

SPRINGER BRIEFS IN
APPLIED SCIENCES AND TECHNOLOGY

Patrick R erat

Cycling to Work

An Analysis of the Practice of Utility Cycling




Springer

Patrick R erat

Cycling to Work

An Analysis of the Practice of Utility Cycling

 Springer

Patrick Rérat 
Institute of Geography and Sustainability
and Observatory for Cycling and Active
Mobilities
University of Lausanne
Lausanne, Switzerland

Translation by Hannah Juby and Becky Warner of Express Language

ISSN 2191-530X ISSN 2191-5318 (electronic)
SpringerBriefs in Applied Sciences and Technology
ISBN 978-3-030-62255-8 ISBN 978-3-030-62256-5 (eBook)
<https://doi.org/10.1007/978-3-030-62256-5>

This book is a reworked and extended version of:

© 2019 Éditions Alphil-Presses universitaires suisses, Neuchâtel, Switzerland. Original title: Au travail à vélo...La pratique utilitaire de la bicyclette en Suisse.

© The Author(s), under exclusive license to Springer Nature Switzerland AG 2021

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Acknowledgements

This work was supported by the University of Lausanne, the Canton of Vaud and Romande Energie as a part of the Volteface research programme. I am grateful for this support.

I would like to address a special word of thanks to Gianluigi Giacomel and Antonio Martin for their work on the statistical analysis of the large-scale survey on which this book is based. I would also like to thank the other previous and current members of my research team in the geography of mobilities at the University of Lausanne. Their involvement in various research and teaching projects on mobilities and on cycling have enriched the analysis and reflections presented in this book.

A first version of the book was published in French by the Editions Alphil—Presses universitaires suisses. The English version has been reworked and extended for an international readership. I would like to thank Hannah Juby and Becky Warner of Express Language for having translated the manuscript.

Finally, the research would not have been successful without the support of PRO VELO Switzerland, who agreed to send the survey to the participants in the *bike to work* scheme. Almost 14,000 of them took the time to fill in a (long) questionnaire! Particular thanks are due to them.

Lausanne, Switzerland
August 2020

Patrick R erat

Contents

1	Introduction	1
1.1	The Return of the Bicycle	1
1.2	Why Should We Care About Cycling?	2
	References	6
 Part I Theoretical Framework and Context		
2	Velomobility	11
2.1	Analysis of the Practice of Cycling	11
2.2	Uses	14
2.3	The Cycling Potential of Individuals	14
	2.3.1 Access	15
	2.3.2 Skills	16
	2.3.3 Appropriation	17
2.4	The Cycling Hosting Potential of Territories	19
	2.4.1 Spatial Context	19
	2.4.2 Infrastructure and Amenities	20
	2.4.3 Rules and Norms	23
2.5	Cycling Promotion Campaigns	24
	References	26
3	Cycling in Switzerland	31
3.1	The Majority of the Population Cycles at Least Occasionally	31
3.2	Increasingly Urban Usage of the Bicycle	31
3.3	Practices According to Profiles and Reasons for Travel	36
	References	38

Part II The Participants in the Bike to Work Scheme

4	Research Approach	41
4.1	Objectives of the Study	41
4.2	The Bike to Work Scheme	42
4.3	The Field Survey	43
4.4	Profile of the Sample	44
	References	46
5	Journeys	47
5.1	Participants Are Mainly Cycling Enthusiasts	47
5.2	Characteristics of the Commuting Journeys	48
5.3	The Place of Cycling in Mobility Practices	51

