Utopias of slow cycling. Imagining a bicycle system

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Abstract

This research investigates post-automobility futures by exploring the mechanisms through which the bicycle could reconfigure urban mobilities and catalyse change towards slow living. Drawing upon readings in mobility and utopian studies, the thesis considers three complementary aspects that could be decisive in the transition towards a 'slow bicycle system'.

I investigate first the potential of embodied and sociable practices of cycling to prefigure mobility futures that successfully challenge the 'car system'. Using (auto)ethnographic and mobile methods to document my own cycling, as well as that of various groups in London and Amsterdam, I unveil a cycling subjectivity informed by richly engaged immersions and interactions with the natural and social worlds. Their slowness challenges the dominant mechanical rhythms of automobility and the utilitarian space of the road. I consequently and secondly propose a critique of the current configuration and anticipated trajectory of the car system. I argue that the utopian promises of personal autonomy, freedom and economic progress epitomized by the motorcar have lost their strength. Furthermore, traffic congestion, air pollution, climate change and the shortcomings of neoliberal society could trigger the end of automobility. Instead, and thirdly, I show that a slow bicycle system could be articulated in the 'cracks' of the car system. Building on existing niches of innovations, I outline the steps required for societies to follow so that a slow bicycle system becomes a reality by 2050. I argue against the dominance of the car within the realm of

urban movement and against the presupposition that speed constitutes the only way to assess the quality of human mobilities.

Thus, this research takes forward contemporary academic debates framing cycling as an alternative or subaltern mobility by claiming its central role in imagining post-automobility futures. Such sustainable futures can only be achieved once the doctrines of fast mobilities and economic growth are called into question.

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Prologue: Imagining a slow bicycle system

London, 30 July 2050

Dear diary, today is a special day. I have been invited to deliver the keynote to an event which, three decades ago, was the first academic conference I attended. I will use you, trusty diary, to structure the speech I am about to give.

In 2017, during my doctoral studies, when I first wrote about the urban mobilities of cycling, the time ahead seemed grim. Yet, I felt that the only way to bring about a desirable future was by being hopeful. Here I am now, at 72, an emeritus professor who has been invited to give a plenary presentation at the Cycling and Society conference, which is held in Lancaster, almost 50 years since its inception in 2006. I will discuss how history has dealt with what I wrote in my PhD thesis, more than 30 years ago now. The plan is to reflect, one week at a time, on the arguments I gathered in my thesis and how things evolved since those early days of the twentieth century.

So, the year is 2050, many things have changed, but quite a few of the arguments from the work I did in 2017 seem to have anticipated and maybe have contributed, I dare think, to what cycling represents today. These ideas will be flagged in the coming pages, where I will try to structure the speech I am about to give. They still seem to be essential elements for the success of this swift transition:

First, I proposed that we needed to seriously confront the car and the increasingly uncomfortable place it occupied in our cities. Second, I advocated for an informed discussion of what kinds of cycling futures, either slow or fast, we are embracing. Third, I highlighted and promoted the embodied experience of cycling, because it enabled a distinctive and richer way of being in the world and contributed to a sense of freedom which were increasingly denied by the car. Fourth, it was essential to uncover the sociable interactions that the bicycle afforded as they socialized and repurposed the utilitarian and instrumental spaces of the road. And, finally, a case for slowing down mobilities and the broader pace of everyday life was proposed for consideration. I deemed it at the time to be the only way in which a sustainable future could be achieved. These five tasks represented the focus of my doctoral thesis.

Going now back to my original work, it would be appropriate to be entirely faithful to my initial research goals and present them below, as they have been put on paper in 2017:

My thesis aims to investigate under which circumstances a bicycle system could replace the car system, at least for the shorter urban journeys. The new mobility system takes its departure from 'niche' innovations in bicycle cultures and evidence of 'cracks' in the dominant automobility system. By using utopianism not as a destination, but rather as a processual tool, a heuristic device and a method for the imaginary reconstitution of society (Levitas 2013), the thesis aspires to reimagine urban mobilities in three distinctive ways. In doing so, it deals with the systemic requirements for and consequences of accelerating the process of post-automobility transition towards a 'slow bicycle system'.

First, it provides an overview of said niches of innovation and sets the contours of a utopian future where most everyday journeys are done by bike in conjunction with other alternative transportation modes such as walking and public transportation. This new mobility system is different not only in that it makes the automobile redundant at least for short distance travel, but it also facilitates forms of movement which encourage slower and more human speeds and rhythms.

Second, and deriving from the above, the thesis examines the utopian assumptions that are embedded within the system of automobility and, more broadly, within the culture of fast urban mobilities. Their ideals of desirable futures are scrutinised and their silences about the individual and the social beings they generate are laid bare. They range from pollution and congestion, to the erosion of public space and the pursuit of unsustainable economic growth.

Third, this work deals with the kind of societies and individual selves which might be required for and which might also ensue from the inauguration of a slow bicycle system. The thesis is particularly concerned with how human flourishing, through one's experience of the natural and social world from the bicycle, can 'blossom' in different ways than it does today. I argue that the slower, more embodied, more convivial and sociable mobilities afforded by bicycle enable human nature to 'desire otherwise' (Abensour 1999).

Through this three-faceted endeavour, the thesis departs from most utilitarian and functionalist approaches to human movement in cities, as they are formulated in mainstream transportation studies. Everyday mobilities are also experienced in their

mundane practices, they escape rationalistic schemes of interpretation, they are, as the new mobilities paradigm (Sheller and Urry 2006) suggests, fleeting, ephemeral, embodied. This research asks the fundamental questions: what might a bicycle system look like? under which conditions will it operate? how will it be different from other mobility systems? and what are the broader individual and social changes it necessitates and further instigates in the process of establishing itself as dominant urban mobility?

The new 'structure of feeling'

London, 26 August 2050

The number of cycling trips made in London has increased dramatically in the last few decades: from a meagre 4.3% of the total modal share registered in 2011 to more than 50% today (Kami 2050)[1]. Not even the more optimistic forecasts anticipated this boom: the best-case scenario advanced an increase of up to 28%, which at the time, believe it or not, was still considered utopian (Propensity for Cycling 2016). The more realistic, official prognoses, courtesy of Transport for London, only projected an increase of cycling to 5% by 2025, then up to just 10% today. In retrospective, the increase is mind blowing and begs the obvious question: how did we get to such a radical result in less than five decades?

Hopes were flying low in the 2010s, despite cycling having been on the political agenda for the last three decades, despite the fact that the first cycle highways were put in place as early as 2016, even despite the fact that the leader of the opposition himself was regularly

[1] This (and other further references in this prologue that are dated post-2017) is an imaginary reference. The author and the text do not exist … yet.

riding a bicycle. No annual financial commitment to investing in cycling was put forward, infuriating most advocacy groups which at that time were asking that at least 10% of the transport budget to be allocated to both cycling and walking across the country.

A mix of reasons made this spectacular increase finally possible. They were related to a radical change of the principles governing the everyday life of individuals, as well as an equally important shift in the way institutions used to operate. We can say that there was the emergence of a new 'structure of feeling' that made all this possible. Individuals gradually learned to appreciate modes of being that were slower, more embodied, more open to the urban environment, as well as more sociable urban mobilities. At an institutional level, this new structure of feeling was visible first and foremost in the ways societies changed their perspective on what represents the appropriate pace of life, as well as on their relation to work and waged labour. The institution of the citizen income in the UK in 2020 radically transformed the way most journeys are done now by the British people.

The most important role in the embracing of slower human-powered mobilities was certainly played by the gradual disappearance of the automobile from the urban realm. Once cars ceased to monopolize the cityscapes, cities became more attractive for walking and cycling, new and old body capabilities were (re)discovered, smells and sounds escaped from the tyranny exerted by automobility, and the cold and warm weather, as well as the mild efforts put into being mobile, made humans aware again of their own bodies. Now, the same bodies also enjoy the proximity of other bodies in the social space of the urban street, something the metallic carcass of the car made very difficult. A sense of belonging

and solidarity slowly and quietly replaced that of competition for road space and resources that automobility too often embodied.

Eight important factors explain how more than half of the trips in the city of London are done today by bicycle: 1) radical changes in urban landscape; 2) the integration of cycling with other alternative mobility systems; 3) the transformation of mobility policies; 4) changes in the cultural status of cycling; 5) the rise of the bicycle economy and big data; 6) technology and know-how transfer amongst countries; 7) innovation in bicycles and accessories and 8) broader societal and economic changes.

The end of neoliberalism: Embracing the slow

London, 3 September 2050

Let's start in the middle of my list. It may appear that changes in urban mobilities in the previous decades occurred somehow 'naturally', as people voluntarily and even enthusiastically embraced the bicycle, while giving up on driving cars for most of their everyday journeys. But this is only partly the case.

It is indeed true that the embodied nature of cycling played a major role in the uptake of the practice. The ways in which the bicycle engaged the human senses, which were increasingly numbed by the desensitized metal cage of the automobile, contributed to the appeal of cycling amongst many urbanites. Through the embodied performance, the hybrid rhythms, as well as the slower velocities, cycling found itself in contrast to the mechanized rhythms and fast mobilities which dominated the urban landscape. As I argued in my work

on the cycling senses (Popan 2017), the wellbeing enabled by the bicycle greatly contributed to its appeal since the first decades of this century. Freedom and individuality also influenced the uptake of cycling, especially since these values were less and less symbolized by the automobile, particularly in the Western world. Even at that time, the younger generation already proved reluctant to buy and own cars (Klein and Smart 2017), and thus the bicycle slowly replaced desires which were once embodied by the motorcar.

A second aspect which proved decisive to the current cycling system had to do with the mundane bodily interactions on the move that the bicycle allowed. As the number of cyclists increased steadily in the first two decades of this century, so did the opportunities for people to engage more easily in sociabilities which, similarly to the senses, were otherwise constrained by the metal box of the automobile. Throughout my research of such playful interactions on the move (Popan 2017), which were mainly confined, at that time, to practices of leisure cycling and to cycle friendly environments such as Amsterdam, I indicated how the functional and instrumental spaces of the road transformed into more convivial, less competitive social spaces. These anticipatory practices only grew in importance in the following years.

Having said that, something more important had to happen, and indeed, to general surprise, it eventually did. There was a broader and decisive shift in the world economy which accelerated these changes in mobility practices: Western societies gradually phased out the neoliberal doctrine which had seized virtually all domains of life starting with the late 1970s. Devolving both political problems and solutions from public to private, through minimal governmental intervention and market fundamentalism (Brown 2006), in the

context of urban mobilities neoliberalism meant ‘ongoing failure to treat cycling as a strategically important mode meriting substantial national transport funding’ (Aldred 2012a: 95).

Ironically, for a short period of time, the neoliberal doctrine proved somehow beneficial for the adoption of cycling. The billions of dollars in economic productivity which were lost due to traffic congestion initially pushed many cities worldwide to invest in cycling infrastructure to avoid the risk of a complete and permanent gridlock. These initiatives were nevertheless short-lived, mainly because significantly retrofitting the urban landscape was just too expensive, and not just for cycling. The same policy makers also pushed for investment in an even more ambitious direction: the ‘smart’ road infrastructure to be used by electric and autonomous cars, an ‘autopia’ against which I argued at that time (Popan 2017). But such investments also proved too costly and they had to be abandoned by the early 2030s. This inconvenience was supplemented by the increasing price of self-driving cars, which had to be fitted with expensive technology to respond to the ‘not so smart’ infrastructure.

More generally, the religion of economic growth preached by neoliberalism had to be phased out when its devastating consequences were too apparent to ignore, even by the International Monetary Fund (Ostry, Loungani and Furceri 2016). It was finally accepted that growth was not capable of ‘trickling down’ the global wealth to the entire population, leading instead to long-term unemployment and income inequality (Ball et al. 2013). A de-growth pattern, characterized by the slowing down of urban mobilities and the installation

of a norm of sufficiency (Gorz 2010), which I also observed at the time in relation to cycling (Popan 2017), slowly gained momentum.

Thus, the bright future of an autonomous car system, in the form that it appeared in the early twenty-first century, was simply not sustainable. Two important outcomes resulted from this situation. Firstly, the car system underwent some radical transformations, which I had partly anticipated in my work (Popan 2017). Smaller, shared automobiles became the norm, something that was already observed by Zuev (2016) and Tyfield et al. (2016) through their investigation of low-carbon mobilities in China. From individualised and autonomous mobility, the car progressively morphed into an integrated system, with pre-defined routes within which autonomous cars now operate and where the car is no longer owned, but rather shared. From this perspective, the car system is not much different today from public transportation, becoming what Urry has described a *nexus* system, with 'complex specialization and integration of the different components' (2007: 94).

Secondly, a bicycle system emerged as an alternative, largely inspired by the prefigurative practices that I just mentioned. The pain, the rhythms, the slowness, the side-by-side-ness of cycling contributed to a sense of freedom and individuality that the car failed to provide. All these enabled a social change which was driven in equal measure by the top-down changes in the system of neoliberalism, as well as by the practices of everyday cycling upon which I focused my attention in my first years of academic work.

The urban form

London, 10 September 2050

The urban landscape was the major deterrent to cycling in the first decades of the century, but this has changed in a spectacular way. The fifty-plus years of car dominance, which began shortly after World War 2 across the entire world, and the resulting increase in urban sprawl had shaped most cities to the whims of the automobile. The built environment had been modified to serve the interests of motorised transport and not the pedestrian, cyclist, child, or elderly person, while the tendencies towards suburbanisation and the lengthening of journeys reshaped cities so that they became heavily dependent on motorised transport and cheap oil while exterminating walking and cycling trips (Oldenziel et al. 2016; Whitelegg 2013; Pucher and Buehler 2012).

It is inconceivable today to think that in 2014 around two thirds of all trips covering less than five kilometres in the UK were still done by car. But this is how things looked less than half a century ago. It was often assumed that in the previous century Henry Ford was the most influential urban planner, while Le Corbusier was regarded as the most influential transport planner. Looking back today, we can certainly say that Danish architect Jan Gehl, with his radical transformation of Copenhagen into a walking bonanza, is the most influential transport planner. While the professional cyclist turned cycling advocate Chris Boardman is the most influential urban planner of this generation. Boardman became particularly famous after he proposed in 2016 the prosecution of British motorists who drive too close to cyclists as they overtake (Reid 2015b). His campaign was adopted by the police nationwide, leading to a significant drop in road accidents involving cyclists.

The Dutch, Danish and Germans were the innovators who took the whole world by storm in the years to come. As early as 1970s, the transport and land-use policies in these countries had 'shifted dramatically' to favour walking, cycling and public transport over the use of the private car (Pucher and Buehler 2008), the ensuing policy reforms coming as a reaction to the increasingly harmful environmental, energy and safety impacts of rising car use. Urban and transport planners from these countries organised into so-called 'cycling embassies' in the early 2000s, offering consultancy across the globe. As it became more and more clear that mobility systems and land-use systems are strongly interdependent, their vision was straightforward: coordinate metropolitan transport and land-use plans, so that all new investments translate into more cycling, walking, and public transport use.

Inspired by their vision, many cities have developed so-called Urban Intensification Guides, the first one being published by Hamilton, in Canada (City of Hamilton 2011). They were meant to help evaluate and implement more intense urban development and included descriptions and illustrations of various buildings and street designs that would cater for walking and cycling rather than driving. Google Street View also proved a useful tool at the time, as many images of street and area improvements and the flourishing social life they enabled could soon be compared with their pre-improvement look and feel. All over Northern Europe city governments were said to 'regard cycling as a key contributor to and indicator of high quality urban liveability, which in turn is then expected to attract high-income groups specifically enthusiastic about wholesome urban lifestyles' (Carstensen and Ebert 2012: 48).

The real change occurred only in 2032 when the Mixed-Use Development Act, ratified by the United Nations, came into effect (United Nations 2032). More neighbourhood shopping centres within cycling distance and restrictions on out-of-town developments, as advised almost twenty years before by Pooley et al. (2011), became mandatory policies pretty much all over the world. This only added to the already dramatic decrease in car use driven by the increasing price of oil as well as that of the highly sophisticated autonomous cars.

The radical reconsideration of urban land use was certainly effective in the dramatic increase of cycling. Still, most of the cities were already a reality and the significant distances between places were often impossible to simply erase. A great deal of the urban form was still difficult to retrofit and it was at that point that electric bicycles and cycle superhighways made a huge difference. These two innovations significantly impacted cycling for a couple of decades, until the 2040s, when increasing urban mobility speeds became less and less sought after. They might be largely obsolete today, but at the time both the superhighways and the e-bikes contributed to a spectacular increase in cycling levels.

E-bikes were considerably heavier than ordinary bikes in the 2010s, but the design of batteries constantly improved, thus making them increasingly easy to store even in multi-storey flats and pedal while the battery is switched off or empty. The e-bike proved quicker, it enabled longer trips over hilly routes and it soon became an alternative for people who for various reasons were averse to bicycling.

The innovations came mostly from China, which accounted for 90% of worldwide e-bikes sold in the mid-2010s and where one in every ten people already owned an electric two-wheeler (Aia 2013). The boom initiated by the first generation of e-bikes was eventually tamed by their poor quality, difficult maintenance and the accidents that occurred amongst many non-experienced users (Davis 2022). This resulted in costly lawsuits, prompting producers to improve the second generation, which became a huge success, particularly amongst older users, but also in combination with cargo bikes, allowing for an increased carrying capacity. The final boost to electric velomobilities was given by the E-Bike Act, adopted by many countries, which directed important state subsidies towards the e-bike industry. The trend was started as early as 2017 by Sweden, who became the first state to offer 25% subsidy for all e-bike sales (Christofides 2017). Policy makers in the United Kingdom had been floating the idea of subsidies for e-bikes since the late 2010s (Walker and Laker 2017), but it took three more years before the country had officially ratified the E-Bike act.

Somehow predictably for those days, the electric bicycles only got faster and faster. The 'speed pedelecs', a term used to describe them back then, could go as fast as 45km/h and first became popular in the Netherlands (van der Zee 2016). Soon they had to be forced out of the cycle lanes and classified as mopeds. What initially represented an e-bike boom gradually faded, and today they are used mostly in hilly cities such as Sheffield or Lisbon and by the older population. Of course, electricity drove changes in the car system as well, an issue that I explored at that time (Popan 2017). It resulted in increasingly small vehicles which, with the advent of autonomous driving, became heavily interconnected. Yet, the

immense costs of putting such a car system in place eventually hindered its mass expansion.

Still, the e-bikes alone could not solve the problem of distant urban and peri-urban destinations, which often were not within the reach of most cyclists back in the 2010s. Cycling superhighways connecting various cities in those days became the latest trend in the Netherlands, Denmark and Germany at about the same time (Ruiz 2016; Kildergaard Groot 2015; ECF 2014a). But the original plan for cycle superhighways to provide fast routes soon had to be abandoned. The need to travel at fast speed became obsolete, something that was anticipated as early as 2013 by Anne Jensen in her analysis of the then newly installed Danish highways for cyclists: 'the cycle super highways are presented as inclusive urban transport. Such an urban identity legitimizes and authorises the fast and pervasive mobility of the frictionless cycle tracks and imitates automobility. Cycle practices on the green cycle track and cycle motorways interweave with the promises and cultures often associated with the automobility of the car and air travel, responding to desires of speed, flexibility, zero-friction and overcoming of distance' (2013: 224).

London completed its first 100 kilometres of superhighways in 2021 (TfL 2021), but by that time they were functioning more like leisure routes for everyone to enjoy rather than fast tracks for hardened commuters. Also, not enough money was available to build a comprehensive network of segregated lanes and, by that time, the number of cars was already in decline and so a segregation ceased to make any sense.

Stimulated by the global competition coming from the likes of Barcelona and Paris, London got on to implement other measures. The city followed the lead of the Catalan capital and started to build the so-called Superblocks (Bausells 2016), which were mini neighbourhoods which car traffic could flow around, but without being allowed access. Similar to the success in Barcelona, this initiative reduced car use by more than 20% in the concerned areas. Then, following the example of Paris, which decided to trial the pedestrianisation of a busy expressway on the right bank of the river Seine in 2016, London proceeded four years later with the pedestrianisation of Oxford Street (Jameson 2020), the first main route in the city to be completely taken away from cars.

The strongest contestation of both electric bicycles and cycle superhighways came in two forms. It was firstly connected with the pace of mobilities and social life that these two types of innovations promoted. The fast rhythms they fostered proved detrimental for the quality of individual and social life, something which was already greatly affected by a century of fast automobility. The number of road accidents directly related to faster and faster e-bikes and cycle superhighways only kept on rising, while the less confident and less able cyclists dropped the practice altogether. The efforts required to pedal e-bikes decreased gradually and they become more and more like motorised vehicles. Secondly, the investments to build new and segregated bike superhighways were only getting more and more expensive. Similarly, the prices of smart bikes proved problematic for mass adoption, even in the West, in the years of austerity following the economic crisis of 2008. By 2016, even cycling countries such as the Netherlands were experiencing a decrease in e-bikes sales (Bike Europe 2017). And on top of that, the e-bikes transformed into more and more complex machines, thus putting off any attempt to repair them by regular

cyclists. Many of them simply preferred to use instead bicycles over which they had at least some sort of control.

The real boost in cycling was not brought by e-bikes and cycle superhighways. Instead, the energy crisis related to worldwide oil shortages that became prominent in the early 2020s, combined with the Mixed-Use Act adopted a decade later, contributed to a significant diminishing in scale of most urban mobilities. Telecommuting further consolidated the trend: by 2025 most work was done remotely via computers, phones and other smart devices. More and more people started to opt for less money and more flexibility and chose to work at home or in local 'communication centres', which were not only equipped with the needed technologies, but also offered the sociability of others. These centres are near residential areas and incorporate nurseries, shops and even bike stores. Finally, the basic income adopted in London in 2040 (Hennessey 2040) and the subsequent demise of waged labour meant that most of the already decreasing number of long commutes across the city were no longer required. Rush hours, speed pedelecs, and cycle superhighways were a thing of the past.

But giving up on speed and long distance travel is not something that Londoners were simply prepared to do. They were not ready for this a few decades ago, and certainly many are still not ready today. A lot of people still want to be able to travel fast across London, but fortunately the bicycle did not evolve into a speed machine. While relatively fast electric and road bikes are still available, for the most part cycling remains a slow mode. Yet, compared to five decades ago, the bicycle is far better integrated with other sustainable means of transportation such as electric buses, trams, subways, monorails and

taxis. It also has more carrying capacity than ever before and is given more space, not just on the road, but also when it is not in use.

Bike + Train + Cargo = Love

London, 19 September 2050

Most apartment buildings today do not come equipped with any parking facilities at all for autonomous electric cars. They are already part of a rather sparse 'nexus' system (Urry 2007) very similar to the train system from previous decades. The few remaining vehicles that are not part of that 'grid' are now commonly shared amongst neighbours and are all parked away from where residents live. The generous space and the money suddenly made available by not owning a car or a parking garage are used today not only to accommodate the less voluminous bicycles, but also to solve some of the common problems that we used to encounter decades ago, such as theft or carrying heavy goods by bike.

The start was perhaps given in the mid-2010s by a team of Swedish architects who designed the first Cykelhuset, or 'the bicycle house' (Peters 2016). The project became an instant success. The seven-story Cykelhusets are each equipped with a stock of cargo bikes that can be borrowed and used to transport heavy loads from town or to 'haul' several children at a time to school or day care. The building offers commuter bikes for people who want to use a folding bike on the train as well as a 'mobility subscription' that includes car pools, a bike repair service, and credits on the bus or train. The elevators inside the building are wider than usual, so that a cargo bike can easily fit inside. There is bike parking space in a garage downstairs, in front of each door and inside the apartments.

This radical transformation of living space to accommodate bicycles was perhaps the last of the decisive steps towards giving more 'space for cycling', a slogan which was made famous by the London Cycling Campaign in the 2010s. The previous 'revolutions' in the design of bike parking spaces at train stations as well as in the design of cargo bicycles have both contributed to this subsequent overhaul of the household space. When cities were finally ready to offer more space for cycling, individuals saw no reason why their houses should not also accommodate their beloved bicycles more generously.

In the 2010s the immense bike park in front of the central station in Amsterdam, which hosts 2,500 bicycles, was still the most iconic cycling image of the Dutch city. Today this is a common thing, and not just in the Netherlands. In those pioneering years, there was still a worldwide competition between prestige projects: Stockholm opened a parking garage for cyclists only, offering 700 bike spots, lockers and showers (Peters 2015a), Utrecht became the world's first city to use digital signs to guide cyclists towards available parking (https://www.utrecht.nl), and the Swedish city of Malmö inaugurated a parking unit specially designed to accommodate cargo bikes (https://www.hoe360consulting.dk), while Amsterdam, under constant threat of running out of bicycle space, built a partially underwater 7,000-space bicycle garage (Aluvihare 2014). These were still the days when transport planners acted in response to increases in cycling rather than being truly pro-active.

But a study published in 2016 (Kager et al. 2016) in the Netherlands, which showed the strong connection between bikes and trains, radically changed the game. Confronted with the reality that 47% of the Dutch daily train users were coming to the stations by bicycle,

transport planners in the Netherlands and elsewhere could no longer neglect the opportunity to make a stronger link between the two modes. Cycling and public transport can have a symbiotic relationship, noted the Dutch researchers, 'forming a hybrid, distinct transport mode, which should be reflected in transport planning. The bicycle is a versatile way to soften the rigid nature of public transport and thus accommodate diverse individual travel needs and situations. Public transport can be seen as a means to dramatically extend cycling's spatial reach' (Kager et al. 2016: 208).

We can hardly imagine today that there were times not long ago when the carriage of cycles in trains was still problematic across Europe and in the UK. Most local trains and some regional train services allowed bicycles on board for free or a small charge, while most high-speed trains and long distance trains crossing country boundaries restricted them (Weston et al. 2012). Today there is no shortage of amenities and facilities such as cycle carriage on all trains, accurate online and offline information, accessibility, consistent pricing, reservations, bike parking at stations and connections to cycle hire schemes (ECF 2047). They are all standard now. But not long ago the European Cyclists' Federation (ECF), a pan-European cycling advocacy organisation, fought hard to promote such basic services to remove barriers to combine bikes and trains (Küster and Lancaster 2013). Similarly, in those days only a few US cities such as Chicago, Portland or San Francisco allowed bikes to be carried on a rack at the front of most buses. In the following years the idea became mainstream, both in North America and elsewhere.

The folding bicycles played an important role for the later success of intermodality, particularly before enough space was allocated for bikes in trains and before sufficient

parking space was granted at transport interchanges. The ‘foldies’, whose sales increased significantly in the 2010s (Grous 2011), successfully overcome the limitations of traditional bicycles in terms of distance and storage space.

Today, these sorts of strategic alliances between cycling and trains or other public transportation options are so natural that we can hardly remember the days when bikes, trains and buses were situated in parallel universes. The system of automobility for so long offered the only reliable door-to-door form of mobility that any other alternative system simply could not gather any momentum. In the late 2010s something essential happened, which gradually coalesced into an alternative. The increasing levels of urbanisation which effectively brought the traffic in London to a standstill in 2020, the need to address climate change as well as the constant development of mobile technologies contributed in equal measure to the rise of what was then called ‘mobility as a service’. Various public and mostly private entities started to provide single platforms for combining transportation options available around: shared cars and bikes, buses, trains, metros, trams, and even the much-anticipated self-driving cars. With a single mobile phone application and a single payment, one could seamlessly travel from A to B in any ‘smart city’, claimed the enthusiastic developers of those days.

In the end, the whole idea of mobility as a service worked only partly. For many people, particularly in the developing world, the idea of car ownership was still so strongly embedded that they could simply not conceive of not possessing a car as a marker of social status. The hacking scandals and the privacy issues around the use of personal data by private entities operating these platforms further complicated the situation. The Teslagate

hacking scandal in 2025 (a name derived from the famous smart electric cars produced by Tesla), exposing the levels of both state surveillance and use of personal data for commercial purposes, has made the use of self-driving cars and smart mobilities apps highly contentious (Beacham 2025). Most importantly, the cost of infrastructure as well as the high prices of such autonomous cars, laden with expensive sensory equipment, hampered their mass adoption. But the concept of mobility as a service itself had an important legacy for today, as both municipalities and people realised just how much sense it makes to connect sustainable means of transportation.

Aligning slow bicycles and fast trains to effectively work as a single mobility system has solved the slow-fast dichotomy of post-automobility. The concept of speed itself became less and less relevant, a trend I uncovered in my early work (Popan 2017); what proved more important was the notion of 'quickness', something that the bike-train system made finally available. The irony is that the bicycle is by no means faster than any of the cars of today. Yet, in comparison to the now ubiquitous walking, as well as the heavily automated, sparse and constraining system of autonomous cars, cycling is indeed the quickest way to move around for short distances.

These days we also carry many more things by bike than before. Most of the goods that used to be transported by motor vehicles are now being ferried around by cargo bikes, while most school runs are also done using these slightly modified bicycles with front platforms that can easily hold up to 500 kilograms (Illustration P.1). Unlike traditional bicycles, the cargo bikes are usually shared within the community as nobody really needs 24/7 access to a pedal powered mini truck: children learn to cycle at very young ages and

soon ride to school on their own, while most of the groceries we need are delivered by small cargo bike fleets that local co-operatives operate.

The car traffic clogging the streets of London thirty years ago is now a thing of the past and, looking back, we can say cargo bicycles certainly have had an important role in making the streets of the city liveable again. But their ubiquity today is by no means the result of a predictable trajectory. As with the case of the above-mentioned love affair between bikes and trains, the 'cargo bike revolution' was initially driven by the desire to make cities more efficient. Radical changes in the distribution of goods were needed at a time when the digital economy and e-commerce were booming, while the just-in-time delivery systems and the rise in energy costs in the transportation sector were posing serious challenges (Cox and Rzewnicki 2015). And where hi-tech innovations such as drone delivery and 3D printing were slow to take off, the cargo bicycles proved just the right solution.

London had an unsettling history at that time with lorries which were responsible for most road fatalities involving cyclists (Walker 2016). It nevertheless took ten years of protests by cyclists, dozens of Critical Mass rides and die-ins (a form of protest in which participants simulate being dead) in places where collisions took place before the change was visible. Initially the cargo bikes were only trialled by some outer boroughs, such as Waltham Forest, who rented them for free to parents for the school run (https://www.enjoywaltham forest.co.uk). Then private businesses got interested, and it was at that point that the cargo revolution took off. In the mid-2010s, a European-wide project, Cyclelogistics (https://www.cyclelogistics.eu), encouraged the use of cargo bikes as last-mile delivery solutions and big companies like IKEA, DHL, UPS and SPAR stepped in and embraced this

option in some countries, including the UK (Illustration P.1). The move was well received, a study published at the time showing that of all trips related to the transport of goods that can be shifted to the bicycle, shopping has the highest potential (40%) (Wrighton 2015). The rise of online shopping further contributed to the use of cargo bikes, by both the supermarkets and delivery services, which became an established industry.

Today cargo bikes are no longer the transport of choice used by large corporations for last-mile deliveries simply because the age of corporations is gone and forgotten. With the demise of waged labour and the quest to increase productivity rates, transportation speeds disappeared altogether as drivers of social and economic activity. The cargo bicycles no longer transport goods coming almost exclusively from afar, but rather ones that are locally sourced and produced in small-scale co-operatives. The inspiration for these initiatives comes from pioneering projects such Cargonomia in Hungary, which emerged as early as 2016. Cargonomia was a co-operative uniting socially and environmentally conscious small enterprises in Budapest, formed of a Do-It-Yourself (DIY) bicycle social cooperative, an organic vegetable farm and sustainable agriculture community education centre which distributed weekly vegetable boxes to food communities in Budapest, and a self-organized bike messenger and delivery company (https://www.cargonomia.hu; Illustration P.1). Finally, the Cargo Bike Act adopted ten years ago, which heavily subsidised the industry, finally sealed the adoption of cargo bikes on a national scale in the UK (ECF 2040).

An affectionate relation with cargo bikes was responsible for the adoption of these machines by many households. There was an increased level of interaction between parents and children which was suddenly made possible as they could cycle facing each

other (Illustration P.1). The school run was no longer that dull journey where the children sit in the back seat of the car, having no idea of what their journey looked and felt like. New sociabilities which I previously explored in places such as Amsterdam (Popan 2017) are now ubiquitous. Similarly, the levels of creativity and improvisation that were required in building a cargo bicycle meant that an entire community of passionate tinkerers emerged and further inspired many others to create their own personalised versions of cargo bicycles. Equally important, these tinkerers united in various co-operatives spanned a cargo bike revolution not just in the domain of ferrying goods and children to school. They also innovated the design of tricycles, recumbent bicycles, handcycles and wheelchair bikes, which made cycling even more inclusive. Electric bicycles were also hacked and re-engineered in the process. E-bike kits that could be mounted on any bicycle were not very common in the beginning (see, for example, https://www.senseable.mit.edu/copenhagenwheel), but they slowly grew in popularity.

Illustration P.1 (from top left to bottom right): one of the most solid cargo bicycles from the 2010s (https://www.larryvsharry.com); DHL using cargo bikes for last mile deliveries (photo: Lawrence Holmes: https://flic.kr/p/oFLTah); Cargonomia uses cargo bikes to deliver organic vegetables (photo: Mátyás Szilágyi); cargo bikes allowing for face-to-face interactions (Work Cycles: https://upload.wikimedia.org/wikipedia/commons/f/f2/9-girls-in-a-bakfiets.JPG).

Cycling as mobility policy

London, 26 September 2050

Much of the flourishing cycling we see around today was made possible once the problem of the travel distances and the carrying capacities of bicycles were cracked. For most of the everyday trips and the types of baggage that need carrying around, the bicycle is the trustworthy metal steed that almost everybody uses. We look around and see both a diversity in terms of cyclists, from the youngest to the oldest, men and women alike, and of bicycles, small and big, for one, for two or for the entire family, all idling along the wide

roads with hardly any large vehicles impeding their journey. There is a genuine joy in cycling that only a few decades ago seemed impossible. We take for granted today the old saying that our roads were not built for cars (Reid 2015a), but the majority forget that only a few decades ago they really were the playground of the automobile. Until quite recently we lived in car-centric cities, designed and engineered around them, with functionalities and legislations carved to serve them before any other means of locomotion. The joy of cycling we experience today was then more of a fear of cycling (Horton 2007).

A gradual makeover took place in the years to follow the 2010s, slowly reclaiming the streets from the cars, for the benefit of cyclists and pedestrians. Both passionately advocated by cycling advocates and activists and fiercely opposed by the still car-dependent majority, these changes in mobility policies seem trivial today when we have so many bicycles around, but they proved instrumental in encouraging more people into cycling as well as discouraging them from driving. The Netherlands, Denmark and Germany were, of course, pioneers during those years and their best practices were summarised as early as 2008 by scholars such as John Pucher and Ralph Buehler. The policy interventions they proposed were gradually taken up by many cities across the world, with the final results we see today.

The most fought for proposition from that time was to put in place extensive systems of separate cycling infrastructures, from ambitious superhighways to smaller interventions. Various innovations made the segregated bicycle lanes very popular, attracting many less confident and new cyclists into the practice. The Netherlands inaugurated at the time the first bicycle lanes that kept the cyclists safe in the dark: Glowing Lines, charging during the

day-time, and glowing at night for eight hours (https://www.studioroosegaarde.net), while Copenhagen installed tiny LEDs in the bike lanes letting bikers know they are pedalling at the right pace to catch all the green lights ahead, as well as trash cans that were angled to make it easier for a person on a bike to toss their waste while riding by (Walker 2014). But one development inaugurated in 2010 in the capital of Denmark became so popular across the world precisely because it demonstrated the potential of cycling beyond just yet another form of effectively transporting us from A to B. The Conversation Lane, which encouraged cyclists to ride two abreast and talk to one another, inspired many cities to copy the model and slowly change the way urban mobilities took place. Today almost all streets in London are working under the principles of conversation lanes, enabling slow, convivial and sociable mobilities for all city dwellers.

Today we might not have traffic lights, stop signs and the rest of the paraphernalia that was needed to 'fluidise' the motor traffic a few decades ago. But when these were still in place, the decision to tweak them for the benefit of cyclists was deemed revolutionary, albeit highly contested. The modification of intersections and traffic lights to prioritise and protect cyclists might have enraged drivers who complained they were slowed down, but they also drove more and more people into cycling. Alongside the famous green waves, which were traffic signals synchronized at cyclist speeds to assure consecutive green lights for cyclists, there were other innovations that really made a difference back then. The Danish city of Aarhus had initiated a pilot program whereby cyclists were given RFID tags that trigger traffic lights in their favour (Hansman 2015), while Copenhagen's 'smart traffic system' had been equipped in 2015 with sensors designed to speed up the bicycle flow and

ensure the comfort of cyclists: those caught in rainstorms received longer green lights (https://www.thelocal.dk 2015).

Another very popular measure at the time, but which would make anyone smile today, was to train children as well as adults to become competent and confident cyclists. Training should be attended by cyclists as well as motorists, believed Pucher and Buehler (2008). The idea was widely regarded as an important means to ease transition into cycling, but it had its critics even then. Horton and Parkin (2012) noticed that training was often counter-productive as it helped people ride in circumstances very hostile to cycling. Many people simply did not want to venture out on their own immediately after these short training sessions ended and they could not really be blamed. As long as the number of cars on the roads was still significant, these initiatives did not make a great difference.

A complementary approach began to be developed by the mid-2010s, when various community initiatives decided to ensure a longer-term cycling education, beyond what the classic cycle training schemes offered. I remember a workshop I attended in Manchester in 2015, where I contributed to developing a prototype for a mobile phone application, 'Match My Route', which aimed to match experienced cyclists with beginners, to guide them in traffic and on the safest routes (https://www.cyclehackmcr.co.uk). Similar projects, dedicated to children, existed in Germany, where 'RAD-BUS' and 'Radlbus' encouraged pupils to ride their bikes to school together (https://www.nationaler-radverkehrsplan.de). These slow-moving bus-shaped groups had the more confident cyclists in the front and at the back. In 2020, the Cyclebus app, similar to the prototype I

was working on in 2015, was finally launched: the levels of cycling safety increased exponentially as a result (Belcher 2020).

But it was only in 2020, when drivers formally acknowledged that the road was no longer theirs only, that safety improved dramatically on a wider basis. Before the Strict Liability Law was imposed worldwide, only Germany, the Netherlands and Denmark offered special legal protection for children and elderly cyclists. In these countries, the motorists were assumed by law to be responsible for crashes with cyclists and with a strict enforcement of cyclist rights by police and courts. At the time the UK was still one of only five European countries that did not operate some form of strict liability for vulnerable road users (https://www.roadshare.co.uk). But when in 2016 British police started to prosecute all drivers who got too close to cyclists (Laker 2016), everyone felt that a radical change was about to take place.

The slow pace of everyday mobilities that we all enjoy today was perhaps the most challenging thing to achieve. The segregated bicycle lanes and even the cycle training lessons were at the time encouraging in equal measure safe and confident cycling as well as faster cycling. The bicycle was largely framed as the pragmatic means to get around in more and more congested cities, but the practice was often the privilege of brave young men. The levels of cycling increased tenfold in London between 2001 and 2011, but this coincided with a decrease in gender and age diversity (Aldred et al. 2016).

But with the continuous decline in the number of cars on the streets and the increased diversity of cyclists, something extraordinary happened: people started to pedal at a slower

and slower pace. The traffic calming measures enforced while the cars were still numerous certainly contributed to this. In the mid-2010s a European initiative was collecting signatures to set 30 km/h as the standard speed limit for villages, towns and cities (https://www.30kmh.eu). Around 160 cities and villages in Europe had implemented wide areas at the time with 30 km/h limits, and this number increased exponentially, to virtually all the 1,000 or so cities of over 50,000 inhabitants across the continent (Leeming 2048). In the UK, the *Slow Street Sourcebook* guided street designers in achieving this goal (Urban Design London 2015). The trend was once again set by the then exotic Dutch bicycle streets or 'fietsstraat', essentially narrow roads where bikes have absolute priority over cars. The initiative was derived from another Dutch concept, 'shared spaces', imagined first by the traffic engineer Hans Monderman in 1970s. It proposed minimising the segregation of different users as curbs, road surface markings, traffic signs, and traffic lights were eliminated.

When the cars had finally become invisible on most city streets, cyclists started riding in huge flocks, and not only because it was safer, but also because their senses were engaged in a much more meaningful way, something I previously wrote about (Popan 2017). The unpleasant smells resulting from exhaust gases, the irritating roaring of engines, the annoying visual barriers of ubiquitous metal carcasses were all but gone, with the sensescapes of the city liberated for cyclists as well as pedestrians to enjoy. The smell of food stalls was again distinguishable, the small chats were suddenly audible, people could look each other in the eyes, instead of paying attention to traffic lights. They could not only feel the mobile hybrids formed by their bodies and bicycles, they could effectively listen to them. They could understand more about their functioning, knowing when they are

exhausted, when they are in pain, broken or just in need of some chain oil. The street space turned for once into a truly social space, where interactions could be meaningful again.

The pedestrians also benefited from these radical changes in the urban landscape. Not only did the shameful rate of five pedestrian deaths per day in the UK alone (DfT 2014) become a thing of the past, but the number of people choosing to walk increased exponentially. With less cars and lower speeds, more areas in cities became pedestrianized. In 2015 only half of the UK population walked at least five times a week (DfT 2016); this figure has reached 85% today (DfT 2049).

From subculture to culture

London, 3 October 2050

In the mid-2010s, when I was still working on my PhD thesis, my topic of research, urban cycling, was a new and arguably exotic field. I remember that one of the few academic books on cycling that I could find at the university library, titled *Cycling and Society* (2007), was shelved in the section 'Sport and Physical Activity'. Even though I was a young, relatively fit and confident person who did not wear protective helmet and high visibility clothes, my identity was clear: I was a cyclist, riding a light and springy road bicycle, one which would allow me to be fast in the traffic, where I had to be alert and assertive or else I would have been easily run over inadvertently by drivers. I had to change clothes as soon as I got to the office and most people assumed I watched Tour de France and necessarily knew how to fix bikes. Which I did!

While I am partly nostalgic about those days, when I admit that I felt a bit special being in a minority, it is more comforting to know that today somebody riding a bicycle is not defined as a cyclist. Because now almost everybody is a cyclist! Cycling is not a subculture, but part of one's habit, we are riding in normal clothes, we know how to fix punctures, true a wheel and grease a chain, and we are not all committed athletes with calves made of steel. But it was not always like this. Ever since the 1970s, when it became popular again in the Western world, cycling was very much a lifestyle choice for environmentalists. In the following three decades cycling metamorphosed into both a marker of a middle-class inner-urban life style (see for example Stehlin 2014, Green et al. 2012) and an expression of grassroots and subcultural energies and creativities (Furness 2010). There were two subcultures from the 2010s which today are credited with an important role in the normalisation of cycling: the bike couriers who later inspired the urban hipsters into riding single speed bicycles and the Danish-inspired 'cycle chic' movement.

With their defiant attitude towards automobility and disobedience of traffic rules, bicycle messengers in those days developed antagonistic identities (Fincham 2007, Kidder 2005), but also inspired the urban youth and inner city middle-class to ride similar single speed bicycles, which were easy to fix and required very little maintenance. These bicycles, styles of riding and dress codes have travelled the world thanks to Do-It-Yourself movies, fanzines, websites and web forums. The success of single-speed bicycles was 'indicative of a growing interest in technological conviviality, utilitarian design, and a stripped-down aesthetic' (Furness 2010: 162).

Their appeal became so broad in the next few years that consumer brands such as Playboy, Diesel, Puma, Reebok and Vans decided to launch their own versions of single speed bicycles, making them even more fashionable amongst many urban cyclists. But equally important were perhaps the DIY and the protest spirits that these young urbanites brought into the mainstream. Many of these cyclists soon became very good at tinkering and repairing, instituting an entire ethical movement around recycling and repurposing. Their relentless creativity spread into various areas, from the launch of repairing co-operatives, to DIY urban planning as they built their own bike lanes and crosswalks, to the rise of crowd sourced Kickstarter-type projects enabling unprecedented innovations in the early 2020s in the design of easy-to-use-and-fix bicycles. Their political involvement was also emblematic as they initiated most of the die-ins and other bike protests in London in 2025, effectively forcing the city to pursue pro-cycling policies at a faster rate. Two years later, the first car-free party, created by these young activists, got no less than 15 seats in the European Parliament.

A more inclusive subculture, the ‘cycle chic’ phenomenon began around the same time, also heavily promoted through the internet. Started in 2007 in Copenhagen by the blogger Mikael Colville-Andersen, who launched the eponymous blog, cycle chic transformed into an international network of more than 100 blogs featuring photos of urban cyclists wearing casual clothing on their bicycles. The implicit idea was that one does not need specialised equipment to ride a bicycle. Lycra clothing, helmets, high vis jackets or slim road bicycles were conspicuously missing from these blogs, even when they covered everyday traffic realities from outside the Netherlands or Denmark. Instead, they were replete with pictures of particularly female cyclists wearing comfortable dresses, even high heels,

carrying wicker baskets while often speaking on the phone. At the time, the images of 'cycle chic' were experienced as problematic, showed Aldred, with cyclists 'expressing concern about pressure to look stylish while riding' (2012b: 25). But, nevertheless, 'cycle chic', as well as 'messenger chic', arguably contributed to making cycling a desirable activity, at least for some.

Peter Cox points out that these phenomena were at the time not just a symptom of low levels of cycling; instead the subcultural and even elitist manifestations were often allowing marginalised cyclists to express collective identities, defending themselves against potential stigmatisation: 'we allow and even embrace this collective identity because it offers us solidarity. It offers security and protection. It assures us that we are each not just isolated deviants. It can offer leverage to be seen as part of a significant minority' (2015: 21). Nevertheless, the practices of distinction reflected by these two movements were indeed at the time both promises and threats for the future of cycling: the fashionable image they promoted could have attracted more people into the practice, but at the same time their sub-cultural nature could also have restricted access for broader groups. Fortunately, the fashion won and today almost nobody is excluded from cycling. As more and more people were inspired by the cycle and messenger chic to take up cycling, it is hard not to remember how John Urry predicted in 2016 that any mobility system that aims to challenge automobility must do that by means of seduction, that is a chic of some sort: 'Any post-car system must become an object of consumer fashion and not only involve "loss" and nostalgia for the previous regime. It may not involve the affordances of the current car system but it will need to provide others, a new kinaesthetic intertwining of

motion and emotion … The new system should be fashionable and faddish, that wins hearts and minds as it is more fun' (Urry 2016: 85).

The bicycle economy and big data

London, 10 October 2050

For a long time, the bicycle was regarded as the poor man's transportation. In the first few decades of the twenty first century this image started to change gradually, as we have already seen, but the transportation budgets were still reflecting a bitter reality as cycling was consistently considered the poor cousin of driving, with minuscule amounts of money made available compared to the latter. 'This one runs on money and makes you fat. This one runs on fat and saves you money' was a famous activist poster at the time regarding the car and the bicycle, yet, even with the economic crisis of 2008, the bicycle was seen only by very few as a legitimate way to put the economy back on track.

A new field of bicycle economics, or bikenomics, was starting to make headway in the first decade of the twenty first century, calculating the benefits of cycling in relation to various indicators, ranging from space saving, to productive time lost in traffic, to health benefits, to job creation and economic growth more broadly. While some of these measurements are trivial today, in an era where the pursuit of economic growth is no longer the indicator of prosperity in our societies, these methods of calculation proved essential in those days to shift both individual and societal priorities from the car to cycling and other more sustainable urban mobilities.

For a long time, the most common way to assess the popularity of cycling and to consequently make the case for further investments was by using modal split figures. They indicated how many trips were made on foot, by bicycle, public transport or car. Increasing the modal share of cycling had become a popular commitment amongst many cities across Europe in the 2010s. For example, Copenhagen aimed to increase its modal share for cycling to 50% by 2025, Dublin targeted 25% by 2022, while London set a target of 5% by 2026 (ECF 2015a).

Yet, data collection was even then a contested issue: for almost a century now policymakers have either not counted or undercounted cyclists and pedestrians, observed Oldenziel (2016). When this was not the case, most bike counts still only focused on daytime commuters and calculated the 'primary' means for commuting, often to the detriment of cycling (Kager et al. 2016; Blue 2013). It was only when the counting of cycling trips included all types of journeys, not just the 'productive' ones, and when the distinctive modes were calculated as part of the same journey that the case for heavily investing in cycling became apparent. This change occurred gradually, being brought by two essential trends: the advent of big data and the democratisation of data collection itself.

Increasingly, the big data generated through GPS technology incorporated in mobile phones and bicycles themselves offered resources that city planners who were committed to cycling could finally use. Most bicycle sharing systems across the world were already fitted with geolocation units in the 2010s, allowing for new bicycle lanes to be developed according to the most frequent routes taken by their users (O'Brien et al. 2014). Similarly, self-tracking mobile applications such as Strava collected data from users which they then

sold to policy makers interested in knowing more about patterns of cycling in their cities (https://metro.strava.com/). These valuable resources for city planners, who often lacked reliable data on cycling, nevertheless posed some problems. One was related to the type of cyclists they counted, as bike sharing and mobile application users were often not representative for the broader group of cyclists. Another one related to property rights for big data: because the data that was collected was in most cases private, a problem of ownership and use soon arose, thus 'begging the question whether the public – and thus policy makers – can access them' (Oldenziel 2016: 194).

An important transformation in measuring the levels of cycling occurred when the price for traffic counters dropped to only a few pounds, which was due to the rise in smaller and smaller devices fitted with electronic traffic sensors and connected to the so-called Internet of Things. Expensive traffic counters were replaced in most cities by thousands of simple boxes (Barker 2024). These devices began to be installed by individuals, thus shifting data ownership from governments and corporations to communities. A new breed of DIY traffic planners was literally born in the first decades of the century, which were, of course, closely connected with the already existing cycling subcultures. Their expertise was more and more valued in those years after the financial crisis, when public investments in cycling were virtually absent.

Big data as well as visualisations also helped considerably with effectively measuring and drawing attention to the enormous volume of space that cars occupied in cities. Cycling advocates have promoted the bicycle as a space-saving means of travel ever since the 1960s, this being perhaps best illustrated through the famous 1979 poster by the Dutch

cyclists' union depicting the space required for each form of transport. This iconic juxtaposition has sparked copies across the world in the 2010s (see Illustration P.2). Other more recent initiatives followed and proposed a similar critique: a promotional poster for the Swedish Road Administration imagined a situation where roads were giant holes in the ground; an inventive protest in Riga, Latvia, where bikes pretended to be cars; or bike parking areas making a pithy comment on how the space usually occupied by cars can be used (Illustration P.2).

These striking images toured the world in those years and initiated heated debates about what was deemed to represent the 'arrogance of car space' (Colville-Andersen 2015). The creative initiatives were soon complemented by rigorous studies which portrayed some striking realities (Illustration P.3). In US cities, almost 500 square metres of land were dedicated to roads and off-street parking per automobile, often exceeding the amount of land devoted to housing per capita (Litman 2014). In 2010, it was estimated that in Los Angeles there were about 3.3 parking spaces, or almost 100 square metres per vehicle, which was more space for each car than for each person in the county (Chester et al. 2015). While in London, a combined area six times the size of Hyde Park was already taken up by public car parks (Powell 2016). Even in pioneer cycling cities such as Copenhagen or Amsterdam the amount of car parking was extravagant. The total existing parking spots put together would have covered the entire city centre (Colville-Andersen 2015). In Amsterdam, cycling represented 45% of the modal split in 2015, while driving accounts for only 11%. Yet, the space dedicated to roads and car parking amounted to 60% of all the space in the city, while bicycle lanes only occupied 11% (Visser 2015).

The evidence against the space taken by the car continued to pile up, with the expenses resulting from traffic congestion estimated to account for £150 billion in 2013 in France, the United Kingdom, Germany and the United States alone and expected to rise to over £200 billion by 2030 (The Economist 2014). Yet, as always, radical changes were postponed until 2020, when traffic came to a standstill in London and other Western capitals (O'Sullivan 2020). The increasing population and the rise in electric car use, which had been heavily subsidised, led to a total gridlock. Municipalities rushed to organise hitchhiking spots and slash taxes on car sharing services such as Zipcar or Car2Go, but it was already too late. A huge number of people were already giving up on their cars when they could not move around the city anymore.

Illustration P.2: (from top left to bottom right) poster showing the space required for each form of transport in Bucharest, Romania (photo: Cristian Vasile); a promotional poster by Karl Jilg for the Swedish Road Administration; a protest in Riga where bikes pretended to be cars (photo: Artūrs Pavlovs); bike parking areas designed by Cyclehoop in London (photo: George Rex: https://flic.kr/p/tZDqnZ).

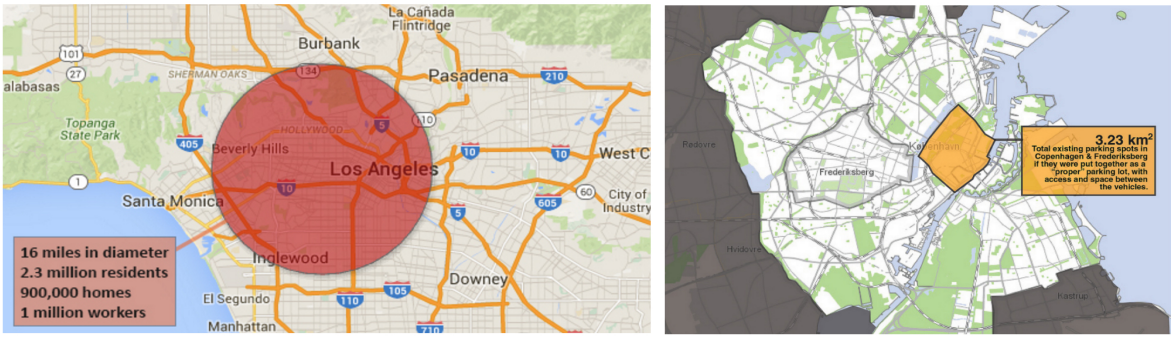


Illustration P.3: (left to right) The Los Angeles 'Parking Crater' (Chester et al. 2015); The arrogance of parking space in Copenhagen (Colville Andersen 2015).

