachlichen Debatte

- Was ist ökonomisch richtig?
- Kosten-Nutzen-Analysen in der Verkehrsplanung üblich
- Fokus meist auf Infrastruktur für das Auto
- Seit ca. 2010 Entwicklung neuer Ansätze

# Kopenhagen

1. Vergleich von Nutzen/Kosten von Auto und Fahrrad
2. Überparteilicher Konsens zur Nutzung der Ergebnisse für die Verkehrsplanung



The image shows a screenshot of the Visit Copenhagen website. At the top left is the logo "VISITCOPENHAGEN - The Official Website". To the right are social media icons for Facebook, Twitter, YouTube, Instagram, and Pinterest. Further right are links for "Other sites" and "English". Below the logo is a navigation menu with four categories: "INSPIRATION" (Copenhagen is the most liveable city in the world), "SEE & DO" (Attractions, activities, shopping, wine & dine), "PLAN YOUR STAY" (Book accommodation, FAQ & how to get around), and "CITY AREAS" (In & around Copenhagen & North Sealand). A search bar is located on the right side of the page. The main content area features a large image of a street scene in Copenhagen with people sitting on a bench. Overlaid on the right side of the image is a white text box with the heading "World's most liveable city" and a quote: "World-conquering urban quality of life requires the trickiest of balancing acts between progress and preservation, stimulation and security, global and local. Perfection is unobtainable but Copenhagen is striking one of the best deals right now." According to Monocle Magazine, Copenhagen is the most liveable city in the world 2013. Below the quote is a purple button that says "Watch Monocle's film".

# Schritt 1:

## Festlegung der Parameter

### Methodik der Berechnung der Faktorkosten

| CBA parameter                                       | Methodology to quantify effect   |
|---|--|
| Vehicle operating costs                             | Change in vehicle kilometre by mode, i.e., for different motorized vehicles, public transportation and bicycles. |
| Time costs  | Change in transport time by transport mode.  |
| Accident costs                                      | Change in the number of accidents with and without bicycles involved.  |
| Pollution and related externalities                 | Change in vehicle kilometres for each mode of transportation.  |
| Recreational value <sup>a</sup>                     | Change in cycle kilometres and cyclists' statements.   |
| Health benefits                                     | Change in cycle kilometres.  |
| Safety <sup>a</sup>                                 | Change in the number of accidents, cyclist statements and change in cycle kilometres.                            |
| Discomfort <sup>a</sup>                             | Change in cycle kilometres.  |
| Branding, tourism, and open land value <sup>a</sup> | Not considered to be traffic effects   |

<sup>a</sup> Not included/measured in the CBA.

# Schritt 2:

## Ergebnisse als private und soziale Kosten

Average cost per kilometre for cycling/car, summary for 2008 (Euro).  
Source: COWI and Københavns Kommune (2009).

|                          | Cycling (16 km/h) |        |        | Car (50 km/h) |        |        |       |
|--------------------------|-------------------|--------|--------|---------------|--------|--------|-------|
|                          | Private           | Social | Total  | Private       | Social | Duties | Total |
| Time costs (travel time) | 0.672             | 0      | 0.672  | 0.215         | 0      | 0      | 0.215 |
| Vehicle operating costs  | 0.044             | 0      | 0.044  | 0.296         | 0      | -0.159 | 0.137 |
| Prolonged life           | -0.358            | 0.008  | -0.348 | 0             | 0      | 0      | 0     |
| Health                   | -0.149            | -0.242 | -0.391 | 0             | 0      | 0      | 0     |
| Accidents                | 0.034             | 0.073  | 0.105  | 0             | 0.030  | 0      | 0.030 |
| Perceived safety         | + (?)             | 0      | + (?)  | ?             | ?      | 0      | ?     |
| Discomfort               | ?                 | 0      | + (?)  | ?             | ?      | 0      | ?     |
| Branding/tourism         | 0                 | -0.003 | -0.003 | ?             | ?      | 0      | ?     |
| Air pollution            | 0                 | 0      | 0      | 0             | 0.004  | 0      | 0.004 |
| Climate change           | 0                 | 0      | 0      | 0             | 0.005  | 0      | 0.005 |
| Noise                    | 0                 | 0      | 0      | 0             | 0.048  | 0      | 0.048 |
| Road deterioration       | 0                 | 0      | 0      | 0             | 0.001  | 0      | 0.001 |
| Congestion               | 0                 | 0      | 0      | 0             | 0.062  | 0      | 0.062 |
| Total                    | 0.243             | -0.164 | 0.081  | 0.511         | 0.152  | -0.159 | 0.503 |