Part III Individuals' Cycling Potential

6	Access	59
6.1	The Emergence of the Electrically Assisted Bicycle	59
6.2	Access to Other Means of Transport	61
7	Skills	65
7.1	Levels of Ease Depending on Degree of Cohabitation with Road Traffic	65
7.2	Strategies for Cohabitation with Road Traffic	68
7.3	Learning by Experience	69
	References	73
8	Motivations	75
8.1	A Plurality of Rationales for Cycling	75
8.2	Well-Being	77
8.3	Civic Engagement	79
8.4	Independence	80
8.5	A Typology of Cyclists According to Their Motivations	81
8.6	Participation in Bike to Work	84
	References	87
9	Barriers	89
9.1	Barriers to Cycling	89
9.2	Weather Conditions	91
9.3	Logistical Constraints	92
9.4	Safety	92
9.5	Comfort	95
	References	96

Part IV Territories’ Cycling Hosting Potential

10 Territories 99

 10.1 Marked Spatial Disparities 99

 10.2 Variable Parking Conditions 102

 10.3 Journeys with Inadequate Bikeability 103

 Reference 108

11 Politics 109

 11.1 Critical Appraisal of Public Authority Action 109

 11.2 The Measures Recommended Most 112

 11.2.1 Safe and Developed Infrastructure 112

 11.2.2 Norms and Rules Legitimising Cycling 115

Conclusion 117

About the Author

Patrick Rérat is Full Professor in geography of mobilities at the University of Lausanne, Switzerland. He holds a PhD in social sciences from the University of Neuchâtel and he has been a visiting researcher at King's College London, HafenCity University Hamburg and Loughborough University.

His research interests focus on urban planning and sustainable development, which he addresses through the various forms of residential and everyday mobilities. He has published about 50 papers in journals such as *Transportation Research Part A*, *Urban Studies*, *Transactions of the Institute of British Geographers*, *International Journal of Housing Policy*, *Applied Mobilities*, *Environment and Planning A*, etc.

He is the co-founder and co-director of the Observatory for Cycling and Active Mobilities ('OUVEMA'), launched in 2020 at the University of Lausanne.

Chapter 1

Introduction



In 1817, Karl von Drais travelled 14 kms around Mannheim on a strange two-wheeled vehicle, a ‘running machine’, which is considered to be the ancestor of the bicycle. Two centuries after its invention, the bicycle is back on centre stage, and it may just be one of the keys to the mobility of the future.

1.1 The Return of the Bicycle

What a journey the bicycle has been on! Baron von Drais’s running machine marks the beginning of a series of innovations which gave rise to the bicycle in the late nineteenth century. Initially, a leisure pursuit for the bourgeoisie, the bicycle, thanks to mass production, became a cheap and popular means of transportation for workers. At the end of the Second World War, increased purchasing power and the proliferation of motorised transport caused the practice to collapse in all industrialised countries [9, 19, 20] including Switzerland [12, 21]. In the 1970s, an upswing was observed in the Netherlands and Denmark while, in general, the bicycle continued to lose relevance. Finally, over the last 15 years, a comeback has been observed in Western cities, with increasing numbers of urban centres promoting cycling. Construction of infrastructure, the emergence of new types of bicycles (electrically assisted bikes, bike share services, etc.) and a renewed image have allowed the number of users to increase. In central Copenhagen, bike traffic is now greater than car traffic and the same is now observed during rush hour in central London.

So, what’s the situation like in Switzerland? At the national level, the growth in the proportion of travel completed by bicycle is modest and recent. In the larger cities, however, the increase is evident as we will see in Sect. 3.2. The bicycle has also become a political object. In 2018, about 75% of Swiss people agreed to incorporate the principle of promoting cycling—without any binding measures though—in the federal constitution. The city of Bern has launched a ‘bike offensive’ (*Velo-Offensive*)

and aims to become the Swiss capital of cycling (*Velo-Hauptstadt*). Other urban centres—Basel, Winterthur, Lucerne, etc. —are not far behind, and contest this title. In Zurich, in 2017, signatures were collected in record time to support an initiative to challenge the authorities over a claimed delay in the provision of cycling facilities.