The bikenomics of health also had a strong tradition in the early 2010s. Studies suggested that regular cyclists were taking 1.3 less days off per year than drivers (Viesser 2015), while in the UK cycling and walking were calculated to save £17 billion for the National Health Service (Jarrett et al. 2012). In the Netherlands, it was estimated that for the £450 million invested annually in bike infrastructure, there are £17 billion saved to the economy (Claessen 2017). The viability of cycling was also acknowledged by the World Health Organisation, which had developed a health economic assessment tool for cycling and walking to facilitate evidence-based decision-making (http://heatwalkingcycling.org/).

Even if theories of behavioural change initially had only a small effect in encouraging people to cycle, the health sector became increasingly involved in cycling matters. Following the early example of Denmark, many countries decided that cycling was a public health issue, so the ministries of health got involved, alongside the ministries of transportation, in allocating considerable budgets to this end. The issue was so important that significant communication budgets were put forward to advertise cycling and walking as healthy means of transportation, while at the same time all advertising produced by the

automotive industry was forced to carry similar messages to those appearing on tobacco products, an idea first championed by Colville-Andersen (2009) (Illustration P.4).

Illustration P.4: Driving Kills Health Warnings (https://www.copenhagenize.com).

The ministries of environment in many countries, together with the bicycle industry, made a huge difference in the following years in making sure that both bicycle production and use got a well-deserved boost. Bicycle production was heavily subsidised in the following years, so that 'Bicycle Valleys' were popping again all over the Western world after decades of imports from Asia. Similar stimulants were directed towards bike hiring schemes and bicycle purchase by individuals. This echoed earlier tentative moves such as the CycleScheme in the UK (which provided tax-free bikes for work), the subsidies allocated by the Italian government for bike purchase (https://www.bike-eu.com 2009), or the decision in France to pay commuters to cycle to work (De Clercq 2014). In parallel, bicycle companies

from all over the world began a common effort to lobby governments and European institutions in pretty much the same way as car companies had been doing for decades (Condron 2027).

Soon enough, as the number of bicycle co-operatives increased significantly, various measures aimed at encouraging repairing and mending rather than just buying new bicycles and accessories were put in place. The start was given in 2016 by the Swedish government who decided to tackle the 'throwaway culture' by cutting VAT on fixing everything from bicycles to washing machines (Orange 2016). Many countries bucked the trend so that today a whole alternative economy is flourishing around repairing, which is stimulated through state subsidies for bike mechanic classes, an industry ethic that does not allow designing products that cannot be repaired, as well as strict standards imposed by governments to ensure that parts and components are interchangeable between different bicycle brands.

Know-how and technology transfer

London, 17 October 2050

One hundred years ago when the automobile took over the space of our streets it was not only the city landscapes that changed dramatically. The following decades of car dominance ensuing from the 1950s onwards also led to an entire culture of designing, planning and engineering the urban form. The concepts of the transportation planner or transportation engineer were too often conflated with those of the car-oriented planner or engineer. A gradual change occurred only at the beginning of this century, when many

cities started to pay close attention to what represented then the best of cycling expertise: the Netherlands and Denmark.

These European forerunners were examples to emulate by the aspiring cycling nations, as 'Going Dutch' or 'Copenhagenize' had become mainstream expressions testifying their inspiring role. Design and planning companies selling the Dutch and Danish ways of 'doing cycling' were very popular at the time: The Dutch Cycling Embassy was launched in 2012 to export cycling expertise, while the University of Amsterdam organised in 2015 the first ever summer school on this topic, 'Planning the Cycling City'. The first academic research programme on urban Active Mode Mobility started in 2016 at Delft University of Technology, offering a dozen doctoral and post-doctoral positions. The Cycling Embassy of Denmark, established in 2009, united a similar network of professionals. Many of these initiatives believed they had a 'moral responsibility' to share their cycling knowledge across the world.

In the beginning the inspirational lead offered by the Netherlands and Denmark was effective in encouraging many countries with low levels of cycling to set ambitious goals. But gradually, as other cities across the world increased their cycling levels, they became more appropriate examples to follow because their struggle was often considered more similar to other cities that adopted cycling later on than that of the long-established cycling bonanzas of Amsterdam or Copenhagen.

The transfer of technology from countries with higher levels of cycling towards the less developed was also important in those times. The Velo-City cycle planning conferences

(https://www.ecf.com/projects/velo-city), which were organised annually by the European Cyclists' Federation in various cities across the world, offered a platform for such exchanges. I remember attending four of those conferences in the early 2000s in Copenhagen, Vienna, Nantes and Nijmegen and in retrospect I can say that the cycling mini-ecosystems displayed at these events resembled what we have in most of our cities today.

The technologies featured at Velo-City ranged from automated pedestrian and cyclist counting systems (https://www.eco-compteur.com, https://www.vekso.com), bike shelters, bike pumps, bike wash stations, vending machines selling bike tools, spare tubes, lights and other basic parts, footrests and railings at intersections and parking solutions (https://www.altinnova.com, https://www.cyclehoop.com, https://www.bikefixtation.com, https://www.hoe360consulting.dk), to bicycle sharing systems delivered by world leading outdoor advertising companies such as JCDecaux (which was running services in Paris, Vienna, Brussels and Dublin) and Clear Channel (that had bike systems in Stockholm, Milan, Barcelona, Oslo and Mexico City).

Innovations in bicycles and accessories

London, 24 October 2050

An even more interesting trajectory than the know-how and technology transfers has occurred in 'the evolution' of the bicycle itself. In the early years of our century there existed a prevalent misconception that bicycles do not evolve (Cox and Van De Walle 2007). Yet, urban bicycles were incorporating more and more of the 'smart technologies' available, very much in the same way that the automobiles did. Whether bicycles needed

indeed to become more complex machines or, on the contrary, their simplicity was precisely what should have been preserved was rarely a question that was addressed. High tech innovations were pursued without much deliberation, from ‘smart bikes’, to mobile phone-based ‘operating systems’ for bicycles, to bikes connected to cars.

Some of these high tech innovations were: road navigation facilitated by smartphone and integrated navigation lights (showing directions via GPS), mounted on the handlebars (see https://www.smarthalo.bike, Illustration P.5); real-time positioning of the bike, via GPS, to prevent theft (see https://www.cobi.bike); signalling a turn of the bicycle with lights that are connected to GPS (https://www.ridehelios.com, Illustration P.5); vibrating bicycles that warn the rider when he is too close to a car (Denholm 2015); bicycle lights that turn on when the cyclist is braking (see https://www.blinkers.io); bicycle pedals that notify the owner if the bicycle was stolen (see https://www.connectedcycle.com); bike helmets tracking the position of the cyclist and communicating it to the car driver (see https://www.volvocars.com; Peters 2015b); airbag for cyclists, that activate in case of an accident (see https://www.hovding.com, Illustration P.5); laser projected bicycle lanes (see https://www.blaze.cc, Illustration P.5); bicycle lights that send an emergency text if the cyclist crashes (see https://www.seesense.cc); cycling jackets with in-built LED lights (see https://www.lumo.cc); multi-functional bike shelves (see https://www.theknifeandsaw.com).

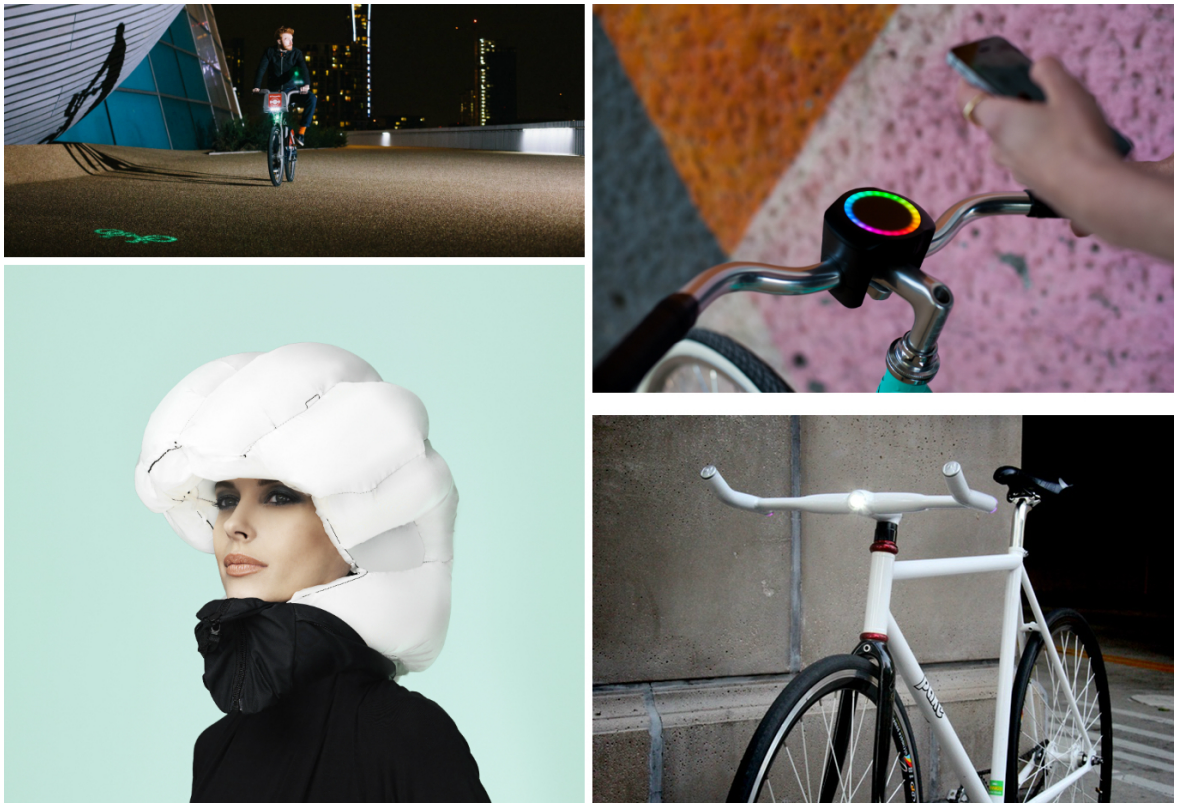


Illustration P.5 (from top left to bottom right): laser projected bicycle lanes from Blaze (https://www.blaze.cc); integrated navigation lights from Smart Halo (https://www.smarthalo.bike); airbag for cyclists from Hövding (https://www.hovding.com); lights signalling left and right turns from Helios (https://www.kickstarter.com/projects/kennygibbs/helios-bars-transform-any-bike-into-a-smart-bike).

It is important to observe that even then most of the innovations were not coming from established bicycle companies, but rather from niches, small engineering and design companies and even individuals that tried to launch their products through crowdfunding online platforms. This already signalled a shift away from big industry players towards more DIY projects and co-operative style enterprises. Their high-tech visions of bicycles were certainly beneficial in the beginning in attracting new cyclists, but the innovations that really made the difference were eventually the low-tech ones. They required less expertise, less repairing skills and finally resulted in more convivial tools (Illich 1973). They were mainly represented by the so-called 'small technologies' (Birtchnell and Urry 2015), which

had disappeared from most of the bicycles used in cities in those days. Most of them still existed in countries where everyday cycling was more common. Mundane objects such as mudguards, chain guards, lights, racks, bells, kickstands and even dress guards for the back wheel became fashionable again.

Finally, it must be said that it was not always the developed countries which led the innovation processes in cycling. Projects from Africa, Asia or South America were often adopted in the North, usually because their simplicity and sustainability was impossible to resist. Some of the most inspiring lessons came precisely from those parts of the world where bicycles had different significations and sometimes even different uses. The practices of repairing and repurposing, long-time forgotten in the Western world where consumption was encouraged for most of the last century, were given a boost through the DIY culture.

A great deal of the inspiration for making more with less came from African countries where only a few decades ago bicycles were one's means not just of transportation, but also of literally making a living. The kinds of improvisations such as stripping the bicycle down to its essentials for ease of fixing, replacing broken parts such as the rubber blocks of the pedals with even more solid rubber blocks cut from car tires or bicycle tires that are doubled from the interior with ribbons cut out of old and worn tires (Hahn 2016) were just some of the examples of low tech innovation that permeated from the South to the North. Another example of African best practice massively taken up in the North was the bamboo bicycle (Illustration P.6). Initially developed by various social enterprises to addresses climate change, poverty, rural-urban migration and youth unemployment, the bamboo

bicycles caught on as well in Europe and North America as low cost alternatives to relatively expensive and unsustainable aluminium and steel bicycles.

A whole diversity of pedal powered machines initially very popular in South America were also adopted in the West and used particularly during the oil and energy crises that preceded the switch to massive cycling. Making use of spare parts from bikes and harnessing the power of human energy, these 'bicimaquinas' were originally handcrafted in Guatemala using a combination of old bikes, concrete, wood, and metal. A bicycle mill, a bicycle blender, a bicycle rope water pump or a bicycle washing machine might not be very common contraptions today, but they are still indicative of the resilience of bicycles even in the most adverse situations (https://www.bicimaquinas.com; Illustration P.6). Today such machines are a vivid reminder that there is no such thing as a throw-away bicycle.

Illustration P.6 (from top left to bottom right): a bamboo bicycle (https://www.ghanabamboobikes.org); a bicycle mill; a bicycle rope water pump; a bicycle blender (https://www.bicimaquinas.com).

Broader societal and economic changes

London, 30th October 2050

The gradual inauguration of the slow cycling system which today governs the pace of our urban travels was made possible only through a complex set of transformations which required in equal measure a radical reconsideration of urban mobility infrastructures, technologies and policies as well as a new reconfiguration of the very social fabric.

Throughout this comprehensive description of a bicycle system I have insisted on a series of changes which allowed for the bicycle to become the default means of urban locomotion particularly over short distances. These changes were made possible when an appreciation

of slowness was rediscovered and promoted across our societies. And this slowness was in turn reinforced once the bicycle system gained even more traction. Still, the new system was initially only to a very small degree different from that of the car: fast velocities were still praised, competitiveness was still a defining value within societies, while profit and economic growth continued to frame most of our imaginaries. The bicycle alone did not seem powerful enough to derail societies from this path. Yet, once the bicycle claimed an even more active place in our everyday lives, it gradually became a catalyst for more radical social changes, echoing and boosting the key role it used to play in the environmental activism of the 1970s and 1980s.

This radical social change, brought about by the near societal collapse caused by neoliberalism, found in the bicycle a fertile terrain where new social values could be articulated. The bicycle enabled an engagement with the surrounding environment which is in a way humbler and reminds us that human-scale technologies give us a greater sense of personal and social autonomy as well as a more sensible equilibrium with the world around us. The slow bicycle empowered individuals to reconnect with communities in their vicinity, rather than forge connections over long distances. The equally easy to build and fix bicycle furthermore facilitated the creation of small scale co-operatives amongst the same individuals, which were built on alternative systems of value, promoting sharing resources, skills and responsibilities, rather than monetary exchange. And most importantly, the simple and nimble bicycle shifted the agency of social change away from the confines of the top-down levels of states and corporations and into the hands of self-organised groups of individuals.

This narrative certainly did not appeal to everyone from the onset. Renouncing resource- and energy-intensive and high carbon emitting lifestyles was only partly done voluntarily. In equal measure, the ecological limits and those of neoliberalism forced us to steer the wheel towards the slow bicycle system we have today.

Steps from 2016 to 2050

The chronology below highlights the most important shifts that occurred between 2016 and 2050. They focus on the major changes that took place in London, but also refer to the global developments across these decades. This schematic calendar of events guides our understanding of how the urban mobilities have outgrown their car-dependence from the beginning of the century onwards and embraced a mix of sustainable modes which orbit around the bicycle, particularly for short journeys. Also, this timeline hints at a broader process of slowing down urban velocities and away from growth-oriented social practices.

2016: Team GB's cycling heroes call for 'legacy of everyday cycling'.

2016: Britain starts to prosecute motorists who drive too close to cyclists as they overtake.

2016: US and China agree to ratify Paris climate deal. The rest of the world follows suit in the years after.

2018 - 2022: The price of oil goes up and up and up. The International Energy Agency (2016) forecasts a global increase of 25 percent in oil demand, particularly led by consumption in China and India. The price of oil is set to triple by 2040.

2020: The pedestrianisation of Oxford Street. This sparked similar initiatives across the UK and the Western World, particularly since the money spent by pedestrians was similar to that spent by people visiting by car.

2020: The Cyclebus app revolutionises cycling mobilities. Levels of cycling safety increased exponentially as a result.

2020: The Strict Liability Law is imposed worldwide.

2020: Traffic comes to a standstill in London. This is mainly due to increasing population and the rise in electric car use which have been heavily subsidised.

2021: First 100 kilometres of superhighways completed in the UK.

2021: 75% of all trips by bicycle in Amsterdam, up from 45% in 2016.

2022: Congestion charges extend and prices increase.

2022: High-tech innovations gradually replaced by low-tech ones. The rise of crowd sourced Kickstarter-type projects enabled unprecedented innovations.

2025: Die-ins and other bike protests in London.

2025: Teslagate, the hacking scandal making the use of self-driving cars contentious.

2027: Car-Free Party gets 15 seats in the European Parliament.

2029: Levels of cycling in India and China reach those of 1980s.

2030: E-Bike Act is adopted in the UK, heavily subsidising the industry.

2032: Mixed-use Development Act.

2033: 30km/h limits enforced in residential areas across London.

2036: The London Bike-and-Train System inaugurated.

2040: Cargo Bike Act introduced, which heavily subsidised the industry.

2041: 'No car' bans across all Chinese cities of over 100,000 inhabitants, thus confirming one of the scenarios developed in 2016 by Tyfield et al.

2042: Zero Road Deaths Act.

2043: Basic income established in most countries takes DIY and tinkering to unprecedented levels.

2045: Royal family cycles together from Buckingham Palace to the Tower of London, Manchester United players ride their bicycles to home matches, The New Spice Girls ride to Glastonbury. Cycling becomes a national habitus in the UK, in the same way it was described by Kuipers in the Netherlands (2012).

Chapter 1 Introduction: Tips of the cycling iceberg

The fictional account from my future self that you have just read is intended to sensitize readers to the utopian analytical character of this thesis, to stimulate the imagination and make explicit the way in which the future is now: shaped by the social and material practices of our present day. From here on, this thesis follows a more conventional line, albeit one that depends on the effect of the prologue. In this introduction, I begin to position the core concerns of this research in relation to key debates and outline the structure of the argument.

The slow resurgence of everyday cycling in the last two decades across the Western world, combined with a more recent plateau in the use of motorcars, has sparked lively debates regarding the futures awaiting urban mobilities. This renewed interest in the practice of cycling, associated with the dominant role it played in many cites not long ago, as well as the current social and environmental crises caused by automobility, warrant the investigation of the possibilities that a 'bicycle system' becomes one alternative to the 'systemic domination' of automobility (Urry 2004). This thesis takes forward the academic debates concerned with post-automobility futures by explicitly changing the focus from the car to the bicycle as the main mobility nexus in urban areas.

The last twenty years or so have witnessed a global reconsideration of a humble means of transportation that in the previous decades was mostly relegated to the dustbin of history[2]. Excluded as early as the 1940s from all visions of modern urbanism, once the car came in full swing, the bicycle is today making a courageous come back in many cities all over the world. Overly enthusiastic voices proclaim a 'bicycle revolution' taking the urban realm by storm, often oblivious to the fact that the levels of cycling now are hardly comparable with the golden age of the 1920s and 1930s, when in most Western cities cycling accounted for the majority of travel (80% of trips in Eindhoven and Enschede in 1930, see de la Bruhèze 1999; 20% in the UK, see Pooley and Turnbull 2000; for a graphic illustrating the evolution of cycling levels in Europe, see chapter four). Still, the more recent increases in cycling in many cities are worth closer consideration. They are tips of the 'cycling iceberg' and a good starting point for imagining what a bicycle system could look like.

The number of cyclists in certain areas of New York has tripled in the past ten years (Department of Transportation 2015), while in London the number of people cycling to work has doubled since 2001 (Office for National Statistics 2015). Paris, the first big city to implement a bicycle sharing scheme in 2007, aims, for its part, to increase the number of bike journeys to 15% by 2020 and thus to become no less than 'a world cycling capital' (Mairie de Paris 2015). Flaunting such figures in the media and setting ambitious targets are PR strategies that are already a common part of broader efforts to brand these cities as attractive liveable environments for tourists, businesses, and skilled professionals.

[2] The cycling resurgence is mostly a Western phenomenon. In Beijing, bicycle use fell from 63% in 1986 to 14% in 2013 (Horton 2015). Bike ownership across the world is in decline since 1989, being highest in Northern Europe and lowest in West, Central and North Africa, and Central Asia (Oke et al. 2015)

It has recently been argued that cycling demonstrates that it represents a sound economic domain. In Europe, for example, the number of bicycles sold has recently overtaken those of cars: 20 million bicycles are bought every year across the continent (Conebi 2015). Also, cycling is creating more jobs in Europe (655,000) than automobile manufacturers are in the United States (ECF 2014b). It is calculated that by doubling modal share, more than 1 million jobs would be generated in EU alone.

The most visible resurgence in urban cycling, apart from the fragile increases in the number of bike trips, is exemplified by the bicycle sharing systems. While Paris and Barcelona kickstarted the trend amongst the big cities in 2007, the number of bike share programmes around the world grew from 13 to 855 between 2004 and 2014. Many of the current bike sharing systems are so-called 'third generation', taking credit card payments, have GPS tracking and can be accessed by smart phone apps which show bike availability and docking stations (Fishman 2015). More recently, 'dockless' systems, with bicycles no longer requiring the implementation of docking stations, have appeared in many Chinese and Western cities (in the UK, the system is implemented in parts of London, Manchester and Oxford). It is estimated that by the end of 2016 there were already more than 3 million dockless bikes in use worldwide, and their number increases at a rate of one million each month (Reid 2017c).

Not only do bicycles aim to tackle the problem of transporting people in ever denser urban areas, but they also offer alternatives for the transportation of goods, as mentioned in the Prologue, as more and more initiatives propose cargo bikes as last-mile delivery solutions. In Britain, the cities of Cambridge and Brighton are benefiting from the potential of cargo

bikes as cycle logistic firms are carrying everything from Amazon packages to takeaway food and bouquets (Walker 2015).

Amongst the cycling nations, the Netherlands, Denmark and Germany are leading the pack. The share of cycling in total mobility in the Netherlands is 26%, 18% in Denmark and 10% in Germany (Buehler and Pucher 2012), with significant variations from city to city. Groningen (55%), Leiden (33%) and Zwolle (30%), which are medium-sized student cities, take the lead in Holland, while Copenhagen (37%) and Odense (28%) are best performers in Denmark (see EPOMM 2015 or Cityclock 2014 for different tools used to calculate these modal shares; for a list of the cities with the highest cycling levels see Illustration 1.1).

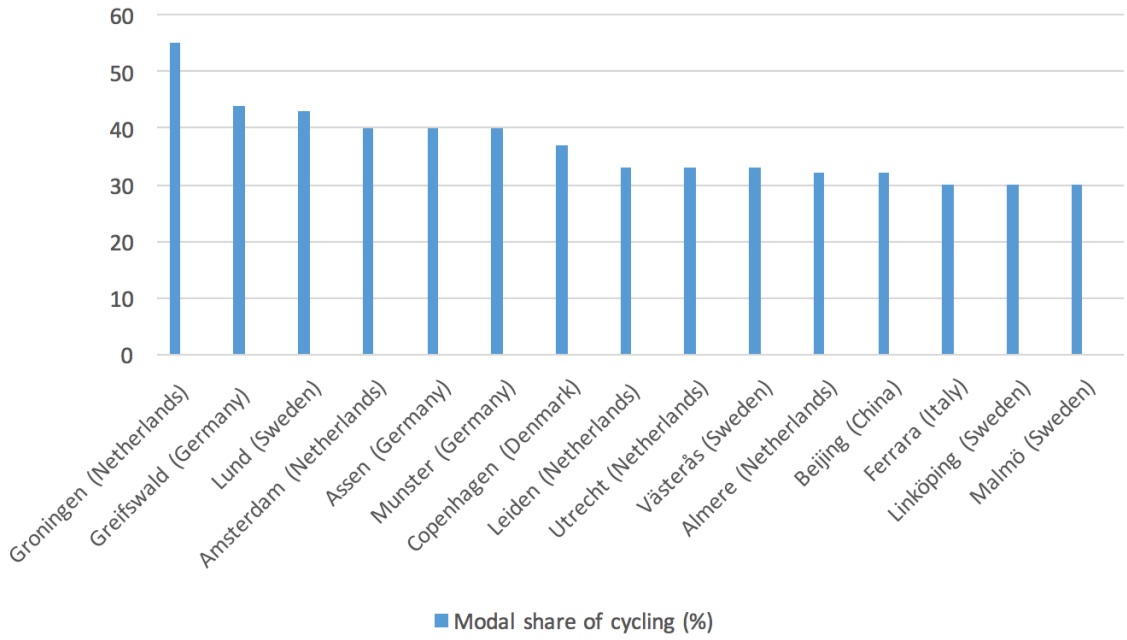


Illustration 1.1: Modal share of cycling in fifteen of the most bike friendly cities. Graphic based on data collected from cityclock.org (2014).

That cycling promotion has become more and more a matter of pride amongst many cities across the globe is demonstrated by the recent creation of a so-called 'Index of Bicycle Cities' (CI 2015). Using thirteen criteria amongst which advocacy, bicycle culture, gender split, perception of safety or social acceptance, the index of 2015 lists in the top five some of the 'usual suspects': Copenhagen, Amsterdam, Utrecht, Strasbourg and Eindhoven. Never before in recent history has the competition to become a 'cycling city' been so disputed. The creators of the Index of Bicycle Cities perhaps express this reality the best:

> The interest in taking the bicycle seriously as transport once again continues unabated around the world. Every city used to be bicycle friendly before planners and engineers started to change the paradigm and plan for cars and relegate bicycle users, pedestrians and public transport users to third class citizens. Now those cities around the world who are taking up the challenge and modernising themselves by implementing bicycle infrastructure, policy, bike share systems, etc. - as well as restricting car use - are the cities we all look to for New Century inspiration. (CI 2015: paragraph 1)

This more recent boom in cycling has not remained without echo in academia. Until recently, cycling research was confined to only a few disciplines such as history, sociology of sport, engineering, design and planning, and medical and public health (Horton, Rosen and Cox 2007). The last decade has nevertheless witnessed a burgeoning academic literature on cycling (Illustration 1.2), particularly driven by the field of mobilities studies, but also by the increase in transportation research more generally (Dill 2017). Increasingly acknowledging cycling as viable transportation and considering it in relation to the dominant socio-technical system of automobility (Urry 2004) have thus inspired broader and more diverse areas of research. While they have not yet established a consolidated

theory of velomobility, these studies are better positioned than before to inquiry the manifold cycling practices performed across times and spaces. Three domains of academic interest in social sciences have become more prominent today.

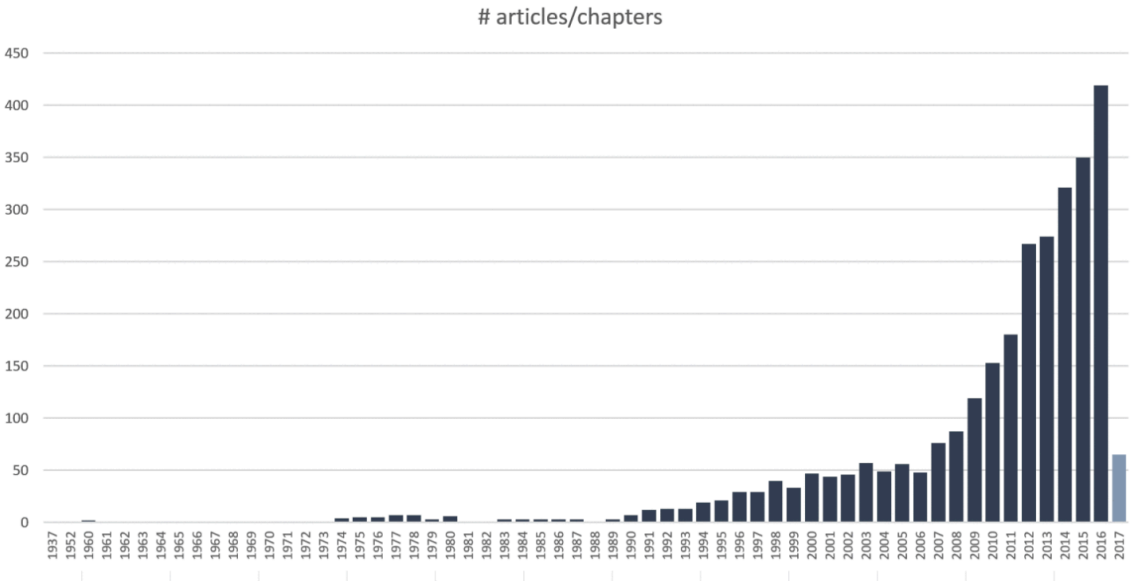


Illustration 1.2: The number of academic articles (including book chapters) on cycling (per year). The boom in published research started in 2000s (Dill 2017).

Firstly, there is an interest on cycling activism, cycling identities and cultural and subcultural representations of cycling (Oldenziel and Trischler 2016; Cox 2015; Vivanco 2013; Aldred 2010; Fincham 2007; Horton 2006). The focus illustrates the marginal place of cycling in transport policies, while highlighting the central role these formulations play in processes of social change. More recently, these appreciations have been balanced by more critical perspectives. Several scholars have showed that often there is a clear neoliberal agenda behind many cycling initiatives (Spinney 2016; Aldred 2012a). Thus, issues of inequalities, processes of gentrification and ecological controversies linked with cycling projects have been addressed by authors such as Hoffman (2016), Stehlin (2015, 2014), Hoffman and Lugo (2014) or Tironi (2014).

Secondly, an increasing number of scholars specialized in mobilities research and cultural geography are directing their interest to bodily senses and the embodied knowledge of cycling (Simpson 2016; Jun Lee 2016; Jungnickel and Aldred 2013; van Duppen and Spierings 2013; Brown 2012; Spinney 2010, 2009, 2007, 2006; Jones 2005;). This research highlights the affordances of cycling mobilities, showing how practitioners engage with the road environment and situations and what are the strategies they use to orient themselves into the city.

Finally, a convergence of culturally different outlooks can be observed in the cycling literature. There is an increasing effort to provide international comparisons and perspectives, which are to an important extent facilitated by specialized conferences such as the Velo-City series (https://www.ecf.com/projects/velo-city) and the Cycling and Society symposiums (https://www.cyclingandsociety.org). Unsurprisingly, the global North and 'cycling nations' such as the Netherlands, Denmark or Germany are still the landmarks (Oldenziel et al. 2016; Héran 2014; Cox 2015), but there are also endeavours to research cycling practices in countries from the South (Oldenziel and Trischler 2016; Vivanco 2013).

My thesis aims to take forward this burgeoning research agenda and to investigate under which conditions a bicycle system could replace automobility, at least for some urban journeys. I argue that the instauration of a slow bicycle system can be achieved in three complementary ways. Firstly, it requires an effective architecture of such a future, something I have already done in the prologue. Secondly, it offers an archaeology and critique of the car system and fast mobilities, which will become evident in the chapter three and four. And thirdly, it proposes an ontology reflecting on the kinds of individuals

and societies made possible by such a bicycle system, which will become apparent in chapters five and six. In the following pages, I am describing in more detail the structure of this thesis.

The opening prologue of this thesis has engaged in a fictitious description of a slow bicycle system as it might present itself in the year 2050. Drawing inspiration from Jonathon Porritt' *The World We Made* (2013), the section described the supposed outcomes and the essential transformations which are needed for the bicycle to become the nexus of an urban mobility system no longer dependent on the automobile, at least for shorter journeys. This is structured as a utopian exercise whereby an architecture of the good society revolving around slow bicycle mobilities is presented. As it displays the coordinates of urban mobilities in London in a few decades' time, the bicycle utopia advanced here draws from past and present socio-technical realities as well as from inferences about how they could evolve in the following years.

The time travel towards a slow bicycle utopia is momentarily suspended, so that a rationale of the whole thesis can be advanced in this first chapter. I acknowledge here the renewed interest in cycling and cycling research in the last few decades, while at the same time noticing the two main limitations within this revival. On the one hand, cycling is largely framed as just an alternative transportation, often simply subordinate to the system of automobility, unlikely to transgress this marginality and rarely questioning the hegemony of the car. On the other hand, and very much in line with the ideology of the automobile, when cycling is presented as viable transportation, it is necessarily understood as utilitarian, effective and fast. My utopia of slow cycling challenges these two

presuppositions, arguing that desiring and imagining slow mobilities beyond car dependency is emancipatory, both for individuals and societies.

To this aim, the second chapter of the thesis clarifies the framing of a slow bicycle system from a utopian standpoint, while also showing how the research methods used contribute to this end. A theoretical perspective claiming that utopias are necessarily ambivalent, transgressing narrow notions of openness and closure, desire and hope (Harvey 2000; Abensour 1999; Bauman 1976), is proposed. This understanding of utopia as a method rather than a goal (Levitas 2013) is useful because it blends three complementary modes of thinking about utopia. First, there is the architecture, particularly reflected in the work done in the prologue, which presupposes delineating the contours of a slow bicycle future, based on an extensive empirical review of current cycling developments worldwide. I use scenario building as a technique to imagine such futures, drawing on various live and inventive methods (Back and Puwar 2012; Lury and Wakeford 2012). Second, a critical, archaeological mode balances the architectural one, investigating through similar empirical methods the blind spots of past, current and future utopian visions of urban mobilities, as they are formulated around the car, fast mobilities or even the bicycle itself. Third, an ontological understanding of utopia as method brings the life of individual actors to the fore, as it aims to elucidate the types of human natures that are required for and generated by a slow bicycle system. Mobile, ethnographic and auto-ethnographic research methods are proposed here as effective ways to capture specific ideals of human flourishing through the rich senses and meaningful sociabilities enabled when cycling.

In order to imagine a future bicycle system, a review of the dominant paradigm of automobility is proposed, which forms the topic of the third chapter. There are complex assemblages of technologies, practices and meanings associated with the overwhelming dominance of the car system. In a relatively short period of time they have generated a path dependence of such an extraordinary power that it seems now that in the foreseeable future the car will not readily concede its worldwide monopoly. The chapter reveals the social and technological mechanisms that have contributed to the creation of the automobile utopia. At the same time, it argues for an archaeological mode of investigating present 'autopias', one which identifies the silences and inconsistencies (Levitas 2013) that the system of automobility produces and which range from ecological damage to the destruction of the urban public realm. A similar critique is also attempted against what is largely assumed to be the future of automobility, represented by autonomous electric vehicles. As always, the archaeological mode of utopia as method is supplemented by its architectural counterpart, something which is done here through an investigation of various 'cracks' in the system of automobility (Geels et al. 2012) and the potential solutions to these problems. They are visible, amongst other places, in the manifold global car-free movements and experimentations, often running at a small scale. The range of new urban mobility systems presented here draws from an extensive review of actual examples of car-free initiatives from around the world which have been developed in the last decades.

A critique and a consequent reconstruction are advanced as well in chapter four, this time in relation to the manifold bicycle utopias from the past and from the present. Using an historical perspective, I argue that a utopia of fast, growth-oriented cycling has dominated much of the last two centuries since the first proto-bicycle was 'invented'. The bicycle used

to power dreams of fast and autonomous mobility amongst the male bourgeoisie of the late nineteenth century, as well as aspirations for fast modernisation and industrialisation with the first production lines designed to serve the newly established bicycle industry. It then slowed down in the social imaginary, as automobility gathered pace in the twentieth century, only to step up a gear again more recently, as traffic congestion and discourses of global competitiveness and urban resilience reappraised its capacities again. Proposing an archaeological mode of utopia, this chapter then considers the implications of pursuing ideals of fast cycling futures, which largely dominate current discourses and practices. It asks what the social and environmental consequences of constantly aiming to speed up mobilities and societies are, while suggesting that a de-growth alternative must be considered instead.

The next two chapters examine the embodied and social experiences of a slow bicycle utopia empirically. By investigating the very practice of cycling, I attend to the 'human natures' which are needed for and created by a slow bicycle system. The chapters examine the meanings cycling generates for its practitioners and enquire about changes in their understanding of what it means to be 'human' or 'beyond human' when moving around by bicycle. It is at this stage that utopia as method, in its ontological mode, becomes useful. Chapter five contends that a future bicycle system considerably expands the human senses, often beyond what automobility affords. New senses are summoned in the practice of cycling, as the visual and the auditory are complemented by a range of more intimate senses such as equilibrium, kinaesthesia or pain, which both attract people and deter them from the practice (Simpson 2016; Jun Lee 2016; van Duppen and Spierings 2013; Spinney 2010, 2007, 2006; Jones 2005). To delineate the new sensorial order of a future bicycle

system, the strategies cyclists use to build sensory tolerances and their adaptation to slower mobilities are investigated. I argue that the more gentle, organic rhythms and flows of cycling create meanings that are distinct from those associated with less embodied forms of urban movement.

The richness of these cycling senses significantly expands the array of sociable interactions with fellow cyclists, which represent the focus of chapter six. There are various instances of people cycling together investigated in this thesis, ranging from mainly unacquainted cyclists 'swarming' at rush hour through the intersections of Amsterdam, to the highly regulated and fast paced 'chain-gang' formations within a club ride outside London. They are all enabling an interaction order (Goffman 1982) which is abiding by rules that differ significantly from those governing automobility. Many of these sociable instances within the practices of group cycling could generate new patterns of interaction, which not only resist the interaction order of the car system, but are also more convivial and different from car traffic, in terms of speed, bodily proximities, face-to-face encounters and co-presence.

In chapter seven I ask to what extent a slow bicycle system is not only possible, but most importantly, desirable for future generations. In the face of manifold ecological imperatives and societal breakdowns, slowing down urban mobilities and thus challenging the orthodoxy of economic growth have been proposed in this thesis as beneficial, albeit difficult to enact, outcomes. Using utopia as a method to reimagine the social world is once again a valuable approach, as it can help us understand how a slow bicycle system and the de-growth alternative it proposes are themselves imbued with tensions and contradictions. Taken on its own, slowness can be emancipatory, but, similarly, it can become a privilege

of the few. Slow mobilities should then be understood relationally, through their innate interdependence with fast mobilities. For this, new vocabularies and sensibilities must be invented in relation to urban velocities, guiding us beyond the simplistic fast versus slow dichotomy. If cycling is indeed the closest you can get to flying, as actor Robin Williams famously said, maybe then lightness, flow or quickness are more appropriate metaphors to describe and guide our mobile lives.

As this thesis ends, I consider to what extent a new system of urban mobilities centred around the bicycle could bring to life a desirable and sustainable future for the greatest number of people. While the imperatives of going beyond the current socio-technical arrangements made possible by the automobile seem more urgent than ever, it is nevertheless essential to retain a critical perspective regarding the limitations of cycling to solve the plethora of complex problems facing our societies in the twenty first century. I argue that only by attending to the heterogeneity of everyday mobility practices of individuals and their prefigurative potential, as this thesis has tried to do, can we grasp how better futures might be defined and made.

Chapter 2: Methods on the move: How to imagine biketopias

This research journey started as I embarked on a plane from Bucharest to Manchester in April 2013, alongside a suitcase of clothes and my bicycle disassembled and fitted into a cardboard box. I hardly moved around other than by bike and, as I began my PhD, the ambitious and generous question I wanted to tackle was how to get more people cycling more often. I am certainly not alone opting for this form of mobility, yet the overall levels of cycling in Lancaster, as pretty much everywhere else in the UK, are well below those in other European countries (ECF 2015a) and even below levels registered less than fifty years ago in this very country (Pooley and Turnbull 2000). My research ambition was partly fuelled by the conviction that mass cycling can be more than a thing of a forgotten past or practiced in some distant, flat European states. Cycling in the UK has, in fact, a promising future ahead.

My own cycling, as well as that of others with similar preferences to mine, naturally became the site of investigation for my thesis. After all, we represent a minority whose mobility practices not only resist the hegemony of the car, but, as the latest UK Census shows, we are an increasing minority: 90,000 more people were cycling to work in 2011 compared to 2001 (ONS 2014). For some time, as I was making sense of my new adopted home city Lancaster, I cycled on my own, commuting repeatedly the same five kilometres between work and home. Up and down the Bowerham and Greaves hills, mixing with traffic or enjoying car-free routes, I used auto-ethnography (Muncey 2010; Reed-Danahay 1997) and mobile methods (Büscher, Urry and Witchger 2011) to reflect on how I embody the bicycle,

and together the road space, but also on the ways in which the materialities of these two affect the mobile experience. This is the experience of a non-encapsulated, self-propelled movement which enables a mobile subject substantially different from a car driver, and even a pedestrian. The sensory worlds of cycling, where the supremacy of the visual and the auditory are contested by the multitude of internal senses which are awakened, and where the whole body engages in perception, are opening unprecedented possibilities for a human body increasingly desensitized by its encapsulation in motorized means of transportation. As I will further demonstrate in chapter five, the sensory engagement of cyclists harbours a utopian promise of a body which rediscovers its full potential.

Soon, I became increasingly preoccupied with how this subjective experience shapes and is shaped by the social world where my cycling is unfolding. The new ways in which the cycling senses are engaging the environment also create the possibility of moving together with others in significantly different ways. I joined leisure groups in Lancaster and, later, a cycling club in London, as well as groups of cyclists in the bicycle-friendly Amsterdam, and used participant observation (Whyte 1943) and interviews (both based on informed consent) to note how new social spaces are generated amongst cyclists. The cycling sociabilities, with their playful associations of 'Ride-Formations', which represent the focus of chapter six, openly contest the dominant narrative shaping the road space today. The 'swarms', 'accordions', 'chain-gangs' or 'carnivals', which I have explored while cycling with various groups throughout my fieldwork, are arguing against the utilitarian and productive functions of road traffic. In doing so, they similarly unveil a utopian potential, prefiguring post-capitalist futures.

The cycling senses and sociabilities are illustrative of prefigurative practices that anticipate the emergence of a slow bicycle system. While Levitas mentions cultural artefacts such as music as 'a prefiguration of wholeness or a better way of being' (2013: 5), I also draw on anarchist literature to extend the idea of prefiguration and connect it with broader social practices which resist the dominant system of automobility. Thus, prefiguration is also 'linked to creativity, subversion, playfulness and to the development of alternative relationships and ways of living', all the while stressing 'the experimental, productive and innovative characteristics of anarchist practices that challenge and seek to replace or challenge hierarchical and oppressive social forms' (Kinna 2017: 201).

Drawing further inspiration from the systemic approach to human movement developed within the new mobilities paradigm (Sheller and Urry 2006), as well as the emergence of mobility studies (Adey 2010; Urry 2007; Cresswell 2006), the initial interest in cycling senses and sociabilities prompted me to further explore this prefigurative potential of cycling. This pursuit was also encouraged by the systemic thinking around cycling, which has emerged in the last few years, partly as a counter-narrative to the 'system of automobility' (Urry 2004), and which takes into consideration the larger socio-technical arrangements that could turn cycling into a more common activity (Oldenziel el al. 2016; Vivanco 2013; Horton and Parkin 2012). Senses and sociabilities can only partly offer a satisfying answer to the initial question of how to get more people cycling more often. Societies could start to appreciate the richer, more rewarding sensory experience of cycling and, similarly, they could engage in more playful, convivial uses of the road space. Yet, the question remains: how actually can the senses and sociabilities of cycling that I am describing be experienced by more people than today?

While a system of automobility is currently dominating our societies, its days, at least in its current instantiation, seem numbered (Humes 2016; Newman and Kenworthy 2015; Whitelegg 2015; Ross 2014; Montgomery 2013; Dennis and Urry 2009). But for cycling to really become an alternative, the crushing monopoly of the car system over the urban realm must be somehow broken, something which is unlikely to happen overnight and which requires an effort of imagination. I have thus expanded my initial interest in the prefigurative capacities of cycling in two ways. On the one hand, I embarked on a critique of the car by highlighting the ever-increasing number of 'cracks' (Geels et al. 2012) in the system of automobility. In chapter three, my attention focuses particularly on emphasising the problems that the much-anticipated future of self-driving, shared and electric automobiles could bring about, as well as on the promises and constraints embedded within the manifold visions and instantiations of car-free city developments. On the other hand, I propose an imaginative construction of a bicycle system (in the prologue), which draws on the existing 'niches' of innovations (Geels et al. 2012) and which further extrapolates to envision a post-automobile, bicycle-powered future.

In parallel to the more traditional empirical methods, I thus assembled specific empirical techniques to 'wedge' open the cracks in the car system, as well as to bring together the dispersed fragments of a future bicycle system. Following Back and Puwar's (2012) contention that 'live' methods, using new technological opportunities, are needed for 'a more artful and crafty approach to sociological research', I worked, for example, with social media platforms such as Twitter to identify, track and systematize the most recent cracks in the car system, alongside the latest niches in innovation in relation to cycling across the (Western) world. In doing so, I expand the reach of mobile methods through 'lively

experimentation with multiple methods … that can capture, perform, and even intervene in processes of movement as they happen' (Sheller 2014a: 801).

The imaginative construction of a slow bicycle system proposes a method of scenario building, which draws inspiration from Jonathon Porritt's book *The World We Made* (2013). Porritt offers a detailed analysis of events and changes that need to take place so that his scenario for 2050 can actually be achieved. Mixing facts and fiction, Porritt backcasts from 2050, detailing, through the account of a character born in 2000, what occurred in the coming decades. The desirable future Porritt describes does not arrive in a smooth way: a series of potential U-turns and catastrophic episodes (mainly climate related, but also cyber-terrorism and massive protests against the rich) are documented. Eventually, a 'global empathy', facilitated by technologies such as the internet and solar energy, enables a 'vibrant, dynamic, risky, innovation-driven transition' (Porritt 2013: 276). The scenario I propose in the prologue similarly describes desirable futures, where the collapse of neoliberalism, a complete traffic gridlock and the emergence of a slow pattern of mobilities contribute to the inauguration of a bicycle system by 2050.

To some extent, these research methods are normative, engaged in the framing of a future which this thesis considers to be more desirable than the one enabled by the system of automobility. More to the point, the methods I described here are effectively seeking to shape an alternative mobility system, which is more socially acceptable and whose aim is to replace the current unsustainable car system. In this sense, these methods can be said to enact the social, rather than just describe it (Law and Urry 2004). At the same time, they are 'inventive', because through their use 'the social world is not only investigated, but may

also be engaged', thus actively contributing 'to the framing of change' (Lury and Wakeford 2012: 6).

Using such research methods allows a prefiguration of a different future for urban mobilities. During my engagement with the empirical realities of cycling, in its different forms, the initial question of how to get more people cycling more often stayed with me. And while I was formulating it in various research environments, it never ceased to generate a multitude of always incomplete answers, which I tried to somehow piece together in the quest for a greater meaning. Can these disjointed anticipations of a future bicycle system amount, if not to a fully operational and 'right on time' solution, at least to a convincing narrative that such futures could be imagined? And, similarly, can the research methods deployed to account for these piecemeal changes find a more systematic frame of reference under which they might operate? In other words, can this utopian vision transpiring through the empirical methods somehow translate into an analytical method?

I use utopianism to investigate such futures and to link my empirical methods with the construction of these futures. Utopia must be understood as a method rather than a goal or a blueprint, argues Ruth Levitas (2013), suggesting that utopia must be recognized as intimately related to the discipline of sociology. It does so in three distinctive ways: archaeology, architecture and ontology. They will become evident throughout the thesis, as I demonstrate their close connection with the empirical toolkit described so far.

Mobile methods

Cycling, like most urban mobilities, has only recently captured the attention of the social sciences. Transport studies have long regarded mobility as an empty category: for traffic modelling purposes, more important than the journey itself were the departure and destination points. Mobility has often been black-boxed as a 'basic signifier – getting from point A to point B' (Cresswell 2006: 2). As already demonstrated in the previous chapter, this conception has been challenged in the last decade, particularly through the 'new mobilities paradigm' (Sheller and Urry 2006) and the emergence of mobility studies (Adey 2010; Urry 2007; Cresswell 2006).

Urry argues that to break with a 'static sociology' we need to reconstruct 'the social as society into the social as mobility' (2000: 2), and for this purpose new 'mobile methods' of investigating the social are essential. As Urry and Law show, the current methods within social sciences deal

> poorly with the *fleeting* – that which is here today and gone tomorrow, only to reappear the day after tomorrow. They deal poorly with the *distributed* – that is to be found here and there but not in between – or that which slips and slides between one place and another. They deal poorly with the *multiple* – that which takes different shapes in different places. They deal poorly with the non-causal, the chaotic, the complex. And such methods have difficulty dealing with the *sensory* – that which is subject to vision, sound, taste, smell; with the *emotional* – time-space compressed outbursts of anger, pain, rage, pleasure, desire, or the spiritual; and the *kinaesthetic* – the pleasures and pains that follow the

> movement and displacement of people, objects, information, and ideas (Urry and Law 2004: 403-4, emphasis in original).

Mobile methods of research are consequently needed 'to gather new empirical sensitivities, analytical orientations and methods to examine social phenomena' (Büscher, Urry and Witchger 2011: 1-2). As I will show below, mobile methods have been extended and developed by many researchers investigating cycling (Larsen 2014; Aldred and Jungnickel 2012; Spinney 2009). The purpose of returning to the original idea of mobile methods here is to highlight their sociological, but also inventive and utopian momentum.

Büscher, Urry and Witchger (2011) argue that a 'movement-driven' social science understands movement, potential movement and blocked movement as 'constitutive of economic, social and political relations' (2011: 4). And, they continue, such social science must not be content with the dominating 'metaphysics of presence', which confines all analyses of social life to 'the immediate presence of others'. Instead,

> all social life, of work, family, education and politics, presumes relationships of intermittent presence and absence depending in part upon multiple technologies of travel and communications that move objects, people, ideas, images across varying distances (Büscher, Urry and Witchger 2011: 5).

Consequently, their invitation is to devise 'an array of methods that in different ways capture, track, simulate, mimic, parallel and "go along with" the kinds of moving systems and experiences that seem to characterise the contemporary world' (2011: 7). For a deeper understanding of why some people cycle while others choose not to, or simply cannot, and

how cycling could entice more practitioners than today, it is important to go beyond the 'professional examination of "transport"' (2011: 3), which obscures essential aspects such as the embodied nature of cycling mobilities, the ways in which technologies extend the bodily capacities of cyclists or how patterns of movement are articulated and produce meaning.

Thus, the research of cycling senses and sociabilities necessarily involved my participation in various patterns of movement, observing both my own mobility as well as that of others. In order to provide greater levels of detail to enhance the direct observation, audio and video technologies of recording complemented this unmediated observation (Büscher, Urry and Witchger 2011: 8-9). Yet, some senses escape capturing techniques, an issue I have tried to mitigate by using auto-ethnographic accounts of my own cycling experience. The use of these mobile methods in various combinations and sometimes overlapping each other indicates just how complex this entanglement of bodies, technologies, motions and emotions is. And, ultimately, how reducing cycling mobilities to the rational modelling of transport fails to capture the sensibilities and socialities giving so much meaning to this practice.

Making sense of cycling senses

Researching one's body as it moves on a bicycle requires an awareness linked with proprioception, as well as a certain reflexivity; even so, corporeal sensations are often very difficult to elicit and to articulate into words. Once we learn to ride a bicycle, the process becomes gradually internalised into habit: we no longer calculate every time we take a left

or right turn, every time we stroke the left pedal, then the right one, or every time we balance our bodies on the bicycle by slightly leaning them to one side or the other. While replaying the video footage of a ride with participants allows indeed a 'very nuanced account of place and the body to emerge' (Spinney 2011: 168), the multitude of senses which are involved in cycling are still difficult to capture. Descriptions of sensations relating to pain, temperature of the body and the environment, the internal struggle of our muscles and organs are enriched when using video as a prompt for riders to remember and translate into words the embodied experiences. But the moment of the actual movement has already long passed, thus making the effort of recollecting memory a challenging one.

An alternative approach in this instance is to engage the researcher's own body into the process of data collection. Real-time auto-ethnography, involving audio descriptions of the cycling experience as it occurs, adds an extra layer of valuable information to those provided by video camera. I have used voice to describe the reality that the video camera itself could not capture, particularly senses such as smell, touch, taste, but also the sensations registered within the inner body. Consciously reflecting and real-time reporting on as many of the bodily sensations as possible offers at times an even richer account of the cycling feeling.

I have opted to engage my own body in data collection, rather than relying only on insights from other research participants, for two reasons. First, the cycling practices under investigation are extremely diverse, ranging from slower ones to others that are rather fast, from rides done in heavy morning traffic to weekend or holiday rides taken on leisure car-free routes, from solitary rides to others which involved cycling with a group. In each of

these cases, not only my cycling style has to adapt accordingly, taking into consideration in each of the situations the different bicycles and cycling equipment, as well as the road environment. Above all, these cycling instances are important for consideration in their own respect because the sensorial experience that they afford is often different, as I will demonstrate in chapter five. Involving in each of these cases other research subjects in a similar effort would have been challenging from a logistical perspective, but also in terms of effectively involving each of the participants in very diverse cycling practices. Second, the range of techniques used to account for how cycling senses operate, involving audio, video, real-time recordings of the rides, as well as note taking after the rides, have been deemed too difficult to handle by the research subjects I have tried to approach. Having said that, the use of auto-ethnography to account for the prefiguration of a slow cycling future remains problematic: it legitimates an ontology based on my own bodily preferences which have been generated through the fast cycling of a capable young man. As chapter five will show, I have mitigated these risks by focusing more on both my slow cycling as well as that of others.