Note: Car occupancy is 1.54 persons per car (DTU Transport and COWI, 2010), external values for cars are reported for gasoline cars in the city during off-peak hours. Cycling's health benefits are split into private and social benefits, it is assumed that 50% of the gain is own consumption and thus internalized. The rest is taxes, etc. In cases where unit prices cannot be estimated as yet, the table contains question marks (?). Plususes indicate where these are expected to entail a cost.

# Entscheidungen:

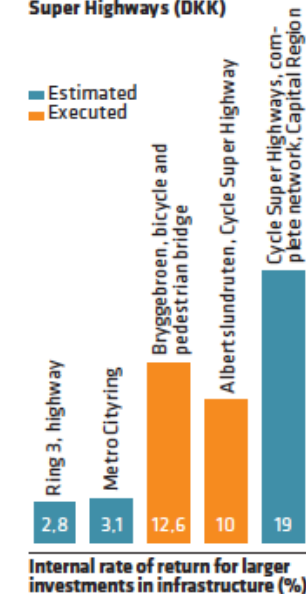
- 28 neue Fahrradautobahnen
- Investitionen von einer Milliarde DKK
- Erwartung sozialer Nutzen von 7,3 Milliarden DKK

Kopenhagen investiert seit 15 Jahren rund 40 Euro pro Einwohner und Jahr in Fahrradinfrastruktur.



## 7,300 M

Socio-economic gain by complete network of 28 Cycle Super Highways (DKK)



### CYCLE SUPER HIGHWAYS ARE GOOD VALUE

In the spring of 2012, Albertslundruten, Copenhagen's first Cycle Super Highway was inaugurated as a test route of 17.5 km passing through the municipalities of Albertslund, Glostrup, Rødovre, Frederiksberg and Copenhagen. In total 28 Cycle Super Highways are planned, which together form a network of high-class bicycle commuter routes across 22 municipalities in the Capital Region.

An analysis of the socio-economic impact of the overall network of 28 Cycle Super Highways shows that over a 50-year period with an investment of just under DKK 1 billion, there is an expected economic gain to society of DKK 7.3 billion. This is equivalent to an internal rate of return on investment of 19%. The ministry of finance's minimum requirement is 5% for infrastructure projects and compared with other investments in infrastructure, this is a very high return.

Especially the health benefits of the extra cycle are beneficial, as the people who cycle daily are expected to have a longer life expectancy on average. In addition, the increase in the number of people engaged in a more active form of transportation is expected to result in 34,000 less sick days per year.

# Ansatz auch kommunal kopiert

ANNONS

”Om cykelresorna ökar från 16 till 19 procent sparar man 1,8 miljarder per år i bara hälsoeffekter.”

”Bei Erhöhung des Anteils der Fahrradwege von 16% auf 19% werden Gesundheitskosten von 180 Millionen Euro gespart.”

MALMÖ 12 oktober 2016 07:00

## Skånes cykelsatsning ska spara miljarder

Att få skåningarna att cykla mer ska spara miljarder bara i hälsoeffekter. Bättre anknytningar till kollektivtrafiken, en sammanhållen cykelled från Båstad till Simrishamn och arbetsgivare som får personalen att cykelpendla är några av förslagen i Skånes första övergripande cykelstrategi. På fredag ska alla instanser ha tyckt till.