Little is known about cycling practices in Switzerland and there is little research on the subject. The imagery and conversations around cycling are at the very least contradictory, even clichéd. The bicycle is the vehicle of the penniless student; it is a means of transport for the young trendy executive, a toy for children, a flexible and rapid means of transport, an experience associated with holidays; cyclists play fast and loose with traffic rules; users have been left behind due to decades of planning policy prioritising cars, etc.

Given the recent return to grace of the bicycle in urban policy and the current challenges in the field of mobility, it is important to investigate the utilitarian dimension of cycling.¹ This is the objective of this research, which is based on a survey answered by nearly 14,000 *bike to work* participants. Each year, this action brings together people who agree to use bicycles as much as possible in their commuting journeys during May and/or June. The various empirical chapters of this book relate to the uses of cycling, commuter cyclists' access to means of travel, the skills required to manage daily journeys, the motivations for choosing to cycle, the barriers encountered, as well as user evaluations of traffic conditions, the quality of amenities and infrastructures, and the focus on cycling by the public authorities. Because of its scope, this approach captures in detail the various dimensions of utility cycling as well as its shortcomings in the case of Switzerland. By doing so it brings theoretical and empirical elements to the research on and the politics of cycling in the many countries where cycling culture is being redefined.

1.2 Why Should We Care About Cycling?

In a world described as being increasingly fast, fluid and (inter)connected, is not cycling an anachronism? What role can it play in the transportation system? What problems can it contribute to solve? What are the arguments put forward to promoting cycling?

A first challenge is energy transition. Lifestyles, travel habits, indeed the entire economic system, all operate on the basis of abundant and cheap energy. This organisation is being challenged due to climate change and the heavy dependence on

¹Utility cycling emphasises its function as a means of transport, while recreational cycling refers to a leisure or sporting activity.

non-renewable resources. Energy transition involves objectives such as the progressive rejection of fossil fuels, the promotion of renewable resources, and a reduction in greenhouse gas emissions.²

But the energy transition simply cannot be implemented without another transition: the ‘mobility transition’ or the transition to ‘low-carbon mobility’ [6]. This involves a change in mobility practices, or at least in the way in which they are exercised. Mobility plays a central role in the energy issue. In Switzerland, transportation accounts for 36% of final energy consumption, and 94% of this share comes from fossil sources [15]. Greenhouse gas emissions, for their part, owe 32% to transportation, despite international air traffic not being counted [14]. Other environmental impacts, on both the local and regional scale, are also listed. They relate, in particular, to the emission of various pollutants and suspended particulate matter, which have significant impacts in terms of public health.

Three action levers, three verbs, summarise the discourse on mobility transition: improve, transfer and avoid [5]. Improving refers to technological solutions, which aim to reduce negative externalities by making the transport system more efficient and by opting, for example, for alternatives to petroleum fuels (for example, electricity). Transferring involves promoting more resource-efficient forms of mobility by favouring shared forms (public transport, carpooling and car sharing) and demotorised forms or active mobility.³ Avoiding means encouraging lifestyles that are no longer based on high mobility but on a more restricted spatial scale and on the valorisation of proximity.

The mobility transition is therefore not just a technological issue; it is eminently social and political in nature and is intimately linked to the very organisation of lifestyles and the way in which cities and territories are organised. From this perspective, cycling can make a significant contribution. It only requires a low level of energy for both its manufacture and its use and it is characterised by the absence of pollutants and greenhouse gas emissions. The e-bike requires more materials, energy and a battery. However, it is characterised by much lower greenhouse gas emissions than other motorised vehicles [4].

Cycling has other equally significant benefits. In terms of public health, it facilitates the reintroduction of physical activity into increasingly sedentary lifestyles and reduces the problems that result therefrom. The studies agree on the health benefits of cycling: reduced risk of and mortality from stroke and infarction, reduced incidence of and mortality from certain cancers, prevention of diabetes and obesity, etc. [2, 8, 11]. For this reason, in 2017, nearly 500 doctors in Geneva called for the prioritisation of developing secure cycling facilities as part of the canton’s political agenda. There are also positive effects for users of e-bikes, which increase their level of physical activity [7].