The front facing camera (GoPro) mounted on top of the head (or the bicycle helmet), at around ten centimetres above the eyes, takes an almost 'point of view shot' (see Illustration 2.1)[3]. Albeit making objects at the periphery of the visual field (particularly the cars) seem closer than they are, the wide camera angle of the GoPro further extends the capabilities of the eyes, bringing to attention details which are beyond the immediate perception of the researcher. Such features, which can be further analysed after the ride

[3] In other circumstances, I have faced the camera to the ground, recording my pedalling and thus highlighting the proprioception sense. See Illustrations 5.7, 5.8 and 5.9 in chapter five.

itself, are particularly useful for the investigation of mobile interactions amongst cyclists, upon which I focus more in chapter six. Yet, for the description of the multitude of senses, the video camera itself only uncovers a limited reality. In this instance, I have used the video footage mainly as a complement to other methods, upon which a richer description of these senses was consequently built.

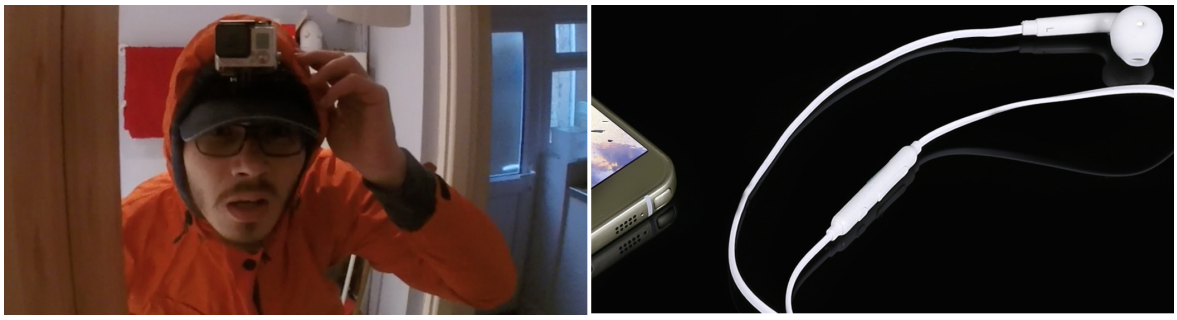


Illustration 2.1: Front facing GoPro camera and headset microphone connected to voice recorder.

One last observation about the use of video methods for researching the senses of cycling relates to how other mobile subjects situated in my proximity might react to the presence of a very conspicuous camera on top of my helmet. While I have not conducted substantial research on perceptions related to this topic, anecdotal evidence reported in the media suggests that many drivers are annoyed by cyclists who use helmet cameras to capture instances of careless or dangerous driving (Vine 2015; Hopkins 2015; MacMichael 2015). Of course, this is not true of all drivers, yet questions about how drivers' perceptions of 'helmet cam' cyclists impact on the subsequent interaction is an important one.

Real-time audio recording is a less intrusive method that I have also deployed as an auto-ethnographic technique to describe the sensations while riding the bicycle. I have used a headset microphone which is connected to a voice recorder onto which I have dictated an

account of the sensations experienced on the move (see Illustration 2.1). This real-time audio diary complements the video recording of the GoPro, which is more exposed to background noises, but it also provides additional cues on the 'voice' of the body, often materialised in heavy breathing, coughing or any other gasps that a microphone set close to the mouth and protected against the noise of the environment with a scarf tied around the neck could potentially register. Previously hidden sensations such as balance (equilibrioception), movement (proprioception), temperature (thermoception) or pain (nocioception) are thus brought to the fore in a way that the video footage alone cannot elicit.

Audio describing the senses as they embrace the moving cyclist is not without shortcomings. At times, it is difficult to focus on the task of narrating one's own sensations, especially when the practice of cycling itself is challenging. Even in the relatively familiar environments that I have used for my research on senses, which are my regular commuting routes in London and Lancaster, aspects such as a steep road, heavy or fast traffic or dreadful weather can impact on the quality and quantity of details I am able to produce; often it is more important to focus instead on negotiating the more demanding and sometimes less pleasant road conditions.

The auto-ethnography does not stop with the pedalling. As some of the sensations are registered by the cyclist's body only after the ride, another auto-ethnographic technique is required: that of writing down how the body feels afterwards. The mild pain in the muscles, the sweating which continues even after the ride, sometimes even the general euphoria and feel-good sensations can only be accounted for in retrospect.

An auto-ethnographic account involves, as I have demonstrated above, using a variety of methods to record the fleeting and ephemeral sensory world of cycling. It represents, as Muncey argues, 'a means of getting across intangible and complex feelings and experiences that somehow can't be told in conventional ways' (2010: 1). Yet, while the method has been previously used in cycling research (Larsen 2014; Spinney 2006, 2007; Jones 2005), it mainly involved using standard note taking after the rides or 'ethnographic fiction' blending researcher's own experience with other cyclists' narratives (Spinney 2007), and focused on specific spaces such as London (Larsen 2014; Spinney 2007), Copenhagen (Larsen 2014) or Birmingham (Jones 2005).

In comparison, I have conducted my own research in two relatively distinctive sites (see Larsen 2014 for a similar approach with his cycling in Copenhagen and London): in London and Lancaster, focusing on the senses elicited by two very distinctive environments: the traffic-choked, yet relatively flat Central London at rush hour (from Aldgate to Saint Pancras) and the hillier and partly traffic-free commuting route from the centre of Lancaster to the University of Lancaster campus outside the city (see Appendix 2.1 for details of the two research sites). The research site in London reflects more faithfully the current system of automobility, which forces cyclists to cycle faster and often mix with the heavy morning traffic. On the contrary, the shared use routes for pedestrians and cyclists which I have used in Lancaster are more representative for a slow bicycle system that this thesis investigates.

The research in the two environments was conducted between October 2014 and March 2016. As I will show in chapter five, the different rhythms of the two types of journeys I

investigate stimulate the senses differently and at the same time require an adaptation of some of the research methods as well: from riding fast and assertively, with my attention well focused, in London, to cycling at a more leisurely pace in Lancaster, yet working the body muscles differently as I do more climbing.

Overall, an auto-ethnographic approach in relation to cycling senses has its own limitations. My sensorial experiences are not only informed by personal capabilities, but also by other social and cultural backgrounds which underpin my identity. Gender, race or class play a role on the perception of my own cycling experience. For example, research done by Aldred and Jungnickel (2014) in the UK or Stehlin (2013) in the US have already indicated how individuals are excluded from or drawn into cycling according to such identity markers. Sensations of safety, comfort or appropriateness that some cycling subjects experience play an essential role into how people are affected by cycling and how they sense the world from the bike saddle.

Researching cycling sociabilities: Closing the gap

Is it possible for everyday urban mobilities to be understood otherwise than as atomised, individualist or economically productive practices? Drawing on the tradition inaugurated within the field of mobilities studies, where, unlike abstract movement, mobility is always considered in relation to the meanings and experiences it generates and engages (Cresswell 2006), I argue that the social interactions facilitated by the instances where people cycle together represent forms of place-making (Büscher and Urry 2009) which challenge the dominant utilitarian and productive functions of the road space. The cycling

sociabilities I study in chapter six suggest that new forms of urban mobilities, involving less competitive and more convivial and playful encounters, can represent an alternative to the current traffic orthodoxies. For my research of these sociabilities I participated in patterns of movement alongside various cycling groups, delineating a series of Ride-Formations which slowly become visible in such instances.

The use of mobile methods for researching cycling has been mainly associated with so-called 'ride-alongs' (Aldred and Jungnickel 2012; O'Connor and Brown 2007; Spinney 2006), which involve the researcher cycling alongside the subjects of her investigation. Urban cycling especially holds 'unique challenges for the mobile researcher in that it largely precludes the "ride-along" method due to the hazards of riding in the city and the unique skills and styles displayed within different cycling cultures' (Spinney 2011: 162-3). For this reason, Spinney (2011, 2009) and others (Laurier 2013; McIlvenny 2013; Brown and Spinney 2010; see also Laurier and Lorimer 2012 for driving) complemented and sometimes replaced the classic 'ride-alongs' with video footage. Noting the 'inadequacy of particular research methods to highlight the more intangible and ephemeral meanings of mobility' (2009: 826), Spinney advocates the use of video recordings produced by his research subjects as a form of 'feeling there' for the researcher himself. The latter then uses the footage to complement the more formal oral accounts 'in order to keep as much of the context of practice as possible when it comes to interviewing participants' (2009: 827). On the contrary, I insist on the necessity of the researcher engaging in these patterns of movement. Being a participant in group rides has helped me identify and classify, in a way that otherwise would have been impossible, the manifold Ride-Formations which are constitutive of these mobile practices.

Alongside the bodily skills and the use of video methods, already deployed for investigating the senses of cycling, one other essential aspect must be considered when researching sociabilities: making sense of and getting involved in the actual formation and functioning of the mobile group. For this purpose, I have engaged in in-depth participant observation (or 'participant observer research', as Whyte (1943) describes it) with the subjects, participating and contributing to sustaining their cycling. Between October 2014 and August 2015, I have taken part in a total of twenty-six rides with different groups, of which I have video recorded thirteen (see Appendix 2.2).

During my fieldwork, I have highlighted various types of mobile formations, from the highly-organised ones, observed, for example, in the practices of leisure club cycling, to the smaller and more flexible ones visible in the 'swarm cycling' or the 'conversation sociabilities' taking place in Amsterdam, to the very unregulated groups of cycling protesters in Central London. Two methodological issues arose from this mode of making sense of the nature of the cycling groups. First, I had to learn how to become myself a group member, one that could at times be trusted not to upset the Ride-Formation, but also to keep the formation as effective and safe as possible in its movement. The second deals with researching the group dynamics as they occur on the move. For this purpose, a proficiency of easily moving and placing oneself to the front, the middle or the back of the group to video capture various interaction instances must be acquired. Let us discuss the two methodological challenges in more detail.

Most instances of group cycling do not require the learning of special skills. Riding side-by-side is easily achieved with relatively little effort by any two cyclists as soon as they agree

on a common pace. More important in this case is negotiating the potential obstructions appearing on the route, ranging from potholes, to steep hills, to approaching motor vehicles. Sustaining conversations and even exchanging brief glances with the cycling partner are possible once the front wheels are aligned. Such basic social interactions become even easier to initiate when specialized bicycles such as tandems or cargo bicycles are used. As I shall also show in chapter six, the researcher's skills become even less essential when research is conducted alongside the 'swarm' of cyclists in Amsterdam as riding upright bicycles, at a slow pace, in urban environments with low levels of car traffic, makes the 'ride along' a relatively accessible method to use.

The same cannot be said about other groups of cyclists which I have researched. For the study of the two groups of leisure cyclists associated with the club CTC Central London, the skills required to follow them during the rides were far more complex. First, the physical capabilities needed to cycle at an average speed of 25km/h for about 100 kilometres are very different from the previous instances. Building up the strength to endure such a strenuous challenge requires weeks if not months of training. Being a regular bike commuter is hardly an adequate build-up for a week-end ride with the fastest CTC cyclists:

> Physical condition is very important to keep the group compact. I lost the contact with the pack two times, when climbing some not very steep hills. Because I wasn't accustomed with their rhythm, but also because I didn't cycle for more than one month; the last ride was on the 30th of November last year (Field notes, 11 January 2015).

Running sessions of about three kilometres, two or three times a week, have complemented my training for each of these relatively difficult rides. Similarly, during the ride itself eating and hydrating at the right times is essential in order to keep pace with the rest of the group. An energy bar must be gobbled before the fatigue kicks in, or else the risk of 'going off the back' (being dropped by the main group) is imminent.

Effective research alongside the faster cyclists also relies on learning how to ride with the group. Cycling near one another, both to the cyclist at the front and to the one on the right or left side, changing gears smoothly and at the right moment and maintaining a constant pace within the group are requirements that all must be attended to, and the researcher is not spared from following them as well. 'Align the wheels!' and 'Close the gap!', two of the commands that the ride leader often gives to the rest of the group, are meant to both keep the group safe on busy roads and to make it more aerodynamic.

The second task, that of placing oneself as a researcher in the right position within a group to capture the mobile interactions of various cyclists, is directly related to acquiring the skills that I have just described. But this involves not just internalising the rigid rules of cycling within a group formation; it also asks the researcher to foresee where the interactions are likely to take place, something that Garfinkel has described as 'anticipatory following' (1967: 147). As Büscher, Urry and Witchger argue, 'to capture people as they move and interact with others on film, the researcher needs to anticipate their moves and must position the camera's view finder in place as, or ideally before, actions unfold' (2011: 9).

Because the front facing camera only records a relatively limited array of interactions taking place within a cycling group, it was important that I could easily and frequently change my position in relation to the group. The group of faster cyclists that I mentioned previously allowed for constant changing of position as this strategy is part of achieving a better efficiency at pedalling. Everyone in the group is required to regularly come to the front, expend more effort than the rest riding behind, then gradually drop towards the back of the formation to recover (this riding style is called 'chain-gang' and will be further discussed in chapter six). These strict yet highly co-ordinated rotations of position help the researcher to virtually occupy all the possible positions within a group, thus video recording a great deal of the interaction situations available.

The less strict group formations that I have researched allowed me to move and record the participants more freely. The decisions regarding when to move either to the front, the middle or the back of the group were my own, and, therefore, where to position myself in relation to participants was a matter of either speeding up to catch up with the faster riders at the front of the group or slowing down to engage with the less physically capable who lagged behind.

The formations within the slower and especially the faster groups of club cyclists I have just mentioned exhibit nevertheless characteristics which are more similar to competitive cycling than to everyday cycling. Their investigation, which often demanded physical skills beyond the capacity of many cyclists, is of critical importance for articulating the sociabilities within a slow bicycle system. On the one hand, they contextualise the sociable mobile encounters amongst cyclists within the current system of automobility, which is

partly responsible for the velocities I am describing. On the other hand, these 'racing-style' formations also indicate that sociabilities are possible amongst cyclists even within the most hostile road environments.

For the research of more organic and slower Ride-Formations, such as the ones I have investigated in Amsterdam or on car-free routes in the UK, both the physical capabilities and the cycling skills were less important for the researcher. As I shall show in relation to the 'swarm' and conversation sociabilities, the effort required to ride side-by-side with fellow cyclists, as well as to effectively capture the movement on camera, was far less intense than in the previous instances.

Today, the workings of urban mobilities are determined by the rigid rules of traffic management. Through their functionalist, quantifiable and economy-driven approaches to human movement, they fail to illuminate how mobilities are embodied and offer meaning when people move together. Using (auto)ethnographic, mobile, video and audio methods I have offered an alternative narrative to the dominant ways of investigating human movement in cities. The senses and sociabilities of cycling, together with the techniques of investigation I have used to grasp their unfolding, have revealed the possibility of a future where the human body redeems its lost sensibilities, while the notionally public spaces of the road also claim their publicness back. In doing so, in a sense they postulate the kinds of people and societies that a future bicycle system could accommodate. As Levitas (2013) would argue, utopianism operates here as a method in an ontological sense, describing the changes both brought about by and needed for a future better society.

Nevertheless, the effectiveness of mobile, video and audio methods to account for the cycling ontologies investigated in this thesis must not be taken for granted. Despite allowing researchers to experiment with what is it like to 'see there' or 'feel there', mobile methods have been criticised more recently for their lack of depth in investigating bodily sensations. Justin Spinney argues that they 'give us only generalised sensory and affective accounts, telling us less about the separation of quality and intensity (feeling and affect), the levels of intensity experienced, and lacking specificity regarding the relationship between phenomena and feeling' (2014: 238). This scepticism is also echoed by Merriman (2014), who argues that the use of audio and video recorded 'go-alongs' is questionable, particularly when it is 'underpinned by a rather problematic assumption that these methods enable the researcher to more accurately know and represent the experiences of their research subjects (2014: 174). Merriman goes on to say that

> video technologies can only present specific aspects of the visual and aural dimensions of environments and contexts, and an excessive faith in such technologies is in danger of obscuring the many complex (often invisible) social and political practices and relations which co-constitute spaces, events and contexts (…) Physical proximity and co-presence present an illusion of 'first-handedness', closeness, accuracy and authenticity (Merriman 2014: 176).

Some researchers have consequently tried to respond to these limitations by advocating for the use of bio-sensing technologies such as global positioning system (GPS)-enabled electroencephalogram sensors, galvanic skin response (GSR) sensors (Jones et al. 2016; Spinney 2014) or heart rates and power measurement (Cox 2015) to quantify the bodily experience of cycling. While acknowledging that the data derived through such

measurements 'are still a partial representation of reality derived from hardware and software', Spinney argues that there is value 'in experimenting with new ways to gain understandings of previously inaccessible phenomena or indeed representing these in ways that may be persuasive to previously sceptical audiences' (2014: 239).

I similarly attempted to address the restrictions of the mobile methods used to research cycling senses and sociabilities. I did this in three distinctive ways. First, I supplemented the visual with real-time audio diaries trying to capture the senses which escaped the vigilance of the video camera. This was only partly successful, as the onrushing of sensations, particularly when cycling in car-dominated environments and at speed, are still difficult to grasp. Second, I took detailed field notes at the end of each ride, trying to compensate for what the other techniques could not apprehend. Often, through these notes I could reflect retrospectively on the body sensations immediately after the ride, as well as offer a more detached and reflexive understanding of the senses and sociabilities I was researching. Third, I conducted a series of interviews with some of the cyclists I have researched to further investigate how their sociabilities operate. The questions I asked related mostly to their motivations for cycling together.

Curating cycling societies

'Go Dutch!' has become a slogan among aspiring cycling cities across the world in the last few decades. For any ambitious cycling city in the Western world it has become almost an imperative to facilitate at least a field trip for its transport planners to Amsterdam, Eindhoven or Delft to get immersed in what is assumed to be a solid cycling culture. I also

spent three weeks in the capital of the Netherlands in 2015 for a summer school called 'Planning the Cycling City', during which I pursued my research interest alongside a few dozen other students and practitioners, mainly from the fields of urban and transport planning.

My main aim during the stay in Amsterdam was to identify the elements of a bicycle system as they were already visible in the very bike-friendly Dutch city. Both men and women of all ages, riding upright city bicycles in everyday clothes, were a sign that the future of cycling could look different from that of fast paced hardened male commuters cycling in London and even Lancaster. And so were the wide, segregated bicycle lanes allowing for chatting and even holding hands when riding two abreast, a sort of conversational sociability which I will describe in more detail in chapter six. Yet, by the end of the programme, not only did we not discover the silver bullet for how to transform every city around the world into a 'Mini Holland', but even here the utopia of a truly inclusive cycling system seemed equally unattainable. As one of the municipality representatives revealed, the plan is to increase the speed at which cycling takes place in the capital: fast, comfortable and safe are the goals of the city for the future (de Kievit 2015).

The case of Amsterdam as a research site where bicycle utopias are currently generated nevertheless remains important. And so does the methodological approach that I have devised for this purpose. Participating at summer schools, but also attending conferences, symposia, consumer shows and workshops, undertaking internships with cycling organisations, participating at festivals, 'sportive' events or conducting extensive desktop research (see their full list in Appendix 2.3) are part of a methodological device useful for

identifying and organising the sparse elements of a bicycle system as they appear in the cracks of the car system. In doing so, my argument is that research methods are not just describing social realities, but they also make those realities possible. Law and Urry (2004) contend that the essential role of research methods is to perform the social: 'they have effects; they make differences; they enact realities; and they can help to bring into being what they also discover' (2004: 393).

The inventiveness of research methods lies not just in their investigation, but also in their engagement of the social world, believe Lury and Wakeford (2012):

> To describe them as inventive is to seek to realize the potential of this engagement, whether this is as intervention, interference or refraction […] this potential can be realized through an exploration of how the knowledge of change they permit need not be limited to ascertaining what is going on now or predicting what will go on soon, but may rather be a matter of configuring what comes next (2012: 6).

In the prologue of this thesis I sketched the contours of a slow bicycle system through a scenario building exercise. I extrapolated from existing socio-technical realities from across the (mainly Western) world to re-imagine a future of urban mobilities that would enable gentler and non-motorized forms of movement. Following Sheller's (2014a) advice to expand the use of mobile methods through lively experimentation to capture, perform, and intervene in the very act of movement, I have identified, investigated and assembled into a system the various niches of cycling innovation.

Alongside the innovations which I identified in Amsterdam and other Dutch cities during the three-weeks summer school, the elements of the bicycle system described in the prologue of the thesis have been gathered through many other opportunities. For example, attending professional conferences such as Velo-City (2013 in Vienna, 2015 in Nantes and 2017 in Nijmegen) or doing internships with advocacy groups such as European Cyclists' Federation in Bruxelles (2013) and London Cycling Campaign (2015) enabled me to grasp the complex interplay between various infrastructures, policies and economic calculations that a future bicycle system must take into consideration. These events and work environments allowed me to investigate the radical transformations in the urban landscape, the strategic partnerships with other sustainable means of transportation or the technology and know-how transfers amongst countries and municipalities that a bicycle system must develop to be successful. Similarly, doing participant observation at consumer shows such as SPIN London (2014) or the London Bicycle Show (2014), as well as getting involved in cycling festivals and 'sportive' rides such as Eroica Britannia (2014) and The New Forest Spring Sportive (2014), or even attending professional races such as Tour de France (2014) facilitated a more profound understanding not only of the innovations in bicycles and accessories discussed in the preamble, but also of the needed changes in the cultural status of the practice, from a subcultural enterprise to a habitus (Kuipers 2012).

In a manifesto for a 'live' sociology, which would run against a 'dead' sociology that is 'objectifying, comfortable, disengaged and parochial', Les Back (2012) argues for research techniques that are mobile, sensuous and operate from multiple vantage points. Doing live sociology means being committed to 'pluralizing the vantage points from which sociological attentiveness is trained' (Back 2012: 30). For researchers,

> the future holds an opportunity to rethink procedures and devices we use within social research. In addition, there is a potential to expand our modes of writing and representation. We can contemplate the creation of new kinds of vital texts: curate sociology rather than just write it (Back 2012: 34).

The idea of curating sociology instead of just writing it represents an apt description of the piecing together of a bicycle system that this thesis proposes. Excavating within these niches of cycling innovation, bringing them to the fore, while articulating an alternative to the car system, means, as Back argues, 'making some realities more real' (2012: 34). But even as research methods are inevitably enacting the social (Law and Urry 2004), the question becomes one of critical judgement: 'Which realities should be turned down or cut down to size and which others, through our sociological imagination, turned up and magnified?' (Back 2012: 35).

During the construction of a bicycle system the question regarding the types of realities I am 'turning up' or 'turning down' emerged incessantly. The type of bicycle system articulated in most of the instances I focused upon seemed to 'turn up' two types of futures which I believe are problematic. On the one hand, the place of the automobile in urban contexts was too often seen as natural, a given that was rarely contested and regarded as something unlikely, even unnecessary, to change in the foreseeable future. Instead, reducing car dependency seems to be the preferred approach across Western cities, with cycling seen as merely an alternative urban mobility, in need of more safe and comfortable space.

On the other hand, whenever cycling futures were envisioned, too often they appeared to feature affordances conspicuously similar to those of the car system: these futures necessarily involved fast mobilities, ensuring seamless and effective movement and, as a consequence, requiring direct connectivity from A to B. Most such cycling futures did not seem to consider the possibilities that an urban mobility system could be centred around the bicycle and that slowness could be the norm for urban mobilities rather than the exception.

I consider that the task of 'turning down' the kind of realities that a car-neutral and fast bicycle system would enable is an essential one. For this reason, the research methods used to enact such alternative futures must produce what Lury and Wakeford describe as a 'self-displacing movement':

> the inventiveness of methods is to be found in the relation between two moments: the addressing of a method … to a specific problem, and the capacity of what emerges in the use of that method to change the problem. It is this combination, we suggest, that makes a method answerable to its problem, and provides the basis of its self-displacing movement, its inventiveness, although the likelihood of that inventiveness can never be known in advance of a specific use (Lury and Wakeford 2012: 7).

Thus, the inventiveness of research methods is not an intrinsic thing, but rather it is a matter of use. This inventiveness cannot be secured in advance as the methods necessarily change the nature of the problem as they address it. The inventiveness of methods presented in this section derives then not merely from their capacity to aggregate the elements of a bicycle system, one which is intrinsically complicit with the system of

automobility and which is content to replicate the former's insatiable quest for more speed. On the contrary, their inventiveness resides in their power to enable a critical judgement on the prospect of 'turning down' such less desirable futures.

It is within this capacity of inventive methods to make some realities more real than others that a utopian promise can be identified. The empirical material of this thesis and the methods used to uncover it indicate that the construction of a slow bicycle system necessitates a utopian vision. The niches of innovations I have just explored, alongside the senses and sociabilities, are all prefigurative of a slow bicycle system. Effectively building this system, specifying at the same time the social arrangements within it, all the while criticizing the prevailing narratives around fast and car-centric futures represents the task of this thesis. In this way, utopia becomes itself not just an empirical, but also an analytical method for the imaginary reconstitution of society Levitas (2013).

Utopia as method

Too often we hear the triumphalist proclamation 'The future has arrived!' It is particularly the favourite exclamation accompanying the launch of the latest mobile device by the likes of Apple, the conception of yet another smart car courtesy of Tesla, or even the new electrical bicycle built by companies such as BMW, now fitted with GPS, proximity sensors warning the cyclist about the cars around and dedicated mobile phone applications to lock and unlock it with just one swipe of a finger. And if we believe strongly enough, as Google almost fooled us all on the 1st of April 2016, we will soon be surrounded not only by autonomous cars, but also by self-driving bicycles!

Futures are everywhere today and thinking about them has become a mandatory task for organisations and societies alike. Both assume more and more frequently that the future offers a better guide to organise the present than the past (Urry 2016). Gabriel Tarde famously said that 'it seems to me neither more nor less conceivable that the future *which is not yet*, should influence the present than the past, *which is no more*, should do so' (cited in Bauman 1976: 11; emphasis in original).

More recently, Urry (2016) has advocated for 'social futures' and the necessity to democratise their study, by mobilising them away from the exclusive confines of various political and economic elites. He argues that social science's role is to elaborate 'how there is no single future as such but multiple futures related to different time regimes' and calls for a 'mainstreaming' of the future. He argues that futures are 'too significant' to be entrusted to states, corporations or technologists. They have formidable consequences and therefore 'social science needs to be central in disentangling, debating and delivering those futures' (Urry 2016: 8).

The twentieth century witnessed the development of new techniques to think about multiple possible futures. Foresight scenarios gained popularity as they explored multiple options and involved different social groups to think about the future. Thus, some futures are probable, others are only possible, while others are deemed preferable. As Adam and Groves (2007) argue,

> today's experts on the future — futurologists, futurists and foresight specialists — tackle the problem of uncertainty head-on and acknowledge that futures studies are necessarily

> concerned with a combination of *possible*, *probable* and *preferred futures*. This means that unlike their traditional counterparts, these experts have abandoned expectations about a pre-existing future, and assume instead an open future that is yet to be imagined, designed and produced (2007: 31; emphasis in original).

Exploring the promises embedded in visions of preferred futures represents the task of utopian studies. This is an expanding field of enquiry holding the view that 'utopia is not escapist nonsense but a significant part of human culture … The variation in the forms of utopian expression means that it can be looked at from the perspective of a range of disciplines: history, literature, theology, cultural anthropology, sociology, political theory, psychology may all concern themselves with representations of the worlds we would like to inhabit' (Levitas 2010: 1-2).

Utopianism has had a major, albeit highly contested role in proposing that there should be more than one single future. More than five hundred years ago Thomas More (1516) popularized the term utopia, which conflates the Greek words *outopos* or 'no place' and *eutopos* or 'good place'. In his quest to answer questions such as 'How is a state constituted?' or 'Which is the best form of state?', More's *Utopia* is thought to represent a specific stage in the developing of social consciousness and one of the predecessors of future social sciences (Elias 2009).

Ever since More, utopia has come to be regarded as an imagined perfect society or specific space which does not and even cannot exist. More's original intended ambiguity has nevertheless lost its complexity with time, utopia gradually becoming the place that does

not exist rather than the place to be desired. Utopia, observes Bauman, was 'irretrievably cast among the false ideas which in fact hinder human progress by diverting human effort from the ways of reason and rationality' (1976: 10). This relegation of utopianism to the realm of predictions which often turned out to be false, as well as its negative connotations, often related to totalitarianism, contributed to a general neglect of its potential.

But Bauman reminds us that 'social life cannot in fact be understood unless due attention is paid to the immense role played by utopia', which is a 'necessary condition of historical change' (1976: 12-13). Oscar Wilde also thought that 'a map of the world which does not include Utopia is not even worth glancing at, for it leaves out the country at which Humanity is always landing' (quoted in Bauman 1976: 11), while Anatole France famously said that 'without the utopians of other times, men should still live in caves, miserable and naked' (quoted in Bauman 1976: 11).

Most importantly, Bauman insists that utopias must be active, meaning that they are never fully achieved, but find themselves on the limits of what is possible:

> There is no method which allows us to establish in advance the 'truth' or 'untruth' of utopia, for the simple reason that the fate of utopia, which hinges in a considerable measure on the occurrence of an appropriately massive social effort, is not determined in advance. Any inventory of supporting or hindering factors is bound to be incomplete without the decisive, yet unpredictable, constituent of an adequate human action. Therefore, the 'realism' or 'practicability' of utopia may be discovered … only in the course of action (1976: 17).

This understanding of utopia as processual rather than complete has only more recently permeated social sciences, mainly from the domain of science fiction literature (Levitas 2010, 2013). Critical utopias, such as Ursula Le Guin's utopian science fiction novel *The Dispossessed* (1974), which emerged from the politics of the 1960s and 1970s, have partly contributed to this turn (Moylan 1986). According to Moylan, the 'central concern in the critical utopia is the awareness of the limitations of the utopian tradition, so that these texts reject utopia as blueprint while preserving it as dream' (1986: 10).

A certain balance between the openness and closure of utopias must be nevertheless achieved, if we aim indeed to effect political and social change. This need has been more recently echoed by the geographer David Harvey in his suggestive book *Spaces of Hope* (2000). Eternal openness transforms utopia into 'a pure signifier of hope destined to never acquire a material referent' (2000: 189). Instead, Harvey argues that some boundaries are eventually necessary: 'the materialization of anything requires, at least for a time, closure around a particular set of institutional arrangements and a particular spatial form' (2000: 188).

Ruth Levitas (2013) tries to solve the tension between desire and hope, between openness and closure, by proposing an understanding of utopia as a method rather than a goal. She argues that utopia is both the expression of a generic desire 'for a better way of being or of living (…) braided through the human culture' (2013: xii) and at the same time a 'more holistic outline of an alternative society' (2013: xiii). The core of utopia as a method is

> the desire for being otherwise, individually and collectively, subjectively and objectively. Its expressions explore and bring to debate the potential contents and contexts of human flourishing. It is thus better understood as a method than a goal (2013: xi).

It is through the three dimensions of utopia as method proposed by Levitas and mentioned above that the constant frictions between desire and hope, immanent within utopia, are resolved. The *archaeological* mode involves the thorough excavation of fragments of what represents ideals of the 'good society' from our utopian political, literary or artistic accounts. Most often this process requires an examination of the inconsistencies inherent in such utopian propositions. The claims of 'the good society' are thus opened for scrutiny and critique. Amongst the images of the 'good society' that Levitas demystifies through her archaeology is that of meritocracy as well as economic growth. The ideology that both meritocracy and economic growth are essential to progress must be challenged, believes Levitas.

In my thesis, I use utopia as a method in archaeological mode to criticize the prevalent myths of the 'good society' as they are embedded in the system of automobility as well as in the practices of fast urban mobilities. This archaeology will be particularly visible in chapters three and four of this thesis.

Complementary to the archaeological mode, there is the *architectural* mode, which deals with the institutional design and delineation of the good society. It consists of 'imagining a reconstructed world and describing its social institutions' (2013: 197). Levitas offers some specific non-fictional examples of utopian socialist policies such as a minimum basic income

removing the need to labour, a revaluation of care work as a 'socially necessary labour', as well as measures to prevent climate change. On its own, the architectural mode could easily bring about the closure of any dialogue and debate, thus transforming utopia into a mere blueprint. But, as Levitas argues, the architectural mode is constantly under pressure coming from desire, it is 'subject to archaeological critique, addressing the silences and inconsistencies all such images must contain' (2013: 153). The different modes of utopia as method are permeable to each other, iterative, and experimental.

The prologue of this thesis has developed a similar architecture to the one proposed by Levitas, but unlike her non-fictional reconstruction of the world, the slow bicycle utopia I have imagined is only loosely based on current realities. Instead, I propose an extrapolation from existing niches of cycling innovation to imagine how a bicycle system could look in 2050.

Finally, the *ontological* mode is concerned with the subjects and agents of utopian change. It is interested in finding out how people bring about change in society, but also how they are changed themselves in the process, how they 'should' be, as well as the new social relations which are consequently developed. The idea of utopia as a process and an ongoing experience is highlighted by Miguel Abensour (1999) in his interpretation of Williams Morris' *News from Nowhere* (1891). For Abensour, the proper function of utopia is that of educating the desire: '[t]he point is not for utopia … to assign "true" or "just" goals to desire but rather to educate desire, to stimulate it, to awaken it – not to assign it a goal but to open a path for it: ... Desire must be taught to desire, to desire better, to desire more, and above all to desire otherwise' (1999: 145).

Thus, in its ontological mode, utopia represents a continuous process, rather than a destination, a blueprint. Abensour links utopianism to the idea of 'becoming'. He opposes 'eternal' utopias, which produce 'a closed, static, authoritarian society that negates temporality and does violence to plurality and individual singularity' to 'persistent' utopias, designating 'a stubborn impulse toward freedom and justice – the end of domination, of relations of servitude, and of relations of exploitation' (2008: 406). For many literary utopian studies, observes Nadir, the desire discourse 'reflects modern utopias' move away from totalizing blueprints and toward open-ended, self-reflexive, provisional world-making' (2010: 25).

This ontology asks what kinds of people might comprise a better society and how to educate them such that their desires are geared towards developing just and sustainable worlds. But in doing this, Levitas is also overtly normative to what represents 'human nature', which seems very much abstracted from everyday social and material practices. For example, she argues that utopia 'is concerned with what ought to be and the processes of conforming the world to that standard' (2013: 66).

But, as my (auto-)ethnographic work on senses and sociabilities demonstrates, a narrowly humanistic normativity regarding 'human nature' is counter-productive. Because, as I shall argue in chapters five and six, cycling requires not just one's body, but a hybrid which also engages the bicycle, the road environment and the other mobile subjects. There is no universal human nature because what it means to be human will vary according to the specific circumstances we find ourselves in and the network of relations that we are a part of in those circumstances. I thus extend utopia as method with ideas of post-human

interdependencies (Urry 2007; Hayles 1999). Thus, in chapter five I show how cyclists' perception of the environment is done through their bodies as well as through the cycles they ride, which *afford* a specific orientation to the world around. Similarly, in chapter six the group cycling arrangements I investigate are manifesting their sociable character only to the extent that their structure accounts for the bicycles that are ridden, but also the road space negotiated amongst cyclists themselves and other road users, as well as the geography of the terrain or the weather and its elements. Following Hayles, the post-human view of cyclist 'thinks of the body as the original prosthesis we all learn to manipulate, so that extending or replacing the body with other prostheses becomes a continuation of a process that began before we were born' (1999: 3).

The ontological mode of utopia is also linked with prefigurative practices and politics of resistance which transpire through my analysis of senses and sociabilities. This resistance is mounted against the comfort, effortlessness and speed of urban mobilities, as well as against utilitarian and competitive cycling. In the contemporary congested cities, cycling has come to be regarded as a nimble and quick means to move around. As my own and other people's cycling suggest, the bicycle can be the fastest means of locomotion in cities, particularly for short distances and at peak hours. The account of my commute in London and some of the fastest weekend group rides I have joined are a proof of this predilection for fast velocities. But at the same time, cycling similarly stimulates the human senses in ways which resist speed, encouraging and producing instead slower rhythms. The side-by-side riding within certain leisure groups, the conversations that some infrastructures in Amsterdam allow or the bodily proximities within a Critical Mass ride are fostering more gentle cycling, where eyes, gestures, expressions, and voices often co-ordinate seamlessly.

I also argue that, to an important extent, the cycling senses and sociabilities I investigate, together with the slow cycling that they sometimes enable, are similarly mounting opposition to the doctrine of economic growth and the neoliberal society. This view is relevant in relation to the future of cycling, especially since a great deal of the practice today is primarily assessed, as I will show in chapter four, in relation to its contribution to fighting congestion, economic recovery and overall contribution to growing economies. Indeed, some authors have already indicated how cycling in the UK in increasingly used to fit a neoliberal agenda. For example, Aldred (2012a) observes how the current policy understands cycling as the individual choice of 'active' and 'responsible' citizens, while the national cycling infrastructure is still being delivered by a charity (Sustrans), rather than the state. Spinney similarly describes cycling 'as a mode of neoliberal governance through which circulation and quality of labor are improved' (2016: 450).

Conclusions: Enacting the social

The quest of describing in intimate detail the elements of a slow utopian bicycle system that is yet to be established involves an effort of imagination whose intricate techniques constituted the focus of this chapter. Using ethnographic and mobile research methods I uncovered the utopian propensity that resides within the cycling senses and sociabilities: they contest the prevailing ideas of desensitized mobile bodies and strictly utilitarian road environments. In doing so, they enact an ontological mode of utopia. In this thesis, this is leveraged for an analytical method of reconstructing society. This form of utopia as ontology introduces us to the kinds of people and values that a slow bicycle system could make possible.

Further, I utilized live and inventive methods both to wedge open for creative scrutiny the cracks within the dominant system of automobility and to identify the niches of cycling innovation which could lead to an alternative bicycle system. Such methods are enacting and curating new social realities different to those afforded by the contemporary car system. Their work is similarly utopian in character. On the one hand, they represent an archaeological mode of utopia as method whereby a critique of the car system is produced. On the other hand, they constitute an architectural mode enabling the effective reconstruction of an alternative bicycle system.

The prologue of this thesis dealt with an architecture of a slow bicycle system as it could appear in 2050. The next two chapters propose an opposing, archaeological enterprise: they mount a critique of the current (and future) system of automobility (chapter three), and of the utopia of fast cycling mobilities (chapter four). In doing so, they dispel two of the myths of the 'good society': the need for speed and for eternal economic growth.

In conclusion, this thesis uses three different types of methods to investigate the possibility of a slow bicycle system. First, there are the empirical, mobile and ethnographic methods, particularly adequate to highlight everyday cycling practices, their senses and sociabilities. Second, there are inventive and live methods which are used to explore and connect the existing niches of innovation drawn together in the prologue, as well as the manifold 'cracks' in the car system, explored in chapter three. Third, there are the more analytical utopian methods, which are building on the previous two sets of methods to advance a scenario of a slow bicycle system, to criticize the utopias of fast mobilities and neoliberal order and to anticipate the society that slow cycling could bring into existence.

Chapter 3: Beyond Autopia

In 2017, the bicycle celebrated two hundred years since its inception, in the form of a 'draisine', the first practically used, yet very rudimentary two-wheeled, steerable, human-propelled machine, invented in 1817 by the German baron Karl Dreis. Yet, despite its well established history, only briefly did the bicycle represent the main form of locomotion in cities across the world. Its golden age, which coincided with cycling making the transition from a bourgeois pastime to a working-class activity, merely stretched from the late 1800s up until the early 1960s. And while the non-Western world, China and India might still have enjoyed high levels of cycling until the turn of last century, the reign of the bicycle was certainly short-lived.

With the rise of automobility after the Second World War, all other forms of mobility have been subordinated, if not bluntly excluded. The car has won the 'mobility battle' by promoting a powerful imaginary of modernity, autonomy, freedom and privacy, which continues to be essential in maintaining its hegemony today. But, as with any utopia, 'autopia' (Wollen and Kerr 2002) too has ultimately revealed its inherent flaws: in an age of climate change, resource scarcity and ever increasing urbanisation, the car as a driving force for the 'good society' is under intense scrutiny.

In this chapter I situate the argument for a slow bicycle system proposed in this thesis in the context of the dominant mobile utopia enabled by the automobile. The 'niches' and 'cracks' left open in the system of automobility are explored, as alternative urban

mobilities, often including the bicycle, are made explicit. Against the destruction of public spaces, social life and environment, claims that autopia is keen to silence, I suggest that a different mobile utopia can instead be built, partly drawing inspiration from the numerous worldwide car-free initiatives.

The chapter is structured in three sections, each proposing a critique of the system of automobility in its three distinctive forms. First, it deals with the contemporary 'autopia', focusing on its promises of modernity, freedom, autonomy and privacy. I consequently demonstrate how this utopianism has partly reached its limits today due to increasing congestion, pollution and climate change. Second, the chapter proposes a leap into the future to anticipate how an updated version of automobility, featuring electric, autonomous, networked and shared vehicles, might look. Rather than solving the current problems generated by the car, as it is often claimed, this 'smart' automobility future could further complicate urban mobilities. Issues of data privacy, the high cost of both cars and infrastructure, and increased road congestion are just some of the issues likely to hamper the realisation of this high-tech future. Finally, the chapter investigates an alternative car-free future, initially driven by a social movement which has turned more recently into institutionalized actions across the world. I propose a review of most recent car-free initiatives, but at the same time I argue that in most situations the car-free developments are not really concerned with pursuing post-car futures, but rather with managing automobility.

The elephant in the city

Almost half a century ago one of the first and most powerful critiques of the automobile was formulated by the Situationist Guy Debord. By 1959, the car was already driving the hurried processes of urban reconstruction across the Western world in the wake of the Second World War. With just over 100 million units registered worldwide at that time, the threat of the automobile can hardly be compared with the situation today, when their number has increased more than tenfold. Yet, Debord noticed that even at that time the automobile was not only synonymous with post-war reconstruction and modernization, but faithfully reflected an entire capitalist society[4]. More than just an essential means of transportation, the private automobile

> is the most notable material symbol of the notion of happiness that developed capitalism tends to spread throughout the society. The automobile is at the center of this general propaganda, both as supreme good of an alienated life and as essential product of the capitalist market (Debord 1959: theses 1 and 6).

The opposition to automobility continued in the following decades, reflected both in the works of intellectuals such as Ivan Illich (1974), Jane Jacobs (1961) and André Gorz (1975), as well as in the activist movements crystallised during the energy crisis of the mid-1970s (which will be discussed in chapter four). Still, in the fifty years since Guy Debord made this

[4] The opposition to the car emerged since its early days. Norton (2008) notices that in the 1920s the motorists in the United States were called 'joy riders', 'road hogs' or 'speed demons', while their cars were 'juggernauts', 'death cars', or 'the modern Moloch'. In the UK, 'pioneer motorists were disparaged for the dust they threw up from macadamized roads, despised for their speeding, and derided for their desire to make the public highway into a conduit for transport alone' (Reid 2015a: 5). I am nevertheless interested in the more recent opposition to automobility, as it directly impacts the utopia of slow cycling that this thesis is advancing.

pertinent observation, the car not only did not fade away, but has instead metamorphosed into an entire socio-technical system which has become indispensable for the everyday life of most societies across the world. Today, automobility means more than just the mere artefact represented by the car, it is 'one of the principal socio-technical institutions through which modernity is organized. It is a set of political institutions and practices that seek to organize, accelerate and shape the spatial movements and impacts of automobiles, whilst simultaneously regulating their many consequences' (Böhm et al. 2006: 3).

Böhm and his colleagues make an extremely important point here, which has to do with the way in which automobility, through the process of dominating most aspects of life, is effectively creating the conditions of its own perpetuation and expansion. Through this phenomenon of self-expansion, or autopoiesis (Urry 2004), the system of automobility both advances its dominance over other mobility systems *and* generates not only the conditions of its own expansion, but can potentially (and paradoxically) lead to the emergence of fairer and more sustainable transport alternatives.

How is it then that the critiques against automobility, first mounted half a century ago and particularly intensifying in the last two decades in the light of urban congestion, pollution and climate change, have hardly diminished its dominance? And not only is this supremacy almost intact, but it seems that automobility is bound to inaugurate in the decades to come yet another 'golden age': that of the electric, shared, networked and driverless cars. This persistence of autopia, albeit in different forms than those encountered by Guy Debord, has been theorized more recently by John Urry (2004), who has noticed both the utopian

and dystopian condition of the automobile, seen as a combination of flexibility *and* coercion which enable its constant regeneration.

According to Urry, automobility possesses an 'exceptional power to remake time-space, especially because of its peculiar combination of flexibility and coercion' which ensures 'the preconditions of its own self-expansion' (2004: 27). More to the point, says Urry, the very freedom of movement that the car allows us is not a matter of choice, because 'the structure of auto space forces people to orchestrate in complex and heterogeneous ways their mobilities and socialities across very significant distances. (…) Automobility is thus a system that *coerces* people into *intensive* flexibility. It forces people to juggle fragments of time so as to deal with the temporal and spatial constraints that it itself generates' (2004: 28; emphasis in original).

The last century has witnessed the overwhelming dominance of the car over virtually all aspects of our everyday lives. The automobile has given new meanings to the ideals of freedom, autonomy, privacy and ultimately modernity itself (Urry 2004). While most of these aspirations had been previously embodied by the bicycle (Reid 2015a; Furness 2010), it was the system of automobility which perfected such mobile utopian visions. The author Virginia Woolf was amongst the first to have illustrated these desires in 1927, as she bought her first car: 'Yes, the motor car is turning out to be the joy of our lives, an additional life, free and mobile and airy. (…) Soon we shall look back at our pre-motor days as we do now at our days in the caves' (quoted in Morris 2008, paragraph 1). Gradually, the cars also came to represent status and emotional affect conveyed by speed, security, sexual affluence, career accomplishments, masculinity and family (Sheller 2004).

Thus, any effective critique of the car system cannot proceed before first acknowledging both the coercion *and* the flexibility it necessarily entails. Clearly the car does not simply represent the epitome of contemporary capitalist production and consumption, but has far more complex social and cultural bearings. This has been highlighted particularly within the anthropology, where a concern with material culture has contributed to unpacking these relationships. Attempting to emphasize the 'evident humanity of the car', Daniel Miller illustrates 'just how simplistic a concept such as 'alienation' appears to be when set against a relationship to cars which is not just contradictory but convoluted in the extreme' (2001: 2).

Instead, Miller argues that the car's humanity 'lies not just in what people are able to achieve through it, nor yet in its role as a tool of destruction, but in the degree to which it has become an integral part of the cultural environment within which we see ourselves as human' (Miller 2001: 2). The texts in his edited volume, *Car Cultures* (2001), demonstrates just how the relationship with the car transcends the mere utilitarian aspects. Thus, the car is shown to be indispensable for religious ceremonies amongst the aboriginal populations in Australia, car repairing practices in Ghana are very similar to Christian concepts of miraculous resurrections, while Black identity in the US proves to be strongly linked with car ownership.

The more recent sociological and anthropological literature also provides more nuanced perspectives on automobility that go beyond the usual rationalistic and economistic approaches. For example, in analysing the mobile lives of social workers, Ferguson (2009) demonstrates the essential role of the car not just for juggling with the complex tasks

required by the job, but also shows how the automobile acts as a safe space for children abused by their parents: 'Car use is now central to social work and the need to travel faster and more often has arisen in part from the emergence of new knowledge about risk, especially since the 1970s when physical child abuse and the prevention of death became the central preoccupation of social work' (2009: 74). Similarly, Andrew Dawson's account of car use in conflict zones such as the 1992-1995 Bosnian war indicates how automobility can prove to be, at times, a tool against alienation. Whilst conducting passenger-seat ethnography in the Balkans, Dawson notes the roles of car atmospheres in 'ameliorating post-socialist and post-war unease concerning namely identification, mistrust, insecurity and estrangement' (2017: 3).

Cairns et al. (2014) argue that car dependence is so powerful across societies because it is both an 'objective phenomenon (dictated by a lack of alternative transport options), and a subjective phenomenon (where people assume that access to a car is necessary to maintain their quality of life)' (2014: 111). A set of reasons contribute to this dependence; they range from the emotional and ethical dimensions of car use, to its symbolic and cultural significance, to the existence of specific group norms associated with cars, to the experiences of using cars (2014: 111-113).

The immobile infrastructure which caters for the needs of automobility equally manifests this ambivalent aspect. In post-communist countries such as Albania, the motorway is shown to dominate social life of the Balkan country, symbolising the transition to a market economy, new forms of national identity, while also sustaining massive emigration to neighbouring countries (Dalakoglou 2010). In Romania, parking spaces similarly contribute

to better the lives of the more vulnerable members of society. Chelcea and Iancu (2015) show how the informal parking practices of self-appointed parking attendants in Bucharest allows a growing number of disenfranchised families and individuals to subsist.

The above examples point precisely to an ambivalence of the car, to its both utopian and dystopian dimensions. For a bicycle system to become an alternative to automobility, such nuances must be fully grasped. While this thesis ultimately argues that the car system is intimately wedded to the utopia of economic growth, the everyday uses of the car across the world underline a multitude of experiences that are not always embedded in this logic.

Overall, the influence of the automobile over the past century was so powerful that it was considered to define our times in the same way the great Gothic cathedrals did in previous ages (Barthes 1972). They are 'the supreme creation of an era, conceived with passion by unknown artists, and consumed in image if not in usage by a whole population which appropriates them as a purely magical object' (1972: 88).

Some of this magic has been lost in the remaining time since Barthes has written about the mythology of the car. Much of the utopia of the automobile has transformed more recently into a dystopia.

From Autopia to Carmageddon

The last two decades, despite being characterised by growing urbanization and globalization, have witnessed a more co-ordinated opposition against car dependence,

particularly visible in the urban agglomerations of the Western world. Ever since the economic crisis of 2007-2008, which, in turn, was partly due to the oil price shock (Urry 2013), it is assumed by some that we have reached 'peak car' (Metz 2014; Lyons and Goodwin 2014), with a significant number of countries confronted with 'a slowing down of growth or even a decline in per capita car travel that has pre-dated the global economic downturn while also continuing through it' (Lyons and Goodwin 2014: 2).

The more recent concerns raised about automobility nevertheless rarely question its place in the urban realm. While the 'elephant in the city' is indeed acknowledged as a problem for the smooth functioning of the city and, to an increasing extent, for the wellbeing of its inhabitants, the politics around 'peak car' are not concerned with replacing the car system altogether, but rather with better managing demand within the system. This is particularly visible, as Metz (2013) rightly notes, in the ways traffic modelling in the UK implicitly assumes that car use will inevitably grow in the future: 'the increase in both London and national car traffic projected by the Department [for Transport] is about twice that of projected population growth, implying continuing growth in per capita car travel. The modellers explicitly reject the proposition that an individual's car travel demand has saturated and expect that, as the economy recovers, car demand will begin to grow once again' (2013: 266).

Over the last few years a consistent body of literature has mapped a series of more recent negative consequences of automobility, alongside the congestion problems, thus significantly contributing to the argument against car dependence (Humes 2016; Newman

and Kenworthy 2015; Whitelegg 2015; Ross 2014; Montgomery 2013). I summarize them as follows:

1. Pollution. Automobile traffic generates extraordinary levels of nitrogen dioxide, particulate matter and noise. It is estimated that around 200,000 US citizens die prematurely every year from vehicle pollution (Caiazzo et al. 2013), while in London alone almost 10,000 people die early each year due to long-term exposure to air pollution (Walton et al. 2015). In the UK, there is 'a massive indifference to the scale of the problem and a seriously inadequate governmental response' (Whitelegg 2015: 700). In recent years, cities such as Paris, Rome and Madrid have banned cars for up to three days to cut air pollution.
2. Road traffic deaths and injuries. Road crashes claim 1.3 million lives annually and injure almost 80 million people, most of them in developing countries (Bhalla et al. 2014). According to WHO statistics, half of those dying on the world's roads are pedestrians, cyclists and motorcyclists. Road accidents represent the largest cause of death among young people and the number of crashes is predicted to rise to become the seventh leading cause of all deaths by 2030 (WHO 2016). Whitelegg argues that these events should not be referred to as 'accidents', a word conveying 'a message of unpredictability and a suggestion of inevitability', (2015: 470) when this is certainly not the case.
3. Energy and material consumption. Transport is accountable for 22% of total global energy consumption, the majority of which is used to power road transportation (United Nations 2013). Global population increase, fast economic development and car ownership growth in developing countries, as well as 'peak oil', will generate

serious difficulties for traditional forms of oil-based mobility (Whitelegg 2015). Similarly, the demand for rubber and other materials for various vehicle components has devastating impacts where it is grown, produced, used and disposed of (Mann 2016). More generally, the carbon footprint of producing a new car (17 tonnes of CO2 emitted for each medium-sized new vehicle) rivals the exhaust pipe emissions over its entire lifetime (Berners-Lee 2010). Also, with around 25 million kilometres of new paved roads expected by 2050, road building is today considered to represent a significant human threat to nature (Ibisch et al. 2016).

4. Climate change. Around one quarter of rising CO2 emissions result from transport (UITP 2009; Sims et al. 2014) and in Europe alone this figure is expected to rise by 120% by 2050 (UITP 2009). Cars are responsible for 12% of total EU emissions of CO2 (European Commission 2016). Transport is the fastest growing source of greenhouse gas emissions, effectively cancelling out the gains that are made in reducing similar emissions in other areas of the economy (Whitelegg 2015). Oil is particularly problematic as fluctuations in its price affect the future of urban areas and climate change, yet the system of automobility seems oil-dependent for the foreseeable future (Urry 2013).
5. Health impacts. The lack of physical activity associated with driving greatly impacts upon the wellbeing of individuals. Even though it is not directly caused by automobility, obesity is certainly connected to transport policy and the promotion of motorized mobility. Car drivers walk only half the distance and for half the time compared to the rest of the population, resulting in a deficit of one hour of walking every week (Davis, Valsecchi and Fergusson 2007). Moreover, a recent study has

also demonstrated that people who live near major roads with pollution or noisy traffic have higher rates of dementia (Chen et al. 2017). Conversely, it has been demonstrated that walking and cycling improve subjective mood, wellbeing and self-esteem, that they are an effective anti-depressant and reduce anxiety (Lane 2016; Broman-Fulks et al. 2004; Biddle, Fox and Boutcher 2000; Camacho et al. 1991).