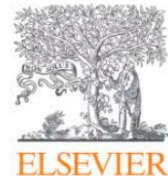
Av: Yvonne Johansson

– Skåne ska ligga i framkant när det gäller cykelinnovationer. Ingen annan region har tagit det här övergripande greppet. Vi har redan högt cyklande i regionen. Nu ska vi stärka cykelturismen och bygga Sydkustleden, som förlänger Kattegatleden från Helsingborg via Malmö och Trelleborg till Simrishamn, säger Johan Raustorp, strateg av hållbara transporter i Region Skåne.



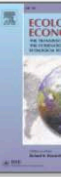
# 2018: Ein Update

1. Climate change
2. Air pollution
3. Noise pollution
4. Land use and infrastructure
5. Traffic infrastructure maintenance
6. Soil and water quality
7. Resource requirements (LCA)
8. Vehicle operation
9. Travel time
10. Congestion
11. Health benefits
12. Accidents
13. Perceived safety & discomfort
14. Quality of life, branding and tourism



Ecological Economics

Volume 158, April 2019, Pages 65-74



Analysis

## The Social Cost of Automobility, Cycling and Walking in the European Union

Stefan Gössling <sup>a, b, c</sup> ✉, Andy Choi <sup>d</sup>, Kaely Dekker <sup>e</sup>, Daniel Metzler <sup>f</sup>

[Show more](#) ✓

# Zusammenfassung

| Parameter                             | Car, € <sub>2017</sub> /pkm |              | Bicycle, € <sub>2017</sub> /pkm |                  | Walking, € <sub>2017</sub> /pkm |                  |
|---------------------------------------|-----------------------------|--------------|---------------------------------|------------------|---------------------------------|------------------|
|                                       | Social                      | Private      | Social                          | Private          | Social                          | Private          |
| Climate change                        | <b>0.011</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Subsidies                             | <b>0.003</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Air pollution                         | <b>0.007</b>                | 0            | 0                               | 0                | 0                               | 0                |
| Noise pollution                       | <b>0.007</b>                | 0            | 0                               | 0                | 0                               | 0                |
| Infrastructure Construction           | <b>0.030</b>                | 0            | <b>0.002</b>                    | 0                | <b>0.002</b>                    | 0                |
| Roadway land use                      | <b>0.011</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Parking land use                      | <b>0.021</b>                | <b>0.022</b> | <b>&lt;0.001</b>                | <b>&lt;0.001</b> | -                               | -                |
| Ecosystem services                    | ?                           | 0            | ?                               | 0                | ?                               | 0                |
| Traffic infrastructure maintenance    | <b>0.004</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Soil and water quality                | <b>0.005</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Resource requirements                 | <b>0.007</b>                | 0            | <b>&lt;0.001</b>                | 0                | <b>&lt;0.001</b>                | 0                |
| Cycle/vehicle operation               | 0                           | <b>0.250</b> | 0                               | <b>0.047</b>     | 0                               | <b>0.041</b>     |
| Travel time                           | 0                           | <b>0.253</b> | 0                               | <b>0.474</b>     | 0                               | <b>1.264</b>     |
| Congestion                            | 0                           | <b>0.355</b> | 0                               | <b>&lt;0.001</b> | 0                               | <b>&lt;0.001</b> |
| Barrier effects                       | 0                           | <b>0.005</b> | 0                               | <b>&lt;0.001</b> | 0                               | <b>&lt;0.001</b> |
| Health benefits                       | 0                           | 0            | <b>-0.193</b>                   | <b>-0.134</b>    | <b>-0.386</b>                   | <b>-0.268</b>    |
| Prolonged life                        | 0                           | 0            | <b>0.007</b>                    | <b>-0.320</b>    | <b>0.014</b>                    | <b>-0.640</b>    |
| Accidents                             | <b>0.002</b>                | ?            | <b>&lt;0.001</b>                | <b>0.066</b>     | <b>&lt;0.001</b>                | <b>0.066</b>     |
| Perceived safety & Discomfort         | ?                           | ?            | -                               | <b>0.014</b>     | -                               | <b>0.036</b>     |
| Quality of life, branding and tourism | 0                           | 0            | ?                               | ?                | ?                               | ?                |
| <b>Total</b>                          | <b>0.108</b>                | <b>0.885</b> | <b>-0.184</b>                   | <b>0.147</b>     | <b>-0.370</b>                   | <b>0.499</b>     |