²The research presented in this book is taken from the Volteface research programme. Relating to the social challenges of the energy transition, a dozen of projects have been carried out at the University of Lausanne with the support of Romande Energie and the Canton of Vaud [13].

³Active mobility includes forms of travel that utilise human energy (walking, cycling, scooters, skateboarding, etc.). In Switzerland, we speak most frequently about ‘soft mobility’ in French (*mobilité douce*) or, in German, ‘slow transport’ (*Langsamverkehr*).

Overall, the research shows that the benefits of regular cycling outweigh the negative consequences of exposure to air pollution and the risk of accidents. According to the studies reviewed by Héran ([9], 163), ‘Motorists breathe air which is twice as polluted as that of cyclists and four times more than that of pedestrians, with wide variations depending on pollutants and the routes travelled. These results are explained by the different distance of users from pollutants that stagnate at ground level. However, by exerting themselves, cyclists inhale 2.4 times more air than motorists, which slightly more than negates this advantage’. Air quality improves, however, as soon as cyclists are moved a short distance away from the flow of motor vehicles.

With regards to the risk of accidents, this should not be underestimated, but can be reduced considerably by means of adequate infrastructure. A so-called *safety in numbers* phenomenon is also observed: the more cyclists there are, the less they are proportionally victims of accidents [10]. This is explained by greater visibility of cyclists, greater attention by motorists, more cycling amenities, traffic calming measures, etc. The lowest accidentology rates (in proportion to number of cyclists and kilometres travelled) are thus observed in the countries of northern Europe.

An additional element is the growing emphasis on quality of life and conviviality, especially in cities where the negative externalities of car traffic are felt the most. Ecological, silent, and economical on space, bicycles are particularly attractive in the context of urban centres which are rethinking the role of cars due to their air and noise pollution. In Switzerland, one in seven people during the day, and one in eight people at night, are exposed to harmful or bothersome noise emissions from road traffic when at home. Exposure to noise from road traffic is most widespread in the heart of urban areas, where one-third of the population is affected [16]. The development of cycling would start a fundamental movement towards a relative calming of cities.

The bicycle is also interesting due to its smaller footprint, both in terms of travel space and parking space. The promotion of cycling is considered by some urban planners as an opportunity to rethink and transform circulation spaces into public spaces [1, 3]. The low spatial footprint of active mobilities has become crucial with the need to guarantee physical distancing during the COVID crisis. To cope with the diminished carrying capacity of transit, many cities have used ‘tactical urbanism’ and implemented pop-up bike lanes.

In economic terms, using a bicycle is less expensive than other modes of travel—with the exception of walking—not only for the users but also in terms of investments in infrastructure. In addition, because of their speed and flexibility, bicycles are effective on short journeys and, in particular, in urban areas where the volume of traffic and access or parking restrictions make car use less competitive. Mechanical bicycles⁴ also, compared to walking, make it possible to travel three or four times further for the same amount of energy expended, i.e. to have access to a territory 10 to 15 times the size [9], 31).

The promotion of cycling mobility could seem to go against the grain in the increasingly mobile society before the COVID crisis. This assumption ignores the

⁴The terms mechanical, conventional or traditional bicycle in this book denote bicycles, which are propelled purely by the energy expended by their users (in contrast to e-bikes).