6. Community disruptions and social inequalities. Car-based mobility reduces community partly because most car trips involve driving alone, partly because any engagement with others on the road is reduced to a minimum (Urry 2007): to inhabit the roads of modern societies, 'is to enter of world of anonymized machines, ghostly presences moving too fast to know directly or especially to see through the eye' (2007: 29-30). The spatial fragmentation that automobility has generated is harmful to community life, something demonstrated as early as the 1960s by Jacobs (1961) and, more recently by Montgomery (2013). More generally, it is argued that the current emphasis on long distance trips, which favours the automobile and which is embraced by most transport policymakers, 'discriminates against the old, the young, women and the poor and exacerbates inequalities' (Whitelegg 2015: 1843).
7. The cost of driving. There are huge economic costs incurred in the form of subsidies, investments and taxes, all in the name of the motorcar. The total cost of annual EU subsidies to all transport modes is around 300 billion Euros (of which almost half goes into road building and maintenance), a sum that is comparable to the recent Greek bailout (Whitelegg 2015). In the USA, the amount of money that road users pay through gas taxes accounts for less than half of what is spent to maintain and

> expand the road system; the other half is paid for by the entire American population (Dutzik, Weissman and Baxandall 2015; Blue 2013). 'At the level of ordinary citizen and daily trip making experiences it is obvious that there are economies to be made and better ways on offer when it comes to sorting out urban transportation', notices Whitelegg (2015: 872).

The above list of negative externalities generated by the car system indicates without doubt that autopia is far from what Virginia Woolf imagined at the dawn of the automobile era. At the same time, it is very clear that the car system is rapidly and constantly changing. Electric, shared, networked and driverless vehicles are indicative of this autopoiesis of automobility (Urry 2007), as they are considered by many to drive the future of urban movement. But the great deal of flexibility that the car has initially made possible could turn into yet more coercion even with the advent of this 'smart' car future.

Electric, autonomous, networked, shared

Autonomous, networked, shared and electric cars have not yet become mainstream and it will probably take some time even in the Western world before this happens. Still, most visions describing the future of urban mobilities assume that the emergence and consequent installation of these technologies, and associated practices, necessarily represent the natural trajectory.

Private trials involving self-driving automobiles are being conducted by both carmakers and technology companies such as Tesla, Uber, Google and Apple (Kang 2016), while Ford,

Volkswagen, General Motors, BMW, Toyota and Audi are all planning to launch automated models by 2020 (https://www.driverless-future.com). Government incentives for electric cars have been made available for almost a decade now, the latest initiative in the UK allowing electric vehicle drivers to use bus lanes and to get priority at traffic lights (Vaughan 2016). Road legislations are already drafted in anticipation of autonomous vehicles, as it is the case in the USA, where the Obama administration has put in place guidelines on 'how driverless cars should react if their technology fails, what measures to put in place to preserve passenger privacy, and how occupants will be protected in crashes' (Kang 2016: paragraph 7). Established car producers such as Daimler, Ford, General Motors and Volkswagen have more recently branded themselves as 'mobility companies', with an increasing interest in car sharing and carpooling services (Ziegler 2016; https://www.moia.io). Finally, emerging markets such as China and India are leading the way in developing small, low cost, low speed and (in some cases) electric vehicles, that could become mainstream in the western world as well (Tyfield et al. 2016; Zuev 2016). China has over half a million such low-speed electric vehicles and is expected to reach two million by 2020 (Reportlinker 2016). In India 200,000 vehicles, most of them small, are added to the streets of Delhi every year, while Tata Motors hopes to put 1 million small cars on the road each year (Shiva 2016).

Such unidimensional, car-centric visions are to be found even in the rather sparse academic literature dedicated to the future of urban mobilities. For example, Tyfield et al. (2016) and Dennis and Urry (2009) investigate a series of scenarios regarding the future of urban movement, all generally concluding that in the foreseeable future it is unlikely that the car, in its various instantiations, will cease to be the dominant means of locomotion. Dennis

and Urry present three possible post-car futures: 'Post-oil localism', very similar to a slow bicycle utopia; 'regional warlordism', more probable than the former and involving energy and social collapse; and the 'digital network of control', which the authors seem to favour. In this latter scenario, Dennis and Urry describe many of the features currently promoted by the autonomous, shared, networked and electric vehicles. They anticipate

> a fully functioning post-car system which transforms very many kinds of vehicles away from being separate and autonomous towards the automation of movement. Digital and physical movement are integrated to form a *digital nexus system* but this is a future which will augment the integration of databases that will have direct implications for human freedom (2009: 161; emphasis in original).

In a more recent effort, Tyfield et al. (2016) deploy a similar methodology based on scenario building to determine the future awaiting urban e-mobilities in China. Echoing the previous work done by Dennis and Urry, the four scenarios devised by Tyfield et al. operate once again with some immutable assumptions: that cars will not simply cease to exist and that electric mobilities will ultimately prevail over other forms of movement across Chinese cities. The authors conclude that two scenarios are more likely to come to fruition by 2041. One is 'hi-tech elite mobility', which will be common in the most developed megacities and which will deepen social inequalities, 'with growing separation of the mobility rich and the mobility poor' (2016: 10). The other, 'business as usual digitalized mobility', will be more habitual in smaller cities and will involve a lot more largely private internal combustion engine cars, leading to gridlocks. On the flip side, cars will 'become smart homes, incorporating a lot more interconnectivity and digitization' (2016: 12).

Thus, this highly anticipated new autopia, consisting of self-driving, electric and shared cars, has so far faced very weak contestation. Yet, if we want to anticipate how the future of urban mobilities might look, such emerging critiques must be brought more forcefully to attention, alongside the more prevalent visions. The above authors have rightly, albeit briefly, indicated the manifold risks associated with this new autopia, ranging from privacy issues derived from increased digitization, to excessive mobility for the most affluent versus lack of mobility for the poor. But there are other 'silences' which the proponents of this new autopia often seek to exclude from the debate.

The task of anticipating how a future with self-driving, shared and electric vehicles would look might be a difficult one. Yet, in recent years a series of modelling efforts, speculative endeavours and empirical studies have indicated the potential shortcomings of this new autopia. I have identified some potential negative outcomes that the new system of automobility is likely to bring about:

1. Increasing mobilities and congestion. The demand for mobility could rise once the number of electric self-driving vehicles increases. 'With lower marginal costs to travel an extra mile in an electric vehicle, and without requiring a driver's attention thanks to autonomy', the demand for travel will increase, and 'thus add to congestion' (McKerracher et al. 2016: 7). Other studies estimate that autonomous vehicles could free fifty minutes a day for users (Bertoncello and Wee 2015), while passenger miles travelled could grow 25% by 2030 in some cities (McKerracher et al. 2016).

2. Increasing number of cars. Self-driving cars could increase not only the number of trips, but also the number of vehicles on the road. When driving licences and insurances are no longer needed or when one can simply call a driverless car at a moment's notice, the number of cars is poised to grow (Greenwood 2016). Also, a report by the World Economic Forum (Lang et al. 2017) shows that self-driving automobility will lead to more cars on the road and further encourage urban sprawl. The popularity of autonomous vehicles can have a boomerang effect, as 'a lot of regulation and intervention [are needed] to manage this process to limit the otherwise devastating effects of induced demand' (Lubell 2016). At the same time, the number of cars on the roads could also decrease, if car-sharing and car clubs becomes more common. Car2go and Zipcar, the leading car-sharing companies in the world, have over 3 million registered members, while big car manufacturers such as General Motors, Daimler, BMW and Ford are already investing in these niches.
3. Failing to predict human behaviour. Even if studies claim that autonomous vehicles will reduce accidents by up to 90% (Bertoncello and Wee 2015), complying to anything more than formal traffic rules will be challenging. Self-driving cars will have to deal, at least until they become the dominant transportation, 'with drivers who speed, pass even when there's a double yellow line and drive the wrong way on a one-way street' (Boudette 2016: paragraph 4). The situation is further complicated with pedestrians and cyclists: 'Once people realise that an autonomous vehicle will stop automatically, will pedestrians and cyclists deliberately take advantage and step out or cycle in front of them?' (Jones in Greenwood 2016: paragraph 10). Some of the negative outcomes from the failure to predict human behaviour might

include accidents, congestion, slower and unreliable journeys and system snarl-up due to unexpected stop-start progress.

4. Traffic slows down. Directly related to the previous point is the travel behaviour which is likely to change as well. According to a study by Millard-Ball (2016), thanks to the risk-averseness of autonomous vehicles 'pedestrians will be able to behave with impunity, and autonomous vehicles may facilitate a shift toward pedestrian-oriented urban neighbourhoods' (2016: 1). The study also suggests that autonomous vehicle adoption may be impeded by their 'strategic disadvantage' that slows them down in urban traffic.
5. Detours, puddles and bad weather. Unexpected events or situations could also pose problems to self-driving cars. Weather is a prime cause of system failures during the on-road tests of autonomous cars carried so far by Google. Puddles and oil spots are similarly difficult to negotiate as they cannot be easily detected with current radar, lasers and high-definition cameras, while maps can quickly become outdated when construction works or detours get in the way (Boudette 2016). Similarly, this could result in accidents, congestion and other negative outcomes.
6. Lost tax revenue. Major sources of revenue for cities and countries derive from transportation infrastructure (such as fuel taxes, parking revenue, parking and speeding fines, driver registrations). They could disappear with electric automatic vehicles, which, it is believed, will use less frequently available parking spaces and are less likely to break speed limits (Chase 2016). Still, at the same time, an increase in car ownership, once self-driving vehicles will become more accessible, could equally lead to an increase in tax revenues. Conversely, the cost of the new infrastructure is likely to be enormous, as an entire ecosystem of 'smart' urban

features must accompany them: ‘street lights, roads, curbs, and parking spots equipped with sensors and special markings that “talk” to the cars’ (Bliss 2017: paragraph 15).

7. Moderate social acceptance for autonomous cars. While governments and industries might be enthusiastic about the prospect, an important segment of the public is still reluctant to adopt the self-driving idea. Almost half of the respondents of a study conducted by the London School of Economics feel they would be uncomfortable using an automated vehicle, whilst more than 40% have a feeling of unease with regards to driving alongside one (Tennant et al. 2016; see also Schoettle and Sivak 2014 for the USA and Australia). Overcoming this lack of trust will arguably require investing time and resources. Moreover, the prohibitive cost of self-driving cars means that most of them are likely to be shared, at least initially (Bliss 2017), something that could also make them less appealing.
8. Electric vehicles drive health inequalities. Research conducted in the USA shows that the health benefits of electric cars are not equally distributed across the nation: electric vehicles often rely on power plants situated in rural areas, far away from the urban centres where most EVs are used. EVs are effectively exporting emissions to other places that generate their required electricity (Holland et al. 2016). Furthermore, if electric, shared and autonomous vehicles are predicted to increase demand for automobility, that could further depress the amount of active travel, which would also have negative public health impacts.
9. High social costs of car hailing services. Uber, the biggest car booking operator in the world, has faced criticism on several levels: that it is unfairly competing with taxi drivers by accessing markets without following regulations or fare schedules,

that it aims to become a monopoly, that its cars and drivers are unsafe or underinsured, that it may abuse customers' privacy, that it allows discrimination by drivers and passengers and that it is eroding working standards for taxi drivers and remunerating its own drivers poorly (Rogers 2015). More recently, Uber has lost its operating license in London for public safety and security reasons (Transport for London 2017).

10. Job losses. Automation will lead to massive job losses in the near future. In the UK alone, more than 10 million workers are at high risk of being replaced by robots within 15 years (Elliott 2017). The transport sector is likely to be affected as well. With Uber's self-driving truck making its first delivery in late 2016 (Davies 2016), the race to get driverless lorries on the roads is on, with even more far-reaching consequences than for the autonomous cars. The impact on professional drivers is going to be immense: with 3.5 million truck drivers in the United States alone, huge disruptions are expected, leading drivers to 'ring' cities with their trucks in protest (Solon 2016).

The possible outcomes sketched above highlight some of the challenges that such an infrastructure would need to address. There are also the legal and policy aspects that must be considered before any widespread adoption of driverless cars. All these challenges, many of which are yet to be grasped, demonstrate that the new autopia that self-driving, electric, networked and shared cars promote today is far from representing a blueprint for a frictionless mobile world.

Rather than simply solving the contemporary problems of automobility, the new autopia would probably generate new and potentially more complex ones. Rather than leading to a post-car future, this utopia would instead further increase the circulation of both people and goods. With technological progress increasing the efficiency of mobility, the rate of 'consuming' mobility would also increase, simply due to an overall increase in demand due to decreased marginal costs. This phenomenon is known as the Jevons paradox (Alcott 2005).

Thus, the new mobility system that this thesis advocates, involving slower, human-powered velocities, which enhance senses and sociabilities, is unlikely to be brought about by the new autopia that I have just described. These anticipated changes, involving electric and autonomous futures, herald a new era characterized by a further numbing of the personal and social experiences of being on the move. This would certainly result from removing most senses and sociabilities from the existing car system. On the contrary, a bicycle system may benefit from these change in automobility. A slow bicycle system where such experiences are still possible could arguably draw more people into cycling.

The very act of feeling the car while driving, which involves 'the full power of automotive emotions that shape our bodies, homes and nations' (Sheller 2004: 237), seems under threat in the era of self-driving cars. This will have overwhelming consequences for the concept of personal autonomy that has driven the rise of automobility over the last century. Once an autonomous driver takes over the steering wheel, feeling in control of one's own mobility would diminish considerably. This has already been demonstrated on preliminary tests which have assessed the impact of automated vehicles on driver skills.

According to Spulber (2016), drivers resuming manual operation of the vehicle after a period of automated driving perform poorer overall: 'Prolonged use of automation may cause a loss of skills and awareness of the state and processes of the vehicle' (2016: iii). No longer being in control of the car represents one of the main concerns, according to respondents of a survey in the USA which investigated public attitudes toward self-driving cars (Howard and Dai 2013). A slow bicycle system, on the contrary, preserves most of the senses that automobility, in both its forms discussed in this chapter, have fought to suppress.

Similarly, the sociabilities anticipated by the self-driving cars are also questionable. Some proponents of automated driving argue that freeing people from the task of steering the car will enable them to be more sociable with other passengers (but not with those outside the car!), while others insist that even more work could be done on the move. Research in the future of commuting to work suggests that engineers will 'need to create space to move around some, and interfaces that allow touch, talk, and digital recording … It would be critical to allow the space to be customizable – either walling off the passenger or allowing light and openness to the outside world (through glass). Different strokes for being productive' (Harrison, quoted in Hardigree 2017, paragraph 14). Howard and Dai (2013) also note that the ability for multitasking, and hence, less interaction with other passengers within the car, is one of the most attractive features of self-driving vehicles. On the other hand, the two authors suggest that sharing self-driving cars could also encourage more sociable interactions amongst fellow travellers: 'Opening the market for self-driving cars to those who have been excluded from the automobile market could encourage adoption,

lower the price of the technology, and enhance network benefits' (Howard and Dai 2013: 5).

Yet, a slow bicycle system can further improve the quality of social interactions, not least because the overall speed of mobilities will allow for more convivial encounters also within the public space of the road. In the following three chapters I further delineate how and why such a slow bicycle system can and should be different from faster mobilities, both human and machine-powered, and argue that the role of senses and sociabilities is essential for such a system to take hold.

Furthermore, the system of automobility, in its present and future forms, denies any personal reflexivity to its subjects. To this constant quest to progress one's movement, to get on, to rush, to do more work on the move, to be frustrated by traffic jams, there is the alternative to get distracted from such immediate preoccupations and think of something else altogether. Walking and cycling allow for such moments of reflexivity to occur, where one can think more profoundly about one's being in the world. In this sense, the words of Arthur Conan Doyle seem the most appropriate: 'When the spirits are low, when the day appears dark, when work becomes monotonous, when hope hardly seems worth having, just mount a bicycle and go out for a spin down the road, without thought on anything but the ride you are taking' (Conan Doyle 1896, quoted in Norcliffe 2015: 222).

This section has criticised some of the optimistic future visions embodied by the autonomous, electric and shared vehicles. The automobile has restructured time and space in such a radical way, allowing for driving to seize such an important chunk of our daily

routine, that, paradoxically, it now seems that only self-driving cars can help us claim back this lost time. Similarly, the road carnage wrought upon us by the automobile is so devastating that, the argument often goes, it is only the autonomous, 'faultless and emotionless' vehicles which could ever restore the safety of our roads. The emerging car hailing apps, and their insistence that owning a car is now optional, are doing nothing more than trying to defeat the traffic congestion ultimately generated by the very system of automobility. Contrary to these arguments, I have demonstrated that while the autopias of small, electric, autonomous and shared vehicles testify to the resilience, self-expansion and combination of flexibility and coercion of the automobile system, the types of futures they herald are by no means devoid of controversies.

The mobility growth paradigm

The most important utopias that the automobile, both in its current and future manifestations, has nurtured remain those of modernity, progress, speed and growth. The car's unyielding expansion of, and domination over, other forms of mobility came to be regarded 'as natural and inevitable', observes Urry, as too often the argument is that nothing 'should stand in the way of its modernizing path and its capacity to eliminate the constraints of time and space' (2007: 114). In the age of the automobile, the city streets have ceased to be multi-functional public spaces, acquiring instead a narrow utilitarian purpose, that of enabling frictionless motion (Sennett 1977):

> We take unrestricted motion of the individual to be an absolute right. The private motorcar is the logical instrument for exercising that right, and the effect on public space, especially

> the space of the urban street, is that the space becomes meaningless or even maddening unless it can be subordinated to free movement (1977: 14).

Guy Debord described the car as the 'supreme good of an alienated life', arguing that we 'should reckon on gradually phasing it out' (1959: theses 1 and 6). A decade later, in the context of oil crises which further raised awareness of the problems associated with automobility, Gorz argued that automobility is instrumental for the functioning of capitalist bourgeoisie:

> Mass motoring effects an absolute triumph of bourgeois ideology on the level of daily life. It gives and supports in everyone the illusion that each individual can seek his or her own benefit at the expense of everyone else. Take the cruel and aggressive selfishness of the driver who at any moment is figuratively killing the 'others', who appear merely as physical obstacles to his or her own speed. This aggressive and competitive selfishness marks the arrival of universally bourgeois behaviour, and has come into being since driving has become commonplace (1980 [1975]: 70).

In many ways, the age of the automobile has reduced urban *mobility* to mere *movement*, abstracted from its production, representation and practice, that is from any context of power in which it operates and which it subsequently generates (Cresswell 2006). Automobility has often come to be 'black boxed' into mobility for the sole purpose of growth, a growth whose aim is almost never placed under scrutiny. While, of course, this is not necessarily true for all aspects of automobility (as I have shown earlier in the chapter), this 'mobility growth paradigm', chiefly powered by the car, arguably represents the quintessential utopia of contemporary capitalist societies. As John Whitelegg indicates:

> Mobility is inextricably linked to economic growth and economic performance and any arguments that we would gain from having more accessibility and less mobility are very quickly trumped by the economic arguments (2015: 368).

The language of economic growth is intimately linked with more mobility and improved infrastructure to the extent that it has become part of a vocabulary that is beyond critique. Better connections, regeneration and assisting lagging regions are part of a common language that conveys 'powerful images around progress, job and growth' (Whitelegg 2015: 365). This paradigm is so dominant today that 'it is currently unthinkable that a policy of reduced mobility would be promoted by politicians seeking to be elected for another term of office' (Whitelegg 2015: 365).

It is precisely this ultimate utopia, of automobility's endless growth, which began to be contested most vehemently in the last few decades across many world cities. In a paradoxical fashion, the automobile, which for the last century drove the most ardent ideals of economic growth, is now threatening to hamper this very growth. The fear that our cities could end up in permanent gridlocks seems to become so paralyzing for our societies that we can see soon the use of cars being thoroughly regulated, not only in some city centres as it is the case today, but on a substantially greater scale. Indeed, there have been huge increases in the numbers of cars on the world's roads: around 1 billion today and expected to grow to 2 billion in the next decades if there is 'business-as-usual' (Sperling and Gordon 2009).

The overwhelming process of urbanisation of the last century has largely been driven by automobility and its extraordinary capacity to eliminate the constraints of time and physical space (Urry 2007). And with the prospect of another 2.5 billion people living in cities by 2050 (United Nations 2014), it only seems 'natural' to grow these cities and to move around by car. Yet, there is nothing 'natural' about this mobility growth paradigm.

In the face of this 'business-as-usual' model driving the mobility growth paradigm today, a new utopia is slowly emerging. In the last few decades, the many 'cracks' in the system of automobility (Geels et al. 2012) have created momentum for a more ambitious mobile utopia, which is burgeoning across the world and in which the bicycle plays an essential role. Some of these cracks have been already mentioned and range from the current limits of physical infrastructure, to changing perceptions of car use and ownership, to a weakening of policy makers' commitment to the car culture, to the heightened awareness of climate change and peak oil (Geels et al. 2012: 355-356). The car-free movement which I explore in the final section of this chapter invites us to be more optimistic about the possibility of post-car futures.

Going car-free

As this chapter has so far demonstrated, concerted opposition against the automobile has a significant history, dating back to the post-war years, when the push for reconstruction and modernization led to the car being embraced almost unconditionally, particularly across the Western world. But it was in the 1970s, with the first oil crises and the rise of the environmental movement, that a global 'social movement' around the idea of car-free

has gained momentum. A new utopia of urban environments free from the movement and parking spaces of privately owned steel-and-petroleum automobiles has emerged, initially driven by radical movements, then institutionalised, as nowadays more and more municipalities are committing to reduce their car dependency. In the following pages, I provide an overview of the worldwide car-free movement. This was initially developed during a project investigating the possibility of a car-free Birmingham, as part of the Liveable Cities programme, in which I was involved during my PhD research (https://www.liveablecities.org.uk; see also Urry et al. in preparation; Ortegon and Popan 2015).

The car-free movement partly stems from radical movements opposed to new road building, especially popular during the 1990s (Wall 1999). In Britain, the anti-roads movement began in the early 1990s with the resistance against the building of the M3 extension in Twyford Down, Hampshire. The protests gave birth to Street Parties, Reclaim the Streets events and other non-violent direct action happenings. A related movement has been Critical Mass, a form of protest, involving cyclists taking over the space of the streets. In more recent years, these counter-cultural movements have morphed into consumerist manifestations such as the European Mobility Week, the Car-Free Day and the Park(ing) Day, organized by municipalities and corporations.

Both the social movement and later an increasing public pressure contributed to the building up of the car-free city movement that we witness today. Still, the car-free phenomenon must not be necessarily conflated with the advent of a post-automobility system. On the contrary, restricting access or parking spaces for cars, often enough

advocated through car-free initiatives, are just about managing automobility rather than really pursuing post-car futures.

In the 'Car-free Observatory' (Ortegon and Popan 2015) we documented over 150 significant initiatives in 88 cities. Similar efforts have been pursued elsewhere. For example, an extensive Design Manual sets out how to organize car-free cities taking inspiration from European cities with squares, street furniture, arcades, high densities and narrow streets (Crawford 2009). Other recent studies have observed the end of so-called 'automobile dependence' (Newman and Kenworthy 2015) or offered in-depth analysis of prominent car-free developments in Europe and the USA (Foletta and Henderson 2016). In parallel, the 2014 Davos Summit of the World Economic Forum asked that 90 trillion dollars should be dedicated to rebuilding cities as car-free (Edwards 2015).

The car is no longer universally seen as the road to modernity (Urry et al. in preparation) and most cities are assuming a less car-dependent direction. Below I present some elements which have already been put in place in some cities in order to engineer a car-free future, as they have been documented in the 'Car-free Observatory'.

Restrictions on car movement and parking

In most Chinese cities, car ownership is managed by restricting new automobile registrations using a system by which people bid money for a certificate allowing the purchase of a car (Newman and Kenworthy 2015). In the UK, congestion charging has been introduced in London and Durham, while Stockholm, Singapore, Milan and Gothenburg

have implemented similar schemes. The banning of cars for a certain number of hours on specific days already occurs in Athens, Beijing, Bogota, Mexico City, Santiago, Davis (US), and Sao Paulo. In some areas of Freiburg, Germany, vehicle circulation is permitted at walking speed but no parking is offered. In the UK, restricting parking is a common mechanism for reducing congestion and improving air quality. Parking garages to limit on-street parking have been introduced in central business and residential districts in cities like Groningen and Barcelona (Ortegon and Popan 2015). Most significantly, Singapore is the first country in the world to prohibit, from 2018, its citizens from buying private cars (Lahiri 2017).

Sharing bicycles

Helsinki is planning to develop an app enabling citizens to order a shared bike, car, taxi, or find the nearest bus or train and the city hopes to make it unnecessary to own a car by 2025 (Greenfield 2014). Also, the business of bike sharing is booming worldwide: there are more than 1,000 public bike-share schemes in more than 50 countries. Europe's biggest scheme is the Paris Vélib' (more than 20,000 bikes), while Hangzhou in China hosts the world's largest system (over 60,000 bikes) (Nikitas 2016). Increasingly, cargo bikes are also made available for sharing: in London, Hereford, Cambridge, Vienna, Cologne, Paris and Bern residents can hire them to carry heavier stuff (https://www.cargobikefestival.com).

Better infrastructure for walking and cycling

Cities increasingly reclaim spaces for pedestrians and cyclists from the car, proposing visions of 'walking and cycling cities' in central areas, in new housing developments and in

the proximity of public transport. In Madrid, for example, there are plans to pedestrianize much of the central area within five years, with many major streets redesigned for walking instead of driving. Oxford Street in London will be pedestrianized by 2020, while the municipality of Paris recently announced plans to permanently pedestrianize the city centre (Willsher 2017). In Hamburg, the municipality plans to create networks of green spaces filled with parks, playgrounds and promenades in order to transition 40 percent of the city to being car-free by 2034 (Ortegon and Popan 2015). Also, as already highlighted in chapter one, many cities have installed bike lanes, some of which are segregated from car traffic.

Careless car-free?

The car-free cities that the initiatives gathered in our Observatory are characterised by a series of features, which range from revived and lively public spaces and streets, to public buildings facilitating access and sociability, to areas designed to ease non-motorized movement. In these visions, cars are more and more costly and impractical to operate, while other slower forms of mobility are becoming more appealing. The housing facilities that such car-free environments will make possible are more people-centric, while their density and design will encourage face-to-face interaction. Streets will be increasingly repurposed for the use of people and not cars which over time would disappear (see Foletta and Henderson 2016; Newman and Kenworthy 2015; Crawford 2000).

Even as it advertises all these optimistic and positive images of the future, the car-free utopia is unlikely to completely avoid a significant number of wicked problems, something

which the existing literature has not yet fully addressed. Foletta and Henderson (2016) acknowledge, for example, that low car developments are generating social problems such as displacement, gentrification and housing affordability, arguing for the need to ensure that 'all income levels can enjoy' a 'car-free lifestyle' (2016: 7), but they do not address these important challenges in detail. Similarly, Melia (2010) notices that while at least in Europe there is a potential market for housing in car-free areas and that 'anecdotal evidence' suggests that property values are higher in such developments, there are no specific studies yet on the topic. More generally, the urban density that car-free developments presuppose can have a negative effect on social diversity: density causes land values to increase so much that they lead to poorer people being displaced as rents become too high (Sassen 1994).

But while advancing these utopias of car-free cities, even more important debates seem to be marginalized, which are those concerning the unfettered growth of both mobilities and economies. Few of the car-free visions challenge what Whitelegg (2015) has termed a 'mobility growth paradigm', which inextricably links more urban mobility to economic growth and economic performance. Most efforts to reduce motorized transport insist that the decrease in car use should not hamper the growth of economies. The overwhelming consensus is that it is possible to decouple the transport growth from the GDP growth. For example, the European Council states in a policy document that '[a]ction is needed to bring about a significant decoupling of transport growth and GDP growth, in particular by a shift from road to rail, water and public passenger transport' (2001: paragraph 1). Researchers in academia advance a similar argument. Tight, Delle Site and Meyer-Rühle (2004) have identified a series of transport policy measures that could help decoupling transport

demand and economic growth. Some of the measures can be found in many car-free initiatives: car sharing, controlled parking zones, car-free housing, road pricing or speed limits.

The arguments that car-free futures represent the ultimate solution to reducing traffic congestion and keeping the economic growth steady are thus manifest in most of these visions. Accordingly, whatever form it takes, be it motorized or non-motorized, urban mobility must not question 'the religion' of economic growth. And fervent car-free advocates such as Newman and Kenworthy seem convinced by this growth 'necessity' when they claim that 'decoupling economic growth from automobile dependence is now happening not only in the world's developed cities, but in the emerging cities of the world' (2015: 103). But their argument is missing precisely the point I make in this thesis, and which will be developed in more detail in chapter seven: that urban mobilities must be valued beyond just their input to the economy.

Thus, car-free visions too often seem to be embedded in unchallenged visions of economic growth. The task that my work assumes is precisely to challenge the idea that urban mobilities should be valued solely against this single quantifier. The utopia of a slow bicycle system imagines urban futures no longer dependent on the automobile, but, most importantly, this biketopia aims to reconfigure the nature of mobility itself, away from narrow utilitarian purposes and towards more embodied, sensuous and sociable mobilities.

Conclusions: Beyond cars, beyond growth

In this chapter I have described two of the mobile utopias into which the current system of automobility could metamorphose in the not-too-distant future. On the one hand, there is the technology-driven autopia of shared, autonomous, networked and electric cars promising fewer road accidents, less pollution, less 'dead time' on the road. On the other hand, there is the car-free utopia, featuring human-sized cities whose mobilities would supposedly restore the public function of our streets.

I have firstly argued that, at least in its current form, automobility has reached an impasse which is increasingly difficult to disregard. Unlike during the previous decades, its critique does not reflect only social and environmental concerns, insisting exclusively on the destruction of urban public spaces, pollution or climate change. More recently, it became clear that the car effectively hinders cities from operating efficiently and obstructs economies from their 'natural' growth. To solve this conundrum, a future of electric, autonomous and shared automobility is often presented as the desirable route to follow. This chapter has demonstrated instead that this 'smart car' future could exacerbate traffic congestion, increase privacy issues and impact negatively upon human senses and sociabilities.

An alternative to the 'smart car' futures is represented by the car-free initiatives, upon which I have focused on the final section of this chapter. I have offered a review of the most recent car-free actions from across the world, highlighting measures such as restrictions on car movement and parking, providing better infrastructure for walking and cycling,

promoting public transportation and car and bike sharing as alternatives to car use. I have nevertheless demonstrated that, despite their commitment to reduce car dependency, these initiatives are not challenging automobility upfront, but rather try to manage the 'car problem'. The car-free movement is thus unlikely to significantly contribute towards a bicycle system.

While both the 'smart' automobility and car-free utopias remain silent on several issues, the most important for this thesis is that of growing mobilities and economies. The two future visions are promoting more and faster mobilities, something which is not socially sustainable. The bicycle could embody a different promise, involving human powered, more embodied, more sociable, and above all, slower mobilities.

Chapter 4: Utopias, dystopias, biketopias

There is an interesting if not troublesome paradox today in the way in which ordinary cycling takes place in most urban environments across the world. On the one hand, there are the relatively high speeds and levels of confidence which are required to negotiate urban traffic, which have a detrimental effect both on the overall levels of cycling and the demographics of those who ultimately adventure in the practice. With the anecdotal exception of cycling countries, the pedalling populace is predominantly male, young and relatively fit (for the UK context, see Aldred et al. 2016). On the other hand, most of the political efforts of the last two decades or so to increase everyday cycling are concerned with making cycling a 'viable alternative' to using the car, at least for the shortest urban trips. But in doing so, speed is rarely placed under scrutiny, as it is unanimously assumed that cycling should be as fast as possible. This becomes visible particularly when considering the notions of 'convenience' and 'directness' which permeate most design manuals for cycling infrastructure (see CROW 2007, the *Dutch Design manual for bicycle traffic* whose guidelines are currently inspiring most bicycle plans in the Western world), or the vocabulary deployed to define provisions such as 'cycle superhighways' or 'bike autobahns'.

But how can one address this paradox of urban mobility policies promoting fast cycling and the visible negative consequences of fast mobilities in cycling uptake? This thesis has started with a prologue that set up the architecture of a slow bicycle utopia as it could look like in the year 2050. That imaginative section derailed the future of urban mobilities from

their current path and advanced instead another vision, not only with fewer cars and more bicycles, but also with lower overall velocities. The rationale behind such a dramatic change was briefly sketched and involved a mix of motives: from shorter travel distances and better integration of cycling with other means of transport, to the transformation of work practices and the impact of universal income upon the need to commute to earn a living, to the reappraisal of senses and sociabilities by bicycle, which further scrutinize the practices of fast cycling.

In this chapter I expand this initial discussion and further propose the necessity of a slow bicycle system. I show not only that fast cycling excludes most of the population and deteriorates the quality of public spaces, but, equally important, I contend that the speed imperative is damaging at a broader social level, as it further validates and sustains utopias of unfettered economic growth. This utopia is reflected not only in the effective speed of cycling mobilities, but also in the numerous ways in which more general production and consumption practices have co-opted cycling into the growth paradigm. History is important here, as it teaches us that what constitutes a cycling utopia has constantly changed over time: the alternating fast and slow utopian visions show us not only that the future must be open, but also that any utopia, be it slow or fast, is always provisional.

In her book *The Concept of Utopia* (2010), Ruth Levitas proposes a definition of utopia that considers three essential aspects: *content*, *form* and *function*. The *content* of utopia is useful here because what constitutes an ideal of 'the good society' rarely accommodates everyone's preferences. 'There is a common assumption that utopia should be a portrayal of the good society. It is however obvious that this will vary, being a matter not just of

personal taste, but of the issues which appear to be important to different social groups, either in the same society or in different historical circumstances' (Levitas 2010: 4-5). There is not a single bicycle utopia to which humanity has subscribed unconditionally. For some and at certain times in history the bicycle conveyed desires of emancipation and progress, while for others, in other times, it simply translated as backwardness or, on the contrary, simplicity and conviviality.

The second aspect of utopia, which is its *form*, refers to the manifold manifestations of the utopian imagination, which should not be relegated to literary texts alone. Modern constitutions, political programs, intentional communities, even daydreaming must also be regarded as utopias. Levitas thinks that 'depictions of the good society do not necessarily take the form of literary fictions (…) Broader historical comparisons require more inclusive definitions, to accommodate changes in the way in which aspirations for a better life may be expressed' (2010: 5). The bicycle utopias can be found in the largely peripheral science fiction literature of the last few decades, which imagines post-car, sometimes post-apocalyptic, and consequently pedal-powered futures. But they are also visible in the actual 'bike boom' of the late nineteenth century, which nourished equally utopian ideals of modernisation and industrialisation. Or, more recently, in the urban mobility plans associating cycling with visions of development and economic growth.

A third way of defining utopia is in relation to its *function*, which refers to the role that utopia is supposed to fulfil. For this, of course, we must go beyond the common understanding that sees utopia as something useless. The function might be that of compensation or a form of escapism, a critique of the present, an anticipation of change or

the education of desire for social transformation. While these functions vary substantially over the time, we can see how, depending on the fluctuating popularity of cycling in history, bicycle utopias served different goals. They were anticipating change, as was the case during the bike boom years or more recently during the so-called cycling revolution. Or they were alternatively fuelling escapist desires, something that continuously happened ever since the dawn of the automobile age.

Thinking about bicycle utopias in these three ways allows us to consider an extensive range of utopian formulations of cycling futures. Distinctive ideological sensibilities associated with cycling become thus more visible, and so does the multitude of expressions, some artistic, others, on the contrary, very pragmatic, through which cycling relates to desired futures. At the same time, we can establish to what degree the bicycle utopias investigated in this chapter can produce social change.

The predominant representations and practices of cycling as everyday mobility are taking as a given the categories of travel speed and related economic productivity and growth. Their immutable utopianism is often seen as something widely valued across societies. These fast and growth-driven future imaginaries have greatly contributed to the initial bicycle boom of the 1890s and have also greatly pushed for the reappraisal of cycling as alternative urban mobility since the dawn of the twenty-first century. Nevertheless, slower, more sociable and convivial bicycle mobilities, alongside different visions of less growth-driven societies, have always existed, albeit not received due consideration. Social movements such as feminism, socialism or environmentalism have keenly appropriated the

bicycle throughout history. They have thus suggested that alternatives to capitalist relations can be conceived, and have shown that cycling plays an essential role.

In this chapter I address the ambivalence of the bicycle and cycling throughout the history to demonstrate that there is nothing 'natural' about what they have come to represent today. First, I show that in the late nineteenth and early twentieth century the bicycle was synonymous with modernity, social and technological progress, and capitalist mass production and consumption. In a second section I argue that some of these ideals have been recovered in the last decades, as the bicycle represents today an effective tool to keep cities functional and its citizens healthy. Finally, I demonstrate that these bicycle utopias of fast mobilities and productive societies have largely contributed to the rise of automobility, which gradually replaced in the twentieth century an allegedly 'outdated' technology. But equally importantly, the fast cycling was challenged by alternative visions of cycling futures. Environmentalism and anarchism have imagined slower and more convivial bicycle utopias, both in the forms of protests and direct action initiatives, as through various artistic expressions.

In praise of slowness

Fast cycling has a detrimental effect not only on the diversity of those who ride bicycles on the streets of most contemporary western cities, as I mentioned at the beginning of this chapter. The argument for a slow bicycle system goes beyond considering the mere capabilities of individuals to accommodate their cycling to the current velocities of urban mobilities.

Cycling at a slower pace than the car traffic or the sporty lycra-clad cyclists making up for most bike commuters in cities such as London also means to prefer a speed that is more natural for the human body. Instead of offering a gruelling experience, a slower cycling re-awakens the multitude of bodily senses which are otherwise numbed inside the automobile. Also, opting to slow down by bicycle allows for more meaningful appreciation of the urban environment. Similarly, the sociabilities in which, unlike car users, cyclists often engage in, demonstrate that slower cycling enables playful interactions with other cyclists, conversations, as well as the transformations of the utilitarian space of the road into a more socially open space.

But the importance of slower cycling exceeds the experience of those who opt for gentler mobilities. I argue that the investigation of slower mobilities is essential to propose alternatives to contemporary growth-oriented capitalist societies. Slower cycling is embedded in constellations of social practices which oppose the current unsustainable levels of production and consumption[5]. A slow bicycle system can contribute to establishing a norm of sufficiency (Gorz 2010) which is essential to avoid both economic and ecological catastrophes.

Despite the positive qualities of slow cycling, they are still marginalized within the dominant narratives and mobility practices. This thesis argues nevertheless that such unrushed cycling is already occurring in places such as Denmark or the Netherlands, where

[5] Although, the slower cycling unfolding in Amsterdam or Copenhagen produces nevertheless growth economies. While aspects such as the urban form, the materialities of both bicycles and road infrastructures or the mobility cultures in these cities engender overall slower velocities, cycling remains nevertheless embedded in much broader growth-oriented discourses and practices of production and consumption.

municipalities address these tendencies by providing more generous road spaces for cycling in the form of conversation lanes (explored in more detail in chapter six). But the quest for slower cycling is also visible in the practices of individuals in these countries, who ride heavier and more comfortable upright city bicycles than in other countries. Similarly, the use of cargo bicycles to ferry children around, which is very popular in Dutch and Danish cities, indicates that slower cycling is not only possible, but it happens on a regular basis. The elements of a slow bicycle utopia are apparent even outside these consecrated 'cycling countries', as I have discovered throughout my research. The investigation of group cycling in chapter six uncovers the multiple ways in which corporeal proximity encourages in certain situations a gentler cycling pace.

Thus, the fast bicycle utopias investigated in this chapter are not given a free pass to go down the cycle superhighways of economic growth without contestation. Utopia as a method challenges, through its archaeology, the naturalized assumptions of the good society embedded in ideology and common sense. While the inequalities, exclusions and environmental damages produced by the fast and growth-driven mobilities are exposed, architectural modes of utopian reconstitution are proposed as potential alternatives. Slow cycling mobilities bringing about and arising within de-growth rather than growth-oriented economies and societies could open possibilities for substantially different futures. At the same time, advancing these slower alternatives necessarily involves highlighting the strengths, as well as the flaws that they encompass.

Early biketopias of modernity and progress

In the first chapter I described the global resurgence of urban cycling as I presented a short historical account of the fluctuating popularity of the practice, the changing profile of practitioners, as well as its manifold meanings. Cycling transformed from bourgeois pastime in the late nineteenth century, to working class mobility means of choice until the Second World War, to leisure activity again, as well as a poor man's transportation, during the second half of the last century, to the environmental and sustainable practice that it is today. Various utopian visions of bicycle systems, then and now, have formulated their own ideals of better worlds. Sometimes, these visions were hardly congruent if not outright conflicting.

Utopian visions of unhindered technological progress and development were already present in the mass production and consumption of bicycles, which began with the 'bike boom' of the 1890s. During that time, the 'safety bicycle', featuring equal-sized wheels, drive chain and pneumatic tyres, became popular. Modernity and, most notably, automobility drew many of their ideals from the practices, meanings, materialities and infrastructures assembled around the bicycle: the production line, the advertising strategies, the building of roads and various bike components later used in the production of cars and in the improvement of maps and road signals (Reid 2015a; Héran 2014; Furness 2009). The dawn of mass-produced bicycles coincides in this sense with the time-space compression of modernity (Harvey 1989) that witnessed the speeding up of both production and consumption of goods, as well as the consequent ever expanding rate of economic growth.

Today, a world where the social and economic are revolving at the speed of bicycle production, consumption and use is inconceivable. Yet, this was very much the reality less than 150 years ago. A third of all new patent applications in the United States were cycle-related at the turn of the nineteenth century, while in Britain half of all the patents filed in 1896 were for improvements in cycles (Reid 2015a). Assembly-line manufacturing and the idea of planned obsolescence were first related to cycling as 'the weight of an average Safety bicycle fell from 42 pounds (19 kg) in 1890 to 22 pounds (10 kg) by 1895. The constant innovation made cycling very attractive, with frequent launches of new products that improved – or claimed to improve – on earlier models making them lighter and faster' (Reid 2015a: 192). In the US, the cycle industry was one of the biggest in the country, with high specialized machineries developed for the mass production of bicycles (Herlihy 2004). The biggest bicycle factory, Pope Manufacturing Company, experimented with mass production and consumption even before Henry Ford started manufacturing cars (Norcliffe 1997). Colonel Albert Pope created a system that 'involved advances in functional specialization and vertical integration, considerable technological innovation, major advances in the interchangeability of parts, innovative use of advertising and promotion of mass consumption, and the development of a corporate culture that sustained the system' (1997: 268).

Bicycle, the new poster boy

The advertising techniques used by the cycling industry were considered innovative and heralded the era of mass consumption. The bicycle was the first durable luxury item that

was mass marketed as 'producers and retailers blanketed newspapers with advertising, and advertised heavily in the "new media" of their day, magazines, helping to usher in a new era of advertiser-financed media' (Vivanco 2013: 48). According to Ross Petty (1995), the cycling boom set the scene for what later became the modern advertising and marketing industries:

> The bicycle advanced the practice of advertising by developing competitive content, using images in posters, developing research techniques to determine effectiveness, and supporting an emerging media platform: magazines. The industry also developed new promotional techniques, including sponsoring racing teams and obtaining celebrity endorsements. It perfected the trade show and annual model changes. Most significantly, the bicycle of the late 1800s was marketed using segmentation techniques that have been thought to be of more recent origin (1995: 32).

The utopia of autonomous mobility, which became even more prominent with the advent of the car, was often spelled out through the then new advertising poster, as the bicycle industry commissioned artists and illustrators to advertise their products in magazines, on billboards, and behind shopping windows (Herlihy 2004). These posters were thus arguably selling utopias in a different, more imaginative form than the ones afforded through the mundane practice of cycling. The advertising images were often depicting sensual women, represented either as goddesses or warriors, riding or flying their bicycles, so alluding to the liberty and the freedom of movement that cycling suddenly made possible (Illustration 4.1). Key features of the system of automobility were thus put into place during the bicycle era and through such means of advertising, including 'the construction of a mobile subjectivity, the development of an entire meaning system around personal

transportation, and the disciplining of bodies and the environment in service of autonomous mobility' (Furness 2010: 17).

Illustration 4.1: Advertising posters for bicycles from 1890s by Jean de Paleologue (bicyclingart.com).

Smoothing the road ahead

The bicycle paved the road for the automobile not solely by perfecting processes of mass production and consumption. In parallel with the innovations from bicycle manufacturers, culminating with the 'invention' of the safety bicycle, another step towards comfortable cycling came from the early cycling clubs, both in Western Europe and North America, that

campaigned for better roads. In the UK, the main cycling organisations (Cyclists' Touring Club and National Cycling Union) established in 1886 the Road Improvement Association, which lobbied both for better-administered and better-kept roads (Cox 2011). The bicyclist was considered an active agent of progress, bringing 'the road once more into popular use for pleasure riding; who made people aware both of the charm of the English highway and of the extraordinary local differences in the standards of road maintenance' (Webb and Webb 1913 as cited in Reid 2015a: 132).

The League of American Wheelmen proclaimed in 1889 the fundamental importance of roads not just for cyclists, but for modernity itself: 'The road is that physical sign or symbol by which you will understand any age or people. If they have no roads they are savages for the road is the creation of man and a type of civilized society' (quoted in Norcliffe 2001: 150). Touring Club de France similarly asked for smooth surfaces on the side of the roads or even for 'cycling pavements' (Héran 2014), while the Dutch ANWB (The Royal Dutch Touring Club), the Touring Club Italiano, and the Dansk Cyklist Forbund were amongst the first in their countries to pressure governments for road improvements (Oldenziel and de la Bruhèze 2011).

As the bicycle boom ended at the turn of the nineteenth century, both in Europe and North America, cycling was already a common practice in most of the Western world. The falling prices resulting from the boom and the outbreak of the First World War produced a democratic expansion in the accessibility of bicycles that further fuelled other strands of utopianism: the bicycle became an important drive within the cultural and political worlds

of socialists and feminists, both in North-Western Europe and North America (Horton 2006).

At the same time, the utopian promises of technological progress or unfettered autonomous mobility formulated during the golden years of the bicycle boom proved to be problematic. The extraordinary advances in mass production that the bicycle industry made possible may have empowered entire Western societies to travel on two wheels. The heartfelt and effective campaigning for better roads may also have connected places in ways which were not possible before. But, ultimately, these important feats have largely turned against cycling as they paved the roads for cars (Reid 2015a). Behind the utopianism of the bicycle boom of the late 1800s and subsequent mass cycling from the first decades of twentieth century, not only was the new world of automobility slowly coming into existence, but also the processes of mass production and mass consumption that would underpin modern capitalism. Most importantly, with cycling demanding and benefiting from better road infrastructure, it also becomes clear how the practice itself was intimately connected, ever since that period, to the very social dynamics of speed and economic growth which this thesis criticises.

While the automobile gradually embodied the utopian desires that were once associated with the bicycle, cycling lost its modernist appeal and its promises of technological progress. The content of the bicycle utopia changed dramatically: after the Second World War, cycling was systematically rejected from most visions of the future. Progress and prosperity were no longer compatible with the bicycle. Instead, the aspirations of unrestrained and autonomous mobility it encapsulated, and suggestively conveyed,

amongst other techniques, through the compelling advertising posters from the 1890s, turned into representations of slow and backward mobilities, relegated to pastime, childhood or deviant subjects. This is particularly visible in in TV and cinema productions such as *Pee-wee's Big Adventure* (1985), *In and Out* (1997), *The 40-Year-Old Virgin* (2005) or *Premium Rush* (2012), where the protagonists are presented 'as boyish misfits and/or sexually "deviant"' (Furness 2009: 111).

The utopias of fast and autonomous mobilities and of ever expanding economic production represented the very core of the late nineteenth century 'bike boom'. The world has changed dramatically in the ensuing century and a half, and so did the role of the bicycle in shaping the future. But the last few decades have seen a revival of cycling in urban areas and drawing comparisons with the golden age of 1890s, as well as the early decades of the twentieth century, is becoming common. While the scale of the practice is hardly the same, many of the aspirations conveyed then by the bicycle are to be found again all around us. Cycling might be important for many reasons today, but keeping the cities moving effectively and the economies running smoothly have gradually become essential discourses and practices associated with the bicycle.

Fast cycling for urban regeneration and growth

Increasingly, the bicycle utopias of fast mobilities, economic and technological developments are being reinvigorated today in what many see as a 'new bike boom' (Reid 2017a) and a 'pedalling revolution' (Mapes 2009). More than half a century of automobile dominance appears to be coming to an end, at least in the Western world and at least for

the shortest of urban journeys. The last two decades have witnessed a 'cycling renaissance', which I have documented in the first chapter. While the urban conditions today differ greatly from those of the late 1890s and early twentieth century, both in terms of the means of locomotion in use and the travel distances, the 'biketopias' that are emerging through the cracks of automobility are strikingly similar to their previous instantiations.

The fast cycling, contributing to growing the economy, is not much different today than it was a century ago, particularly if we consider the uptake in the practice. Despite the conspicuous lack of data across the Western world on cycling for most of the first half of the twentieth century (and even later), a positive trend in cycling can be observed both in the period between 1920s and 1950s, as well as in the last two decades. Oldenziel and de la Bruhèze (2016) suggest this in the graphic below which features cycling's share of traffic and trips in fourteen European cities from 1920s until today (Illustration 4.2). They notice that 'cycling stayed at a relatively high level until well into the 1950s and even 1960s, before hitting rock bottom a decade later. Over the past twenty years, we see either stabilization or steady growth' (2016: 12). Similarly to the previous century, the bike boom of the last decades has fed a wide range of utopias.

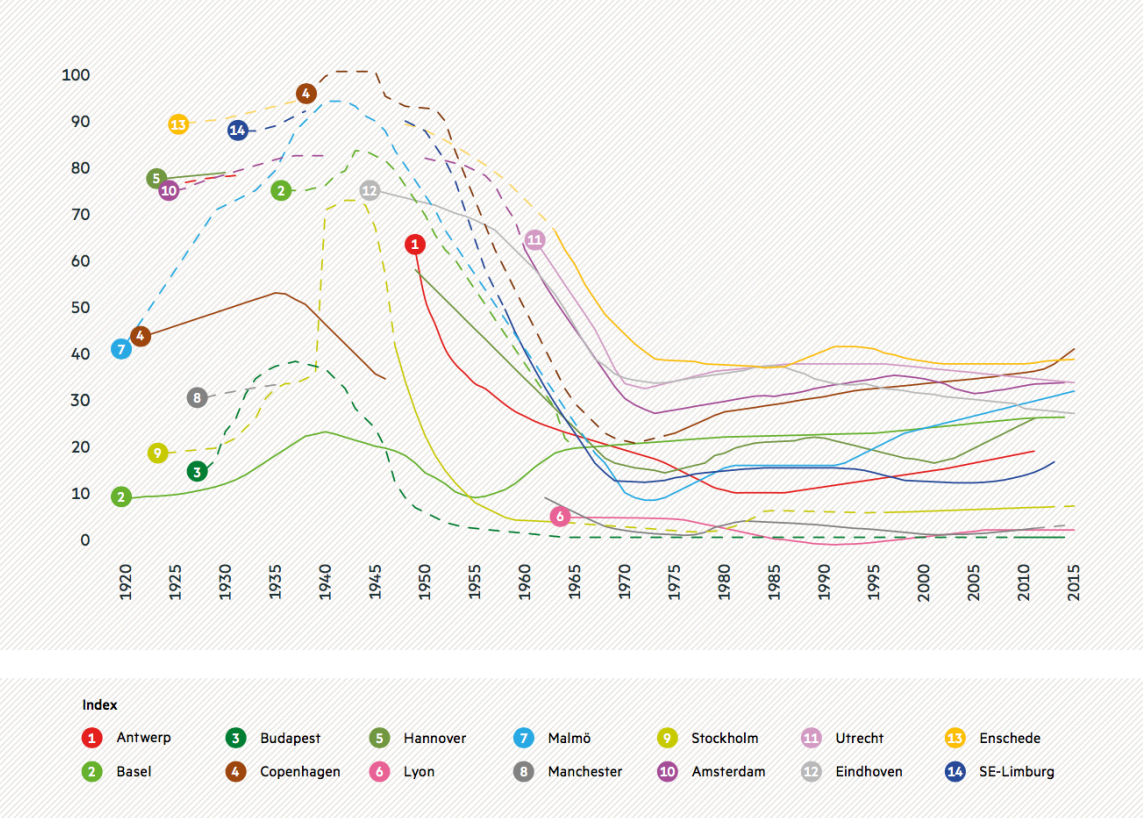


Illustration 4.2: Evolution of cycling levels in fourteen European cities from 1920s until today. Reproduced from Oldenziel and de la Bruhèze (2016). The positive trend in cycling in the period between 1920s and 1950s was nevertheless hampered by the Second World War. For instance, bike use in cities such as Amsterdam was hindered at the time by the lack of tyres and spare parts (Jordan 2013).

In this section, I show that the ideals of fast cycling are not only excluding various users, as already argued, but that they are also feeding into broader utopias of urban regeneration and development and economic growth. A critical investigation of the ideals of the good society immanent in each of these utopian constructions is proposed. I examine three areas where speed is constructed today as a positive value for cycling and, while doing so, it legitimises the ideology of economic growth. These are the cycling infrastructure, the bicycle design and the cycling economy.

Superhighways for two wheels

The most courageous and heavily publicised visions of cycling futures come these days in a similar form as the one envisaged by H.G. Wells in his oft-quoted line 'Cycle tracks will abound in Utopia' (1905: 55). Cycle superhighways, segregated from car traffic, even suspended above ground level are the favoured representations of many urban designers and architects (Illustration 4.3). From the few details of such future worlds we can nevertheless gather that, apart from the ingenious setup of the cycling infrastructure, much of the cycling itself is similar to what we have today: in these future visions the overwhelming majority is represented by young and athletic male cyclists, commuting at a fast pace, hardly engaging in any sociable encounters. As indicated in the prologue, the reality of 2017, upon which I have then built the slow bicycle utopia of 2050, is not much different from the visions above: both are promoting fast cycling and neither of them are contesting the place of the automobile in the urban realm.