# Schlussfolgerungen

- Jeder Autokilometer in der EU verursacht gesellschaftliche Kosten von 11 Cent pro Personenkilometer
- Fahrradfahren (18 Cent/pkm) und Laufen (37 Cent/pkm) generieren Nutzen
- Jeder nicht gefahrene Autokilometer ist 29 Cent (Alternative Fahrrad) bzw. 48 Cent (Laufen) wert

# Weitere Untersuchungen: Die Kosten des Autos



Ecological Economics

Volume 194, April 2022, 107335



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## The lifetime cost of driving a car

Stefan Gössling <sup>a, b, c</sup>  , Jessica Kees <sup>d</sup>, Todd Litman <sup>e</sup>

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<https://doi.org/10.1016/j.ecolecon.2021.107335>

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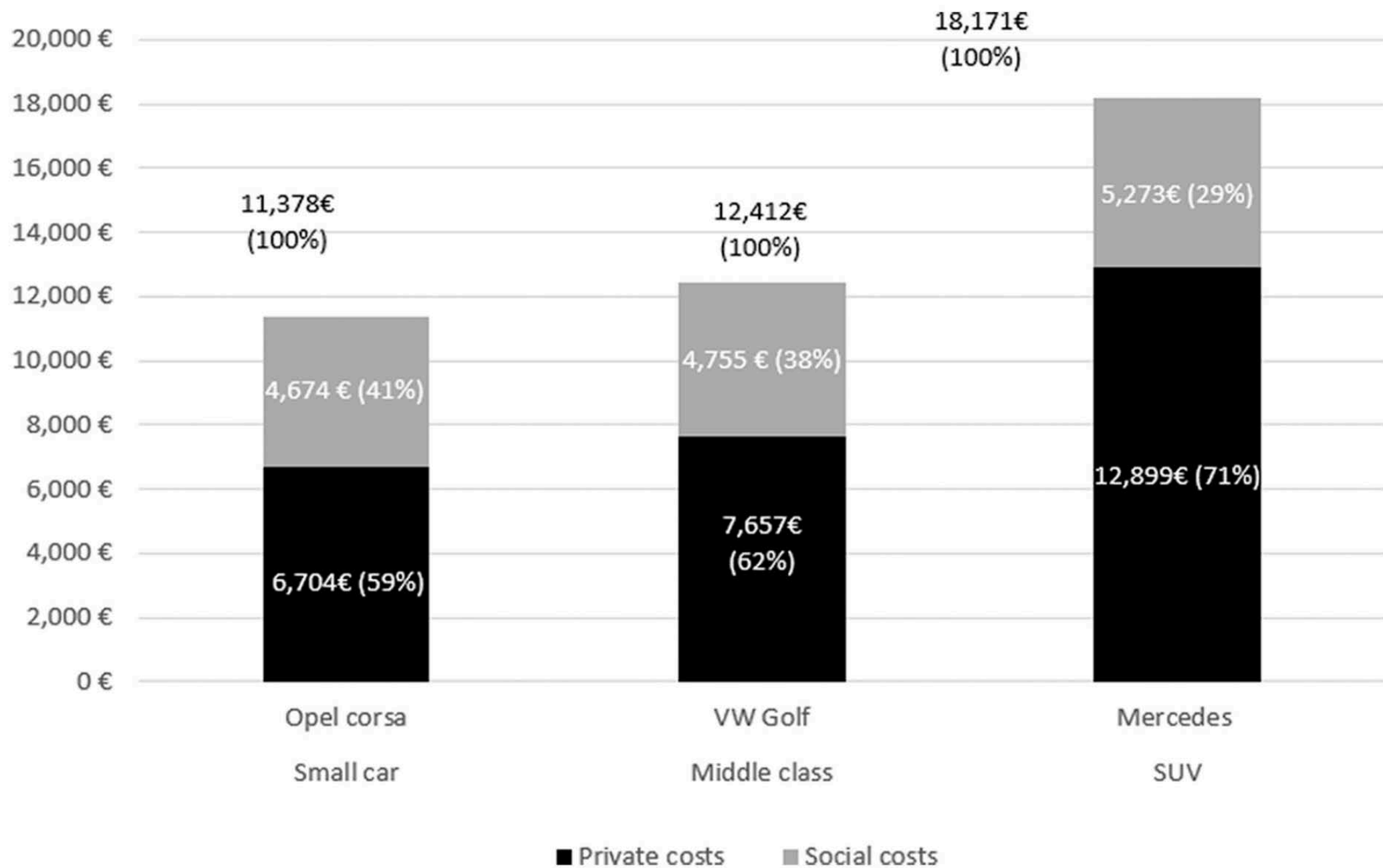
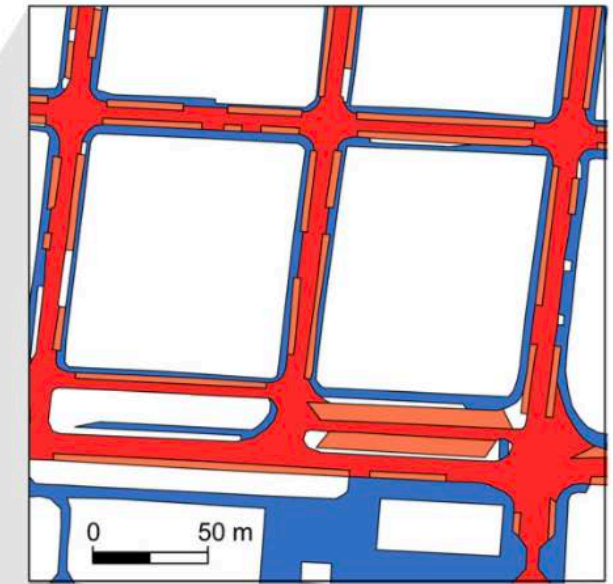
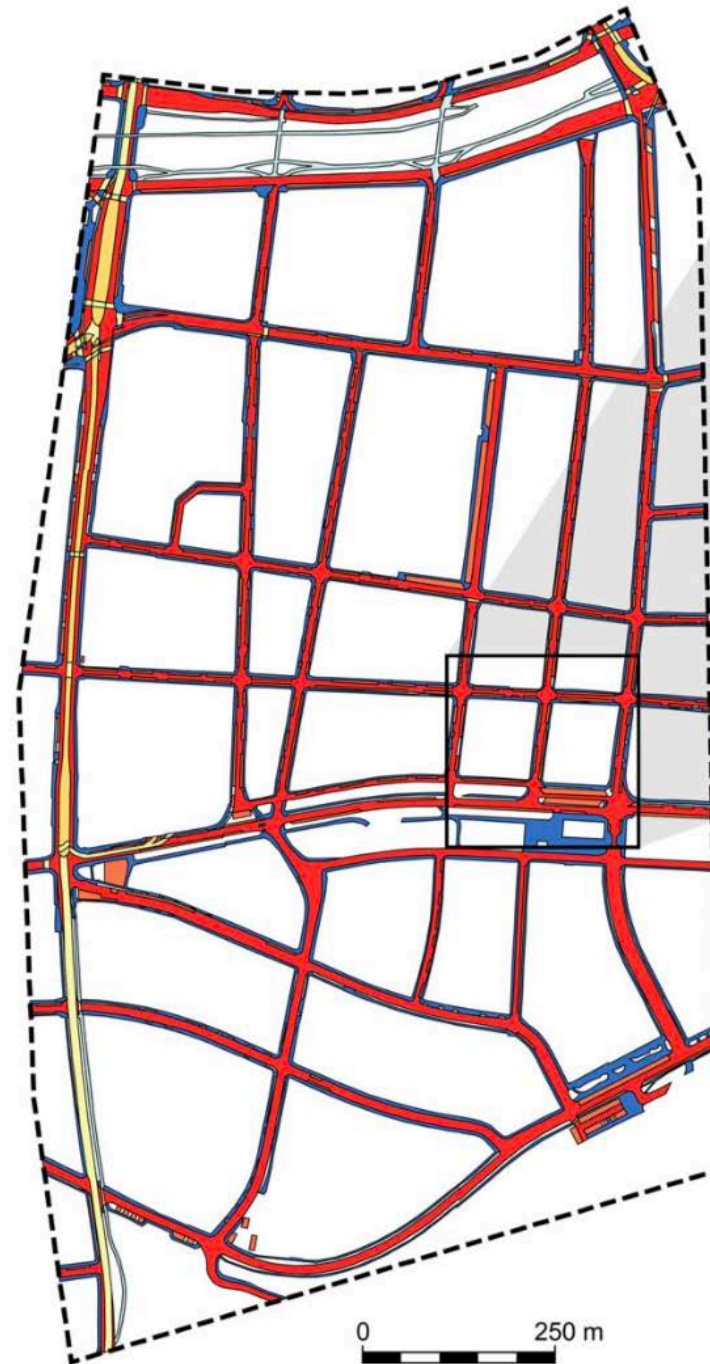