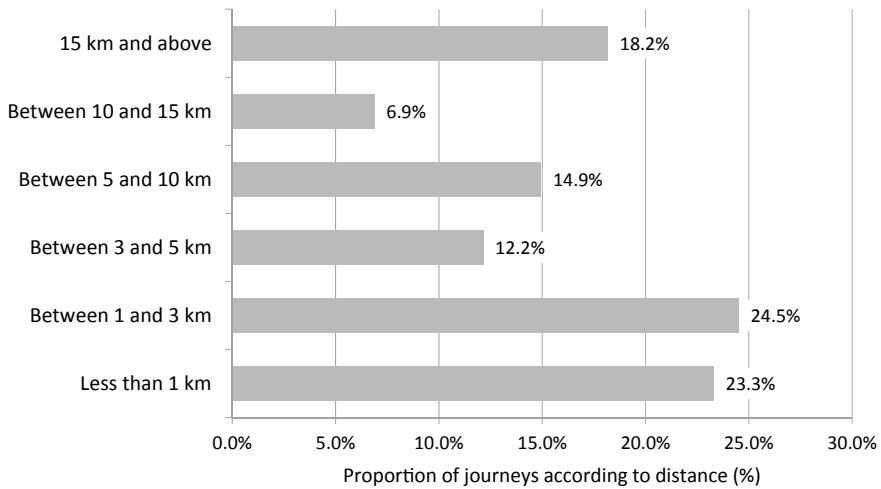


Fig. 1.1 Distribution of journeys by distance travelled, 2015 (*Source* Mobility and Transport Microcensus)

fact that many journeys took place over short distances. In Switzerland, according to the Mobility and Transport Microcensus,⁵ 60% of journeys, irrespective of their reason, do not exceed 5 kms, a distance for which cycling is considered an attractive option [18] (Fig. 1.1). This proportion rises to 48% for journeys to the workplace.⁶ Even over short distances, the share of journeys made by car is significant: 18.4% respectively for commuting journeys of less than 1 km, 46.1% for journeys of between 1 and 3 kms and 56.6% for those of between 3 and 5 kms (*ibid.*).⁷ Of course, some of these journeys cannot be made using another mode of transport due, in particular, to topography, the physical condition of the travellers or the need to complete a succession of journeys.⁸ It appears, however, that there is a substantial margin for progress in the promotion of cycling and the organisation of proximity, especially if we compare Switzerland and its cities with other contexts (see 3.2).

Cycling is, of course, not the only solution to mobility challenges. It cannot meet the transport needs for a certain number of uses, population groups and territorial contexts. However, it does seem pertinent to increase its place within the mobility

⁵This telephone survey is carried out every 5 years using a sample of more than 50,000 people. The latter are questioned in detail about their mobility behaviour on a specific reference day (the day before the survey). The survey takes place throughout the year to avoid seasonal bias.

⁶Another source, the Structural survey, shows lower figures though: 6.7% of the commuters (people working outside their home) travel less than 1 km, 25% between 1 and 5 kms and 21.3% between 5 and 10 kms. This would mean that half of the commuters work at a distance that is accessible by e-bike at least [17].

⁷Furthermore, the car occupancy rate is low: 1.10 person for commuting journeys, 1.56 for all journeys.

⁸However, only 27% of circuits (a circuit is a succession of journeys starting at home and returning back there) are made up of more than a simple round trip (OFS and ARE 2017).

ecosystem and planning policies. The development potential of the bicycle is all the more promising given the emergence and widespread nature of offerings such as e-bikes. Promoting cycling to a wider audience requires better knowledge of this practice. However, little information is available on those people who have already adopted the bicycle as a means of transport, on their motivations and on the barriers that they face. The next chapter proposes a grid for analysing bicycle usage, on which this research work is based.