Illustration 4.3: Bike lanes, based on steel wires (https://kolelinia.com); bike paths in abandoned tube tunnels in London (https://gensler.com); floating bike highways on Thames (https://thames-deckway.co.uk); SkyCycle proposes a network of cycle routes above the trains in London (https://fosterandpartners.com).

Going beyond these future visions, today cycling as fast mobility is intensely advocated and performed through the everyday practices of cyclists, transport engineers, designers and policy makers. The European Commission, for example, acknowledges that 'a bike is faster than a car over short urban distances (5 km and even more in the case of traffic jams)' (1999: 10). More specifically, Jensen et al. (2010) have shown that in downtown Lyon, France, bicycles now compete with the car in terms of speed. Similarly, small scale demonstrations in New York were conducted to show that a morning race between a cyclist and a driver over five kilometres would be won by the former (Lee 2008).

The current utopias of fast everyday cycling are perhaps best formulated in the rise of segregated cycle lanes in many Western cities. Often branded as 'superhighways', they are not very visible yet, as the relatively high costs of implementation and the low social

acceptance still represent significant obstructions. Yet in the cities where these projects are given due consideration, the lobby supporting them as well as the policies underpinning their alleged necessity constantly highlight the fast mobilities that they enable. The Danish already have access to 30 km of Cycle Superhighways and plan to create a network of almost 500 km (Kildergaard Groot 2015). The Dutch intend to build 575 km of Snelle Fietsroutes ('fast cycle routes') by 2025 (ECF 1014a). While the German 'bike autobahn' plans to cover 101 km by 2020, from Duisburg to Hamm, in the West part of the country (Ruiz 2016).

The city of London clearly states that cycling infrastructure is good for business: 'cyclists visit a neighbourhood's shops more often than drivers or public transport users, and spend more overall. Cyclists travel shorter distances to shop than drivers. Cycling can help save precious, but endangered, pubs and small shops' (Greater London Authority 2013: 30). Furthermore, the recently built Cycle Superhighways, which are segregated bicycle lanes, are 'expected to enhance the attractiveness of the urban realm for walking and cycling which is likely to strengthen the economic vitality of commercial streets, and is seen as an important means of sustaining London's competitiveness as a place to do business' (TfL 2015: 63). As Spinney (2016) notices, what we can see at work here is a conceptualization of cycling through a narrow productivist framing, both materially and discursively: 'A prominent outcome of the linking of cycling with improving labor productivity or enhancing health in the form of promoting commuting cycling is that certain types of cycling are promoted as more productive and therefore more important than others' (2016: 456).

The situation in London is not singular: across the Western world bicycles play an important role in contemporary urban revitalization and liveability initiatives, by attracting service workers, investment, and tourism (Vivanco 2013). In the USA, the expansion of bicycle infrastructure goes hand in hand with the return of capital to urban cores, all the while contributing to race and class segregation (Hoffman 2016; Stehlin 2014).

Having said that, the fast cycling which is partly facilitated by the segregated infrastructure, should not be understood as entirely a bad thing. As Fincham (2007) shows in relation to the subculture of bicycle couriers, part of the enjoyment of this job is closely related to riding at fast speed. One of his subjects describes her experience as a messenger: 'I loved it. Absolutely loved it. You get to cycle as fast as you can and get paid for it. It was just lovely' (quoted in Fincham 2007: 200). The thrill of speed, its vitality, the accelerated heartbeats translate into positive emotions and sensations that are enabled by cycling fast, and they cannot be neglected.

Two wheels good, three wheels bad

Another way in which the current cycling infrastructure favours faster mobilities over slower ones also takes place through its very design. Most of the bicycle lanes in Western cities, be they segregated or not, are conceived with a narrow understanding of how a bicycle should look, as well as who is the cyclist. The vast majority of cycling policy documents and design guides in the UK only feature images of two-wheel cycles despite the fact that there is a remarkable variety of three-wheel cycles including tricycles, cargo bicycles, velomobiles and disability bikes (Hickman 2014). Thus, the resulting cycling

infrastructure, to the extent that it is built to protect cyclists from car traffic, limits the access of all these other cycles. The possibilities for less able people who are often riding such slower cycles are very limited under the current fast cycling regime.

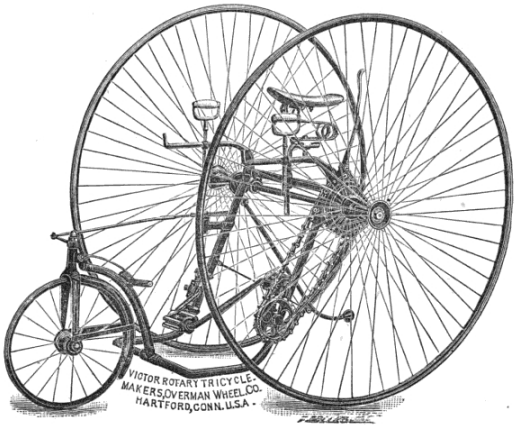
The two-wheeled cycle, ridden in an upward position, which represents the norm today has a longer history, that can be traced back to the 'invention' of the safety bicycle in 1890s (Illustration 4.4), when the 'stabilisation' and the 'closure' of the technology took place (Bijker 1995). Important social, political and economic structures began forming at that time around a certain technology or design, in this case the bicycle 'as we know it' (Vivanco 2013). It is argued that the safety bicycle has closed the venue for alternative designs:

> as manufacturers and investors made important financial outlays in certain kinds of machinery and standardized production processes; as laborers began to organize into industrial worker unions in bicycle factories; as upper and middle class people latched on to the bicycle as a way to show their social distinction and progressive modern attitudes; as women began appropriating the bicycle and influential suffrage leaders connected it to their claims for political and social rights; as a network of repair shops became established; as legal institutions began getting involved in regulating bicycle use; and so on, bicycle technology began to stabilize and close around the design and componentry of the safety bicycle (Vivanco 2013: 37).

Some of the alternatives to the safety bicycle could have enabled faster cycling, as it is the case with the recumbent bicycles (Illustration 4.4), while many more would have arguably made slower speeds the norm, as it is happening with the cargo bicycles or the tricycles (Illustration 4.4). Instead, the generally faster safety bicycle has prevailed and all the others

are nothing but niche categories today. This particular trajectory has, of course, had a tremendous impact on who gets to cycle, but also on what can be carried with a cycle.

Moreover, in the years following the Second World War, as cycling was progressively relegated to the domains of sport and leisure, the bicycle industry further contributed to speeding up the practice by almost exclusively focusing on producing and commercialising race road bicycles and mountain bicycles (Rosen 1993, see Illustration 4.4). These types of bicycles are still prevalent today in most of the urban areas, to the detriment of slower, less specialized and more comfortable city bicycles.



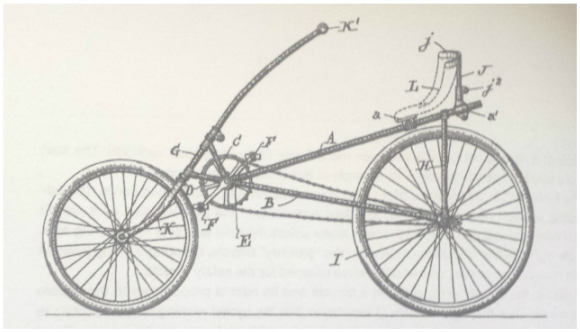


Illustration 4.4: 'Rover' safety bicycle from 1886 (reproduced from *Lexikon der gesamten Technik* 1901); The Coventry Rotary tricycle from around 1884 (reproduced from *Tricyclists indespensible annual and handbook* 1883); patent for a recumbent bicycle from 1895 (reproduced from Hadland and Lessing 2015);

‘Specialized Stumpjumper’ one of the first mountain bikes from 1981 (photo by Franklin Campbell: https://flic.kr/p/7BqDEv).

Most historical accounts regard the ‘closure’ of technology around the ‘safety bicycle’ as something akin to ‘the end of the bicycle history’. They insist on an evolutionary trajectory, which has been more recently criticised as counterproductive, because it has gradually led to the marginalisation of bicycles as obsolete, inferior or failed technology (Cox and Van De Walle 2007). An implicit assumption of such historical accounts is that any move away from the ‘ideal type’ automatically means inferiority: ‘So the bicycle is at the end of its developmental cycle, and has arrived at its “definitive” shape, by the mid-1890s. The popular narrative tells of “a finished product”. Any further developments in this transport technology must involve radical progression from its definitive form by, for example, the addition of a motor to create a motorcycle’ (Cox and Van De Walle 2007: 116). But while this closure has framed the bicycle as inferior technology in comparison with the newly emerged automobile, I argue that there is something more here: the closure also established one ideal of the cycle, which is arguably faster than most of the ‘rivals’ it has superseded.

Runs on fat and saves you money

The promotion of speed as desirable for urban mobilities is loaded with aspirations of efficiency, effectiveness and utility. Progress and development are only considered possible if speed is not under threat. These assumptions are ultimately entangled with what is a utopia of unhampered economic growth. And while the speed of cycling mobilities is deeply embedded today in this overwhelmingly dominant discourse, an even more

obvious link with the priorities of economic growth can be seen in how a bicycle economy is promoted as a vital domain.

The cycling industry may no longer be today the behemoth driving entire national economies as it happened in 1890s, but its value is highlighted by more and more calculations going beyond simple cost-benefit analyses. Increasingly, cycling is being presented not only as the rational choice of individual subjects, something particularly reinforced within the current utility-dominated transport paradigm (Aldred 2014). Additionally, it is argued that cycling has an important monetary contribution to the larger economy insofar as the case for cycling also becomes a strong economic case for cycling. While such calculations do not necessarily translate into immediate investments in cycling provisions, their implied assumption is that increasing levels of cycling would certainly stimulate economic growth.

In the UK, it has been calculated that cycling generates £2.9 billion (3.2 billion euros) annually in the economy (Grous 2014). While in Europe the annual economic benefit of cycling is estimated at more than 200 billion euros (ECF 2013). This respectable sum was calculated by monetizing aspects such as health benefits, reductions in traffic congestion, fuel saving, reduced CO2 emissions, air and noise pollution, also complemented by economic estimates from the tourism and bicycle industry.

Linking cycling with both utilitarian and growth-oriented calculations is detrimental to the practice for several reasons. First, by putting an exclusive economic value on cycling, the other less quantifiable benefits are generally side-lined. From this perspective, it seems

that cycling only matters if it automatically translates into ‘utility’ trips, when it is obvious that many people cycle for leisure or to enhance their wellbeing, as it is the case with the less capable users. Secondly, and resulting from here, this monetization of cycling not only assumes that the practice should be worthwhile from an economic standpoint, both at individual and social levels. It also legitimizes a utopia of unbridled economic growth.

The processes whereby the norms of fast and segregated bicycle lanes, of one-size-fits-all cycles and of utilitarian cost-benefit analyses for cycling investment came into being are complex. They are the result of entangling historical aspirations of autonomous mobilities, productive and effective cities and economies, with equally strong desires to push the bicycle outside the realm of everyday mobilities, and, at times, with discourses about how to make cycling safer and more enjoyable. Throughout its early struggles to win the hearts and minds of late nineteenth century urbanites or its more recent attempts to stay relevant and even regain lost ground cycling has nevertheless too often reflected the dominant ideology. In doing so, it rarely challenged the orthodoxies of fast mobilities and economic growth.

The utopias that cycling has nourished in each of the cases discussed so far seem to ignore critiques and alternatives. There are, nevertheless, times and places that have witnessed the possibility for different cycling futures and alternative bicycle utopias to navigate towards those futures. The content of bicycle utopias has shifted, at specific times and places in history. There are indeed some biketopias which can be slow and convivial, they can accommodate a variety of users and do not aim to strictly increase the economic outputs. They represent the focus of the next section.

Slow bicycle utopias

The fast, growth-oriented bicycle utopias are today the dominant representations of post-automobile futures. They are not significantly different from the ideals embodied by the system of automobility for more than a century now. Increasing mobility speeds for the overarching goal of making cities more economically effective is closing off possibilities for alternative, desirable futures, while insisting that the more probable and even the possible futures necessarily entail fast urban movement. These visions of cycling futures echo the post-car scenario of digital networks of control, developed by Dennis and Urry, who anticipated that 'the movement of vehicles would be electronically and physically integrated with other forms of mobility' (2009: 156).

Contrary to the dominant narrative proposed by Dennis and Urry, the alternative slower bicycle utopias I investigate here follow the other two scenarios that they advance. The dystopian 'Mad Max' vision, instigated by the general collapse of energy systems, could create the opportunity for a post-apocalyptic mobility system centred around the bicycle. In other circumstances, a more harmonious transition towards local sustainability and slower mobilities is anticipated.

Some of the slow bicycle utopias investigated in this section describe post-apocalyptic futures, characterized by simplicity and even austerity, where humanity seems coerced rather than compelled to reconsider human powered mobilities. On the contrary, other utopias emphasize not the scarcity, but rather the conviviality and simplicity of future bicycle worlds, arguing that the choice of such alternatives is voluntary. Similarly, some

slow biketopias are very visible, yet confined to specific times and places, as it is the case with the Critical Mass protests. While others are literary texts, graphic novels and other artistic productions.

What these slow bicycle utopias all have in common is their proposition to consider the bicycle beyond its strictly utilitarian function. Ultimately, these utopias hint to the possibility of imagining bicycle futures where fast mobilities and economic growth no longer represent the dominant social values.

Mad Max on a bike

In June 2012, cyclists from Portland were called 'to test their navigation, problem solving and load-hauling mettle' in a disaster exercise designed to showcase the relevance of cargo bikes to disaster relief (https://www.disasterrelieftrials.com). Four months later, some of the participants even applied their skills and knowledge in a serious real life situation as they mobilized to deliver relief supplies and information in the aftermath of Hurricane Sandy.

Such 'disaster relief trials' are now held every year in several US cities and the organisers believe cargo bikes are the perfect tools to create resilience in the face of climate change related disasters: 'Cargo bikes are light, small, and inexpensive yet highly capable of hauling big loads with relative ease. They operate efficiently without any power or sophisticated transportation infrastructure … These disaster response-compatible qualities need to be proven in dramatic style over and over again before we can permanently erode the "bikes

are toys" paradigm' (https://www.disasterrelieftrials.com). While the cyclists of Portland would argue that cargo bikes work best in times of sorrow, this is obviously not always the case with these sturdy bikes. On the contrary, in Denmark and the Netherlands, they are much more common and already contribute to a slow bicycle utopia as they are extensively used for non-motorized transportation of groceries and 'school runs'.

Yet, the idea that the bicycle can be the most reliable tool when energy and transportation infrastructure break down is not new. The science fiction literature of the last three decades has often placed the bicycle as the slow means of transportation that most people rely on when societies and industries collapse altogether. In a recent web graphic novel, *Bicyclopolis* (2015), Ken Avidor imagines a post-apocalyptic world where the bicycle remains the only option for transportation through the landscape of rusting wreckage of the industrial age, which is narrated through the eyes of a contemporary time traveller to a biketopia placed sometime after 2050.

Bicyclopolis is a remote city in Northern America, which has survived the massive methane emissions in the Arctic that lead to fuel and food shortages and threw the globe into chaos. The city experiments with a post-industrial local economy, based on a 'green belt' of kitchen gardens, vineyards and orchards which surround it. Windmills pump groundwater for irrigation and drinking water for the city, sheep and goats are grazed in a 'pasture belt', whereas a 'grain belt' of wheat, soy and corn is harvested using human-powered machinery. The city has an Ivan Illich Square and its main industry, bike building, is run by guilds which maintain high standards of production. Similar to Avidor's *Bicyclopolis* are some of the short science fiction stories, also in graphic format, edited by Elly Blue (2015).

The apocalypse presaged here by oil shortages also brings zombies into the script: ‘in the not-so-distant future, when gasoline is no longer available, humans turn to two-wheeled vehicles to transport goods, seek glory, and defend their remaining communities’ (2015: book description).

Avidor is perhaps the only science fiction author designing an entire local sustainable community around the bicycle. In this sense, Bicyclopolis functions as a utopian small scale society, which is largely cut off from the external world. The author does not insist much on the inherent tensions and inconsistencies within the biketopia, apart from the frequent conflicts they engage with the ‘Metrorians’ from outside, who are famous for their ‘messianic belief in the return of the age of automobile’ (Avidor 2015: episode 4, page 4). But the limitations of his bicycle utopia can nevertheless be noticed: for example, the bicycles are technologies serving both good and evil purposes. The citizens of Bicyclopolis use them to run mundane daily errands and to perform various pedal powered chores such as ploughing the land (Illustration 4.5). On the other hand, the rival Metrorian army is equally fitted with riding fast ‘battle-bikes exquisitely hand crafted by artisans’ which are ‘deployed in heavy bicycle cavalry regiments’ (Avidor 2015: episode 5, page 2; see Illustration 4.6). Weapons such as bicycle chain flails and even ‘bike bombs’ are part of the ammunition used by the enemies of Bicyclopolis, thus illustrating the ambivalence of the bicycle in Avidor’s graphic novel.

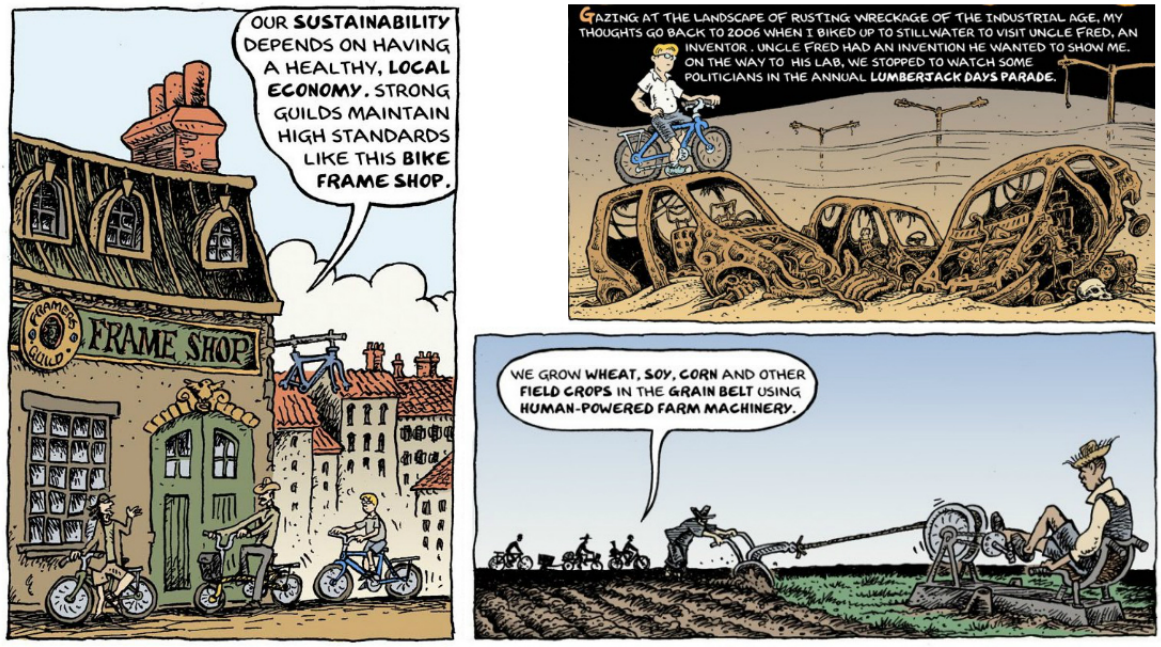


Illustration 4.5: A selection of strips from the web graphic novel *Bicyclopolis* (2015) by Ken Avidor.

Other authors are less preoccupied with presenting in detail a post-apocalyptic bicycle society; yet, the main characters in these novels still ride bicycles to move around in post-oil, post high-energy-density and often precarious futures. One of the protagonists of William Gibson's *Virtual Light* (1993) is a bike messenger, one of the few jobs left available in a dystopian world where the middle class has disappeared in the face of multinational corporations. Similarly, Stirling's *Die by Fire* (2004) describes a future where electricity, gunpowder, and other forms of high-energy-density technology no longer function, leaving humanity with no other option than turning to bicycles. Gibson and Stirling seem even less preoccupied than Avidor to portray the bicycle as a convivial technology that it is readily embraced by the heroes of their novels; instead cycling is presented as the last resort. To the extent to which we can consider them utopias, the function of both *Virtual Light* and *Die by Fire* is to anticipate change, which is perhaps in a greater measure feared than desired.

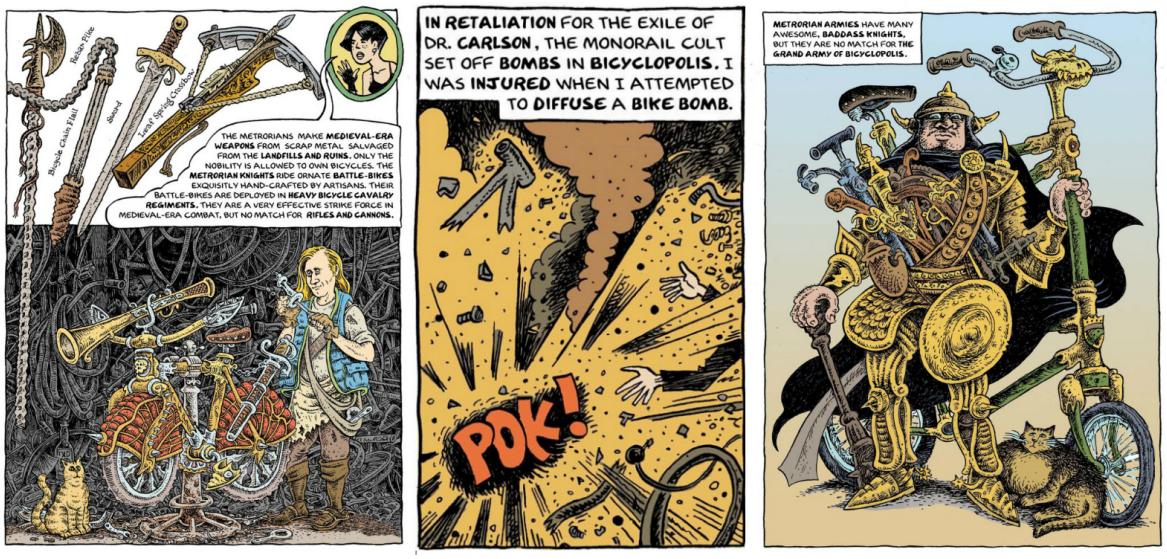


Illustration 4.6: A selection of strips from the web graphic novel *Bicyclopolis* (2015) by Ken Avidor.

I chose to include the above bicycle futures into a broader utopian framework despite the distinctions between utopias and dystopias in each of the cases. This inconclusiveness is apparent in two ways. First, for such cycling futures to emerge, all the novels assume that a catastrophe is necessary, which would ultimately bring about the collapse of most infrastructures, thus disrupting long-distance transportation and communication. The very idea of imagining a utopia relies then not simply on a mutual decision to pursue a better life, but on the very opposite of it, which is a social failure to 'save the future'. Second, and resulting from here, these utopias are by no means universal. The bicycle utopias proposed here are arguably working for some, but not for others: embracing the more simple, convivial, even austere ways of life is not everyone's kind of aspiration, as Avidor's Metrorians would surely argue. These blurry boundaries between utopia and dystopia seem to suggest that utopias describe provisional, fragile, ambivalent futures, rather than the sort of blueprints we commonly associate utopianism with.

Other works of science fiction literature avoid the catastrophism altogether when describing bicycle-powered futures. For example, the acclaimed novel *Pacific Edge* by Kim Stanley Robinson (1990) presents not a dystopia, but an ecological utopia whose inhabitants escape global collapse by repurposing present buildings, cities and infrastructures. The role of bicycles is not central though: they are briefly mentioned in the first pages of the novel when two characters, a building renovator and his girlfriend, ride a tandem bike to the beach, along the now deserted '55', one of the famous highways in contemporary California.

Another science fiction novel, *Childhood's End*, by Arthur C. Clarke (1953), was recently developed into an eponymous TV miniseries in which all automobiles are replaced with bicycles. This biketopia is made possible through a peaceful alien invasion of the Earth which brings peace and prosperity at the expense of creativity.

Both in *Pacific Edge* and *Childhood's End*, the bicycles are used uncritically as mere tokens for sustainable futures. This is partly explained by the fact that bicycles do not necessarily represent the focus of the two novels. But the broader discussion about how environmentalism is appropriating the bicycle is relevant here. It is with the advent of this activist movement, as well as anarchism, both taking shape in the 1960s, that the utopias of slow cycling began to emerge as well.

Convivial biketopias

H. G. Wells is cherished by most cycling enthusiasts for the famous line 'Cycle tracks will abound in Utopia' (1905: 55) from his book *A Modern Utopia*. Yet, this quote is misleading because Wells celebrates the overcoming of distances within an imagined utopian world state, driven by technological optimism. Thus, cycling is valued only from the perspective of accelerated hypermobilities of the Utopians and the cycle tracks are not meant to disturb other faster means of transportation. But three years later, in *The War in the Air* (1908), Wells is less optimistic about such futures: here the most advanced forms of transport lead to confrontations between far-flung people, increasingly put into contact with one another.

Unlike the science fiction literature mentioned in the previous section, of rather recent inception, Wells' slow bicycle utopia was conceived at a time when cycling was still benefiting from the 1890s boom. In 1908, cars were not yet dominating the urban landscape, but their menace was increasingly felt and the futurist clearly anticipated the dangers of complex technologies, motorization, hypermobility and increasing speeds. In this later novel, Wells foresees the First World War as he describes a future where motorized transportation, ranging from motorcycles, to cars and planes, offer on the one hand the ability to negotiate vast distances, while on the other they lead to violent confrontations between people and nations. In contrast, the bicycles used by the main characters to move about, both before and after the catastrophe of the war, are as effective as their motorized counterparts. Through the novel, Wells

> never associates bicycles with an unhealthy mastery of space or a dangerous shrinking of distance. The bicycle is, instead, an ideal form of transportation that provides its users with enough access to places like the restorative countryside surrounding cities but that does not promote people of different nationalities and regions coming into excessive, dangerous contact with one another (Withers 2016: 91).

It seems contradictory that Wells' slow cycling utopia was published at a time when the safety bicycle was articulating slightly different utopias of mass production and industrialization. Social movements such as feminism and later socialism embraced cycling as a symbolic and practical tool to express political visions and distinctive lifestyles, but their aim was mainly to expand geographical, social and political horizons at the turn of the twentieth century (Horton 2009). By the end of the nineteenth century the bicycle 'was both enabling privileged women to directly experience new freedoms, and had become symbolic of women's general push for greater freedoms' (2009: 4), while at the beginning of the next century the political importance of cycling lay 'with predominantly middle class Clarion cyclists seeking to convert "the masses" to socialism' (2009: 6). On the contrary, Wells' bicycle utopia was more akin to later social movements which, espoused bicycles to symbolise and produce 'a desired compression of everyday life, fitting an expressive politics concerned with authenticity, community and, and elevation of the "local"' (Horton 2009: 1). These movements, in particular anarchism and environmentalism, both re-emerged in the 1960s. It is through these anti-capitalist and green struggles that the most convincing slow bicycle utopias have been formulated in the more recent decades.

In the decades following the Second World War, dominated by increasing consumerism and the rise of automobility, a series of intellectuals have echoed Wells' ideas. The

philosopher Ivan Illich was the first not only to condemn the car and advocate cycling, but also to set the bicycle on a different path from that of economic growth, calling it the 'convivial tool' *par excellence*, which is capable of effecting autonomy from industrial productivity: 'Commuter transportation leads to negative returns when it admits, anywhere in the system, speeds much above those reached on a bicycle. Once the barrier of bicycle velocity is broken at any point in the system, the total per capita monthly time spent at the service of the travel industry increases' (Illich 1973: 79).

In another book, *Energy and Equity* (1974), Illich considers that the bicycle is the only vehicle capable of saving people from the 'radical monopoly' of the car, by effecting a dramatic reduction in energy use and the time spent working to pay for vehicle ownership. Participatory democracy, he says, 'demands low-energy technology, and free people must travel the road to productive social relations at the speed of a bicycle' (1974: 12). His ideal 'technological maturity' envisages a 'world of those who have tripled the extent of their daily horizon by lifting themselves onto their bicycles' (1974: 86). Going beyond this 'tripling' represents for Illich, as it did for Wells, unwarranted speeds and technological excess.

Bike spaces of hope

Even in their literary, ideational forms, these utopian visions of slow cycling mobilities, formulated by Ivan Illich and others, have certainly inspired factual – albeit scattered and limited in time – utopian spaces. The White Bicycle Plan initiated in the mid 1960s in Amsterdam and the ongoing Critical Mass protests, are two such legacies. With the advent

of the Provo movement in Amsterdam, formed by various anarchists and activists, the bicycle was officially acknowledged as the technological embodiment of environmentalism (Furness 2010). The Provos drafted the famous White Bicycle Plan, arguing for the ban of cars from the city centre and their replacement with 20,000 free bicycles provided by the municipality. They would be shared amongst Amsterdammers, thus proposing an alternative to the individual consumption promoted by automobility. After their plans were rejected, the Provos painted 50 bikes white and left them on streets for public use. The White Bicycle Plan was situated within a broader radical critique of capitalism, the use of public space and environmental pollution:

> PROVO's bicycle plan will liberate us from the car monster. PROVO introduces the WHITE BICYCLE, a piece of public property. (…) The white bicycle is never locked. The white bicycle is the first free communal transport. The white bicycle is a provocation against capitalist private property, for the WHITE BICYCLE IS ANARCHISTIC. (…) A BIKE IS SOMETHING, BUT ALMOST NOTHING! (Provo 1971: 26-27)

Starting with the 1990s, the cycling community formulated one of the most powerful mobile utopias. Critical Mass can be described as an accomplished bicycle utopia or a 'nowtopia' (Carlsson 2008) which has acquired a spatiality and a temporality of its own. The global event, initiated more than two decades ago in San Francisco, is described as 'an international, monthly event where bicyclists briefly take over city streets to celebrate bicycling, demonstrate their collective strength and send a clear message to the public: "We are not blocking traffic, we are traffic!"' (Furness 2007: 299). Conceived as 'a performative critique of motorized traffic and a critical response to automobility' (2007: 299), the Critical Mass is now being held in over 300 cities around the world.

The idea of Critical Mass as both protest and celebration has been further developed by visual artists such as Ugo Gattoni and Mona Caron (https://www.monacaron.com; Illustration 4.7). Gattoni took the concept to the extreme and imagined the mass, unregulated bicycle ride as a permanent feature of urban mobilities in the city of London. Inspired by the 2012 Olympic Games, Gattoni has produced a 5-metre long drawing, *Bicycle* (2012; Illustration 4.8), featuring bicyclists on the streets of the capital. His proposition is a big bicycle carnival: 'I really wanted to put in bold all the aspects of the cyclists – elite athletes to cycle couriers, commuters, bankers, delivery boys, mums with kids, youths on stolen mountain bikes to fashionistas and hipsters on fixed gear bikes'.

Illustration 4.7: A selection of illustrations by Mona Caron (https://www.monacaron.com).

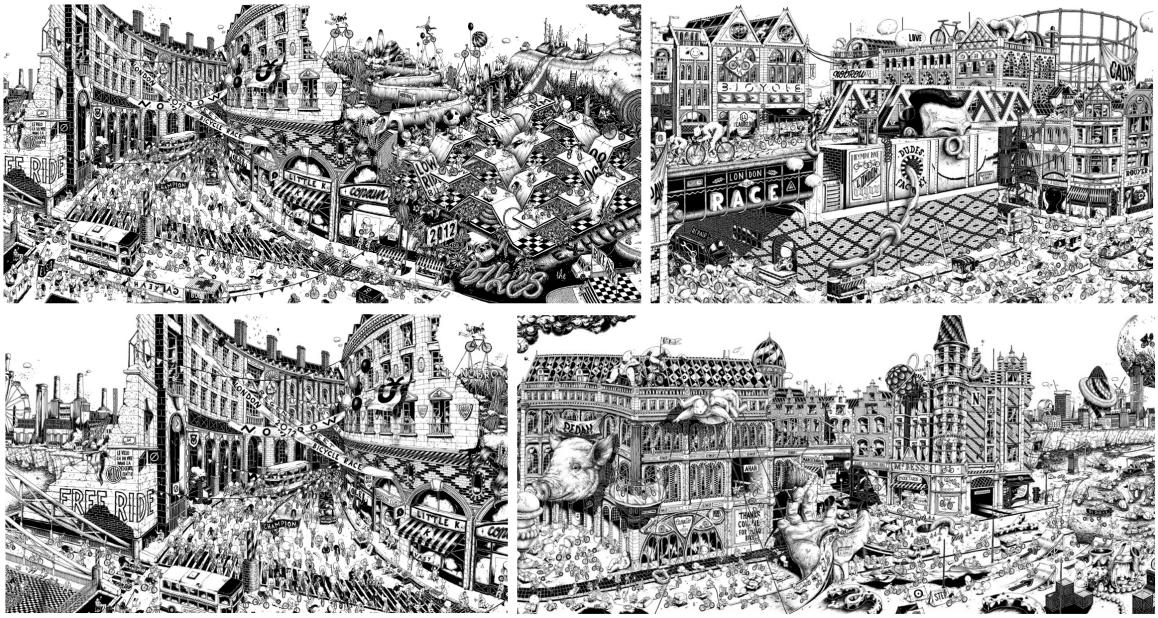


Illustration 4.8: A selection of drawings from Ugo Gattoni's *Bicycle* (2012).

Although the claim of the 'massers' is that they are traffic, the group ride itself is anything but fast. The performance aspect of the Critical Mass rides involves a slow pace which allows constantly riding in a compact group, handing out flyers and informing by-standers about the nature of the event, stopping to take pictures and so on.

Both through their artistic expression and temporary reclaim of the street space, the slow bicycle utopias discussed above are opposing the dominant discourse of fast urban mobilities and economic growth. Through their prefigurative practices, environmentalists and anarchists alike are demonstrating that alternative futures are not only possible, but that, within appropriate circumstances, they can even spring to life.

Conclusions: A break from growth

In this chapter I argued that throughout history the bicycle has often functioned as a free-floating signifier. The bicycle is indeed 'a complex socio-technical object whose meanings and uses are shaped variously through its histories, production and uses' (Vivanco 2013: 26). From bourgeois, to working class, to feminist and socialist, to poor man's transportation, to the contemporary 'creative class', the bicycle meant different things to different people at different times in history.

This historical perspective, which proposes a reflection on how corporeal movements, their meanings and their embodied practices changed over time, is essential if our aim is to help build better cycling futures. The promises of speed, development and growth which today drive most of the 'cycling renaissance' worldwide are neither new nor benign in their nature. More than a century ago, they similarly set the capitalist production and consumption on a fast track, with all the ensuing negative consequences that increased velocities and annihilation of distances brought upon society and the environment. The utopias of fast cycling mobilities risk not only re-enacting the 'bike boom' moment of the 1890s, but they also seem to suggest that no other mobile futures are available. Yet, futures can be different, and the utopias of slow, convivial cycling, which have been burgeoning alongside the dominant fast narrative, represent just such reasons for hope. The anarchist and environmentalist movements of the last decades might not have defeated automobility or reversed the capitalist growth just yet. But through their struggle, they suggested that change is not only desirable, but sometimes it is possible.

This chapter has explored how the past and present of cycling can help us navigate the future of urban mobilities. If the prologue of the thesis has imagined how a slow bicycle system could be implemented by 2050, in this section I have argued that throughout the history the bicycle has inspired imaginaries of both slow and fast mobilities and societies. Acknowledging the diversity and plurality of these visions is central to this thesis which argues that speed should not be regarded as the natural quality of contemporary urban movement. The system of automobility, analysed in the previous chapter, is closely linked with modern and capitalist values of individuality, progress or economic growth, and the bicycle has partly nourished and perpetuated these ideals. But it has also demonstrated that slowness could represent an alternative. As I will argue in the next two chapters, the senses and sociabilities of cycling play a central role in imagining urban mobilities beyond the dominant narratives of speed and growth.

Chapter 5: Senses

So far, this thesis has been concerned with two main tasks. One involves the utopia of building a different future than the one the system of automobility has already made possible. The proposition I make is that this divergent future could be conceived around slower, human-centred, as well as human-powered urban mobilities, where the bicycle plays a central role. The other task, which is always complementary to the first one, constantly scrutinises the normative propositions of various future projections. Both the car and the bicycle have been engaged in the making of 'ideal' urban mobilities, but which proved more complex and problematic than expected. In chapter three I showed how the 'autopia' has gradually morphed into a 'carmaggedon' in which even the autonomous, networked and electric cars of the future struggle to make a difference. And in the previous chapter I returned to the bicycle and pointed to the many flawed futures it risks animating, the most important being that of incessant pursuit of mobility, speed and economic growth.

But these architectural and archaeological modes in which utopia operates as a method of reimagining society (Levitas 2013) only describe the form of an ideal world, not its actual inner workings. The question of how slow bicycle utopias are effectively lived was left unanswered until now. In this chapter, as well as in the next one, I thus turn my attention to the practice of cycling itself, a practice which is highly embodied and extremely rich in social interactions. By investigating my own cycling and that of various cycling groups, I show that a radical change from the car system towards a slow bicycle system necessarily

involves an attentive reconsideration of two essential characteristics of the cycling experience: senses and sociabilities. In its ontological mode, utopia as a method investigates who the subjects and agents of social change are, how they make social change possible and how they themselves change in this process. The cycling senses and sociabilities engage cyclists and non-cyclists alike in an appreciation of the natural and social worlds in ways that automobility does not. They are generative of a human flourishing where the rhythms, flows and convivialities of cycling mobilities, performed both individually and collectively, play a central role.

On growing pedals

'Running reds and killing peds' is one of the most famous clichés amongst bicycle messengers (Nyssa 2004), a category of cyclists generally considered to be 'risk-seekers'. For them, assuming risks as they cut through the clogged intersections of big cities is as much part of the rushing job they have as it is part of the thrill of fast riding in heavy traffic, all the while slaloming through pedestrians. When I cycle I also run red lights quite often, even though I am not that much of an adrenaline seeker (Illustration 5.1). Although I do not endorse law breaking in general and I do not encourage anyone to follow my example here, I am not blindly obeying the rules in question for several reasons.

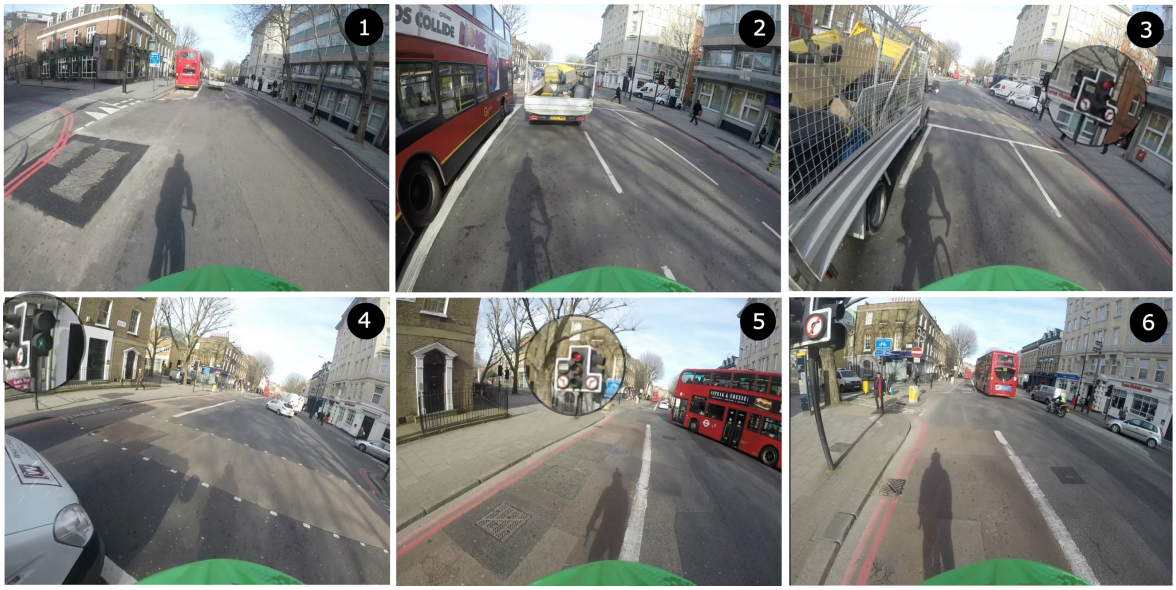


Illustration 5.1 (from top left to bottom right): Running red lights in London. The loupes in sequences 3, 4 and 5 highlight the red lights I am running.

First, I always try to be in the first position at traffic lights, for safety considerations: many accidents involving cyclists occur because drivers turning left (or right) often do not see them. If I get a head start, the chances to be hit by a careless driver diminish considerably. Second, while cycling, you set yourself into a rhythm where the body and the bicycle form a sensitive yet very fluid hybrid of muscles, tendons, cranks and chain that breaks easily at a stop. When the foot is on the ground, the bicycle loses its gyroscopic stability, so that regaining velocity is difficult once the green light is back on. By running the traffic lights, I thus maintain a rhythm as well as a sense of equilibrium which is less relevant for other mobilities (with the exception of motorcycles, where acceleration compensates nevertheless for this inconvenience). Third, there may be a rainy day, I am already soaked and freezing, unlike the dry and pampered drivers who do not share the same urgency to get home. The shell of their cars makes them immune to the rain and cold I am mercilessly exposed to. And, finally and most importantly, I might ignore the traffic lights, but I try to catch the eyes of the drivers and establish some visual contact before throwing my front

wheel ahead. Once they acknowledge my presence and intentions, I know I am safe to go. Although these habits, which could be seen as defiance, if not sheer madness, only developed as I became a skilled cyclist, that is not to say I am entirely comfortable with the risks I am exposed to, not to mention the bad name I could give other cyclists. Also, I am not encouraging anyone to take such risks! Yet, I admit that the thrill, the flow and the sensation of accelerated heartbeats can be quite addictive.

I have used this personal vignette here because it is extremely evocative of a broader argument about how the mundane act of cycling is perceived so differently through the bodies of its practitioners by comparison with other forms of urban mobility, particularly driving. Yet, cycling is too often treated as indistinct from the latter in terms of policies and provisions and the bicycle is defined as a vehicle, with similar rights and obligations as the two-ton automobile. Failing to account for how senses operate so much more differently for cyclists is directly reflected in the all too persistent fear of cycling (Horton 2007), which is still the main reason why more people do not cycle more regularly (Horton and Jones 2015).

The vignette also hints to some important points I make in this chapter. First, I argue that there is considerably more to cycling than just the five dominant senses of vision, hearing, touching, smelling and tasting. Second, the senses cannot and should not be separated from one another in the process of perception. Third, the environment where cycling takes place is perceived through the body *and* the bicycle. Fourth, cycling enables rhythms and flows which generate specific forms of wellbeing and flourishing. Finally, throughout this

chapter I aim to balance my own senses often informed by fast cycling with a sensorium generated through slower velocities, which is less intense and more inclusive.

The quest for a better way of being usually involves greater happiness and this chapter shows that this is intimately linked with the simple pleasure of riding a bicycle. The utopian method as ontology aims to reconsider what are today the human needs, satisfactions and meanings. This investigation of cycling senses proposes a normative definition of human wellbeing and flourishing, one which reclaims the actuality of the body, not just its vision, hearing and smell, but also the pain, the equilibrium, even the perception of one's movement. Thus, this flourishing is both active, engaging the exercise of individual capacities, and relational, making us vulnerable through the relations we forge with others, as well as with the natural and the material worlds. As Andrew Sayers argues, '[a]s needy beings we can distinguish at least roughly between flourishing and suffering, or more specifically between hunger and sufficiency, disrespect and respect, hostility and friendliness, boredom and stimulation, and so on' (2011: 112).

Both the joy and fear of cycling, and, more generally, its affective world, are very subjective experiences and difficult to represent through conventional accounts. Thus, for the most part of this chapter I use my experience to describe the affective geographies of cycling senses. How senses operate is not only a subjective matter of concern, but also a rather difficult task to elicit and represent. As Merleau-Ponty (1962) rightly indicates, too often sensing transcends our linguistic reflexivity and escapes any attempt of scientific scrutiny. Perception, he suggests, 'is not a science of the world, nor even an act of a deliberate taking of a stand; it is the background against which all acts stand out and is thus presupposed by

them' (1958: xi). I am thus using a specific technique of auto-ethnography whereby I combine various mobile methods: audio and video recording (Illustration 5.2), GPS tracking of my commute routes in London and Lancaster (Illustration 5.3), as well as my own of cycling. I complement the investigation of my own experience with ethnographic accounts of other subjects who are less skilled and capable cyclists. Their practices are arguably more representative of a future slow bicycle system.

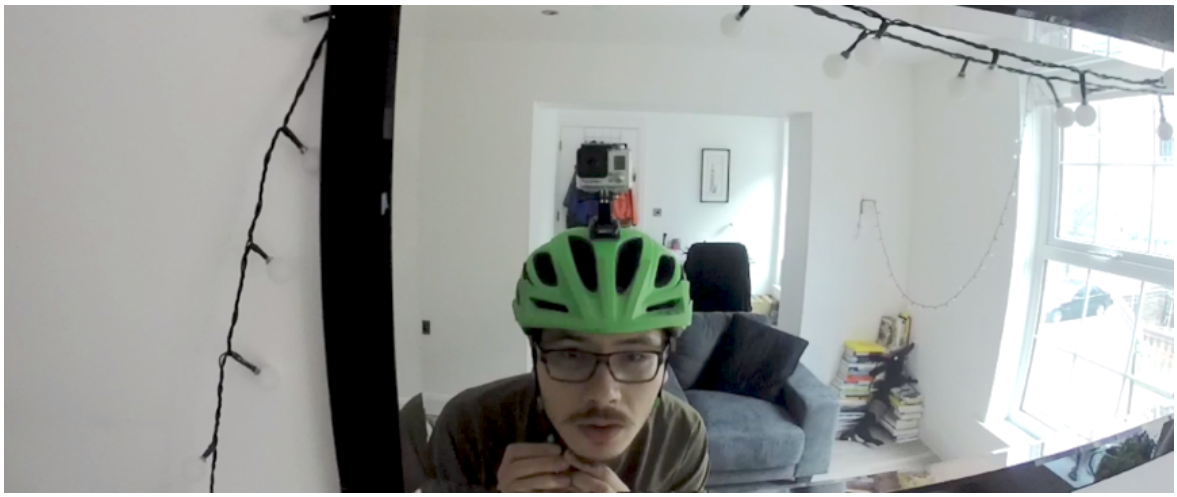


Illustration 5.2: Snapshot of video recording with a GoPro camera attached to the helmet.

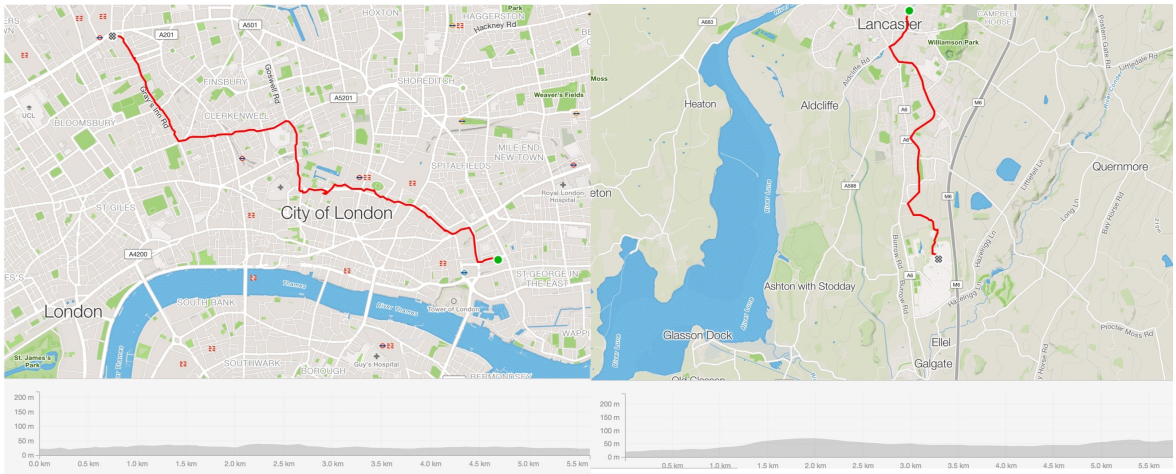


Illustration 5.3: Maps of my two commutes, in London and Lancaster. Source: Strava.com

Velomobility at a glance

I will now get back to the vignette I set out at the beginning of this chapter. The red lights I tend to run have a history of more than a century and, not surprisingly, have not been designed for the use of cyclists. Traffic lights only came into existence with the advent of cars, when the size, power and speed engaged by various road users became so disproportionate that interactions between them had to be regulated to limit the carnage. In the nineteenth century, the traffic was largely unregulated, as 'slow speeds and short stopping distances meant that vehicle priority did not have to be defined and was usually by might rather than by decree' (Emanuel 2017: 105). It was only with the more serious traffic accidents, congestion and chaotic streets from the turn of the century that 'experts of different sorts innovated in traffic control with the aim to control road users and mobility practices' (2017: 105).

The first traffic light was installed in Cleveland, USA, in 1914 (Norton 2008), and ever since catching the eyes of others to avoid collision was no longer needed. It may thus seem less of a surprise that even today some cyclists dismiss this convention, aimed to serve the traffic of automobiles (although research suggests that drivers run the red lights as often as cyclists do; see www.scofflawbiking.org). A slow bicycle system would indeed dismiss all traffic lights and signs and restore, at least in the daytime, the function of the mutual glance to guide interaction amongst road users (something which I will discuss in more detail in the next chapter). This proposition is not just a utopia, because some urban areas have already experimented with 'shared spaces'. But before addressing this not so radical

proposition of shared spaces, I will briefly show how vision, more generally, works differently for cyclists.

Vision has come to represent the most important of human senses and its role is essential in orienting the mobile subject. This might have to do with how Western culture has come to value sight more than other senses as a way of signifying the value of objective knowledge (Ingold 2000) or maybe indeed with the fact that, as in the case of driving, cycling relies heavily on what the psychologist J. J. Gibson (1938) calls a 'visual field of safe travel'. Vision is always entangled with other senses in perception, but for now it is worth considering it separately. This is important not just to justify my running of red lights, but also to highlight some essential distinctions between cycling and driving.

First, the vision of cyclists is not radically different from that of drivers or pedestrians. There is a set of standard visual exchanges that all traffic participants seem to share to avoid colliding with one other and to express approval or disapproval of others' behaviours. Conley calls them types of 'mobile looking' (2012) as he attempts to draw out a sociology of traffic. They are: 'identifying scans', used to make sure others are acting 'normally' or 'abnormally'; 'focused looks', deployed to settle on a particular element if relevant; 'sanctioning looks', to get one's attention in order to convey disapproval; and 'integrating glances', for catching another's eye to indicate a shared assessment of the situation (2012: 208). While these types of mobile looking might be shared by both drivers and cyclists, the differences in speed and material configuration between the two vehicles contribute to quite distinctive visual experiences.

Illustration 5.4 (from top left to bottom right): Strategies to avoid collision: looking back over my shoulder and anticipating a left turning car by checking if its front wheels change position (see the loupes highlighting the front wheels).

The important thing about vision in cycling is its less-mediated, almost shell-less, nature. Unlike drivers, cyclists do not have windshields and mirrors (maybe with the few exceptions of velomobiles[6] and bicycles ridden by people with a stiff neck) that inevitably frame and fragment perception[7]. As a result, they adopt specific strategies, ranging from mundane exchanges of glances with others ahead or looking back over one's own shoulder, to more complex ones that require practice, such as looking ahead over another cyclist's shoulder, particularly at higher speed, or anticipating a left-turning car by checking if its front wheels change position (Illustration 5.4). Less mediation comes at the same time with shortcomings: the absence of a windshield makes it difficult to avoid exposing the eyes to

[6] A velomobile is a human-powered vehicle enclosed for aerodynamic advantage and protection from weather and collisions. They are relatively popular in the Netherlands and Germany.

[7] Car wing mirrors became more common with the emergence of motorways. In the UK, the inauguration of M1 in 1959 has been accompanied by a strong lobby to make both indicator lights and wing mirrors compulsory fittings (Merriman 2006).

various elements such as sun, rain, snow, wind, even insects. Thus, many cyclists wear sunglasses or caps with visors.

Alongside its lack of a shell, the bicycle also has a design that furthermore distinguishes the vision of cyclists. Most often one sits on a bike at a higher level than the seat of the average car, giving better vision in the distance. This potential advantage is nevertheless offset by the constraint to check more often the road surface for holes, bumps or other obstacles. But bicycles themselves are also of so many kinds, with designs and geometries very different from one to another. There is an important difference in ergonomics between the three main types of bicycles we find today in cities: the road bike, the hybrid and the city bike (Sanders 2010, see Illustration 5.5). This consequently results in significant variations in the visual range facilitated by each of the three types. For example, my everyday vehicle of choice in London is a road bike, which is quite common in cities with low levels of cycling, where only the fit, the confident and the fast tend to cycle. It prioritizes efficiency over comfort and thus forces the cyclist into a lean-forward position where vision at a distance and peripheral vision are significantly reduced. The visual range it allows is smaller than that of the common upright bicycles I rode in Copenhagen or Amsterdam.

The ways in which cycles shape one's vision can be better described by using J. J. Gibson's (1979) 'affordances', a powerful concept that has become influential in the study of mobilities, illustrating how the context of perception is essential in structuring the stimulation received by the senses. Affordances imply a complementarity between the subject and the environment, it 'is neither an objective property nor a subjective property

[…]. [It] cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior' (1979: 127-129).