Fig. 1. Comparison of private and social cost of car ownership.

# Ergebnisse

- Die Gesellschaft subventioniert jedes Auto in Deutschland mit etwa 5000 Euro pro Jahr
- In der EU sind Transportkosten der zweihöchste Ausgabenfaktor (nach Miete/vor Nahrungsmitteln)
- Gerade für Geringverdiener ist das Auto eine ökonomische Falle
- Gerechnet über 50 Jahre ist Autobesitz äquivalent zu den Kosten einer Eigentumswohnung
- Stadtplanung sollte nicht möglichst vielen Menschen ein Auto zugänglich machen, sondern Mobilsein ohne Auto ermöglichen.

# Nicht-ökonomische Indikatoren: Flächenverteilung



-  Study area
-  Road
-  Public parking
-  Public transport
-  Bicycle lane
-  Pedestrian area
-  Mixed use (bicycle/pedestrians)
-  Other

Gössling, S., Schröder, M., Späth, P., and Freytag, T. 2016. Urban space distribution and sustainable transport. *Transport Reviews*, <http://dx.doi.org/10.1080/01441647.2016.1147101>

Source: Authors based on Google Satellite  
GIS/Cartography: Marcel Schröder/Birgitt Gaida  
Spatial Reference System: Pseudo Mercator (EPSG: 3857)

# Verteilung in Freiburg

**Table 4.** Summary space allocation, four city quarters.

|                               | Range (%)        | Average (%)   |
|-------------------------------|------------------|---------------|
| Road                          | 40.3–55.6        | 48.6          |
| Public parking                | 3.8–11.9         | 6.6           |
| <i>Road and parking</i>       | <i>44.2–59.4</i> | <i>55.2</i> ← |
| Pedestrian area               | 15.0–33.0        | 24.8          |
| Mixed use bicycle and walking | 1.0–16.8         | 8.3           |
| Public transport              | 1.4–16.3         | 6.5           |
| Bicycle                       | 1.3–4.1          | 2.4           |
| Mixed uses                    | 1.2–4.4          | 2.7           |