References

1. S. Bendiks, A. Degros, *Cycle Infrastructure* (nai010 publishers, Rotterdam, 2013)
2. C.A. Celis-Morales, D.M. Lyall, P. Welsh, J. Anderson, L. Steell, Y. Guo, R. Maldonado, D.F. Mackay, J.P. Pell, N. Sattar, J.M.R. Gill, Association between active commuting and incident cardiovascular disease, cancer, and mortality: prospective cohort study. *BMJ* j1456 (2017) <https://doi.org/10.1136/bmj.j1456>
3. A. Degros, Traffic space is public space! Les espaces de trafic sont des espaces publics! *GeoAgenda* **1**, 18–21 (2018)
4. E. Fishman, C. Cherry, E-bikes in the mainstream: reviewing a decade of research. *Transp. Rev.* **36**(1), 72–91 (2016). <https://doi.org/10.1080/01441647.2015.1069907>
5. M. Givoni, Alternative pathways to low carbon mobility, in *Moving Towards Low Carbon Mobility*. ed. by M. Givoni, D. Banister (Edward Elgar, Cheltenham, 2013), pp. 209–230
6. M. Givoni, D. Banister (eds.), *Moving Towards Low Carbon Mobility* (Edward Elgar, Cheltenham, 2013)
7. B. Gojanovic, J. Welker, K. Iglesias, C. Daucourt, G. Gremion, Electric bicycles as a new active transportation modality to promote health. *Med. Sci. Sports Exerc.* **43**(11), 2204–2210 (2011). <https://doi.org/10.1249/MSS.0b013e31821cbdc8>
8. T. Götschi, J. Garrard, B. Giles-Corti, Cycling as a part of daily life: a review of health perspectives. *Transp. Rev.* **36**(1), 45–71 (2016). <https://doi.org/10.1080/01441647.2015.1057877>
9. F. Héran, *Le retour de la bicyclette: une histoire des déplacements urbains en Europe, de 1817 à 2050* (La Découverte, Paris, 2014)
10. P.L. Jacobsen, Safety in numbers: More walkers and bicyclists, safer walking and bicycling. *Inj. Prev.* **9**(3), 205–209 (2003). <https://doi.org/10.1136/ip.9.3.205>
11. L. Mertens, S. Compemolle, B. Deforche, J.D. Mackenbach, J. Lakerveld, J. Brug, C. Roda, T. Feuillet, J.-M. Oppert, K. Glonti, H. Rutter, H. Bardos, I. De Bourdeaudhuij, D. Van Dyck, Built environmental correlates of cycling for transport across Europe. *Health Place* **44**, 35–42 (2017). <https://doi.org/10.1016/j.healthplace.2017.01.007>
12. B. Meyer, *Vorwärts Rückwärts: Zur Geschichte des Fahrradfahrens in der Schweiz* (Bautz, Nordhausen, 2014)
13. N. Niwa, B. Frund, *Volteface. La transition énergétique : un projet de société* (Editions d'en bas & Editions Charles Léopold Mayer, Lausanne, Paris, 2018)
14. OFEN, *Statistique globale suisse de l'énergie 2016* (Office fédéral de l'énergie, Berne, 2017)
15. OFEV, *Indicateurs de l'évolution des émissions de gaz à effet de serre en Suisse 1990–2015* (Office fédéral de l'environnement, Berne, 2017)
16. OFEV, *Pollution sonore en Suisse. Résultats du monitoring national sonBASE, état en 2015* (Office fédéral de l'environnement, Berne, 2018)
17. OFS, *La pendularité en Suisse 2016* (Office fédéral de la statistique, Neuchâtel, 2018)
18. OFS, ARE, *Comportement de la population en matière de transports: Résultats de microrecensement mobilité et transports 2015* (Office fédéral de la statistique et Office fédéral du développement territorial, Neuchâtel, Berne, 2017)

19. R. Oldenziel, M. Emanuel, A.A. de la Bruhèze, F. Veraart (eds.), *Cycling Cities: The European Experience; Hundred Years of Policy and Practice* (Foundation for the History of Technology, Eindhoven, 2016)
20. C. Reid, *Bike Boom: The Unexpected Resurgence of Cycling* (Island Press, Washington, DC, 2017) <https://doi.org/10.5822/978-1-61091-817-6>
21. B. Spielmann, *'Im Übrigen ging man zu Fuss': Alltagsmobilität in der Schweiz von 1848 bis 1939* (LIBRUM, Basel, 2020)