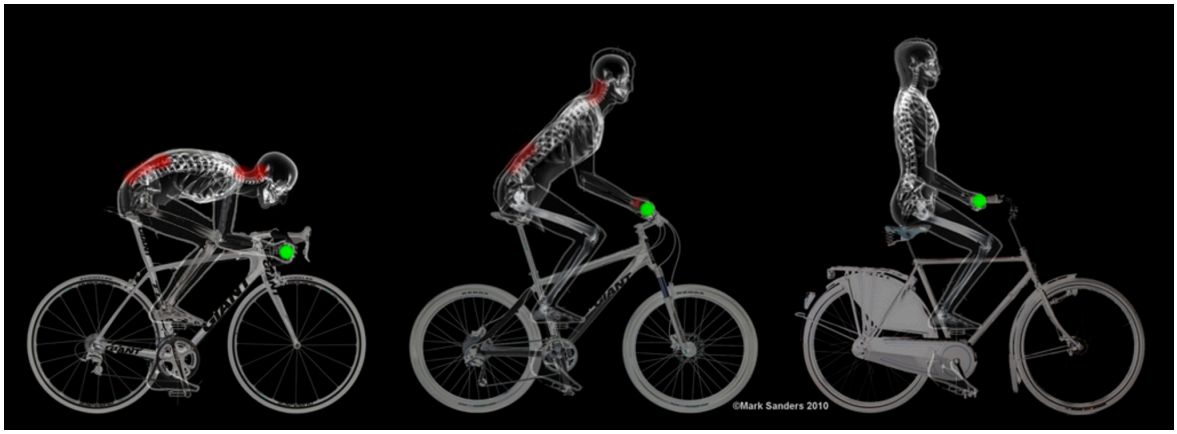


Illustration 5.5: The road bike the hybrid bike and the city bike (Sanders 2010).

Within the future slow bicycle system which I articulate in this thesis, the size, the speed, the power and the consequent threats posed by the automobile will no longer be issues of concern, as most urban vehicles will be human powered. A future society where urban mobilities will cease to be guided by utility principles alone will see the function of vision change as well, from the brief and hurried 'scans' and 'glances' described by Conley, to more meaningful looks.

During the investigation of my own slow cycling as well as that of others I have already witnessed or engaged myself into the exchange of such convivial glances:

> When I cycle from the Lancaster University campus into the city, on the shared use route, I often ride past colleagues, who are either on a bike or walking. Sometimes we only exchange brief greetings; it is either rainy or we are in a hurry. But when the weather is nice, when I'm riding on a shared-use path and when there are no other urgent matters to

> sort at home, I would adjust the pace with fellow cyclists or even stop to walk the bicycle alongside a colleague who is walking. What on a fast and traffic-choked route would have been at best a brief visual exchange, it seamlessly turns here into a half an hour's pleasant conversation (Notes reflecting on various bicycle journeys in Lancaster, 28 January 2016).

The possibilities to engage in more meaningful visual interactions multiply in environments where cycling is more common. Noting the up-right design of most bicycles in Netherlands, which encourages moderate speeds, te Brömmelstroet et al. (2017) observe that

> in this posture, it is easy to make eye contact with other road users, to recognise faces, read advertisements, have a conversation and even window shop … The opportunity to stop at any given moment and the freedom to navigate the narrowest of streets challenges a cyclist to interact with their spatial surroundings at an explorative level (2017: 8).

The number of people, things and mundane details available to the eye will increase significantly within a slow cycling future, while traffic signals and signs will become redundant, even if their absence is inconceivable within the current system of automobility. This proposition is far from being palatable in contemporary cities, but decisions to make such technologies obsolete would finally mean getting from what the Dutch architect Stefan Bendiks (2015) calls a 'car minded thinking' towards a 'bicycle thinking'. Some steps taken in this direction are already visible in places where cycling levels are high enough.

One example is new regulations allowing cyclists to turn right (or left, in Britain) at red lights in countries such as the Netherlands, Belgium or France (Langerijs 2015), or even to run

them altogether as it has been recently decided in Paris (Schofield 2015). The decisions are said to have improved the flow of traffic and reduce the number of collisions. While these initiatives are relatively new, experimentations in the field go back to the 1980s, when Dutch traffic engineer Hans Monderman invented the concept of 'shared spaces'. Monderman's ambition was to make all road users more equal and to allow them to literally look out for each other. His idea that the segregation of different users should be minimized had relative success at the time, being implemented sporadically ever since in cities and towns in Spain, Denmark, Austria, Sweden and Britain. In these urban areas, features such as curbs, road surface markings, traffic signs, and traffic lights were eliminated. Negotiations had to be done by every participant by looking at what the others do.

More recent applications of Monderman's concept of 'shared spaces' have indeed indicated that the overall quality of visual interactions increases with slower cycling velocities. Reporting on an experiment done in Amsterdam in 2016, which involved removing traffic signals from a busy junction, Meredith Glaser notices how cyclists slowed down at intersections and used their vision differently when the lights were turned off:

> [C]yclists at the stop line glared at the signal, almost willing it to turn green. Bodies were focused forward; heads and eyes motionless; posture slouched. Most cyclists appeared expressionless. Stopping at this light seemed to be a moment to zone out, check their phone, adjust their bell or pedals. Very little interaction took place, either among cyclists or between other transport modes, for example with car drivers … When the lights were turned off … [m]ost cyclists slowed down as they approached the intersection, and

> communicated to other cyclists and motorists using eyes, gestures, expressions, and voices. A lot more negotiation was taking place… (Glaser 2017: paragraphs 10-13).

Glaser's account shows indeed that once the traffic lights are eliminated, a less utilitarian aspect of cycling becomes apparent and the role of the vision ceases to be one that merely responds to traffic rules. This regained reciprocity of the eye from the 'shared spaces' indicates that 'there can be more than one answer to the question of how multiple speeds can exist together, and none of these answers will satisfy everyone at the same time' (Peters 2005: 416)[8].

More generally, in a slow bicycle system the role of vision is likely to change substantially. The eyes will be less concerned to perceive the right environmental cues to avoid collisions; instead, vision is expected to perform a more interactional role. Also, such an improved visual scape is likely to benefit not just the cyclists, but others in the city as well. Once the high volume and speed of traffic becomes a thing of the past, the cityscapes will be more appealing for everyone to look at. In the same way people used to say that you cannot see the forest for the trees, many will realize that all this time they have not seen the city for the cars.

[8] Shared spaces may nevertheless pose new challenges and be hard to read and participate in for people with disabilities, especially people with impaired sight. They often 'perceive shared space as likely to bring them into increasing contact with motor vehicles, and as compromising their safety and well-being' (Imrie 2012: 2260).

Grow ears, awaken the whole body

> I pass by a cyclist riding a bit too slow, another faster rider passes me by, car door opeeeeeeeens! Turning a bit left to avoid it, Running the reeeeeed light. This big car is making so much noise [on my left, I take a distance from it]. Keeping the rhythm! Now I'm sprinting a bit, I can hear a worn out chain on the bike in the front. He's not riding very fast, but I don't mind staying behind. I hear a motorcycle now, roaring in the back, he wants to overtake, I can't see it but I can hear it very well (Illustration 5.6) (Field notes from two bicycle rides in London, on 19 January 2015 and 6 March 2015)[9].

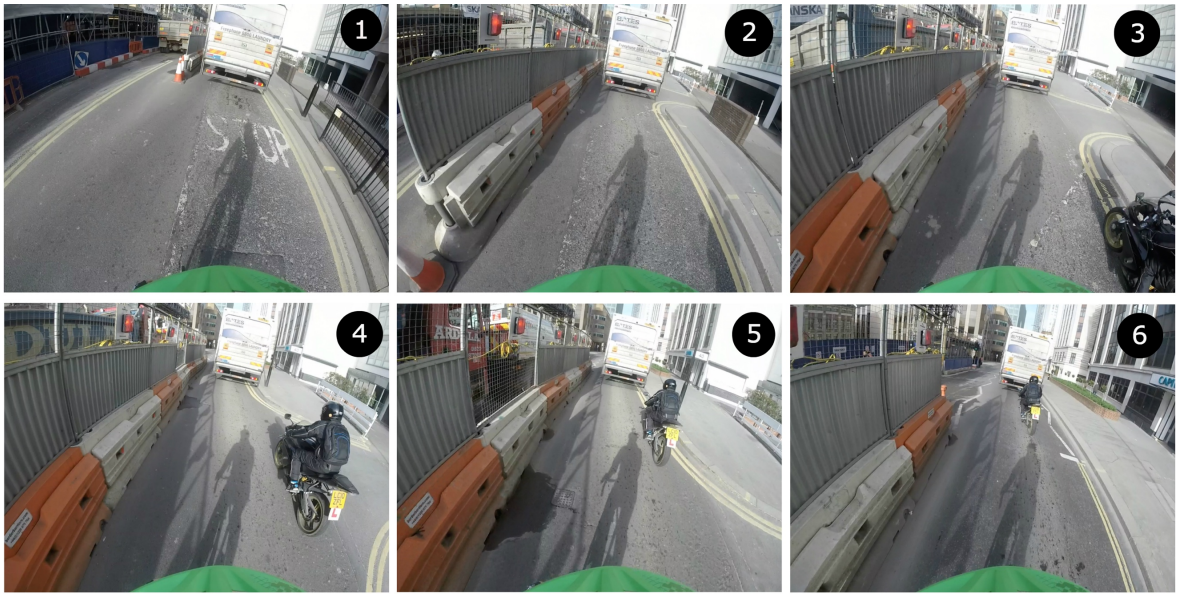


Illustration 5.6 (from top left to bottom right): I can hear a motorcycle now roaring in the back as it wants to overtake, I can't see it but I can hear it very well.

'Individuals' relation to sound in the everyday spaces of the city tends to be one of distraction rather than attention', observes Fran Tonkiss (2003: 304), who insists on how ears cannot discriminate in the same way eyes can (we cannot shut our ears as we do with

[9] This (as well as the following fieldwork notes in this chapter) is a verbatim transcription of audio diaries. In square brackets, I added extra information gathered as I transcribed the audio and video recordings.

eyes). Yet, the field notes presented above illustrate how my stubborn ears would not stop listening to everything around. In contrast to Tonkiss' argument, they are not distracted, but paying very close attention (although see Jungnickel and Aldred's discussion (2013) of cyclists using iPods to control and manage exposure to the urban environment). Aural perception is very poor at specifying direction and distance for mobile subjects, as sight is so much more important for driving and cycling. Progress through space by sound alone is very difficult and potentially dangerous. Yet, sound brings dangers to my attention in the way the eyes do not, so I can look to fine tune the adequate response: steering, braking or accelerating. Moreover, if I pay enough attention I can even tell the next move of the driver behind me: often a rising pitch of engine note indicates the car is going to overtake. A steady, low engine note normally means, on the other hand, that a car is 'tracking' me, still waiting for a good opportunity to pass.

The cyclist-bicycle hybrid is not only exposed to surrounding urban sounds, it also generates its own 'acoustic territory', a 'topography of auditory life' (LaBelle 2010), almost inaudible from the louder engine notes:

> The creaky sound of a rusty chain means that I need to grease it if I want to avoid any further damage. Similarly, when the chain slips it's often a sign that it's worn out and needs replacing. In the same way, I can immediately tell a solid from a deflated tyre merely from the quality of the ride: I will always be slower when there's not enough air pressure in the inner tube, but I'm also going to feel all the road bumps if, on the contrary, I have allowed too much pressure to go inside (Notes reflecting on various bicycle journeys in Lancaster and London, 28 January 2016).

The account above shows how cycling emerges from the work of both body *and* machine, the symbiosis of which generates an enveloping sound membrane, the result of a resounding body voicing the effort through audible heartbeats and alert breathing, and of a machine engaged in circular movement, its scratchy tires, the snoring chain, the clicking freewheel. The sound, but also the feel of the bike, is an integrated sense of the state of the bike. These observations are important for two reasons. First, they show that cyclists perceive the environment both though their bodies and the bicycle. And second, the cycling senses cannot be easily separated from one another. More than a car, which is increasingly becoming a place for dwelling-in-motion (Sheller 2004), the bike is embodied. This is complemented by a 'rushing of the atmosphere' (Urry 2007: 125) upon the cyclist, which is similar to the experience of riding a motorbike described by Pirsig: 'you're completely in contact with it, you are *in* the scene, not watching it anymore, and the sense of presence is overwhelming' (1974: 4; emphasis in original).

Thus, cycling involves a total sensuous experience, where

> the visual field expanding ahead of my bicycle is often complemented by a deafening roaring of traffic, the tactile experience of the wind blowing in my face and the sweat trickling on my abdomen, the mild pain in my leg muscles as I accelerate when the green light turns on, the intimate sense of balance that I feel I could lose at any time when a heavy truck passes me by and the nauseating yet strangely appealing smell of exhaust gas, all these attended at all times by a tiresome back pain from an old bike accident. They all blend into a total sensuous experience where the whole is bigger than the sum of its constitutive parts and where the experience of one sense cannot be effectively separated from others (Field notes from two bicycle rides in London, on 19 January 2015 and 6 March 2015).

The description of the sensuous experience presented above shows how cyclists perceive the environment while engaging their whole bodies in the process: hearing the roaring traffic keeps the cyclists aware of their persistent vulnerability on the road which, in turn and simultaneously, engages their leg muscles to push harder on the pedals to constantly maintain a safe position amongst the heavier vehicles, all the while the overall acceleration rushes the wind in their faces and forces their bodies to break out in a sweat.

Through these accounts I showed how looking, hearing and even feeling one's own heartbeats cannot be easily separated from one another. I started the chapter by describing the particular *modus operandi* of sight for cyclists, but this has been, in fact, a contrivance. Such an artificial delimitation is part of an established Cartesian tradition that separates the body from the mind and, consequently, sensation from perception. This dualist ontology, prevalent for a long time both in psychology and philosophy, was challenged in the last century. Maurice Merleau-Ponty's phenomenological philosophy (largely inspired by Edmund Husserl's anti-Cartesianism) (1962) and J. J. Gibson's ecological psychology (1979) were amongst the first to situate perception in relation to the whole body and to the environment.

J. J. Gibson considers that each of the senses do not operate in a sort of vacuum, but all are engaged in what he calls a perceptual system:

> The senses considered as special senses cannot be reconciled with the senses considered as perceptual systems. The five perceptual systems correspond to five modes of overt attention. They have overlapping functions, and they are all more or less subordinated to

> an overall orienting system. A system has organs, whereas a sense has receptors. A system can orient, explore, investigate, adjust, optimize, resonate, extract, and come to an equilibrium, whereas a sense cannot (Gibson 1979: 244-245).

Senses as perceptual systems facilitate an understanding of the cycling experience not simply as static responses of the mind to specific sensual stimuli registered by the body, but, on the contrary, as an overlapping of active senses accounting for visual, aural, olfactory, tactile and other types of perceptual information which takes place as the cyclist pedals along and makes her or his body available to the environment. But Gibson limits his discussion of the perceptual system to the five main senses. Of particular importance for my discussion are the sensory modes that provide information about the internal world of the mobile human body: the sense of pain (nocioception), the sense of our muscles and organs as we pedal (proprioception) or other senses that hardly come to mind on a regular basis: the sense of balance (equilibrioception), movement (kinesthesia) or temperature (thermoception) (Vannini, Vaskul and Gottschalk 2012).

Most of the perception of the environment comes through effectively moving in it. In his own writings, J. J. Gibson was mainly preoccupied with how to make driving (and earlier, flying) safer (an important issue at that time, when car use was just booming), thus limiting the idea of 'affordances' to visual perception alone. I expand their use beyond vision, because understanding the workings of a dynamic field of vision only scratches the surface for how the body of the cyclist engages with the world. The rhythms and flows of cycling are ultimately acquired through masterful negotiation of these affordances. Unlike most other mobilities technologies, the bicycle dictates a series of affordances in relation to

cyclists' inner bodies. Thus, examples of such affordances are a fast bicycle cycled downhill allowing for an intense acceleration of one's heartbeats, a wavering bicycle climbed up a hill which 'invites' for short and intense bursts of pain in the calves and sweat dripping off the temples. While a bicycle slowing down reveals a sense of equilibrium almost taken for granted until that moment.

Merleau-Ponty's more comprehensive integration of visual perception and bodily movement, and particularly his understanding of perception as a 'being-in-the-world', are more useful here. Unlike Gibson, Merleau-Ponty argues that visual perception is more than a mode of participation, it is a mode of being through movement. Showing that there is no vision without movement, Merleau-Ponty establishes the primacy of the body in connecting the human to the world and demonstrates that the whole body is engaged in perception, rather than a series of individual senses. It is thus impossible to discuss perception without a theory of 'embodiment'; our perception of everyday reality is only possible through a 'lived body':

> My body is the seat or rather the very actuality of the phenomenon of expression … [It] is the fabric into which all objects are woven, and it is, at least in relation to the perceived world, the general instrument of my 'comprehension' (Merleau Ponty 1962: 273).

This view of a whole body engaged in perception is certainly appealing in theorising human mobility. Driving, for example, has been described by Dant (2004) as perception in movement, a process which 'is dependent on orientation to varied fixed points' and which, at the same time, is 'not about the objective judgement of distance and speed but about

noting the changes from one moment to the next' (2004: 73). In this equation, the human driver could be defined as someone who 'is habitually embodied within the car as an assemblage that can achieve automobility' (2004: 73). But one must note that cycling is more than just perception in movement, because the cyclist not only *achieves* mobility, she or he *produces* it constantly, through the effort of her/his own body. Unlike driving, cycling needs more than the coordination of vision, handling the steering wheel and pushing of a pedal from time to time. It calls the inner body into play:

> It's late January, there are only two degrees Celsius outside, it's raining and the wind is quite strong. In these rather adverse conditions, my otherwise mundane ride to campus becomes a sensorial experience engaging my body in unexpected ways. For once, it's my equilibrium which is put to a serious test. Not only does the slippery tarmac force me to firmly grasp the handlebars to avoid a fall, but also the wind is a serious hazard. Particularly as I ride over some smooth cobbles by the canal, all covered in wet leaves, I feel how my whole body clenches to stay upright. Then there are the body heat and pain, which also feel more intense. I am overdressed in this weather, while my sturdy all-weather bike is extra loaded with panniers filled with both food and some changing clothes. I have thus started sweating, feeling the warm blood all through my body and flashing pains in the muscles as soon as I hit the first road inclinations, on the A6 (Field notes from a bicycle ride in Lancaster, on 27 January 2016).

The evocation of this challenging ride shows how senses which were previously taken for granted (such as equilibrium) or silenced throughout most of our everyday lives (such as pain, cold body temperature), are being brought to the fore through cycling.

What makes cycling so different from motorized forms of mobility is the more profound immersion of the body in the environment and the chance it gives to senses that are otherwise dormant to come to the fore. These qualities of cycling senses are arguably transforming the nature of cityscapes more broadly. In the age of the automobile cities have become more and more 'landscape' as opposed to 'land'. Landscape 'involves appearance of look, of leisure, relaxation and visual consumption by visitors' (Macnaghten and Urry 2000: 6), while land refers to a mode of dwelling as it 'is a physical, tangible resource that is ploughed, sown, grazed and built upon. It is a place of work conceived of functionally' (2000: 6). While cycling cannot be really compared to ploughing, there is a sense of engaging with the place beyond gazing. The cyclists move over the land while the drivers only see the landscape changing on their windscreen in a cinematic way (Urry 2000)[10]. The absence of a metal cage, the direct exposure to the environment and the work of physical effort differentiate the cyclists from the drivers inhabiting their comfortable cars. Cyclists work more of their senses and to a greater amplitude to make, so to say, sense of the places they dwell in, to build distinctive sensuous geographies around them (Rodaway 1994). Cyclists hear, smell and feel the touch of the elements of weather much further and even more intensely than from within the car. The sensations are even more powerful when considering the internal body: the perception of balance, pain, temperature, movement are all but more vivid for cyclists who are in command of a smaller, lighter and more fragile vehicle, whose motion is entirely dependent of one's body.

[10] Some authors have argued nevertheless that the experience of driving amounts to more than just contemplating a moving landscape. Merriman shows how 'many of the vehicles which traversed the M1 in 1959 would have been fairly noisy, cold and draughty – producing very different embodied experiences of driving (2006: 79). Similarly, Tim Dant argues that 'the driver's sense of how fast they are going and what speed the road conditions will permit, becomes a skill embodied through the vehicle, not only its dials and controls but also its sounds and vibrations' (2004: 73).

‘Perception is an experience of the whole body and an activity in a dynamic world’, shows Rodaway (1994: 20), nicely summarising some of the points I began to make in this section. There is a very accrued intensity of this perception in the case of cyclists, so much that cycling can be thrilling for some, unbearable for others. It seems both a challenge and an opportunity within a future bicycle system. I now turn to the so-called ‘inner senses’ for cyclists, focusing on balance, movement and pain. I investigate the ways in which they operate today and how this would be different within a slow cycling future.

Working the inner body: balance and movement

In this section I will focus less on vision, hearing, taste, smell and touch, the five ‘usual suspects’ of the Western sensory construct, which are generally limited to external sensory input and lack clear articulation of the intra-bodily senses of muscle feel, fatigues and stress (Cox 2015). Instead, I want to explore the internal sensorium of the cyclist’s body, how it is articulated today and how it will work within a slow bicycle utopia. Thus, I consider how balance (equilibrioception), movement (proprioception) and pain (nocioception) are specific to velomobilities, what kind of mobile subjects they produce and how this could be different in the future.

It is often assumed that learning to ride a bicycle is a rite of passage, something that all children must learn to do, even if their subsequent relationship with the bicycle usually slowly fades away in adolescence and then maturity. But how, in fact, this equilibrium on the bicycle is achieved remains even today a matter of continuous debate amongst engineers, psychologists and mathematicians. Proprioception is essential because it

involves sensors in the arms that provide information about steering inputs, thus contributing to overall balance (Moore et al. 2012). Without getting into too much detail on the complicated calculations, it is worth quoting David Gordon Wilson (2004), professor of engineering at MIT, who explains why the science of balance in cycling is so complex:

> unlike the pilot of an airplane or even the rider of a motorcycle, the [bicycle] rider is by far the heaviest part of the system in bicycling and is able to use all kinds of body motions […], largely unconsciously, as control inputs. Furthermore, the handling behavior that "feels good" to a rider is always changing, conditioned by adaptation and affected by fatigue (2004: 264).

Today I can ride without hands when I reach a certain speed and I do it sometimes for fun, sometimes just to relax my back from too much hunching over those low-slung handlebars of my road bike. I can even take a turn without hands, if it is not very sharp, I just have to gently lean my body in that direction. I can also quite easily rise from the saddle when climbing a hill and swing the bike left and right to push down on the pedals harder, without losing my balance. For this, I needed to build some strength in the legs as much as I needed to gain the practical confidence to raise out of the saddle. I take these things for granted, but they really are not. Most cyclists lack these capabilities, yet they are required to use a hand to signal a turn or to ride without too much wobbling (the so-called 'dynamic envelope' of a cyclist should not take more than one meter in width, as specified, for example, by the guidance for Cycle infrastructure design in the UK, published by the Department for Transport (DfT) in 2008).

Balance has to do with speed, this is true, but how fast one can pedal depends a lot on the environment, on the steepness of a hill or the adversity of the weather. When it rains, when a strong head or side wind blows, or when there is snow on the road, the efforts to maintain balance are greater, whereas inside the car none of these inconveniences are really felt. Moreover, the balance is also dependent on the type of bicycle one rides. I have only mentioned so far the typical bicycle, but there is a multitude of niche pedal powered vehicles such as cargo bicycles, tricycles and velomobiles (Cox and De Walle 2007), that feature more than two wheels. They will certainly be more common in a future bicycle system, thus making balance a less a critical issue amongst cyclists.

Much of the balance is related to another 'deep sense', proprioception or the position sense. It refers to the sensory input and feedback informing us about movement and body position and is located in muscles, joints, ligaments and tendons. While a sense of position on a bike is achieved from the very moment we learn to ride it (upright posture, hands on the bars, feet pushing down the pedals), this is constantly negotiated and improved through practice. I learned in this way invaluable things that were completely unknown to me when I took up cycling. Here is a short list of mundane skills that I was not aware of in my early days on the saddle: for efficient pedalling it is best to use the toes rather than the heels; to avoid knee pain, legs should be fully extended when heels are placed on the lower pedal; when taking a sharp turn make sure to be on the higher pedal on the inside of the turn to avoid hitting the ground (Illustration 5.7); rise off the saddle to absorb shocks when riding off-road or over a pothole (Illustration 5.8); rise off the saddle and place your whole weight on the right foot so you can turn the upper body to better see behind.

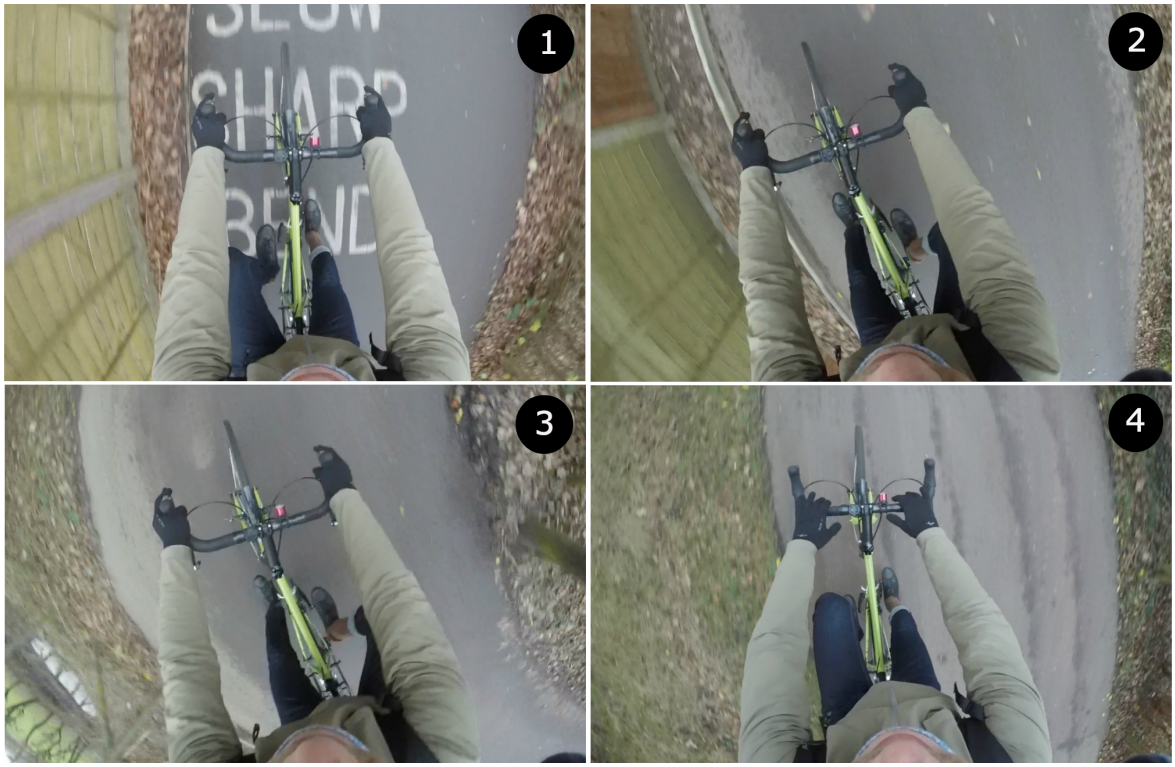


Illustration 5.7 (from top left to bottom right): When taking a sharp turn make sure to be on the higher pedal on the inside of the turn to avoid hitting the ground.

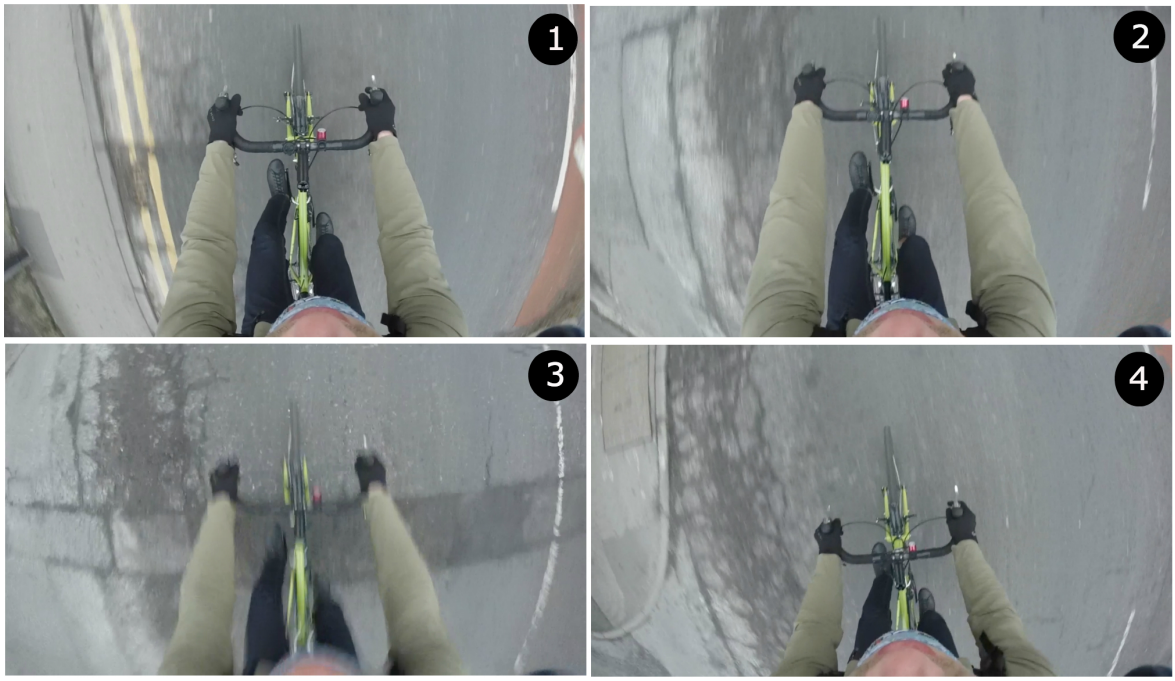


Illustration 5.8 (from top left to bottom right): Rising off the saddle to absorb shocks when riding over a pothole.

It must be acknowledged that the skills I have described, despite making cycling more efficient and more comfortable, particularly for longer rides, they also legitimise a cycling practice emphasizing speed rather than slowness. In environments such as Amsterdam, where cycling is not only more common, but also slower, I have found that balance represents a less critical issue. This happens for several reasons.

Firstly, the physical capacities are so diverse, with many cyclists by no means as capable as the strong and fearless cyclists encountered in London. I have seen in Amsterdam many more cyclists swinging side-to-side as they were setting off when the lights turned green. Secondly, the space that is dedicated to cycling is more generous, thus allowing even for the less confident and capable to be on the road without worrying too much about keeping a straight line as they cycle. In some places such as Copenhagen, the municipality has even installed handrails and foot rests at traffic lights with the message 'Hi, cyclist! Rest your foot here … and thank you for cycling in the city' (See Illustration 5.9). Thirdly, the bicycles themselves are not only more comfortable, but also offer a better balance. The classic Dutch city bikes have wider tires and handlebars, which provide greater equilibrium than the road bikes so common in London. Also, they often feature racks and panniers which further contribute to achieving a good balance.

Illustration 5.9: Message for cyclists in Copenhagen: ‘‘Hi, cyclist! Rest your foot here … and thank you for cycling in the city’ (Photo credit: copenhagenize.com).

Thus, within a slow bicycle system balance would cease to represent the privilege of the strongest and most skilful cyclists. Freed from the constraints to cycle in hostile and fast road environments dominated by cars, cycling will be accessible for people of all capabilities. Learning to ride a bicycle will require less effort once the stigma of not being a ‘competent’ enough cyclist (Aldred 2013) would finally dissipate. Indeed, ‘as easy as riding a bicycle’ will live up to its promise.

Pain festivities: ‘Sufferfest’

Through an auto-ethnographic account of climbing Mont Ventoux, one of the legendary ascents in the Tour de France, Spinney (2006) has indicated that pain is integral to the sport

of cycling, effectively turning places into physical taskscapes: 'Pain and fatigue make us aware of our bodies and thus the rider becomes inwardly focused as the pain increasingly takes over his or her immediate field of experience. […] Pain is the currency and language of ascent' (2006: 727). Everyday cycling is far less demanding than even the flattest stages in Tour de France, yet some bursts of even mild pain are unavoidable. They do not necessarily alter the field of perception in the same way described by Spinney, but the small effort generating them might still have physical side effects, ranging from heating the body, to sweating, to accelerated heartbeats and breathing, to an increased amount of saliva in the mouth:

> Now my left foot is on the kerb, yellow and now green, here I start again [Roaring cars around]. A cyclist in front of me, I'll overtake him probably, raising from the saddle now, two strong pedal strokes, a brief twinge in the calf muscles [Roaring cars], I'm still behind the lazy cyclist, green light ahead. We both pass by a girl on a 'Boris bike' who's quite slow. And another one who signals a left turn. I stay on the first lane, stopping at the red light again, brakes, foot on the … not on the ground as it turns yellow and green, and I overtake, I overtake the lazy cyclist in front of me. I raise again from the saddle, pedal fast now so others won't catch me. I can still feel the back pain I have from an older accident, it's not very acute though. I can feel the sweat now on my chest, beads of sweat dripping down the abdomen (Field notes from 2 bicycle rides in London, on 19 January 2015 and 6 March 2015).

In most cases, pain is for cyclists an accurate indication of a functioning body and, as the auto-ethnographic fragment above demonstrates, an indication of the effort spent to cycle at a fast pace. In professional cycling, and sports more broadly, there is an intimate co-habitation with pain, suffering and a sense of achievement. As Le Breton (2000) indicates,

'the more intense the suffering, the more the achievement has a reassuring personal significance, the more fulfilling the satisfaction of having resisted the temptation to give up' (Le Breton 2000: 1). But even if this co-habitation is much more fluid in everyday cycling, I have found a similar sense of achievement even during a mundane commute by bike.

Still, my own steady cycling is hardly representative for the slow cycling I am advocating for in this thesis. The pains associated with physical exhaustion are less common once people are cycling at a slower pace. When the slow cycling occurs because of a strong head wind, heavy rain, hilly terrain or simply a heavy bicycle loaded with racks and panniers, muscular pain becomes an obvious outcome. On the contrary, when easing the pace is the result of individual choice, the nature of pain changes accordingly.

Many of the bicycles used today on the UK roads are designed for fast cycling and thus do not offer the most comfortable position, something I can testify myself since I have been riding road and touring bicycles for most of my everyday journeys both in Lancaster and London. This can result in common discomforts such as saddle sore or back pains, which obviously are less common amongst people using the slower and more comfortable upright Dutch bicycles. Sometimes the road infrastructure can also cause agonizing riding. For safety reasons, slow cycling often occurs on the edge of the road, in or near the gutter, where the road surface is generally poor and sometimes filled with debris.

In other instances, slow cycling reflects the loss of physical capabilities, and the very idea of joining the road traffic is associated with discomfort and pain. Although he still does a

lot of cycle touring, Paul, one of my research subjects, admits that he feels no longer comfortable riding in the city:

> I do less (urban cycling) now, I am less tolerant of the traffic. If I had to go 20 km I would be quite tired. And I get free travel on all the (public) transport. I reverted to just using the bike pretty much for local, for shopping and journeys of 3 to 5 km. (Paul, 70s)

On the other hand, slow cycling can have the opposite effect: rather than inflicting pain, it relieves it. There are numerous instances when bicycles are used as mobility aids, particularly by people with physical disabilities (see, for example, the work done by the charity Wheels for Wellbeing in the UK). Others, such as Catherine, are drawn into gentle weekend cycle rides to alleviate mental fatigue:

> I go (in weekend rides) as often as I can. And I definitely feel depressed if I don't go. That's the truth … I promise you, it keeps me off the Prozac … You just get on your bike and go and within an hour you're like … (laughs) It's like … totally transformative … and almost alchemical quality (Catherine, 50s).

Once a future bicycle system gets established, it can be speculated that pain itself is likely to be less of a norm associated with everyday cycling. Today, it is mainly the ideology of fast mobilities, and implicitly fast cycling, which cause a great deal of the effort and pain on the saddle. But once a slow bicycle system is inaugurated, the strain placed upon the cycling body will likely diminish. Also, within a future bicycle system, more people will cycle more often, so their physical condition and the consequent pain tolerance will arguably improve.

How to achieve eurhythmia?

> During my commute, I don't like to stop too often, in fact I frequently challenge myself: Can you ride the six kilometres to the university without laying the feet on the ground? Sometimes, when the traffic is sparse or when the green lights are perfectly aligned, it works and I experience some sort of achievement, but most often it doesn't. Knowing how and when to slow down, not too suddenly, gently squeezing the brake levers while anticipating the obstacles well in advance, changing the gears in time for a climbing, for a descent or just to accommodate a rolling speed, all these, as well as keeping the toes glued to the pedals for as long as possible, are expressions of a rhythm that, almost unconsciously, I look for as I cycle (Notes reflecting on various bicycle journeys in Lancaster, 28 January 2016).

The very different, yet effective, operation of the cyclists' senses so far described produces a distinctive cycling rhythm, which is unparalleled by that of other forms of transportation. Arguing that human perception is a mode of being through movement, Merleau-Ponty suggests that we all inhabit rhythm and that we must understand motility as 'basic intentionality' (1962: 158-159): 'A movement is learned when the body has understood it, that is, when it has incorporated it into its "world" and to move one's body is to aim at things through it; it is to allow oneself to respond to their call, which is made upon it independently of any representation' (1962: 160-161).

More explicitly, Henri Lefebvre has famously said that: 'Everywhere where there is interaction between a place, time and an expenditure of energy, there is rhythm' (2004: 15). The French urbanist argues that the production of space can only be understood

through rhythms. The everyday world is produced, he says, through repetition in time and space. Cycling, as a practice, is inhabited through rhythm and the co-ordination of various cycling rhythms to that of the cyclist's body is productive not just of meaning, but is essential to what the utopia of a bicycle system is ultimately both requiring and enabling a new sense of human flourishing. Lefebvre's theorization of harmonized, disharmonized, organic and hierarchical rhythms can help illuminate both how effectively the cyclist's body is attuned to the world in the current car-dominated settings and how this could be different.

Like Gibson and Merleau-Ponty, who argue that the whole body is engaged in perception, Lefebvre also insists on the centrality of the body in experiencing the rhythms we sense. According to Lefebvre, the body should be understood as a bouquet of rhythms: 'the body consists of a bundle of rhythms, different but in tune … the body produces a garland of rhythms, one could say a bouquet' (2004: 20). The bodily rhythms function at their own paces (they are polyrhythmic) and at the same time they are coordinated (they are eurhythmic). Yet, unlike Merleau-Ponty, who does not consider the subject and object in relation to social practices, Lefebvre argues that the space of the body is also the space of others:

> Space – *my* space – is not the context of which I constitute the 'textuality': instead, it is first of all *my* body, and then it is my body's counterpart or 'other', its mirror-image or shadow: it is the shifting intersection between that which touches, penetrates, threatens or benefits my body on the one hand, and all other bodies on the other (Lefebvre 1974: 184).

This point is important here because, for any cyclist, the bodily bouquet of organic rhythms is then engaged with the more mechanical rhythms of the bicycle as well as with those of the broader mobile order that cyclists are necessarily a part of (see also chapter six). Lefebvre defines rhythmanalysis as the project of appropriating the body as a spatial practice and the consequent desire to attain eurhythmia.

> [the rhythmanalyst] listens – and first to his body; he learns rhythms from it, in order consequently to appreciate external rhythms. His body serves him as a metronome … The rhythmanalyst calls all his senses. He draws on his breathing, the circulation of his blood, the beatings of his heart and the delivery of his speech as landmarks. Without privileging any of these sensations, raised by him in the perception of rhythms, to the detriment of any other … Without omitting the spatial and places, of course, he makes himself more sensitive to times than to spaces (Lefebvre 2004: 19-22).

Throughout this chapter I have shown that sometimes the assemblage of bodies and bicycles can achieve such a eurhythmia, the bicycle can be embodied by the skilful cyclist. Knowing how to rise oneself from the saddle to absorb the shocks when riding over a pothole or leaning with the bicycle as one negotiates a sharp bend. Yet, sometimes the body and the bicycle can find themselves in arrhythmia, a destructive rhythm, typically discovered in the case of disease or dysfunction. For example, when one is tired, or when one is new to cycling, the bicycle or the body simply will 'not listen'. Full and deep breathing means the rhythm is there, whereas the quick and shallow one is a sign of arrhythmia. Clogged ears, accelerated heartbeats, even sweating can be similar indicators of being out of rhythm. Yet, through skill learning, the polyrhythmic nature of the body-bicycle hybrid can often be accommodated and celebrated, thus creating a sense of eurhythmia. As

Spinney has similarly shown in his account of climbing Mont Ventoux, the rhythms of ascent are built through repetition: 'the rider must feel for these rhythms initially, concentrating on breathing and feeling individual muscles to create a smooth pedal stroke with each limb until the muscles are formed so that they pull and push in the right directions' (2006: 718).

To complete the challenge described at the beginning of this section, which is to keep the feet on the pedals during my entire commute, is an indication that I have managed to achieve eurhythmia, skilfully coordinating the rhythms of my body with those of the bicycle, as well as with those of the motorized traffic. Nevertheless, this exploit has only been possible through a long routine of cycling the same route repeatedly for almost two years, on a fast road bicycle, and is equally indebted to a body which is strong enough to keep up with the fast pace of car traffic.

The question is how to extend this eurhytmia of cycling beyond my own experience and beyond the dominant system of automobility? An important segment of my commute in Lancaster was done on shared used routes, where my cycling pace was closer to those of pedestrians and, as previously indicated, often involving sociable interactions with walkers and cyclists, both on and off the saddle. Furthermore, in urban environments where cycling is more common, we can anticipate new, post-car, mobility rhythms, which are largely dictated by the overwhelming flock of cyclists who make up for most of the morning commute. These 'swarms' of cyclists from cities such as Amsterdam, which will be further investigated in the next chapter, are often described as 'anarchistic' for breaking traffic, but what they also do is contesting the dominant rhythms of automobility.

Thus, the rhythm in cycling is as much about skill in handling the bicycle as it is about synchronisation, or lack thereof, with the rhythms of other mobilities. It is within this context that, most often, the opposite of eurhythmia, which is arrhythmia, becomes even more visible. Lefebvre (2004) understands eurhythmia as ethically superior to arrhythmia and even more so to isorhythmia, which he describes as a collection of hierarchically coordinated rhythms. Such rhythms are synchronized from above, being brought into occurrence by an exterior agent. This isorhythmia is particularly visible today in the urban mobilities rhythms, dominated by the mechanical rhythm of automobility. Not only is this synchronization taking place from above, in the form of traffic rules and signs, but it also places any other non-motorized rhythms into arrhythmia, they become 'abnormal' rhythms within the automobile-dominated environments.

Through the analysis of rhythms, the multiple temporalities of places and forms of mobility are made explicit, argues Edensor (2013), who notes nevertheless that there exists 'a series of different-paced and orchestrated mobile rhythms [that] produces a collectively constituted choreography that gives temporal shape to place' (2013: 163-164). But Edensor does not highlight the essential point that some of these mobility rhythms are subverting others and that often enough an arrhythmia is visible when the hybrid rhythms of cycling (or the organic rhythms of walking, for that matter) interfere with the mechanical rhythms of automobility. Today, the choreography of urban mobilities is significantly dictated by the mechanized rhythms of automobility, notices Spinney, as 'the spaces, timings and hence rhythms of the road network … reflect a bias towards functionalism but also towards motorised vehicles' (2010: 113). Some cyclists have responded to such challenges by improvising their own rhythms (Spinney 2010; see also Latham and Wood 2015; van

Duppen and Spierings 2013), something that I have demonstrated as well through my own practice of running red lights. There are also other 'improvisations' observed by Spinney (2010), such as filtering through queuing traffic or avoiding the one-way system by riding on the pavement. Often these improvisations necessitate breaking the current traffic rules.

A similar improvisation is part of my everyday commute to campus, where I briefly choose to ride against the oncoming traffic, just before arriving at the office (see Illustration 5.10):

> Most of the times I turn left on Bowland Avenue North, even if I get to cycle against the sparse traffic. The alternative and legal route is just a few hundred meters down the road, via Bowland Avenue South, which is parallel to this one. I get to see any cars coming towards me, so I am comfortable riding there, particularly since that stretch is very short. Moreover, there is enough room for any incoming car to pass by and I am also really keen to leave the North West Drive as soon as possible, as it can be quite busy at times. Most drivers don't seem to complain about the shortcut I'm taking, but there was once somebody yelling at me that I was not supposed to be cycling there. (Field notes from a bicycle ride in Lancaster, on 27 January 2016)

Illustration 5.10 (from top left to bottom right): Negotiating a one-way system. On the map (Google Maps), I have highlighted the legal route with green, while the one I am following is in red.

Through this improvisation, I effectively maintain the eurhythmia of my own cycling against the isorhythmia that is imposed through the car traffic regulations and infrastructures. While such a one-way system proves to be effective for car drivers, who would otherwise not be able to share the narrow road, the road configuration is certainly not beneficial for cyclists. And while drivers can easily maintain and sustain their mechanical rhythms (meaning that they do not have to stop and make way for other incoming cars), cyclists would be instead subordinated to the dominant rhythm, having to both do an unnecessary detour and stay for a longer period on a busier and faster road (the North West Drive).

Thus, a slow bicycle system inhabits an organic rhythm rather than a mechanical one, its practitioners deploying what de Certeau (1984) has described as marginal tactics, to oppose the dominant strategy of everyday life. Fragile and dependent on its own environment, the bicycle and cycling are decidedly situated on the tactics' side, on the side of the avoidance, of the adaptation to circumstances, but also on the side of the appropriation of space and time and the development of varied social practices. In opposition, the car, sustained by its transport, industrial and energy infrastructures, are essentially strategic, as they organize and structure the space, as they modify it to their own advantage, by erasing all specificities.

Conclusions: Flowing towards eudaimonia

Achieving eurhythmia, a situation where the rhythms of bodies and urban mobilities form a special harmony as they work both as a whole and in their own tempo, seems impossible within the current system of automobility. Throughout this chapter, I have nevertheless identified such rare instances when the polyrhythmia of bodies, bicycles and urban mobilities is coordinated into a harmonious project. In such occasions, the bicycle becomes one with the cyclist, a hybrid that is seamlessly gliding alongside the urban traffic. Scanning eyes and trustworthy ears, subtle equilibrium and flashing pain, alongside a whole internal sensorium, coalesce to awaken a resisting cycling body. 'Resistance is a fundamental and necessary experience for the human body: through feeling resistance, the body is roused to take note of the world in which it lives … The body comes to life when coping with difficulty' (Sennett 1994: 310).

Yet, once this resistance, equally mounted by bodies, pedalling machines and mobile environments, is overcome, cycling is like a flow, 'a state of experience where a person, totally absorbed, feels tremendous amounts of exhilaration, control and enjoyment' (Hunter and Csikszentmihalyi 2000: 12). Descriptions of mundane 'cycling choreographies' (Suhr et al. 2013) at busy intersections in Copenhagen, where the less rule-bound velomobilities are the norm, or glimpses into the 'rolling continuity of cycling' (Brown 2012) within practices of mountain biking are indicative that such cycling flows already exist around us.

By challenging the dominant ideology of sensory comfort and mechanized rhythms, cycling promises an affordance that the system of automobility is unlikely to match: engaging the body with the environment, as opposed to disengaging it. A different understanding of human flourishing is thus proposed by a bicycle system; it is one which is not likely to be hedonic, merely seeking immediate preference satisfaction by avoiding pain, sweat or a constant struggle for equilibrium. Instead, the wellbeing for cyclists is rather eudaimonic, rejecting happiness as a principal criterion of wellbeing and insisting satisfaction lays in doing what is worth doing, in what is perceived as 'meaningful' or 'purposeful' (Nordbakke and Schwanen 2014; Ryan and Deci 2001). Thus, it comes as little surprise that countries such as Denmark, Netherlands, Sweden, Finland or Norway, which are ranking high in the World Happiness Report (Helliwell, Layard and Sachs 2017), are also leading the pack in a barometer of cycling friendly countries in Europe (ECF 2015b).

This wellbeing is equally stimulated by the sort of reflexive thought, which is also promoted by walking. Urry discusses the 'peripatetic theory' whereby, in the nineteenth century,

walking was regarded as a 'private emotional activity' (2007: 81). Similarly, for Gros walking is a way of thinking, stating that 'by walking, you escape from the very idea of identity, the temptation to be someone, to have a name and a history' (2014: 20). On the contrary, the freedom in walking 'lies in not being anyone; for the walking body has no history, it is just an eddy in the stream of immemorial life' (2014: 20-21).

From this perspective, cycling is akin to walking. Whereas driving constantly demands extensive attention and can only tolerate the minimal passive distraction of music or talk radio, cycling is arguably more relaxing, it 'gives you a moment to breathe and think, and get away from what you're working on' (Byrne 2009). It allows thinking and musing without the distraction of having to juggle with many other tasks. This has to do with the repetitive motion of pedals and wheels and the overall work of the body, as well as the lack of demand on the mental system. The benefits of this form of physical activity have been extensively documented in the medical literature and they were also mentioned in chapter three. But some authors argue that it is more than just the biological at work here. In connecting cycling with thinking, John Day describes his experience of London from the bike saddle as a form of writing: 'Cycling, like writing, forces you to think not just in terms of individual steps but in terms of conjunctions, routes and structures: how am I to get from here to there? How exactly will I navigate this particular snarl of metal and rubber and steel and chromium? How will I get to the end?' (2015: 26-27).

Imagining ourselves otherwise and thus questioning what represents human flourishing are tasks assumed by utopia as method in its ontological mode. It necessarily involves normative claims 'about who we are and who we might and should be' (Levitas 2013: 196).

Echoing Aristotle, Levitas also makes the point that human happiness is eudaimonic, it requires 'an active rather than a passive view of flourishing', one which is different 'from mere hedonism, the pursuit of short-term pleasure' (2013: 177-178). Unlike most forms of urban movement, cycling rescues us from a complete disengagement with the world. The extraordinary affordances of cycling discussed in this chapter allow for a complementarity between bodies and environment that is otherwise denied by automobility. A richer, more diverse and engaging experience of the world is possible on the bicycle, new sensibilities can be discovered and harnessed through practice, while a distinctive hybrid rhythm emerges, attuning the body to both the bicycle and the space of the road.

In this chapter I indicated that through its senses and rhythms cycling offers an alternative to the dominant narrative surrounding urban movement, which argues for a narrow utilitarian, instrumentalist and effective understanding of human mobilities. I showed that there is more to urban mobilities than the seamless and fast connections which have been historically epitomized by the system of automobility. Through its embodied nature, its hybrid rhythms and slow velocities, cycling stands in contrast to the mechanized rhythms and fast mobilities which dominate the urban realm.

The bicycle system which I have imagined in the first chapter of the thesis would allow human senses to flourish even more than I have revealed in this section. Within an urban environment from where the cars have been removed, the range of stimuli that can be seen, heard, smelled, touched and so on will increase exponentially. On the contrary, as I have argued in chapter three, the system of automobility, in its present and even more so in its future version dominated by self-driving and electric vehicles, negates most of the

human senses. Automated cars, by removing the need to drive, are likely to further desensitize the experience of being on the move.

But the reappraisal of human senses proposed in this chapter has a far-reaching implication for how a future bicycle system could look. By engaging in more hybrid rhythms and more human-sized movement, cycling could also contribute to a slowing down of urban mobilities. As I will show in the next chapter, the sociable interactions amongst cyclists indicate that such slower velocities already exist. Then, in chapter seven I will further investigate how engaging the cycling body and senses in slower mobilities could become part of a political strategy which challenges the current paradigm of unsustainable economic growth.

Chapter 6: Sociabilities

Cycling engages the human body in ways which are distinct from any other form of mobility. The previous chapter explored how sense are experienced differently on the bicycle through an embodied research of my own cycling practice. In this chapter I expand the attention from my own cycling to that of others, by conducting participant observation alongside fellow cyclists. I argue that the interactions between cyclists themselves, as well as between cyclists and other road users, can be conceptualized as forms of sociability (Simmel 1910), whereby playful associations are understood as alternatives to their instrumental counterparts.

These sociabilities are manifested in two main instances. First, they are visible in an emerging 'velomobile' 'interaction order' (Goffman 1982), where cyclists demonstrate informal rather than formal understandings of the traffic order and consequently use techniques of 'negotiation in motion' (Jensen 2010) unmatched by other urban mobilities. And second, these sociable interactions are also observable in situations of cycling together, where mobile 'teams' and 'mobile with' formations (Jensen 2010) get involved in playful interactions to create and sustain a cycling group.

Researching cycling sociabilities is important for several reasons. First, it illustrates that urban mobilities could be understood beyond narrow car-centric formulations. While cyclists' interpretation of traffic rules and use of infrastructures are often considered illegal, what they indicate is the spatial exclusions and inequalities of access that the car produces

on urban roads. Unless these issues are addressed, the dominance of automobility is unlikely to fade away. Second, the interactions between cyclists indicate that a sense of sociability is possible despite the hostile road environments where cycling is performed. Their role is to keep cyclists both safe and capable to socialize whilst on the move. And third, the cycling sociabilities point to a broader argument about the purpose of the road as public space. The playful associations emerging amongst cyclists riding together scrutinize the utilitarian function of the road space. Instead of merely facilitating the flow of capital and enabling ever increasing economic transactions, the cycling sociabilities I research in this chapter suggest that urban mobilities can be also guided by principles of conviviality and slowness and represent more than just mere attendants to economic growth.

Cycling as interaction order and sociable practice

Social life can be understood by investigating the trivial instances where people engage in face-to-face encounters, which are conducted by individuals following a distinctive set of enabling conventions. This domain of micro-sociology was made popular especially by Erving Goffman (1982, 1971, 1969, 1967, 1963, 1959), who used the metaphors of game and dramaturgy to account for how people attribute meaning to their presentation of the self in everyday encounters with others. In this chapter I propose a novel approach to some of the theories and concepts coined by the Canadian sociologist to illuminate how cyclists, as particular mobile subjects, negotiate their co-presence alongside other road users. While mobilities studies expressed an increasing interest in the domain of micro-sociology in order to explore co-presence beyond the rather static confinements imagined by

Goffman (see for example Jensen 2013, 2010, 2006; Conley 2012; Jenkins 2010), a comprehensive analysis of cycling mobilities is largely missing from all these accounts.