Zum Vergleich

Anteil der Wege mit dem Auto: 21%

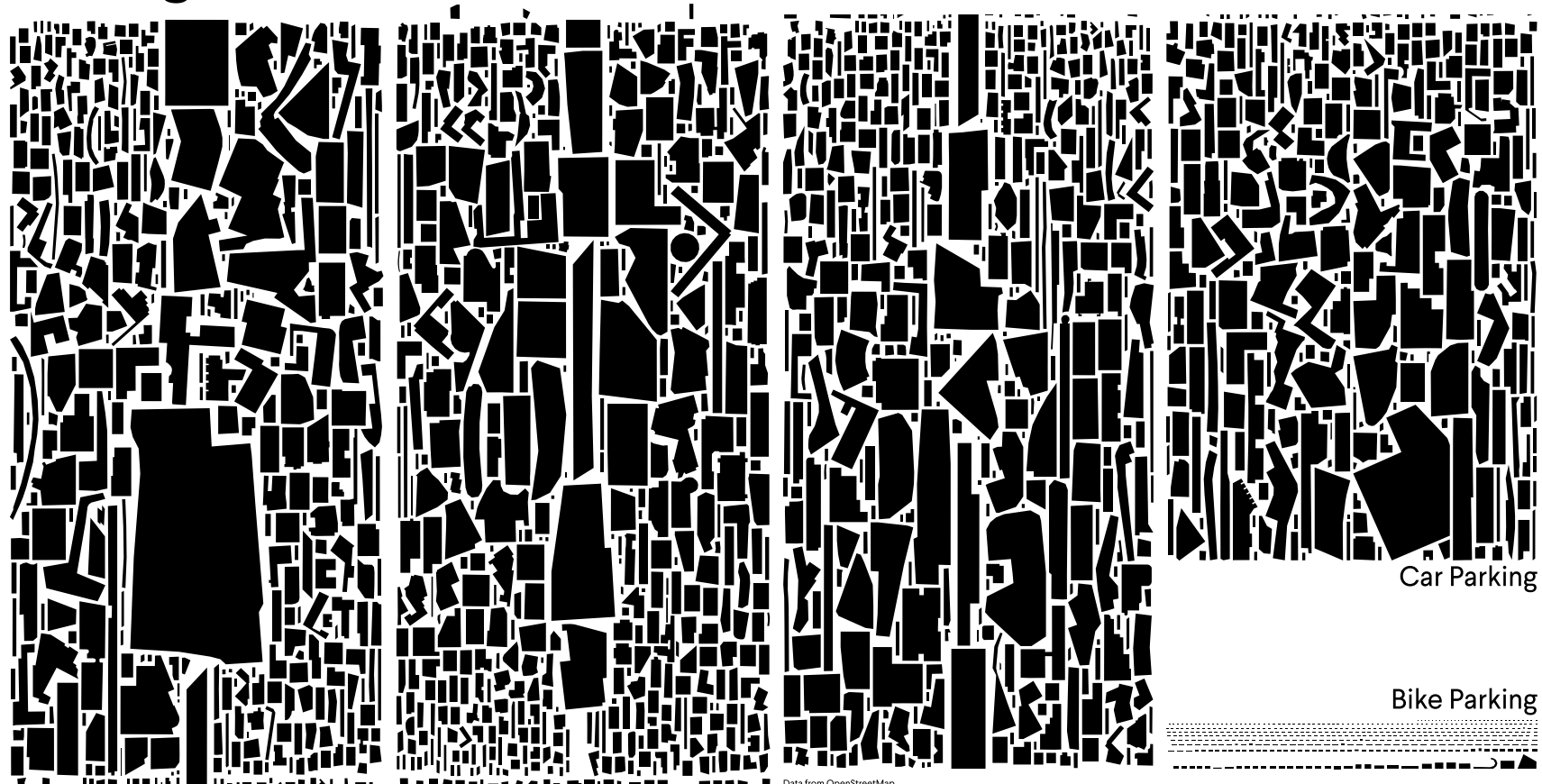
Anteil der Wege mit dem Fahrrad: 34%



# Visualisiert

Stuttgart

<http://whatthestreet.moovellab.com>



# Zusammenfassung

- Verkehrspolitik, Industriepolitik & Politik persönlicher Präferenz
- Das Auto ist Verursacher großer Kosten
- Das Auto blockiert eine bessere Mobilität für alle
- Die Förderung anderer Verkehrsträger ist nahezu immer richtig, sofern Vision Zero, Klimawandel, Gesundheit & Lebensqualität in Städten der Ausgangspunkt für Entscheidungen sind