The principal argument of Goffman's work is that mundane everyday interactions are generative of social order. Social interaction can be identified, he argues, as 'that which uniquely transpires in social situations, that is, environments in which two or more individuals are physically in one another's response presence' (1982: 2). Studying how this social order is generated and sustained at a micro level is essential, as Goffman sees

> treating the interaction order as a substantive domain in its own right. In general, the warrant for this excision from social life must be the warrant for any analytical extraction: that the contained elements fit together more closely than with elements beyond the order; that exploring relations between orders is critical, a subject matter in its own right, and that such an inquiry presupposes a delineation of the several social orders in the first place; that isolating the interaction order provides a means and a reason to examine diverse societies comparatively, and our own historically (Goffman 1982: 2).

A key element of the 'interaction order' is the co-presence of individuals, their 'face-to-face-ness'. This makes people accessible and available to one another, and implicitly carries a moral obligation for involvement. These necessities are 'rooted in certain preconditions of social life' (1983: 3), simply because individuals, who are either strangers or acquainted, will 'find it expedient to spend time in one's another immediate presence' (1982: 3).

A set of enabling conventions must be in place for the interaction order to be sustained, continues Goffman: they are the 'social contract' and the 'social consensus'. They are

ground rules enabling interaction and represent norms, conventions and manoeuvres, and are deployed by individuals to sustain the order. Thus, the social order emerges from both the rules and the manoeuvring of individuals within and beyond set constraints:

> The interaction order prevailing even in the most public places is not a creation of the apparatus of a state. Certainly most of this order comes into being and is sustained from below as it were, in some cases in spite of overarching authority not because of it (1982: 6).

The urban traffic of pedestrians, cyclists and drivers is an instantiation of this 'interaction order', something that Goffman has only briefly acknowledged in his work. Road users find themselves in each other's co-presence when they share the road space, and they have to display trust amongst one another, as well as a moral obligation for involvement to avoid collisions. Similarly, they perform a social contract and a social consensus, roughly translated into a formal traffic code and respectively the more informal exchange of cues allowing for the order to be maintained.

In this chapter I show how the formation and operation of this interaction order amongst cyclist and other road users takes place, to what extent it is different from the prevalent order of automobility and what are the consequences of this new interactional arrangement for the future of a slow bicycle system.

But more than just the instauration of a new interaction order, this chapter also investigates the quality of such mobile interactions amongst cyclists themselves. I use once

again Erving Goffman's (1959) conceptualization of everyday interactions as social 'performances', where 'teams' and 'withs' of individuals make use of a stage (the social context) and props (clothing and any other objects around us) to stage an 'impression' upon others. To unpack the interaction dynamics within 'teams' and 'withs' of cycling, I propose the concept of sociability as the friendlier and more playful social game taking place amongst individuals cycling together.

According to Simmel (1910), people 'play' society using sociability. Mobile contexts such as the instances of cycling together compel people to play by the same rules. Simmel sees sociability as a play form of association, the harbinger of an 'ideal sociological world' in which 'the pleasure of the individual is always contingent upon the joy of others; here, by definition, no one can have his satisfaction at the cost of contrary experiences on the part of others' (1910: 257). I thus define the cycling sociabilities as the types of quality interactions taking place between cyclists riding together in certain formations.

This sociability occurs for various reasons, ranging from safety, to efficiency, to simply engaging in conversations. This is not to say that all cyclists are prone to riding together or that all group cycling is sociable. There are many instances when cyclists prefer riding on their own. Similarly, there are as well associations of cyclists riding together which become quite competitive. The sociabilities of cycling together represent nevertheless an essential element of a slow bicycle system because, rather than a means towards a specific goal, the very forming and maintaining of the 'teams' and the 'withs' becomes an end in itself. As Simmel puts it, it is 'the personal traits of amiability, breeding, cordiality, and attractiveness

of all kinds [which] determine the character of purely sociable association' (Simmel 1910: 254).

The Ride-Formation

Before describing the forms of cycling sociabilities displayed within the various 'withs' and 'teams', I discuss the general characteristics of the cycling formations under consideration. Adam Kendon (1990) uses the term 'F-formation' for the study of spatial organisation in social encounters:

> People often group themselves into clusters, lines, or circles, or into various other kinds of patterns. These patterns may be highly fluid or they may be relatively sustained. When such a pattern is sustained it will be referred as a *formation*. […] An F-formation arises whenever two or more people sustain a spatial and orientational relationship in which the space between them is one to which they have equal, direct, and exclusive access (Kendon 1990: 209).

F-Formation is a useful concept to study the spatial organisation of social encounters, but Kendon only focuses on static situations and which involve face-to-face orientation. In his study of various pairings of cyclists, McIlvenny (2014) proposes an alternative conceptualisation, the 'M-formations', which 'arise whenever two or more people sustain a relational spatial and orientational relationship while in motion, in which the relative spacing between them is one to which they have mutually interchangeable, hearable, and visible access' (2014: 139). The M-formation has some limitations too, related to the study

of acquainted cyclists alone, the small number of participants in a formation as well as its rather narrow purpose to facilitate communication amongst these participants.

I propose instead the term 'Ride-Formation' to encompass all forms of velomobile arrangements consisting of at least two cyclists and which involve some forms of sociability. These arrangements can be devised in five typologies: the single file, the pair, the swarm, the chain-gang and the accordion. They can be forms of 'withs' and feature very little or no organization, involving, for example, unacquainted cyclists clogging the intersections of Amsterdam at the morning rush hour or the participants in a Critical Mass ride. Or they can congregate in 'teams', such as the highly formal and organised type of arrangement visible during a fast weekend ride with the cycling club.

Swarm sociabilities

In the previous chapter I drew attention to my own practice of running red lights, arguing that cycling engages one's senses and rhythms in ways which appear deviant within the dominant system of automobility. But this disobedience is far more common, and I argue that it is indicative of an interaction order that is not only different from the one commanded by the car, but it also threatens its supremacy.

In city environments such as central Amsterdam, where the road traffic is often dominated by bicycles, the social contract and the social consensus governing the interaction order described by Goffman are played differently. Researching the bicycle traffic in the Dutch

city illustrates just how common it is to run red lights. The illustration below (6.1) shows a cyclist running the red light fifteen seconds before the green turns on.

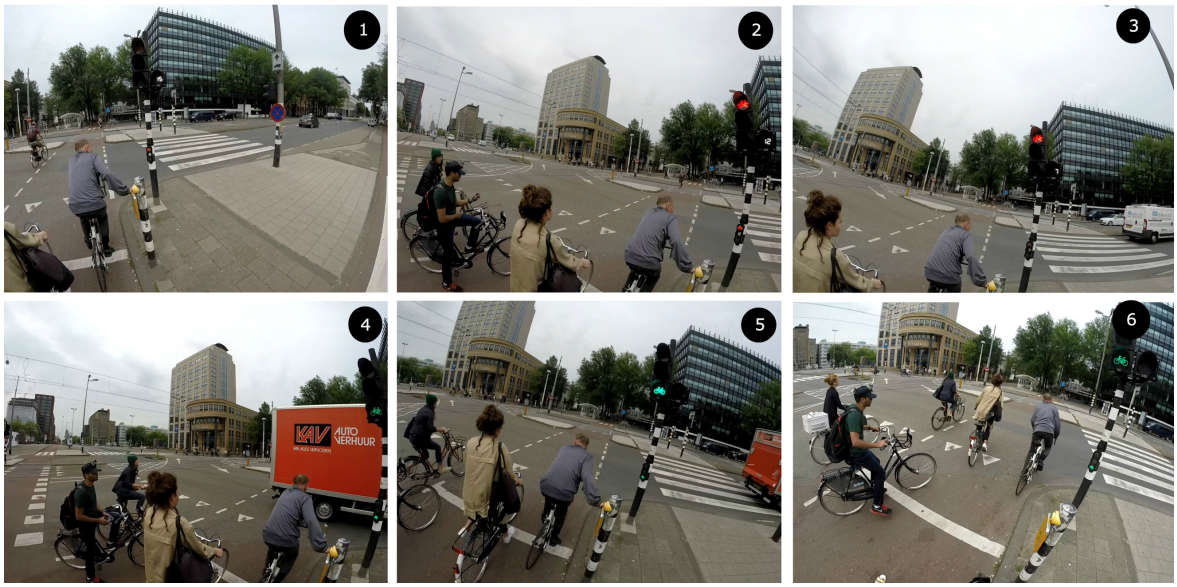


Illustration 6.1: 'Swarm behaviour': (from top left to bottom right) 1) There are still 15 seconds to wait before the lights turn green but one cyclist decides to cross. 2) Three seconds later there are five cyclists waiting for the green. 3) Seven seconds before the green light. 4), 5) and 6) As the lights turn green cyclists make a move into the intersection.

The sequences capture a practice which is even more common earlier in the day, at rush hour, when the volume of cyclists is considerably bigger. In the morning, the space for cyclists at Amsterdam's busiest intersections is often exceeded, generating what Te Brömmelstroet et al. (2014) call a 'swarm' and leaving many of them with no option but to improvise. This means breaking the formal rules to various degrees: occupying the opposite lane and blocking incoming cyclists, obstructing the cyclists coming from left or right, mounting the pavement or simply running the red light[11].

[11] Of course, the swarms of cyclists from the Netherlands are not a recent phenomenon. In the 1960s, flocks of cyclists could be seen swarming on the 'outmuster' from Portsmouth's dockyard (Seymour 2010). Perhaps the most iconic images of cyclists commuting out of factories remain those from the Italian movie *Ladri di Biciclette* ('Bicycle Thieves', 1948).

Other accounts from cyclists in Amsterdam reflect a similar pattern of interaction and even observe how a new norm is imposed upon others:

> The formal conformist cyclist focuses his primary decision-making on formal traffic regulations, rather than informal practices happening on the ground … The cyclist would be better off informally bending the rules – going with the flow and adapting to the swarm (Comeau 2014).

> When one is following cyclists, *obeying* the traffic laws could be hazardous. For example, one morning on my way to school, I was near the rear of a long line of cyclists as we all waited at a red light on Frederiksplein. When the light turned green, dozens of cyclists moved on through the intersection. As I pedalled forward, the light turned yellow. I slowed down, and when I stopped, a bike slammed into Brownie's (the name of his bicycle) back wheel. The rider muttered at me, 'Mafkees!' *Freak!* Then, along with seven or eight other cyclists, he zipped past me, past the red light and through the intersection (Jordan 2013: 73; emphasis in original).

According to Te Brömmelstroet et al. (2014), these all too common practices of rule breaking and rule bending in Amsterdam indicate how cyclists are 'adopting and sharing new rules of conduct in communication with each other' (2014: 26). They distinguish between the 'momentumists', who are those 'who follow their own route and adapt certain formal rules to suit their own ends, without causing any dangerous situations (e.g. turning right through a red sign)' and the 'recklists', who 'recklessly ignore the rules, for instance crossing the road through a red light, and thereby cause conflict with other road users' (2014: 26).

As a result, the swarm behaviour can have dialectical dynamics: it is sanctioned by the traffic code in the Netherlands (and elsewhere) and at the same time it sanctions the cyclists in the swarm who choose to follow the traffic code. But this sanctioning of other cyclists who do not follow the swarm can be understood differently, especially by the local cyclists in Amsterdam, who are more familiar with this distinctive interaction order. As a tourist in the city of Amsterdam, I was initially reluctant to run the red lights, but then I realized that 'getting in the flow' and 'adjusting … pace and speed to the other cyclists' (van Duppen and Spierings 2013: 240) is ultimately the safest option.

The proximity and stillness of cyclists within a swarm waiting for the green light affords a specific form of sociability which is characterized by glances, gestures, expressions, and utterances which would be less common in other environments or from within the car. Moreover, this sociability seems to be maintained through a general tolerance of rule breaking and rule bending, at least from the cyclists' perspective. I have witnessed very few disapproving glances towards such behaviour; after all, none of them were threatening the life of other cyclists. It can even be argued that by breaking the formal rules, those cyclists running the red lights create more space for others, eventually contributing to the comfort of those left behind.

The swarm, with all its instances of rule following, rule bending and rule breaking, can be thus considered to represent what Jensen calls a 'mobile with', as he notices that

> in the mundane and ordinary everyday life we make multiple 'temporary congregations' as we are slipping in and out of different 'mobile withs'. So the 'mobile with' comes into being

> very quickly and can be dissolved equally swiftly. The everyday life experience with 'mobile withs' thus carries a certain ephemeral quality to it (Jensen 2010: 341).

The behaviour of the swarm running the red lights deserves a closer inspection because it questions the interaction order characterising the system of automobility. The empirical material presented above has indicated that not all participants use the roads similarly: shells, speeds and vulnerabilities are so different for cyclists in comparison to drivers that they require and enable distinctive ways of interacting on the road space. What might be understood as a functional mobile interaction order for car drivers is thus not the same as the one perceived from the bicycle saddle. This often results in competing views on how the road should be used. Conley (2012) has shown that the looks and glances regulating the traffic order (which I mentioned in the previous chapter) are different for cyclists, who 'can move more quickly than pedestrians, creating an obstacle to interaction and the possibility of escape to avoid sanctioning looks and comments in case of transgressions' (2012: 11). The lack of a protective shell and the lower speeds also dictate a different dynamic of their road interactions: cycling has the same permeability and pausability as walking, potentially allowing for richer encounters (2012: 11-12).

Cyclists seem thus to be situated somewhere between the pedestrians and the drivers in understanding traffic as an interaction order because they perform both formal (traffic rules) *and* informal (negotiated interaction) understandings of traffic. Sometimes obeying the rules, other times breaking them. They are doing what Jensen (2013) describes as the staging of mobilities from above as well as from below: 'Mobilities are carefully and meticulously designed, planned, and "staged" (from above). However, they are equally

importantly acted out, performed and lived as people are "staging themselves" (from below)' (2013: 4). Thus, an example of 'being staged' is represented by the traffic lights dictating us when to stop or the timetables organizing everyday mobile routines. On the other hand, a 'mobile staging' involves the negotiation of a passage on the pavement or opting for one mode of transport or another.

The informal understandings of traffic lead then to a 'mobile staging', whereby a 'negotiation in motion' takes place, which is based on exchanging looks and glances, but also on observing the body language, hand signalling, use of speed and the bell (Hansborg Olsen and de Vries Bækgaard 2015). This negotiation shows that the social interaction is made 'in a mobile space of norms, values and power' (Jensen 2013: 151). Elsewhere, Jensen notices that cyclists negotiate their mobility with others more often than do both pedestrians and drivers. This situation places them in a vulnerable position, as 'pedestrians are not as "afraid" of cyclists as they are of the buses and cars, and the buses and cars are not forced to stop or hold back for cyclist in the same way that they are for the pedestrians' (2010: 398-399).

The point made by Jensen indicates how much more important the informal understanding of traffic is for the cyclist than it is for other road users. Thus, running red lights, riding on the pavement, cycling against the flow of traffic are not the mere expression of 'reckless cycling', as it is often claimed, but they are part of the rule making and rule bending strategies (Latham and Wood 2015; see also Spinney's (2010) 'improvisation of rhythms' discussed in the previous chapter) that many cyclists use to navigate the obstacles of urban infrastructure. In chapter five, I indicated that these informal understandings of traffic

begin to be validated in some places. For example, new regulations allowing cyclists to turn right at red lights were adopted in Netherlands, Belgium or France, while in some areas of Paris cyclists are permitted to run red lights.

Both these transgressions and the initiatives to formalize them show that the traffic order is not just being negotiated, as Jensen suggests, but effectively re-written. I argue that a new interaction order emerges, which could be called the velomobile interaction order and which is substantially different from the interaction order of the automobile. Instead of merely relying on road legislation, traffic signs and other people's car signals, cyclists are also, and predominantly, using the body and bicycle cues of other cyclists and road users to orient themselves in the world. Within this order, where the processes of 'negotiation in motion' are prevalent, informal understandings prevail over formal ones, which results in mobile staging from below taking precedence over mobilities being staged from above. It is through the instances of negotiation in motion and the consequent staging of mobilities from below that cyclists maintain a sense of sociability at the street level. Within road environments where most forms of social interactions have been consigned to formal road signs and rules, the participants in the swarm direct instead their attention to one other, a practice which requires and enables more trust and which ultimately makes them safer.

Within future urban environments where slow cycling will be prevalent, swarms of cyclists will continue to flock the cities, but their movement through intersections is likely to be more organic and even frictionless since the traffic signs and legislations will become obsolete. Instead, as Glaser (2017) has noticed in the previous chapter, more attention,

communication and negotiation with other road users will be the norm. The velomobile interaction order will be characterized by more conviviality and sociability, particularly amongst cyclists themselves. These playful associations represent the focus of the next pages.

Conversation sociabilities

The conversation sociabilities of acquainted cyclists are also more prevalent in countries with high cycling levels. In his research conducted in Sweden and Denmark, McIlvenny (2014) described the side-by-side cycling with another person as the standard Ride-Formation allowing for conversation sociabilities to occur. He observes that riding abreast 'gives the most affordable co-presence, but (…) requires co-riders to maintain the same pace over the terrain' (2014: 140). It is easier to maintain conversation, but this arrangement is also the least common in urban areas, where most infrastructures and regulations discourage the practice. Variations from side-by-side formation range from riding in single file, to tucking in, to stretching the 'mobile with' (2014: 140). Turn taking in conversation, which is an important feature of the interaction order, suffers as a consequence: 'such talk must attend to the contingencies of mobility. Talk may also be incipient, with lengthy lapses and time-outs peppering the ride' (McIlvenny 2014: 139-140).

One notable exception where side-by-side everyday cycling suffers less interruptions is the so-called Conversation Lane, inaugurated in 2010 in Copenhagen, alongside Nørrebrogade, which is considered the busiest bicycle street in the western world. 'The quicker cyclists now have a space all their own and the Conversation Lane is for the rest of us. It encourages

the social aspect of urban cycling', observes Colville-Andersen (2010). The Danish capital plans to boost 'conversation cycling' in the coming years, so that 'Copenhageners can converse with a friend or cycle next to their mum or dad without being disturbed by the bell ringing of people who want to get past. The goal is 3 lanes in each direction on 80% of the network' (The City of Copenhagen 2011a: 11).

I studied similar conversation sociabilities in Amsterdam, which are reflected in Illustration 6.2 below. For this video footage, a friend is operating the GoPro camera as we had a conversation, which at times allowed face-to-face orientation. Another pair of cyclists at the front also engages in conversation as they ride side-by-side. Lower speeds, accommodating infrastructure, the quasi-absence of cars and their noise, similar skills and capabilities as well as the design of the upright Dutch bicycle make conversation sociabilities possible.

Illustration 6.2: Conversation sociabilities (from top left to bottom right): 1) The couple at the front are engaged in a conversation. 2) In the meantime, my colleague, who is filming, is also engaged in a conversation with me. 3) and 4) The couple continues the conversation as the woman indicates a direction with the right hand.

During my fieldwork in Amsterdam, for three weeks, in the summer of 2015, I investigated one of the busiest cycle streets in the Netherlands, Weesperzijde (where the previous ride has also taken place), which accommodates more than 2,000 cyclists every day (Pieters 2016). I combined both observations on the move and on foot, at one of the intersections, to identify different cycling sociabilities. Weesperzijde is a very welcoming environment for cyclists, particularly outside the rush hour, once the 'swarms' have disappeared. I have noticed people riding abreast and holding hands or putting one hand on the other person's shoulder, others texting or talking on their mobile phones, even people meeting up at a street corner and leaving in the same direction.

> I have cycled together with my friend up and down Weesperzijde street, for about half an hour, on a quiet Friday morning. The silence on the street, with hardly any cars around, allowed us a long conversation about our common interest: professional cycling. We

> debated Tour de France ethics and doping scandals with the only interruptions caused by some noisy scooter passing by. As we exhausted the topic, we turned our discussion to the steel and glass architecture of the business park in Amstel Plein which appeared to our right. Then we turned back to the centre and continued our chat on the already familiar route, this time making more eye contact as we cycled abreast, all the while using hand gestures to emphasize each sentence (Field notes, Amsterdam, 24 July 2015).

Conversation sociabilities are possible even when the Ride-Formation is not side-by-side. Transporting others on specially designed bicycles is very common in Amsterdam or Copenhagen, which makes co-presence and face-to-face interactions easier to maintain. Two bike designs are very popular. The first is the rear mounted bike rack, which enables 'dinking', or carrying another person on top of the back wheel. Dinking is illegal in the UK, but it is perfectly normal and very common in the Netherlands, especially amongst young couples. Getting on the bike rack requires some basic skills: 'the passenger typically performs a little dance: first, a couple of stutter steps, then a tiny leap with the butt landing on the rear rack' (Jordan 2013: 28). There are initiatives such as Yellow Backie encouraging even the visitors to try dinking. Yellow Backie offers free yellow racks to anyone in Amsterdam who wants to transport a tourist: 'When you visit Amsterdam, just look for people riding bikes with a bright yellow luggage rack. Spot one? Shout "Backie!" as loud as possible, hop on, and see where your new guide takes you' (https://www.yellow backie.org).

Another design is the cargo bike, used both in the Netherlands and Denmark mainly to transport young children to and from school. In Copenhagen, almost a third of all children in preschool class are transported by cargo bike and trailer (City of Copenhagen 2011b),

while in Amsterdam three quarters of the child hauliers are women (Jordan 2013). The open box where the babies and toddlers travel has special seats equipped with canopies to protect them from rain and snow, while the front position of the box facilitates the conversation between children and parents.

Finally, there are the niche designs of tandem bicycles, involving a fore to aft arrangement, and tandem tricycles, which presuppose a side-by-side arrangement. While the latter have largely disappeared (despite representing one third of all tricycles in 1880s (Mackintosh and Norcliffe 2007)), tandem bicycles are still used for bike touring. A range of adapted cycles also enable sociable cycling for people with various disabilities. For example, side-by-side cycles, in which one user steers and both pedal, are used by people recovering from injuries. Similarly, wheelchair bikes are used by older people and by those with locomotive disorders. Cycling without Age (https://www.cyclingwithoutage.org) is a worldwide movement whereby volunteers in 28 countries give these people 'the right to wind in their hair'.

The conversation sociabilities I have just described contrast dramatically to the ones observed during my fieldwork in London. Most of the time the capital's busy roads simply preclude riding abreast; even the segregated Cycle Superhighways are often too narrow to accommodate side-by-side cycling. Other factors also contribute to this general lack of sociable cycling. First, there is a great contrast between the average speeds of cyclists in Amsterdam and London: 14.4km/h (Pieters 2016) versus 18km/h which, according to my GPS unit, is my average speed when I commute from East London to British Library. Cycling alongside the car traffic in London, or even on the Superhighways, often requires faster

velocities to stay safe. Cycling distances are also considerably longer in London, which further attracts the more capable and faster cyclists. Furthermore, unlike the upright city bicycles used in Amsterdam, most bicycles in London are road or hybrid, affording, as shown in the previous chapter, a lean-forward riding position which is at odds with face-to-face interaction. All these have a detrimental impact on the volume and quality of sociable interactions amongst cyclists in London.

Carnivalesque sociabilities

There are still a few instances compared to which even the 'anarchist' cycling within the Amsterdam swarm seems rather insignificant: during certain bike protests and parades even larger groups of unacquainted cyclists share the city roads worldwide. They have a ritualistic character: The Critical Mass rides, for example, are held in many cities every last Friday of each month and following a route advertised in advance. In the case of bike parades, they encourage a certain dress code. For example, the Tweed Run (https://www.tweedrun.com), held in London, asks participants to 'don their finest tweeds and brogues', while Eroica Britannia (https://www.eroicabritannia.co.uk; for the original event, organized in Italy, see https://www.eroica.it), organized in the Peak District, UK, only allows 'heroic bikes', by which they mean road racing bikes built before 1987.

It has been argued that the Critical Mass is both a street performance and a critique of automobility (Furness 2007)[12]. But at the same time Critical Mass events are reversing the interaction order of urban mobilities by occupying the entire road space, defying the road regulations by riding more than two abreast, ignoring the traffic lights and blocking the side access for cars in intersections. The space temporary claimed from automobility becomes a carnivalesque environment where the dominant order is reversed. According to Bakhtin (1965), in medieval times, the carnival 'celebrated temporary liberation from the prevailing truth and from the established order; it marked the suspension of all hierarchical rank, privileges, norms, and prohibitions. Carnival was the true feast of time, the feast of becoming, change, and renewal. It was hostile to all that was immortalized and completed' (1965: 10). In this sense, it can be argued that Critical Mass, and to a certain extent the Tweed Run and Eroica Britannia (even if, unlike Critical Mass, they are organised on closed roads and require an entry fee), are carnivalesque expressions projecting a future of an upside-down world, where the car is the fool and the bike is the king.

[12] More recent forms of protest against automobility are the 'die-ins', organized in London for the first time in 2013. Die-ins involve cyclists lay silently in the road and hold a vigil for cyclists and pedestrians killed by road traffic. More details can be found at https://www.stopthekilling.org.uk.

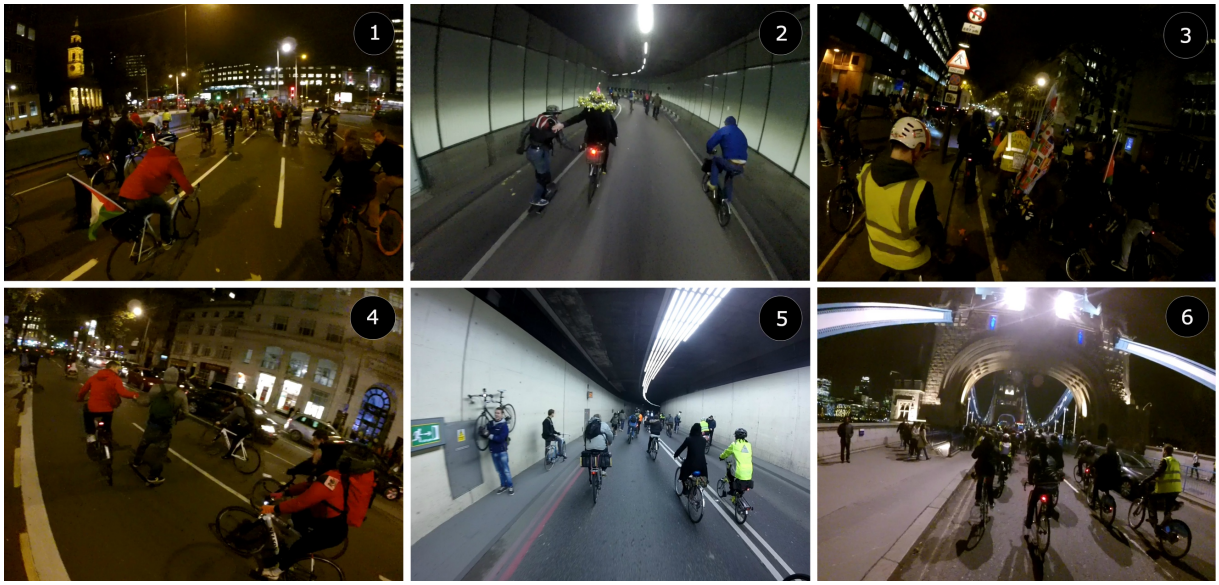


Illustration 6.3: Carnivalesque sociabilities during a Critical Mass ride in London (from top left to bottom right): 1), 2) and 3) Cyclists dress in costumes and attach flags to their bicycles. 4) They hold hands with fellow cyclists or skateboarders. 5) and 6) They occupy the entire road space.

In the illustration 6.3 above I selected still images from the video footage of a Critical Mass event in London, attended in November 2014, where a series of carnivalesque elements can be observed. Every last Friday of each month the streets of Central London are clogged with cyclists, skaters and other non-motorised road users, riding as they hold hands, blasting music through portable speakers, protesting automobility (and sometimes other political causes, such as the occupation of Palestine, in this particular case) and reversing the code of the interaction order on the road space. The participants claim that the ride has no official organisers and insist that there is no route planned in advance. But despite the thousands of cyclists involved, not everybody is equally significant in the functioning of a Critical Mass: there are designated cyclists who distribute leaflets about the event to drivers and pedestrians, others who block the cars from infiltrating the mass and, finally, those who lead the ride.

The carnivalesque and sociable atmosphere of the Critical Mass is implied in the description posted on the Facebook group of the event. The ride

> isn't just for cyclists, sometimes there are wheelchair users, skateboarders, roller bladers and skaters, and other self-propelled people. Cycle sound systems often accompany the ride, creating a colourful, party atmosphere that welcomes riders of all ages and abilities. It is a family-friendly event that relies on participants being considerate to each other and to other road users, even if we do hold their journey up for a couple of minutes. People who are unable to ride responsibly and safely should consider staying away (a post by a participant written on the Critical Mass London Facebook Group).

These sociabilities do not always raise to the set expectations. This is visible particularly towards other road actors, but also amongst cyclists themselves. The message of the Critical Mass is often misunderstood by drivers and pedestrians alike, even when they are handed out flyers explaining the scope of the event. For instance,

> some of the drivers uses their horns to try to get through the compact group of cyclists, while others warned us that we are not making ourselves popular with the drivers if we block them off. When I asked one of the participants what he thought of this he said to me: 'Must people or groups be popular to have their rights? I don't think that's the case' (Field notes, 28 November 2014).

Even amongst cyclists themselves there are sometimes frictions, which indicate that the sociability is in constant negotiation. For example,

> some of the participants blocked junctions that, according to other cyclists, were not supposed to be blocked, others were filtering through stationary traffic, to the disapproval of a minority, while a few were racing at the front of the group without waiting for everyone gather. I have seen certain cyclists telling others what to do, as well as splits in the group as some chose different routes rather than agreeing on a common one. It seems that the closer the cyclists come together, thus completely filling up the road and stopping all the cars from passing, the more successful the event is (Field notes, 28 November 2014).

Riding slowly and close to other cyclists is the measure by which the effectiveness of the Critical Mass is measured. I have shown nevertheless that while these desires are explicitly formulated by the participants, they are not necessarily met at all times during the rides. The heterogeneity of the group, where members often have different motivations for joining, impacts upon its overall sociability. Still, the success of the Critical Mass rides across the world remains incontestable: in the two decades since their inception in San Francisco, there are over 300 cities organising similar events, all sharing, at least notionally, the same principle of slow cycling sociability.

The swarm, the conversational and the carnivalesque sociabilities so far described are only to a certain extent illustrative of the current system of automobility. These congregations of unacquainted and sometimes acquainted cyclists are indeed unfolding in cities where the car is still the dominant transportation or continues to play an important role. The sociable encounters they enable are only possible due to an accommodating infrastructure protecting cyclists from motor traffic, to protest events such as Critical Mass rides, or to cycle-friendly cities where cyclists often outnumber other road users. But through these

practices, the swarm, the conversation and the carnival also anticipate a system of mobility with a different feel and interaction order than the car system.

Still, the vast majority of cycling practices in Western cities do not feature the types of sociable mobile associations I have presented so far. More often cyclists are squeezed in the gutter and forced to ride in a single file, an exclusion that is further reinforced through present road infrastructure and legislation[13]. There exists nevertheless some defiance against this 'atomized' cycling, particularly visible amongst a category of users invested in the more leisured practice of club cycling. Once we follow the country lanes, the cyclists who often seem invisible in most contemporary cities congregate in colourful flocks for convivial or, on the contrary, hardened weekend rides. Found in more hostile environments than their counterparts previously discussed, the club cyclists are often successful at playing the game of cycling together.

Club sociabilities

The cycling sociabilities so far investigated reflect two important things. Firstly, they are unequally distributed in space, with everyday cycling in large formations being mostly a Dutch and Danish tradition. Secondly, they are also unequally distributed in time: rather than being a common daily practice, large groups of cyclists are more likely to gather during special occasions, to celebrate cycling or to protest automobility. The history of the cycling

[13] The London Cycling Design Standards document recommends that cycle tracks 'should ideally be 2 metres wide' (Transport for London 2014: 6), while the Highway Code states: 'never ride more than two abreast, and ride in single file on narrow or busy roads and when riding round bends' (DfT 2015: rule 66).

practice shows us nevertheless that these temporalities and spatialities of group cycling were more evenly distributed in the past.

A century ago, when cycling was arguably more common than today, the bicycle club catalysed the energies of the wider community, particularly in the Western world. Peter Cox (2015) observes that 'one uniting factor bringing cyclists together at local, national and even international levels since the very earliest days of cycling, has been the formation of clubs and other formal associations' (2015: 30). Thus, the Cyclists' Touring Club (CTC) in the UK was formed in 1878. These clubs had both 'an inward support and social function, coupled with an outward, representative function' (Cox 2015: 30).

Even if its activist and lobbying function has gradually faded, in many countries the club plays an important role in gathering under one umbrella a great number of leisure cyclists. In the following pages, I investigate the sociabilities of a cycling club, CTC Central London, which I joined for rides in the countryside. Club cycling is representative for researching sociabilities not only because of the acquainted cyclists it reunites, but also because of the sense of community it encourages. Moreover, there is a diversity of participants (for at least one of the groups I researched) in terms of age, gender and skills, which makes these sociabilities not only more inclusive, but also indicate a certain predisposition towards slow cycling.

I show how the dynamics of two groups within the club, considered as Ride-Formations comprised of mobile teams, feature observable patterns of co-operation and sociabilities, as well as a subtler, yet essential process of socialisation into cycling through the acquiring

of a bodily hexis (Bourdieu 1972). In the period between October 2014 and May 2015 I took part in two types of weekend and holiday leisure rides: the faster '4-star' rides, and respectively the slower '2-star' rides. In total, I have joined seventeen rides. The two forms of sociability the club cyclists maintain as they ride both on infrastructures designed for transport and for leisure mobilities are the chain-gang and the accordion. While the aim of both the chain-gang and the accordion is to ride abreast in a pair and, eventually, engage in discussions, these formations rarely achieve the conversation levels I have observed in Amsterdam. What becomes more important here is to keep the said formations alive, which often proves to be challenging in road environments dominated by cars.

In most Ride-Formations, the mobile arrangement can be held together without the need to make this goal overtly explicit. As previously indicated, unacquainted cyclists sustain, for example, a flow as they swarm through an intersection without prior agreement on how to maintain this cohesion. Yet, during club rides linguistic and gestural codes, as well as very specific do's and don'ts, are essential to avoid the formation breaking down. They represent what Goffman calls demeanor, a type of ceremonial behaviour, involving in this case the body, the bicycle, its wheels and pedals, which is 'conveyed through deportment, dress and bearing' (1967: 77) and reflects how an individual carries himself, through his movements, self-control, and other means of outwardly visible presentation.

In the coming pages, I bring forward cycling interactions which often have little in common with the swarms, conversations and carnivalesque sociabilities. Overall, I argue that these cyclists succeed to engage in sociable encounters despite these vicissitudes. Furthermore, although they are significantly different, I have nevertheless decided to contrast the faster

‘4-star’ group with the slower ‘2-star’ group and their cycling experiences to contextualize group cycling in the current car world and provide at the same time insights into how slow cycling can occur even within these hostile environments.

The chain-gang

The task of riding with the 4-star group can be described in one sentence: achieving efficient intimacy at high speed. I learned this on my own, struggling to stay with the group at the beginning, then becoming better and better at keeping pace. Before joining them, the only thing I knew about this principle was from the website, quantified in speeds and distances: ‘averaging 26-28km/h (…) and approximately 90-100km, with a brief café stop for lunch (…) Be prepared to do your turn on the front and accept that you may get dropped if you can’t keep up!’ (https://www.centrallondonctc.org.uk).

I have decided to join this group after being on a few rides with a slower one (see next section). Being a more capable cyclist than the others, I admit I felt frustrated at times by their gentler pace. But equally important was the desire to discover the much talked about ‘weekend warriors’ and to contrast it with the slower cyclists.

Only when I joined the ride starting in North London on a Sunday morning in October 2014 did I understand that the mobile arrangement of bodies and bikes is more complex than the web description. Efficiency at fast pace is not achieved only when everyone in the group is doing their ‘turn on the front’, but also by riding in close proximity to the rider in front of you and by aligning the front wheels with the rider on your left or right. Once these

requirements are met, a successful formation is achieved, called a 'chain-gang' (the complete name for this is 'chain-gang-through-and-off', an allusion to the formation adopted by the riders, see illustration 6.4).

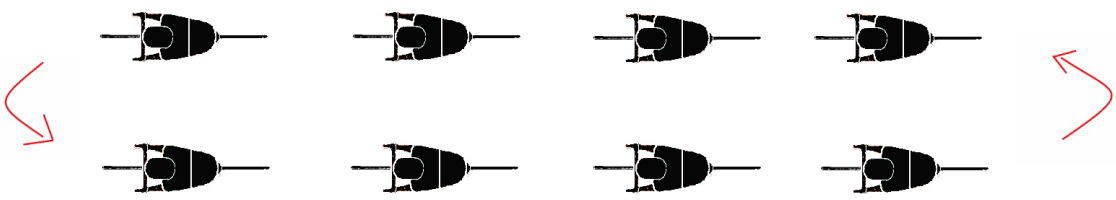


Illustration 6.4: Riding in a 'chain-gang through and off' manner (personal drawing).

As the scheme above shows, the first of the cyclists on the right (the upper row here) advances to take the position occupied by his fellow on his left, while the last rider on the left takes the position of the colleague on his right. There are two lines of riders, with equal numbers in each line (when there is an even number of riders) and they frequently change position counter clockwise, so that every rider gets to be at the front, getting dropped to the tail, coming again at the front and so on. This change in the position of each rider is taking place about every five minutes, to avoid the exhaustion of those at the front. The actual movement of a bike chain is consequently simulated.

> 'Close the gap, there, Cosmin!' 'Sorry?', I reply as I am trying to turn the head back to better hear his words. 'Close the gap!' repeats Jon, this time clearly and authoritatively emphasising each of the three words. He's the ride leader, pedalling behind me, on the left, and this admonition would haunt me for most of the ride.

> ‘Come a bit closer and align your wheel next to mine’, adds Mike, the partner on my left. As we wait for the green light, Jon makes more specific recommendations: ‘Keep alongside the guy to your left’. We’re less than half an hour into this 90km ride and I start to grasp the complex requirements of riding in this group (Field notes 8 February 2015).

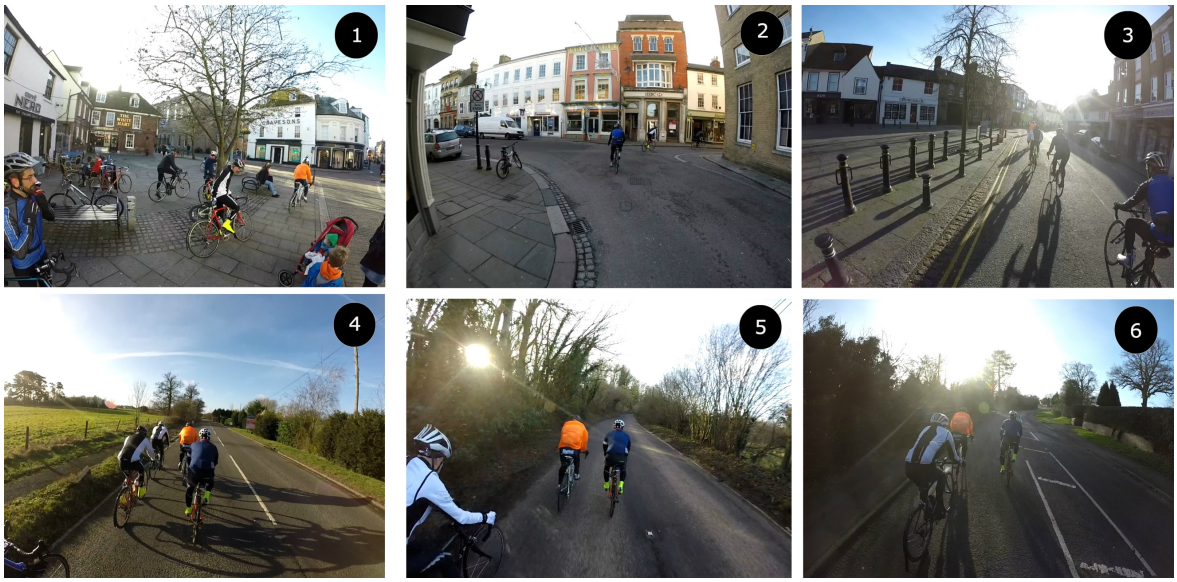


Illustration 6.5: Chain-gang sociabilities. From top left to bottom right: 1) The riders set off. 2) and 3) The chain-gang formation is not yet established. 4) The chain-gang formation is now in place, the cyclists riding two abreast in close proximity. 5) The positions in the chain-gang are changed, I advance on the second line and change my partner on the left. 6) The chain-gang in under threat as I lose contact with the person in front of me.

The chain-gang formation is rarely achieved even by the 4-star riders and generally lasts for short periods of time. More frequent are the single file and the pair, which are easier to sustain in the long run. The physical capabilities and the skills of cyclists, as well as the road environment and the topography influence the life expectancy of a chain-gang. In illustration 6.5 I show the coming together of the chain-gang, the change of places in the group and how the formation risks breaking.

When it is in place, the chain-gang achieves what Goffman calls a 'state of talk', which requires that a 'set of significant gestures is employed to initiate a spate of communication and as a means for the persons concerned to accredit each other as legitimate participants' (1967: 33). Yet, the discussions within the chain-gang are less rich than those I engaged while riding side-by-side in Amsterdam; the effort required to sustain the high speed, the ride formation, as well as the lean-forward position on the road bikes everyone is riding only allow for brief discussions and even less eye contact. The conversation topics are generally concerned with the last training, the new bicycle or accessory one has bought, the recovery from an accident or the latest professional cycling race on TV.

I focus less here on the talk within the chain-gang, which is not the main purpose of the formation. The sociabilities of the chain-gang derive not from sustaining conversation, but from maintaining the formation itself. Even if speech is not an essential feature, the chain-gang illustrates Simmel's play-form of association, oriented to sustain the sociable interaction. The chain-gang ensures the ride as a mutual activity, demanding that the rider does not stand out or upset the mode of sociality. She/he and the others in the group should keep things going by riding fast and close to one another and by seamlessly changing position in the formation.

The talk is often replaced here by a series of shouts and signs. They function as a restricted linguistic and gestural code that is both a mode of sociability and a mode of ordering the Ride-Formation:

> Once at the front, I began using the same utterances and hand signals that I've seen and heard while riding at the back. Not only the 'Slowing!' and 'Stopping', but also new ones: 'Clear right!' when crossing an intersection; 'Hole!' (often accompanied by and a hand signal) indicating a pothole to avoid; 'Car down!' (and alternatively, 'Car up!') to announce a car respectively coming from the front and the back; a left hand swung on the back to signal an overtake of a car, of a cyclist who is not part of the group or of any other obstacle etc. I realised that these warnings (except for the 'Car up!') are echoed by those riding in the back, being passed down the line to the last riders in the group (Field notes 8 February 2015).

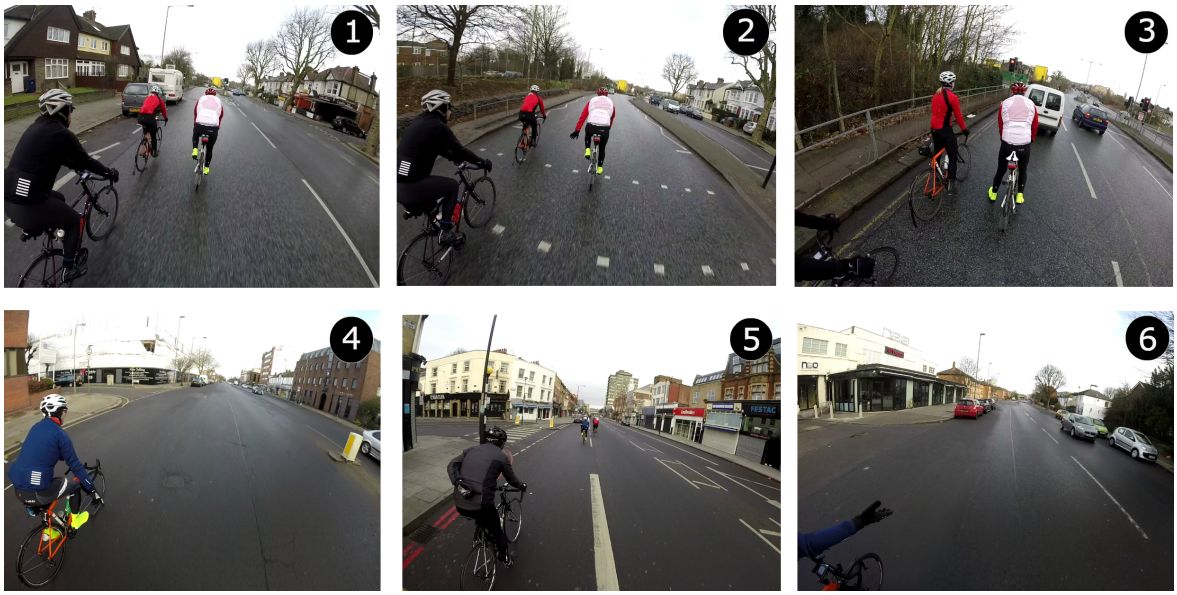


Illustration 6.6: The linguistic and gestural codes. From top left to bottom right: 1) 'Close the gap!' 2) 'Slowing!' 3) 'Stopping!' 4) 'Hole!' 5) Overtaking a car. 6) 'Change position'.

The linguistic and gestural codes above are made to express only when the interaction within a chain-gang is at risk of breaking down. Together with a series of what can be broadly described as 'do's and don'ts', they represent a form of demeanor (Goffman 1967). The do's and don'ts can be summarized as follows:

1. Do not do any sudden moves;
2. The lead riders must give clear warning of any potholes. Any warnings must be shouted down the line. A gentle line must be taken around potholes, rather than a quick switch;
3. Do not focus your eyes on the wheel in front of you, as you will not be able to anticipate risks at a distance. Look past the rider in front of you and up the road;
4. Try not to use the brakes; move into the wind slightly to slow yourself down;
5. Try to maintain 80-100 pedal rotations per minute; that way you will always be on top of the gear and not struggling;
6. The first rider should make sure everyone gets through a junction before resuming the pace. There is no reason to take risks on a recreational ride;
7. Keep your front wheel slightly offset from the rear wheel of the rider in front of you;
8. Accelerate only to re-join the back of the line, after your turn. Do not accelerate at the front.

The entirety of bodily interactions in a chain-gang reveal that the body of the cyclist is itself the 'site of incorporated history' (Bourdieu 1972), which only acquires the embodied knowledge of riding in a Ride-Formation through practice, in this case a painstaking one. But once they are internalised the interactions become part of the 'bodily hexis', which is 'political mythology realised, embodied, turned into a permanent disposition, a durable manner of standing, speaking and thereby of feeling and thinking' (1972: 94). The do's and don'ts effectively list what the expectations are from a cyclist in a chain-gang, but they do, in fact, more than that: they ascertain the bodily hexis of the cyclist, the 'learned' body and

bike movements, gestures and postures that represent the required qualities of a 4-star cyclist riding with CTC Central London.

Overall, the 4-star cyclists are not explicitly competitive. They wait for one another when there is a break in the group, they help themselves with mechanical problems, they spare the less capable riders from riding at the front and 'shelter' them in the group. But they also discourage the weaker cyclists from joining the rides by explicitly stating on the website that they would drop them if they cannot keep the pace. They reflect the cycling that is today embedded in the system of automobility: not particularly sociable, not very diverse in terms of participants and very fast. The contrast between the chain-gang and the slower club cyclists is nevertheless useful to emphasize the richer sociabilities of the latter, but also to dispel the myth that sports cycling is exclusively individualistic and competitive.

The accordion

Stepping down a few gears from the high pace of the chain-gang, I engage now with the 2-star rides, covering half that distance (between 55 and 85km), and run at a 'steady pace (15-20km/h) yet [offering] time to enjoy lunch' (https://www.centrallondonctc.org.uk). Not only is the speed lower here, but the traffic is also sparse or completely absent (on car-free routes). Consequently, the interaction between cyclists is richer as they can ride more often abreast and exchange verbal and visual contact. Stops are more frequent and casual sociabilities develop more easily.

There are some important distinctions between the 4-star and 2-star riders which illuminate why they engage in two different types of Ride-Formations: respectively the chain-gang and the accordion. The 4-star riders have an average age of around 40, are predominantly male and have a better physical condition. They prefer the main roads and the rides generally last up to four hours. The core group is formed of around five people and a formation does not regularly exceed ten riders. On the other hand, the 2-star riders are averaging 60 years, their gender is more balanced and their physical condition is more heterogeneous, some cyclists being more capable than others. The core group comprises around ten people, but the rides can accommodate up to twenty cyclists who may spend a whole afternoon on the saddle. This latter group often organises cycle tours, two of which I joined in the Spring of 2015. The 4-stars and the 2-star rides do not usually mix members.

The 2-star rides develop a different type of Ride-Formation than the chain-gang, which I call the 'accordion', because of the constant spreading and regrouping during the ride. I have noted this during a cycle tour in Northern England:

> These sociabilities (…) with many climbs and descents over the Pennines, seem to resemble an accordion: people getting scattered during the ascent or the descent, then reunite at the top or the bottom of the hill, then getting scattered again. The 'accordion sociabilities' also occur because people stop and wait for one another not just to regroup, but also to redirect the group when arriving at an intersection (Field notes, 22 April 2015).

Unlike the chain-gang, where the ride leader changes position in the same way as the rest of the riders, in the accordion there are three specific roles distributed amongst the most experienced cyclists. Before the start of the ride, both the leader and the last rider in

formation are designated: the role of the first is to indicate the directions, whereas the last rider must ensure no one is left behind. The third role is negotiated on the move: at intersections one rider must stop and make sure that those at the back are aware of the turn (Illustration 6.7 below).

Illustration 6.7: At intersections on rider (the woman in pink jacket in photos 1 and 2) must ensure that the others are aware of the turn.

There are two successive actions recorded in an accordion formation: expansion and compression. As a rule, the extension of the accordion tends to occur more often on busier roads, where the formation shifts into a single file. On the other hand, the compression is visible on quieter lanes which allow cyclists to ride two abreast. Also, during compressions the side-by-side formations are more fluid than in the single file: cyclists often move from one formation to another or create new formations, as they engage in several distinct conversations. This fluidity is in visible contrast with the chain-gang formation, where positions are changed according to specific rules.

Most often, the expansion is due to the inclination of the terrain (see Illustrations 6.8 and 6.9) or to the physical capabilities, which sort the fastest from the slowest. For example, some of the routes taken during the bike tours, in Wales, Lake District or Yorkshire Dales, were quite steep, with elevation of up to 500 metres. Similarly, the age range within the group is very broad, with some cyclists in their mid-70s, whereas others were in mid-30s. Also, amongst them some are cycling and exercising more regularly than others. All these aspects impact upon the compactness of the group and the ensuing sociabilities:

> Simon is riding at the front as often as possible, upsetting the average pace of the group. He's younger and stronger than most. Kumi, on the other hand, is not only far less capable, but she is also often stopping to take pictures. Michael and Paul are in their seventies and the slowest in the group, so we wait them every dozen kilometres (Field notes, 24 April 2015).

Illustration 6.8. Expansion of the accordion formation during the ascent. Some cyclists get of the bikes and push them up the hill (photo 1 and 2). At the top, we stop and wait for the slowest cyclists to rejoin the group (photo 5) and then continue the descent on a single file (photo 6). The expansion here is captured as I overtake some of the cyclists from the group.

Illustration 6.9. Expansion of the accordion formation during the descent. The compact formation at the top of the hill is spread along a few dozen metres as it negotiates the descent. The expansion here is captured with the video camera set in reverse to my field of vision as I overtake some of the cyclists from the group.

Alongside the bodies and their capacities, the bicycles themselves make a significant contribution to the overall velocity of the '2-stars'. Unlike the light, slim and fast road bikes of the 4-star riders, these cyclists are using a variety of bikes, which are all slower: comfortable hybrid bikes, more solid touring bikes and even folding bikes. All these have wider (and sometimes smaller) tyres, are fitted with metal racks, front and back panniers, making them, on average, slower than road bikes.

The traffic volume (as shown in the illustration 6.10) also affects, as in the case of the chain-gang, the formation of sociable pairs during the ride. But unlike the faster group, the 2-stars avoid as much as possible riding on busy roads. For this purpose, during the weekend rides, the group boards a train to get outside London and then back.

Finally, the bad weather also influences the formation. It is less compelling to have conversation or even keep a similar pace with other riders under such circumstances:

> When the weather is bad even riding on quiet lanes can impact upon the composition of the group. The pouring rain only lasted half an hour, but got us all soaked and trembling, prompting us to pedal fast and get home as soon as possible. No words spoken, only teeth grinding, the rattling rain would make any conversation impossible anyway (Field notes, 2 November 2014).

Illustration 6.10. Heavy traffic often leads to the expansion of the accordion. As soon as we join a busy road, the side-by-side formation gives way to a single file.

Curiously, sometimes the expansion of the accordion takes place because of one's own decision. I felt the impulse to ride faster at times, and so did another cyclist as she complained at one point that there are too many stops for tea and coffee. While others have simply expressed the desire to ride without much company around:

> There's something that's so liberating not talking to anybody as well (…) There were times when you could just about see the person in front, we were spread and we were going just through the most beautiful wilderness areas. And yet you were in this group and you all knew you were looking out for one another, we were heading to the same destination. It was so nice knowing you are in this group, but you are completely free in your own head and I would have felt awful if I'd been on my own now. It's a very powerful communal bond (…) And it allows you to be in your own head, in the way that you couldn't be on your own head if you were on your own, because you'd be too stressed to find the route, or feeling lonely (Catherine, 50s).

Despite the manifold obstacles which are getting in their way, the 2-star cyclists spare considerable effort to ride together and be sociable. The compression of the accordion, or the 'face-work' (Goffman 1967), is often done in the same manner as in the chain-gang, but a far less complex set of linguistic and gestural code is deployed (see also Aldred and Jungnickel's 'ongoing communication' (2012: 530)). When the expansion of the accordion formation is critical and the co-presence is compromised, there are a few ways to restore the Ride-Formation: brief stops to wait for the delayed, the use of mobile phones when some riders simply get lost or longer lunch breaks to allow time for recovering.

The mobile phone is an essential technology particularly during rides on less familiar routes and when not everyone has a GPS device or a map. One of the interviewees, Michael, remembers how mobile phones gradually became more important than any other available technology:

> The mobile phone has made a huge difference to how we pursue a lot of our activities. If you go on a Sunday ride and you lose someone, you can usually re-join them by either

> ringing the leader and say 'Where are you?' or being rung and asked 'Where did you go?' And you get back together. Years ago, if you didn't pay attention, you needed your own map (Michael, 70s).

Finally, the lunch is the most sociable moment of a 2-star ride. These sociabilities are possible at least once during a ride and it is generally the ride leader who decides where to make lunch reservations for the whole group:

> One of the problems with cycling is that you can't talk all the time, but you have lunch. Unless it's a quiet lane you can't talk all the time. Though you manage to get through quite a lot of conversation, I think. It's nice to meet people on a regular basis (Graham, 70s).

> For us and for most of the people in the rides that we are on, you've got to have a good stop, in Simon's (her husband) case preferably in the pub, it's good if you get the tea stop in the afternoon as well. That's a big part of the day, whereas for the fitter riders the cycling is the bigger part of their day (Sue, 60s).

> I do go for social reasons because every week it's almost like the same core people go out. You know, Richard, Christine, Michael, Paul, you will be there. The frequent people that come out, it's a pleasure to see them. And you don't see them the whole week, you don't talk to them the whole week, but you cycle with them, you have lunch with them and then you go your separate ways and it's acceptable that there isn't more than that. And it's an easy relationship (Sabina, 50s).

In accommodating the variety of ages, capabilities and desires I have described above, the 2-star rides make an implicit claim that they cater for slower, more convivial cycling. This gentler pace is intentionally enabled by avoiding heavy car traffic and riding instead on

quieter roads. Thus, the slow cycling performed by this groups is both a stated preference and it is constrained and influenced by the aforementioned aspects.

The chain-gang and the accordion sociabilities described above are, as in the case of their urban counterparts, ambivalent in their nature. Through their fast, effective cycling, the chain-gang associations are emulating the existent system of automobility. On the other hand, the accordion formation, with their slower pace and cordial atmosphere, cycling on traffic-free routes, anticipates how a slow cycling future looks like.

Conclusions: Fluid Ride-Formations

In this chapter I investigated the sociable Ride-Formations of cyclists grouped in various 'mobile teams' and 'mobile withs'. The multiple interactions in which they are drawn are markedly contrasting the dearth of sociable encounters amongst automobile users. While the latter might can be sociable to the others within the car, not the same can be said about their interactions with anyone outside their metal cages. With the advent of self-driving cars, which was discussed in chapter three, these sociabilities will become even scarcer, as car users, without any responsibility towards others, will be able to further neglect what happens outside their 'cocoons'.

Through their informal understanding of traffic as well as through their tactics of negotiation in motion, the Ride-Formations analysed here are re-writing the mobile interaction order of the road space to accommodate more fluid and adaptable arrangements of mobile subjects. The single file formation, advised by most traffic codes,

is often metamorphosing into side-by-side formations as soon as the traffic conditions get milder. They mutate, in turn, into 'accordions' which get spread and then regroup, to eventually convert into very functional 'chain-gangs' where cyclists constantly take turns at the front to effectively move forward. Finally, they become 'the carnival' or 'the swarm', where a sense of moving together in a continuous flow is created even as cyclists do not know each other.

Even within a car-choked environment, these ever-changing Ride-Formations produce 'distinctively flexible social spaces' (Aldred and Jungnickel 2012: 523), where the hybrid rhythms of cycling are not just improvised (Spinney 2010) to resist the dominant mechanized rhythms of the automobile, but they subvert and sometimes, as with the Amsterdam 'swarms', even overcome their supremacy.

Within a slow bicycle system, such as the one imagined in the first chapter, these sociabilities will become common. A mobility system where the car is no longer dominant and which is designed around the bicycle will transform the road space into a less constraining, less foreboding, less competitive environment. The Ride-Formations discussed here are likely to be not only more fluid, but also more accommodating of different skills, capabilities and needs. The role of cycling senses, which were discussed in the previous chapter, is essential for how the sociabilities presented in this chapter are performed. The richness of stimuli that can be perceived and negotiated while riding a vehicle that is more open to the environment impacts on the quality of mobile interactions amongst cyclists themselves: instead of merely relying on codes and signals, cyclists use

more their senses to pay attention, communicate and negotiate with others their everyday movement in cities.

The possibility to engage in sociable encounters on a bicycle is indicative not only of a successful bicycle system, but also opens the possibility to think differently about urban movement and our societies more generally. Today, cycling two or more than two abreast is an uncommon practice in most urban environments. By focusing on various Ride-Formations, this chapter has suggested that cycling sociabilities are prefigurative of a slow bicycle system, where cycling together could be a far more common practice. Formations such as the swarm, the conversations and the accordion, which encourage riding abreast and sometimes even verbal exchanges, indicate that slow cycling is already taking place under certain conditions and that it could flourish even more in a post-car future.

Currently, these formations are very heterogeneous, ranging from the very fast, exclusivist and disciplined chain-gang associations of weekend warriors, to the apparently very chaotic swarms of Amsterdam, openly defying the traffic norms. This heterogeneity relates, at least partly, to the hostile road environment dominated by cars, as well as the very functionalistic and rationalistic role attributed to cycling and to urban mobilities, more generally. Yet, alongside these expressions, I showed that more inclusive formations co-exist, represented by the celebratory Critical Mass rides, where huge number of cyclists claim the road space from cars, or by the accordion described by the leisure weekend cyclists.

While variations in speed amongst cyclists will continue to exist, a future slow bicycle system could see nevertheless a more homogenous cycling peloton. Once most of the cars will disappear from the urban environment and once the pursuit of fast cycling to increase the economic productivity of cities will no longer represent a priority, it is likely that cycling will look more like the carnival and the accordion, than the chain-gang and the swarm.

Chapter 7: Slowness

So far, this thesis has advanced the possibility that a bicycle system could emerge in the not-so-distant future proposing a viable alternative to the automobile, at least for short and medium urban journeys. Increasingly, the supremacy of the car as the default mobility option within cities is contested (see Copenhagen and Amsterdam, but also the centres of London, Paris and other European cities where bicycle trips are close to overtaking car trips: Transport for London 2016), particularly in the Western world, where issues of congestion and pollution warrant the adoption of rapid and decisive actions. Even as these potential alternatives are advanced and sometimes materialized, there is an implicit assumption that the new mobility system must retain some essential affordances of the automobile: ensure direct connectivity and seamless, fast, mobility from A to B.

In the previous two chapters I showed that, contrary to the practices of fast movement, the ways in which the cyclist's body engages with the environment enable a different appreciation of the world by carefully and patiently 'listening' to one's senses and allowing them to express their actuality in motion. I also argued that the organic bodily rhythms blend with the mechanical rhythms of the bicycle to produce a hybrid that challenges the dominant fast rhythms of the car. And, most importantly, the smooth co-ordination of organic and mechanical rhythms within this hybridity and the flow that is generated, are only possible because the pace of cycling is slower than that of motorized transportation. Similarly, the sociabilities unfolding between cyclists riding together confront the narrow understandings of the road as a mere functionalist and utilitarian space. By slowing the

traffic down, as the critiques against such practices often go, these sociabilities restore an essential function of the road: that of a genuine public space.

Historically, the bicycle was assimilated with desirable futures only insofar as it encapsulated visions of modernity, progress, development or economic growth. In the late nineteenth century, the bicycle fuelled the fast rise of capitalist mass production, distribution and consumption. Alongside other industries such as those of railway locomotives or the sewing machines, the bicycles set in motion the first assembly lines. Similarly, the early advertising strategies were greatly influenced by the bicycle: promoted through eye-catching colourful posters (see chapter four), the bike was amongst the first mass produced goods for which the sale of accessories was extremely significant, thus anticipating the more recent marketing techniques (Norcliffe 2001). The bicycle was a natural ally of industrial capitalism, the factory system gaining directly and indirectly by bicycle production. 'The bicycle industry was ideally suited to new methods of mass production, and by mobilising workers the bicycle improved the labour supply to larger more efficient factories. In turn, the swelling ranks of bicycle factory workers increased demand for the vehicle, further boosting the industry' (Smethurst 2014: 34). In recent times, the rapid urban regeneration and the pursuit of fast economic recovery and growth are intertwined with images of a vigorous bicycle economy which would – so it is proposed – undoubtedly get struggling cities back on track. In London alone, the construction of cycle lanes in some areas have seen the price of nearby properties rise by 50% (Ferrini, quoted in Reid 2017b).

Against these visions, I contend that a bicycle system must not accelerate mobilities and societies but, on the contrary, aim at slowing them down. As I have insinuated throughout this thesis, what might appear to represent a utopian proposition is, in fact, a very serious prospect. The various cycling practices previously investigated are nothing but an exemplary expression of a broader cultural tendency across Western societies to slow down. The slow everyday practices of cycling might not quite beget the much-awaited instantaneous cycling 'booms' and 'revolutions' that some of the authors referenced in this thesis enthusiastically write about (Reid 2017; Mapes 2009). Yet, they represent, as I will show in this chapter, tactics of resistance (de Certeau 1984) and exemplars of a norm of sufficiency (Gorz 2010), capable of effecting significant social alternatives to contemporary capitalist societies.

In this chapter I aim to challenge the current dominant utopias of speed, the practices of fast production and consumption that they nurture and the promises of economic growth that they embed. In doing so, I explore to what extent alternative utopias of slowing down societies and mobilities could represent more viable solutions for the future. I argue that today both social and environmental exigencies warrant the consideration, investigation and even promotion of such counter-narratives to the hegemonies of speed and growth. I begin the chapter by unpacking the strong links of speed to industrialisation, modernity and capitalist societies, demonstrating how this has impacted on the 'naturalization' of speed as intrinsic to the contemporary everyday life. I continue by addressing the ambivalence of speed, both as a positive experience, mainly in relation to its unusual nature, and its negative impact, resulting in a tiresome routine which today encompasses most of the contemporary everyday life. Consequently, I uncover the manifold expressions

of slowness as a cultural reaction to speed, represented both in more politicised movements such as 'slow food', and in everyday practices of resistance, such as the ones related to cycling senses and sociabilities, described in the preceding chapters. Further, I argue that slowness requires even more consideration today as practices of speed are strongly linked to unsustainable patterns of energy and resource consumption. In the last decades, these practices have generated an unsustainable economic growth, particularly across developed countries, which has proved detrimental to both ecology and society. Instead, I advocate for an eco-political project of limitation which opposes more increases in speed and economic productivity. A slow bicycle system could provide the ground for embracing a norm of sufficiency within a future post- or de-growth society.

Need for speed

Ever since the dawn of modernity, the category of speed has been black-boxed: while it is intimately linked to it, this acceleration is hardly brought into discussion. With the exception of futurism, an early twentieth century art and political movement, the virtues of speed generally received little consideration. Instead, speed has been acting as an almost silent background upon which the processes of modernity and capitalism simply unfolded. The sense of living a so-called 'faster life' that contemporary generations experience is an indication of 'a genuine and significant shift in temporality that occurs and accelerates specifically in modern societies' (Tomlinson 2007: 1).

Despite being central to the cultural experiences of modern societies speed can hardly be found in the social scientific accounts of modernity. Karl Marx, for example, discusses in

Grundrisse (1973) the inherently accelerating and globalizing tendencies of capitalism. For him, speed is important to understand changes in how new technologies of production reorder modern space. Marx describes the significant shift between the uses of tools by workers to expand and amplify cognitive and physical labour and machine production that the Industrial Revolution made possible:

> The worker's activity, reduced to a mere abstraction of activity, is determined and regulated on all sides by the movement of the machinery, and not the opposite. The science which compels the inanimate limbs of the machinery, by their construction, to act purposefully, as an automaton, does not exist in the worker's consciousness, but rather acts upon him through the machine as an alien power, as the power of the machine itself (1973: 693).

Thus, the industrial machinery transforms the relation between the worker and the tools of production: rather than her animating the machine, the machine now animates and alienates the worker. Undoubtedly, the early bicycles and the development of production lines that they made possible (see chapter four) testify to the essential role that this technology had in speeding up the early days of capitalist production and consumption. Still, most classic social theorists have not developed systematic accounts of speed and modernity. Instead, they took the increasing speed within societies 'as analytically inseparable from the social dynamics – industrial production, capitalism, individualism – and the social contexts – mass society, urbanism, rationalism, secularization – which they saw as constitutive of modernity' (Tomlinson 2007: 7).

Georg Simmel is perhaps the only one of the early social scientists to acknowledge the triumph of speed over social life. In his memorable essay 'The Metropolis and Mental Life' (1903) Simmel describes the city of Berlin with its 'rapid crowding of changing images, the sharp discontinuity in the grasp of a single glance, and the unexpectedness of onrushing impressions' (1903: 175). This modern metropolis, with its money economy, the universal diffusion of pocket watches and the intellectual character of its inhabitants, illustrates best, argues Simmel, the growing impact of speed upon the development of the individual. The metropolitans grow in response a 'blasé attitude' towards things and people, which results from 'the rapidly changing and closely compressed contrasting stimulations of the nerves' (1903: 178). For Simmel, speed is an intrinsic characteristic of modernity, but one which primarily impacts senses, sensibilities and social relationships.

Noting the exceptions of the *Manifesto of Futurism* by Marinetti (1909), a 'reckless, hyperbolic celebratory discourse of machine speed' which ultimately inspired fascism, as well as Paul Virilio's *Speed and Politics* (1986), a collection of 'coruscating critical essay[s] on speed, power and violence' (2007: 8), Tomlinson observes how the disinterest in speed amongst academics prolonged into late modernity. Yet, the spatiotemporal acceleration of the last few decades, resulting in a distinct time-space compression (Harvey 1989), as well as a homogenization of place (Augé 1995), has given rise to a renewed interest in speed in globalized societies. Tomlinson argues that speed has morphed into 'immediacy', as the gap of time and space is not just compressed, but fully transcended:

> Early modern speed was heroic … precisely because it displayed the will, the force and the effort involved in the overcoming of distance. But the crucial thing, in terms of the cultural

> imagination and the values it promoted, was that the gap between here and there, now and later, what we desire and what we can expect to receive, was preserved in the necessity of effort, in the application of will, and, for the most part, in the prudential deployment of planning and regulation. The culture of immediacy, by contrast, involves as its core feature the imagination that the gap is already closed (Tomlinson 2007: 91).

Both in its connection to movement and to the broader rate of occurrence of events (something that Harmut (2003) calls 'technological acceleration', and respectively 'acceleration of pace of life'), speed is almost never regarded neutrally, as 'it offers both pleasures and pains, exhilarations and stresses, emancipation and domination' (Tomlinson 2007: 3). Yet, modern societies have not come so far to a total rejection of its intrinsic value.

As an unusual experience, speed has generally acquired a positive meaning throughout history, and not just in relation to modernity. The association of speed with vigour, vitality and masculinity seems to be quite general in most cultures. The pleasure and excitement accompanying the experience of speed are both associated with 'the psychology of thrill-seeking and … the "ergonomic" pleasures to be derived from the experience of merging body and machine functions' (Tomlinson 2007: 52). As argued in chapter five, sometimes the actuality of the senses is better felt at speed, as it enables equilibrium to be established, allows the fresh air to blow in one's face or reminds us that pleasant bursts of pain are part of riding fast. Similarly, sociabilities such as those visible in a fast chain-gang formation of a leisure cycling club (chapter six) can only be sustained if the riders are keeping a similar fast pace.

On the contrary, as a routine way of life, speed is stressful and exhausting, as Simmel has noticed more than a century ago. In specific relation to mobility, speed can be regarded as 'unnatural', in the sense that the animal pace of the human body is greatly outpaced by the expenditure of energy trapped in carbon based fuel powering all motorized forms of transportation. The routine and mundane speed is not useful to the flow of life; instead it damages the body, causing sickness and mental illnesses. In the United Kingdom alone almost half a million people have been diagnosed in 2016 with work related stress, depression or anxiety (Health and Safety Executive 2016).

Tactics of slowness

Despite the ambivalence of speed, most propositions to slow down the pace of mobilities, and more generally the pace of life, fall outside the mainstream. While there is a common link between consumer capitalism, declining trends in well-being and the degradation of the environment, 'a cultural reaction to the velocity, intensity and perceived meaningless of life' (Osbaldiston 2013: 4) only began to be articulated around the turn of this century. Movements such as Slow Food, Slow Cities or Voluntary Simplicity are some of the most prominent examples. At the same time the virtues of slowness have started to be praised in the last few decades in various fields, ranging from gastronomy (Benția 2015; Bossy 2014; Hayes-Conroy and Hayes-Conroy 2010), economics and education (Berg and Seeber 2016; Kahneman 2011), to science, technology and travel (Salasar and Graburn 2016; Dickinson and Lumsdon 2010).

The Slow Food movement has gained some attention in academia. Bossy understands the Slow Food movement as a 'utopia of slowness', requiring 'an art of slow doing as a solution to change the world' (2014: 189). The slowness within this movement is particularly visible in the education of taste. Taste is not something possessed as such, it is relational and processual, created in the practice alongside other individuals. Benția has studied fairs and markets where slow food 'manifests as a material, sensuous, and social presence' and argues that taste is not just 'a mere flagship of Slow Food advocacy for a green way of life but … the practice which makes and keeps making "greenness" into an active, open process of exploration and discovery, wonder, and vitality' (2015: 175). The feelings motivating one's engagement in the Slow Food movement are also relational, involving 'inner-connected biological and social forces', notice as well Hayes-Conroy and Hayes-Conroy. According to them, 'feeling is more than either biological response or socialized reaction to situations / surroundings – feelings are visceral judgments that are simultaneously biological and social' (2010: 2965). The way in which the participants in the slow food movement relate to taste reminds us one of the roles of utopia, as described by Abensour (1999), which is the education of desire.

But slowness is not entirely politically driven, it does not have to reflect organized, politically situated social movements, as often seems the case with the Slow Food movement. As the above authors illustrate, slowness can also be articulated in mundane everyday practices. Similarly, within cycling, the slow practices I investigate are not represented only through the overtly political manifestations such as the Critical Mass protests. Instead, through an investigation of senses and sociabilities of various cycling practices, I contend that slowness slides into the everyday, it 'reflects a style of living that

is dislocated from the norms associated with fast capitalism and is synonymous with meaningfulness' (Osbaldiston 2013: 5).

The necessity of reclaiming slowness from the realm of politics into the everyday is also formulated by Parkins and Craig in their work *Slow Living* (2006):

> At its heart, slow living is a conscious attempt to change the current temporal order to one which offers more time, time to attend to everyday life … But slow living should not be thought of simply as a slow-motion version of postmodern life; it does not offer or make possible a parallel temporality for slow subjects to inhabit in isolation from the rest of global culture. Rather, its patterns and practices, like others in contemporary culture, are non-synchronous, albeit deliberately and consciously … slow living involves the negotiation of different temporalities, deriving from a commitment to occupy time more attentively. 'Having time' for something means investing it with significance through attention and deliberation. To live slowly in this sense, then, means engaging in 'mindful' rather than 'mindless' practices which make us consider the pleasure or at least the purpose of each task to which we give our time (Parking and Craig 2006: 3).

Following from here, it can be said that slowness represents what de Certeau calls *tactics*, which are opposing dominant *strategies*. Michel de Certeau (1984) described the act of walking in the city as a specific politics of resistance. Against the 'grid of discipline' imposed upon us by the city of planners and engineers, de Certeau argues that we must exercise subversion and 'manipulate the mechanisms of discipline and conform to them only in order to evade them' (de Certeau 1984: xiv; emphasis in original). According to de Certeau, strategies assume 'a place that can be circumscribed as *proper* and thus serve as the basis of generating relations with an exterior distinct from it (competitors, adversaries,

"clientèles", "targets", or "objects of research")' (1984: xix). All forms of political, economic, and scientific rationality are constructed on this strategic model.

On the other hand, tactics cannot count on a spatial or institutional localization because

> the place of a tactic belongs to the other. A tactic insinuates itself into the other's place, fragmentarily, without taking it over in its entirety, without being able to keep it at a distance. It has at its disposal no base where it can capitalize on its advantages, prepare its expansions, and secure independence with respect to circumstances. The "proper" is a victory of space over time. On the contrary, because it does not have a place, a tactic depends on time – it is always on the watch for opportunities that must be seized "on the wing". Whatever it wins, it does not keep. It must constantly manipulate events in order to turn them into "opportunities" (de Certeau 1984: xix).

For cyclists, slowing down is an inventive tactic of resistance against an overwhelming strategy of speed, which involves disciplining and regimentation. The investigation of the rhythms of cycling, done in chapter six, illustrates the centrality of the body, together with its skills and capabilities, in achieving a hybridity which, unlike the automobile, does not obliterate the body, but revives it. Such hybrid rhythms are more akin to the organic rhythms of the body than to the mechanized rhythms of automobile traffic, which they contest through every transgression of traffic rules.

More generally, every 'Get off the road!' threat that cyclists so often get from drivers or every concerted media campaign claiming that cycling is slowing car traffic down (see the most recent one from the Daily Mail: Rawstorne 2016), legitimate or inaccurate as they

might be, are further illustrative of this resistance through slowness. Similarly, the Ride-Formations performing the sociabilities described in the previous chapter are using tactics of slowness which oppose at every step the strategies for fast mobilities concealed in the designs and regulations of road space. The discipline expected of cyclists riding in single file is subverted every time they chose to pedal abreast, every time their sociabilities trump the 'proper' use of the road. The flexible social spaces generated by these Ride-Formations dispute precisely the political, economic and scientific rationalities epitomized by a seamless traffic flow.

Affecting the slow

Slow cycling is only slow in relation to faster cycling and, arguably, in relation to automobility. On the contrary, it is most of the time faster than walking or running. Slowness must then not be restricted to an ideal type, a quality, but always considered to be relational, an outcome, an accomplishment. Vannini argues that we should understand slow 'not as an essential quality but as a process, and therefore a verb: a pattern of practices, experiences, and representations focused on the objective of moving slower than a significant or generalized other' (2013: 121). The reappraisal of slowness as part and parcel of the corporeal movement has become particularly visible in the last decade or so within the new mobilities paradigm.

Arguing against the instrumentalist, rationalist, individualistic and functionalist formulations of mobilities coming from transport research, the new mobilities paradigm maintains that the time spent traveling is not dead time that people always seek to

minimise. ‘Whereas the transport literature tends to distinguish travel from activities, the new mobilities paradigm posits that activities occur while on the move, that being on the move can involve sets of “occasioned” activities’, say Sheller and Urry (2006: 213). They further show that this new perspective

> examine(s) the embodied nature and experience of different modes of travel, seeing them in part as forms of material and sociable dwelling-in-motion, places of and for various activities. These “activities” can include specific forms of talk, work, or information gathering, but may involve simply being connected, maintaining a moving presence with others that holds the potential for many different convergences or divergences of physical presence. Not only does a mobilities perspective lead us to discard our usual notions of spatiality and scale, but it also undermines existing linear assumptions about temporality and timing, which often assume that actors are able to do only one thing at a time, and that events follow each other in a linear order (2006: 213-214).

Mobility has been black-boxed in a ‘basic signifier – getting from point A to point B’, without being given any specific meaning, argues Tim Cresswell (2006). The new mobilities paradigm draws a clear distinction between meaningless movement and meaningful mobility (Creswell 2006), between the void and statistical urban transit and the dwelt-in car that produces both motion and emotion (Sheller 2007).

But despite its vivid concern with the actual practice and experiences of mobilities, as opposed to just their representations through planning and engineering lenses, the new mobilities paradigm has so far had little concern for slowness. While often linking contemporary patterns of mobility to concerns over climate change (Urry 2011) and post-

carbon futures (Dennis and Urry 2009), slowness was not directly addressed by this literature. Mobilities scholars have instead taken, as Vannini observes, 'painstaking care to examine fast mobilities – from instant mobile communications to intercontinental aeromobility' (2013: 117).

Yet, argues Vannini, it is through the practice and experience of slowness, as well as through its representations, that slowness acquires meaning amongst mobile subjects. To slow down means

> to affect the way in which we dwell in the world, and in turn to be affected by it. To slow down is to act and move differently, to experience the social and ecological environment in ways that run counter to the logic of speed. To decelerate is also to conceptualize livelihood differently, therefore to represent time alternatively to the logic of speed – both to oneself and to others (Vannini 2013: 117).

The practices and experiences of bodily movements are fraught with efforts and therefore slowing down should be seen as an effort in itself, an accomplishment that must be understood phenomenologically and contextually: 'Moving slower or moving faster is something that must be apprehended as an embodied sensation and performance' (Vannini 2013: 122). The whole-body engagement in the act of perception as well as the performative nature of group cycling, explored in the previous two chapters, indicate that slowness acquires value through practice and experience. Understanding slow-as-affect, which includes the physical work, the struggle, the fatigue of movement (Vannini 2013), is important here because it runs against the contemporary dominant narrative of speed. Opposing the fast pace of capitalist production and consumption, which is embedded in

the speed of urban mobility, is increasingly seen as the only solution to the complex problems facing our societies today.

Slowness, sufficiency, de-growth

The slow cycling practices I investigate in this thesis, articulated as marginal tactics opposing dominant strategies, have the potential to effect change, even if only in the long term. 'Because it does not have a place, a tactic depends on time', argues de Certeau (1984: xix). Similarly, Tomlinson thinks that a slow movement 'might in the longer term be consequential', even if for now it is 'unlikely' that the movement will 'challenge the institutional grip of the condition of immediacy' in any direct way (2007: 149). Slowness could provide some 'balance', which 'implies the reflexive monitoring of practices and experience' (2007: 153) and which is greatly needed in contemporary societies governed by the culture of 'immediacy'. Tomlinson maintains that 'ideas of balance, measure and proportion become crucial to the governance of modernity', and expresses the hope that eventually 'the attractions of personal balance may resonate in the political cultures of democracies' (Tomlinson 2007: 154).

The proposition to strike a balance between slowness and the fast-paced societies appears more urgent when considering not just the negative social effects of speed, but also its environmental impact. The damaging nature of speed becomes clearer once we factor in the high energy needed to sustain it. Technologies of fast mobilities require energy not only for the act of moving, but also for their production, as well as for the infrastructures enabling these mobilities. Since the oil crisis of the 1970s, the relation between high speed

mobility systems and energy consumption was strikingly apparent. Ivan Illich advocated for establishing limits to speed as essential for achieving social justice:

> Past a certain threshold of energy consumption for the fastest passenger, a world-wide class structure of speed capitalists is created. The exchange-value of time becomes dominant, and this is reflected in language: time is spent, saved, invested, wasted, and employed. As societies put price tags on time, equity and vehicular speed correlate inversely (Illich 1973: 23).

The interlocking of increasing speeds and higher patterns of energy consumption indicate that speed is both a more complex and more urgent problem to address. As these fast mobility regimes require 'constant high amounts of energy to be consumed in producing round-the-clock transport of people, just-in-time delivery of goods, and energized communications and logistics networks' (Sheller 2014b: 131), the necessity to reverse gear appears even more important.

But there is more than just the high-speed mobility systems that energy abundance has made possible. As Kate Raworth (2017) observes, the last two centuries of 'extraordinary economic growth' in high-income countries have been largely possible thanks to the availability of cheap fossil fuel. More generally, Raworth argues that the ideologues of economic growth fail to recognize today the economy as an open system, with constant inflows and outflows of matter and energy. Instead, mainstream economics 'relegates ecological stresses such as climate change, deforestation, and soil degradation to the periphery of economic thought, until they become so severe that their damaging economic impacts demand attention' (2017: 74).

Thus, advancing an alternative to fast mobilities entails a dramatic reconsideration of energy consumption, but also of capitalist production and consumption, more generally. Slow cycling is not only oppositional to the dominant cultures of speed and immediacy, but it also suggests that what represents labour and value in contemporary societies may be assessed and 'valued' differently. This argument is developed particularly by André Gorz, who argues that an 'exit' from the current form of capitalism is necessary if we are to avoid both an economic and an ecological catastrophe. In his last book, *Ecologica* (2010), Gorz claims that production should be appreciated outside the narrow capitalist frame, wherein the main value for commodities is their exchange-value. Drawing on Marx's concept of alienation, Gorz shows that mass industry and mechanization transformed production within capitalist societies into an autonomous process, one which became completely independent from its producers:

> The individual worker is now 'a mere living accessory of this machinery'; his 'individual labour capacity is an infinitesimal, vanishing magnitude; the production in enormous mass quantities which is posited with machinery destroys every connection of the product with the direct need of the producer and hence with direct use-value' (Gorz 2010: 62-63).

Not only did the techniques of production change, but also its objectives. Production sided with capital, assisting its increase: 'it is, primarily, in the service of capital's "needs", and it is only insofar as capital needs consumers for its products that production also serves human needs' (Gorz 2010: 65).

Thus, what used to represent a 'norm of sufficiency', which existed in pre-capitalist societies and which governed 'the human metabolism with nature', was broken. Production and consumption in pre-industrial societies was characterized by a self-limitation of needs, as well as of the effort spared to satisfy these needs. According to Gorz, the norm of sufficiency was a norm whereby 'the level of effort is set as a function of the level of satisfaction sought – and, conversely, the level of satisfaction as a function of the effort one is prepared to put in' (2010: 59). It can thus be said that the invention of work in its modern sense is a consequence of individuals' inability to recognise this 'common norm of sufficiency'.

A triple dispossession occurred in capitalist societies: of the product from the direct need of the producer, of producer from product and of workers from work. Therefore, production is no longer attached to the needs and desires of producers; instead it is their needs and desires which are produced through this new arrangement:

> It is only on the basis of this triple dispossession that production can free itself from the decisional power of the direct producers or, in other words, become independent of the relation between the needs and desires they feel, the extent of the effort they are prepared to expend to satisfy those needs and desires, and the intensity, duration and quality of that effort (Gorz 2010: 63).

While he acknowledges that today this norm of sufficiency is no longer compatible with 'the pursuit of maximum output that constitutes the essence of economic rationality and rationalization' (2010: 59), Gorz claims that there is a need for a 'radical change' in the techniques and goals of production. Even though today there is no 'commonly accepted'

norm of sufficiency which would serve as guide for self-limitation, this solution represents 'the only non-authoritarian, democratic path towards an eco-compatible industrial civilization' (2010: 69).

The imperatives of sufficiency and self-limitation have been highlighted for almost half a decade now, with the publication of *Limits to Growth* (Meadows et al. 1972), a report commissioned by the Club of Rome, which highlighted for the first time how population growth and natural resource use interacted to impose limits to industrial growth. With the publication of the report, the "cultural" demands of the ecological movement 'found themselves objectively underpinned by the urgent, scientifically demonstrable need to break with the dominant industrialism and its religion of growth' (Gorz 2010: 55). More recently, Donella Meadows said that growth is

> one of the most stupid purposes ever invented by any culture. We've got to have an enough … If you just listened around you to the mind-set, the current culture, telling you how growth is going to solve our problem, if you just asked: 'Growth of what, and why, and for whom, and who pays the cost, and how long can it last, and what's the cost to the planet, and how much is enough?' (Meadows 1999: public lecture).

Instead of the destructive growth of capitalist production and consumption, Gorz advances the idea of a productive de-growth, where 'productive' has an ecological meaning. Advancing a 'radical negation of capitalist logic', Gorz defines de-growth as 'a form of economic management in which the aim is to satisfy the greatest possible number of needs with the smallest possible amount of labour, capital and physical resources' (2010: 106).

De-growth is 'imperative' for our survival, but it 'presupposes a different economy, a different lifestyle, a different civilization and different social relations' (2010: 27).

In the last decade, a burgeoning academic literature, mainly from the domains of ecology and economics (see Kallis 2017; Raworth 2017; D'Alisa, Demaria and Kallis 2015; Klein 2014; Jackson 2009), similarly advocates for systemic political, institutional and cultural change in order to enable a different system 'where expansion will no longer be a necessity and where economic rationality and goals of efficiency and maximization will not dominate all other social rationalities and goals' (Kallis 2011: 875).

Recognizing the already devastating effects of climate change, social scientists such as John Urry (2016) or Ruth Levitas (2013), also started to question the 'growth orthodoxy'. According to Urry,

> rather than more growth, an alternative cluster of sociomaterial systems must develop to effect 'de-growth'. The earth system would appear to be moving towards unstoppable global climate change unless there is a really dramatic change of direction, to rapidly find reverse gear. And this is not only a question of specific 'systems' and their clustering, but a longer term and broader shift in the structure of feeling within societies. Such shifts may make the world different, although no institutions necessarily planned or envisaged such a shift or even noticed the shift at the time (Urry 2016: 175).

For most economists, the idea of de-growth, or even that of questioning economic growth, is inconceivable. Observing that we are financially, politically and socially 'addicted' to economic growth, Raworth urges us to be agnostic instead and calls 'for taking the

economy out of that growth autopilot and redesigning the financial, political and social structures that have turned growth into … "the normal condition"' (2017: 270). For this, she proposes a principle of sufficiency, whereby, instead of relying on growth, economies could be designed to be redistributive and generative.

Similarly, Gorz believes that the only way in which a future of de-growth can be achieved is collectively and insists that the norm of sufficiency must become an eco-political project within a new political order. But unlike Raworth, Gorz thinks that this order is incompatible with capitalist societies: 'capitalism has abolished everything in tradition, our way of life and daily civilization that could serve as an anchoring point for a common norm of sufficiency' (2010: 69). The transition from a productivist society, or a society of labour, to a society of free time could be done through the introduction of a guaranteed social income, 'independent of the length of hours worked and, potentially, independent of work itself' (2010: 71). This income should not be perceived as rewarding the production of value, but what would enable the development of intrinsically valuable activities. 'As there is a constantly growing gap between productive capacity and the possibility of profit-making, or in other words between the wealth we might produce and its commodity form, a social income would attribute due importance to wealth that cannot take the form of commodities and money' (Gollain 2016: 134).

Whether de-growing economies or being agnostic about growth is compatible with capitalism is a question which I do not plan to address here. Yet, the current neoliberal order, whose demise I anticipated in the prologue, must clearly be dismantled as 'it has taken us to the brink of ecological, social and financial collapse' (Raworth 2017: 70). The

proposition to reject or at least doubt the economic growth mantra is – through its invitation to establish a norm of sufficiency, to live within planetary means or to aim for voluntary simplicity – utopian in nature. Yet, neither social, not ecological justice can be achieved if we blindly continue to follow the religion of growth. A prospect of self-limitation by bicycle is part of the bigger heresy that the growth deniers and agnostics are collectively starting to assemble across the world.

Conclusions: A norm of sufficiency

A slow bicycle system contributes to restoring the norms of sufficiency and self-limitation which, says Gorz, are essential to the political autonomy of individuals and communities. A slow bicycle system involves, as I demonstrated throughout this thesis, a norm of sufficiency in relation both to resource consumption and the consumption of space through speeds beyond the bodily capacity of individuals. To be slow is to resist the perpetual quest for profit embedded within capitalism, to resist the desire to maximize wealth for the benefit of the few.

An everyday bicycle only costs a few hundred pounds, far cheaper than any car. Moreover, bicycles are relatively easy to repair by virtually everyone as, unlike the car, they rarely require 'heteronomous, functionally specialized work' (Gorz 2010: 71). They are 'tools for conviviality' (Illich 1973), representing the precise opposite of the automobile, which is the ultimate quintessence of an industrial-bureaucratic mega-machine inevitably entailing dominance and subordination. Similarly, the cycling infrastructure, including cycle paths and parking spaces, is also substantially cheaper, while their economic, social and health

benefits can be up to seven times bigger than those provided by the car infrastructure (DfT 2014).

Finally, to go slower than the car or even slower than the normative fast cycling, whose virtues dominate the current discourses of most campaigners, urban planners and traffic engineers, also means to re-establish a norm of sufficiency. It means firstly to resist buying a fast and expensive bicycle, while renouncing comfort for speed. But it also means to oppose the implicit demand to acquire an extremely fit body that such speeds necessarily entail. As I have shown in chapter five, a reawakening of the bodily senses whilst cycling does not necessarily entail the exhaustion of one's body. Finally, to cycle slower means, at the same time, to refuse competition and engage instead in sociable cycling practices as the ones I investigated in the previous chapter, showing that the road space can be social too, not merely functional. To go slow by bicycle means, to be more specific, to resist capitalism and its constant demand for growth.

To go slow, by bicycle or by any other non-motorized form of mobility, represents political tactics of resistance against the dominant strategies exerted across urban spaces by the system of automobility. To slow down means to expand the time-space, instead of compressing it and return the time to the control of each one of us to humanise it. The utopia that a slow bicycle system proposes is an invitation for us to imagine, desire and hope for alternatives to the current narratives and practices of speed embedded in capitalist societies.

Conclusions

The year is still 2017, yet the aim of this thesis has been to investigate what kind of mobility futures could shape our societies by 2050. Two thirds of the world's by then 9.7 billion people are projected to live in cities, representing an increase of more than ten percent from today (United Nations 2014). The expected pace of urbanisation across the world does not seem however to mark a significant shift in the way people are moving around: by the end of this decade alone the number of cars sold annually worldwide are estimated to surpass for the first time 100 million units and reach 3 billion by 2050 (The Economist 2008), with the biggest increases expected to occur in Brazil, China, India and Eastern Europe (PwC 2016; IHS Automotive 2015).

Car sales are related today with economic recovery and growth. In the UK, for example, almost 10% of manufacturing output to the economy is represented by cars (Mor and Brown 2017), while car sales have supported the economic upturn since 2014 when fuel prices, which surged after the 2008 financial crash, dropped by more than half (Inman 2017a). Yet, with British car factories producing today more cars than at any time this century and with the UK households borrowing a record of £31 billion in 2016 to buy cars, there are legitimate concerns that another financial collapse is in the horizon (Inman 2017b).

Pollution and climate change are equally worrying outcomes of increasing car use. One quarter of the global CO2 emissions result today from transport, and recent studies warn

that in order to keep global warming below 2°C and avoid the worst risks of a hotter planet, these emissions need to be halved each decade until the end of the century (Rockström et al. 2017). Similarly, according to the World Health Organisation, air pollution, towards which transportation plays a significant role, represents the world's single biggest environmental health risk (WHO 2014): more than three million people die every year because of outdoor air pollution, a figure that is expected to double by 2050 (Lelieveld et al. 2015). These trends are more worrying if we consider that unsustainable economic growth worldwide seems to follow its imperturbable trajectory: it is projected to rise from 3.1 percent in 2016 to 3.5 percent in 2017 and 3.6 percent in 2018 (International Monetary Fund 2017).

How will the current automobility system fare in this challenging future and what are its alternatives are issues which have gained increasing purchase in the last few decades. This thesis has proposed that against the forecast of increased automobility and business-as-usual economic growth, urban movement could *and* should be reimagined differently if we aim to build better futures.

The last two decades witnessed a slow but audacious resurgence of everyday urban cycling across most of the Western world as a potential answer to some of the problems that the car system has caused. The cycling trend is driven by the traffic congestion and environmental consciousness, but it is also linked with the post-financial-crisis austerity, 'peak oil' and 'peak car' (Metz 2014, Lyons and Goodwin 2014), as well as a younger generation increasingly reluctant to own an automobile (Klein and Smart 2017).

Yet, in the face of all these crises generated by the system of automobility, and despite the necessity to take decisive actions against pollution, resource consumption and climate change, cycling uptake remains generally slow, with its prospects not optimistic. In most transport policy documents, infrastructural interventions and even academic debates, cycling is not conceived as a mobility system but merely as a piecemeal solution for the rare occasions when the car fails to present a 'better proposition'. Consequently, cycling is seen as a fringe activity, a pastime, while academia has been less concerned to articulate visions of future around the bicycle.

The thesis has explored how cycling can be different than it is today by looking at prefigurative practices and institutions which together can articulate a bicycle system. With only three percent of the UK population cycling everyday versus 15 percent using the bike no more than once a month (DfT 2016), is it possible to conceive of cycling more than just a leisure practice? Also, can we expect a more homogenous representation in terms of gender, age or race, considering that today the regular cycling commuters in the UK are likely to be male, white, able-bodied, and young (Aldred et al. 2016)?

The thesis has initially looked at these marginal activities, at how the mundane practices of cycling are exercised, understood and given meaning by their practitioners. I have thus investigated the embodied and sociable aspects of cycling as means through which I could illustrate how the practice is sustained over time and in often unpleasant environments. In chapter five I have observed how the cycling senses, by being more invested in the perception of the environment than those of drivers, afford a richer experience for the human body, which can both attract *and* detract people from cycling. For this purpose, I

have drawn on the environmental psychology of J. J. Gibson (1979) and the phenomenological philosophy of Maurice Merleau-Ponty (1962) to show that perception does not represent the work of individual senses, but rather it is situated in relation to the whole body and the environment, and that it must be understood as a mode of being of the whole body through movement.

Using Lefebvre's rhythmanalysis (2004), I have shown that a sense of the body being attuned to the rhythm of the bicycle enables a more organic pace of urban mobility, generating at the same time values of freedom and individuality which the automobile is increasingly failing to convey. For the research of cycling senses, some methodological innovation was necessary and I have combined some of the already established mobile, video and auto-ethnographic methods used to research cycling (Larsen 2014; Spinney 2006, 2007; Jones 2005) with other less common investigative practices such as real-time audio diaries and autobiographical accounts. The use of such a complex array of techniques has enabled a comprehension of the experience of cycling as necessarily embodied, fleeting, ephemeral and emotional.

Inspired by the more common instances of side-by-side cycling occurring in cycle friendly places such as Denmark (McIlvenny 2014, 2013), I have then researched in chapter six how leisure and commuting rides in the UK and the Netherlands further contribute to the future of cycling; both as an interactive, enjoyable, and playful experience, and also as a way in which the functions of the road space are reconfigured to accommodate more than just the seamless and economically productive human movement. I have argued that, unlike most research dealing exclusively with cycling commuting, a closer inspection of the

sociabilities (Simmel 1910) of leisure group rides is extremely significant in order to conceive of cycling beyond the narrow functionalist and utilitarian frameworks.

For the research of cycling sociabilities I have mobilized Goffman's (1982, 1971, 1969, 1967, 1963, 1959) classic theory on symbolic interaction and used it in innovative ways to account for mobile encounters, rather than merely static interactions, which involve more than just their face-to-faceness. The domain of gesture studies, pioneered by Adam Kendon, has further contributed to the thesis, assisting me in accounting for the wider repertoire of interaction strategies deployed by cycling groups to create, sustain and cease various Ride-Formations.

While attention to the senses and sociabilities has offered an invaluable insight into why cycling has such a great appeal amongst some people, but not others, I have gradually understood that these experiences and practices will continue to remain niches within the greater socio-technical landscape produced by the automobile. Only a system or a mode of organization that challenges the system of automobility (Urry 2005) could enable cycling to become a more common activity. The senses and sociabilities have indicated how such a bicycle system might feel and what sorts of human relations it would require and make possible, but its specific architecture is virtually missing.

The more recent endeavours within social sciences to engage in projections about the future of urban mobilities have not been so far particularly interested in exploring in detail what a society without cars could look like. While being sympathetic to scenarios of local sustainability, which assumes the end of automobile dependency, these authors have been

generally reluctant to get rid of the car altogether (Tyfield, Zuev, Li and Urry 2016; Dennis and Urry 2009). According to these studies, car futures, in their various manifestations, represent more probable, even if not necessarily more desirable, futures. In this sense, the thesis has created a precedent within future studies by explicitly focusing on bicycle powered futures, arguing that the effort of imagining them should by no means be hindered by their chances to come into existence (Levitas 2010).

In order to conceptualize a slow bicycle system, I have thus used utopianism as a method (Levitas 2013; chapter two), not only to anticipate the environmental and social experience of cycling futures afforded by senses and sociabilities, but also to construct an alternative to the car system and to criticize the dominant narratives embedded within visions of auto- and velo-mobilities futures. Consequently, imagining such a bicycle system requires not only to replace automobility, but also to reconfigure human movement, from the mere functionalist, quantifiable and economistic valuations characterizing the transport industry today, towards more human-scale, convivial and non-utilitarian mobilities. The proposition to reframe human movement beyond functionalist valuations is largely missing from transport literature. Drawing on the mobilities studies literature, the thesis has made the case to move beyond the 'mobility growth paradigm', which inextricably links mobility to economic growth and economic performance (Whitelegg 2015).

In imagining a society living in the year 2050, when cycling had replaced driving for most urban travels, I have thus followed Jonathon Porritt's (2013) idea of backcasting from a desirable future and detailed the events that would need to happen for such a future to come to fruition. In the prologue, I have blended facts and fiction, anticipating the kinds of

disruptions, such as traffic gridlocks, and broader socio-economic changes, culminating with the end of neoliberalism, that would be necessary for the inauguration of a bicycle system. In parallel to these events, I have highlighted the ways in which infrastructures, materials, policies, practices, values and meanings would have to re-align in order for cycling to become a successful mobility system. From this perspective, the attempt to map and to piece together the elements of a future bicycle system represents a step forward from most academic research focusing on improving conditions for cycling rather than exploring the possibility of a whole new mobility system.

Envisioning a bicycle system does not come without challenges, of which two are particularly important and have been investigated in this thesis. The first relates to how automobility will look in the future, while the second deals with the multiple bicycle utopias competing to shape the future of urban mobilities.

Rather than being simply displaced by the bicycle, I have shown in chapter three that the automobile will continue to exist in various forms and uses, driven by the changes brought about by electric, autonomous, networked, shared and smaller cars which represent today mere niches within automobility. But issues of privacy and surveillance, which will possibly be exacerbated by increasing automation of urban mobilities, are rarely addressed by their proponents. Similarly, how these futures solve the congestion problems and the unsustainable consumption of resources powering these visions is only seldom debated. My tentative critique of these automobile futures certainly needs further exploration as these technologies become more common.

Cycling futures, on the other hand, are not innocent either, as I have argued in chapter four. Most discourses and policies which have attended to the cycle boom of the last decades are embracing ideals of making cities operate more efficiently. The case of London, which I have investigated, but also the competition between municipalities across the Western world to become 'successful cycling cities', are indicative of how the re-emergence of cycling is intimately linked with city performance, job creation and economic growth. The implementation of cycling infrastructures and facilities is often deemed appropriate only to the extent that it does not upset these objectives. Thus, fast mobilities, achieved by car or by bicycle, are the norm to which all urban mobilities today must necessarily conform. But while most mobilities studies (perhaps with the exception of Vannini 2013) have rarely questioned the implicit notion of speed embedded in all urban movement, this thesis has argued precisely against this blind spot.

The speeding up of mobilities, alongside the more general increase in the pace of social life in late modernity, have become untenable both from social and ecological perspectives. More recently, these velocities have represented the reflection of a neoliberal agenda seeking to increase economic productivity and maximise profits, even as the environmental limits to growing economies infinitely have been highlighted for almost half a century (Meadows et al. 1972). Largely inspired by the political ecology of André Gorz, I have shown in chapter seven that slowness, as opposed to speed, is a useful concept to address the tensions between economy and the environment and to re-establish an equilibrium and a norm of sufficiency (Gorz 2010). Such a norm of sufficiency, serving as a guide for self-limitation, represents, according to Gorz, 'the only non-authoritarian, democratic path towards an eco-compatible industrial civilization' (2010: 69).

The extent to which more and faster mobilities could be viable in the long run, considering that economic growth is itself a utopia which powers contemporary capitalism (Levitas 2013), is then questionable. The thesis has aimed to inspire our thinking beyond the 'business-as-usual' paradigm governing not just urban mobilities, but the broader aspects of social life. In doing so, it has explored the possibility that the bicycle could establish an alternative system to the car, but one which does not simply replace one means of transport with another. It also takes aim at the utopia of fast mobilities, understood as an intrinsic positive social value. A new norm of sufficiency to govern the human metabolism with nature could be established once we start to question the implicit speeds governing urban mobilities. 'The exit from capitalism will happen … one way or another', warned Gorz, and it will happen 'in either a civilized or barbarous fashion' (2010: 27). Renouncing speed and embracing slowness and a slow bicycle system could be one way in which a civilized exit takes place.

'A bike is something, but almost nothing' ended the text accompanying Provo's famous 'Bicycle Plan' (1971). In the mid-1960s, the anarchist group opposed the introduction of cars in Amsterdam (chapter four) and greatly contributed to shaping today's Dutch bike bonanza. Intrigued by this 'almost nothingness', this thesis has aimed to illuminate how the bicycle can become more of a 'something'. My original research question, 'How to get people cycling more often?', has taken me to investigate the future of a slow bicycle system by uncovering the 'almost nothingness' of the practices and institutions which would bring such a system into being. Most of them are still invisible: they are too dispersed, too localized, too silent to make a difference on their own within the complex global societies of the twenty-first century.

Anthropologist Margaret Mead once said: ‘Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has’ (quoted in Lutkehaus 2008: 4). I have tried in this thesis to give voice to these small groups of thoughtful and committed citizens, together with their everyday cycling and the small cycling worlds they make possible. Their prefigurative practices and institutions can change the world. For them, the year 2050 imagined at the beginning of this thesis is not a foreign country.

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Appendices

Appendix 2.1: Details of rides for chapter two

Between October 2014 and March 2016, I have commuted regularly by bicycle in London and Lancaster. In London, I have cycled from Aldgate to Euston (route: https://www.strava.com/activities/263682294), covering each time an average distance of six kilometres. In Lancaster, I have cycled from the city to Lancaster University (route: https://www.strava.com/activities/478754003), covering an average distance of 5.5 kilometres.

Appendix 2.2: Details of rides for chapter two

Between October 2014 and August 2015, I have taken part in a total of twenty-six rides with different groups, of which I have video recorded thirteen. Below there is a list of these rides.

12 October 2014 – 76 km (with CTC Central London); route: https://www.strava.com/activities/206494407

19 October 2014 – 78 km (with CTC Central London); route: https://www.strava.com/activities/209204957

2 November 2014 – 32 km (with CTC Central London); route: https://www.strava.com/activities/214688143

28 November 2014 – 13 km (Critical Mass London); route: https://www.strava.com/activities/224148038 (video recorded)

30 November 2014 – 79 km (with CTC Central London); route: https://www.strava.com/activities/224807813 (video recorded)

11 January 2015 – 45 km (with CTC Central London); route: https://www.strava.com/activities/239564514 (video recorded)

1 February 2015 (with CTC Central London)

8 February 2015 – 37 km (with CTC Central London); route: https://www.strava.com/activities/252025292 (video recorded)

15 February 2015 – 57 km (with CTC Central London); route: https://www.strava.com/activities/255326471 (video recorded)

22 February 2015 – 43 km (with CTC Central London); route: https://www.strava.com/activities/258472024

29 March 2015 – 74 km (with CTC Central London); route: https://www.strava.com/activities/275957318

5 April 2015 – 57 km (with CTC Central London); route: https://www.strava.com/activities/279586710

21 April 2015 – 68 km (holiday with CTC Central London); route: https://www.strava.com/activities/289812432

22 April 2015 – 49 km (holiday with CTC Central London); route: https://www.strava.com/activities/290894301 (video recorded)

23 April 2015 – 45 km (holiday with CTC Central London); route: https://www.strava.com/activities/291043371

24 April 2015 – 80 km (holiday with CTC Central London); route: https://www.strava.com/activities/291687256 (video recorded)

25 April 2015 – 50 km (holiday with CTC Central London); route: https://www.strava.com/activities/292302031 (video recorded)

26 April 2015 – 35 km (holiday with CTC Central London); route: https://www.strava.com/activities/292851172

10 May 2015 – 118 km (with CTC Central London); route: https://www.strava.com/activities/301763826

23 May 2015 – 43 km (holiday with CTC Central London); route: https://www.strava.com/activities/310183347

24 May 2015 – 62 km (holiday with CTC Central London); route: https://www.strava.com/activities/310921152 (video recorded)

25 May 2015 – 46 km (holiday with CTC Central London); route: https://www.strava.com/activities/311602096 (video recorded)

26 May 2015 – 73 km (holiday with CTC Central London); route: https://www.strava.com/activities/312211827 (video recorded)

26 July 2015 – Ride in Amsterdam (video recorded)

7 August 2015 – Ride in Amsterdam (video recorded)

Appendix 2.3: Research sites relevant for chapter two

9 – 10 September 2013: Cycling and Society Annual Symposium (Llangollen, Wales)

11 – 14 June 2013: Velo City conference (Vienna, Austria)

1 – 31 July 2013 – European Cyclists' Federation internship (Brussels, Belgium)

13 – 16 February 2014: The London Bike Show (London, UK)

28 – 30 March 2014: SPIN Urban Bicycle Show (London, UK)

12 – 13 April 2014: New Forest Spring Sportive (New Forest National Park, UK)

9 – 10 June 2014: Transport in the Media Symposium (Lancaster, UK)

20-22 June 2014: Eroica Britannia, vintage cycling festival (Peak District, UK)

5 July 2014: stage Tour de France cycling race (Peak District, UK)

15 – 16 September 2014: Cycling and Society Annual Symposium (Newcastle, UK)

19 May 2014: Design and Planning for Cycling workshop (Birmingham, UK)

2 – 5 June 2015: Velo City conference (Nantes, France)

19 – 21 June 2015: CycleHack (Manchester, UK)

14 – 15 September 2015: Cycling and Society Symposium (Manchester, UK)

17 July – 7 August 2015: Planning the Cycling City summer school (Amsterdam, The Netherlands)

13 August – 30 September 2015: London Cycling Campaign internship (London, UK)

11 May 2016: Velomobile Methods workshop (Oxford, UK)

29 – 30 September 2016: Cycling and Society Annual Symposium (Lancaster, UK)