The marginalisation of bicycling in Modernist urban transport planning

1 Introduction

In many cities cycling receives little attention from transport planners and is a marginalised mode of transport. Motorised modes of transport take much more space in cities and within transport planning. In this article this situation is analysed with the help of critical theory, as put forward by Marcuse (2002 [1964]). This article argues that the theory-free pragmatism of applied research is quite problematic when considering bicycle planning. Thus, new theory for bicycle planning, the politics of vélomobility, is developed, which is grounded in Cresswell's (2010) theory of the politics of mobility.

In transport planning, sustainable transport is often connected to increased walking and bicycling and to the increased use of public transport. Walking and bicycling are often seen as self-evident in the discourses of sustainable transport and sustainable urban development. Moreover, both walking and cycling have many health benefits, since these are active modes of transport (Garrard et al., 2012). Thus, research on cycling and an increase in cycling can be seen as both a contribution to a sustainable transport system and to achieving better public health (Haines et al., 2010). However, the analysis of planning for walking and bicycling does not normally go beyond best-practice and policy studies, the road safety aspects of cycling, or the basic idea that cities need to increase bicycling and provide better infrastructure for cyclists (Banister, 2005; Banister and Hickman, 2006; Banister, 2008; Kenworthy, 2006; Pucher and Buehler, 2012). Hence, the focus in bicycle research has most often been on the analysis of empirical evidence rather than on theoretical issues.

Although the work by authors such as Pucher and Buehler includes some theoretical considerations, we argue that it does not contribute to a larger theoretical understanding of bicycle planning. Whilst research in the field of mobility and vélomobility has contributed to the theoretical understanding of bicycling and thus people's mobility patterns (e. g. Spinney, 2007; Aldred, 2013a or Pesses, 2010), this can be seen more as theoretical research about

understanding cycling and mobility than as a theoretical view on *planning* for cycling. The existing literature, therefore, does not contribute directly to the theoretical development of the structured activity of planning for cycling.

In this article we seek, in contrast (but also as a complement) to more empirically-informed work to develop a theoretical framework for bicycle planning that builds on applied and empirical research in order to make cycling a more core element of transport planning and therefore a transport mode that is equal to its motorised counterparts. We argue that this lack of theoretical understanding has led to the marginalisation of cycling in transport planning. This article is an attempt to fill this gap in order to encourage changes for planning for cyclists.

In general, the definitions of sustainable transport and sustainable development differ (see, for example, the wide range of definitions that have been provided by the following authors: Banister, 2008; Kenworthy, 2006; Koglin, 2009). However, walking and bicycling are often included in both concepts as a way to transport people and increase mobility in a sustainable transport system without increasing car use (Bae, 2004; Rosen, 2001).

Using the bicycle as a mode of transport is often seen as one of the most sustainable parts of a transportation system because bicycles do not pollute or produce noise. In addition, bicycling does not require much space in urban areas and creates few risks for other road users or people in public spaces. All of these are negative effects that are connected with motorised traffic (Miedema, 2007; van Wee, 2007; Pucher & Buehler, 2012). Despite this, there is little research into planning theories for cyclists and bicycling, and the theoretical basis for planning for cyclists is poorly developed. Krizek and Roland (2005), for example, research the effects of discontinuities in bicycle networks, which is important, but which has little theoretical bearing on bicycle planning. Likewise, the study by Minikel (2012) on cyclist's safety is another prime example of important but again non-theoretical research. The focus of that study was on

whether there is a difference in casualty numbers when cyclists are riding on bicycle boulevards or on parallel arterial roads.

In the context of the points mentioned above, it is important to analyse what happens in cities in relation to planning for cyclists. Moreover, it is also important to analyse how cities deal with issues such as car use and bicycling in urban areas. This analysis should also include research about the extent to which the cities' work is based on any kind of theoretical framework. Theoretical knowledge can often underlie actual planning initiatives but, if it does not – as we argue is the case for bicycle planning – then this could lead to problems when it comes to implementing bicycle-friendly policies (e.g. Holston, 2002). Cities around the world were developed after the introduction of the car with motorised traffic in mind, and the planning and construction of urban highways and other infrastructures for motorised traffic are still important. This form of development can partly be traced back to the theoretical vision of modernism and other theoretical developments, such as transport modelling. Modelling within transport planning can be seen as both a theoretical underpinning for planning and something that builds on a positivistic approach. It is a way of measuring motorised traffic and its impact (Holston, 2002; Hagson, 2004). This is can be problematic as shown in section 2 and 3. If such theoretical knowledge were to exist for bicycling and for planning for cyclists, it could have the same impact on urban and transport planning and could create more sustainable and equitable urban spaces (Koglin, 2011, 2013, 2014).

Our hypothesis is that theories from other areas, such as the "mobilities turn" introduced by Urry (2000, 2007), can contribute to theories for planning for cyclists. The "mobilities turn" as a theoretical underpinning is analysed and explained in more detail in section 4. The term refers to the analysis of social and transport phenomena from a mobility perspective and includes aspects such as power relations, social relations and cultural aspects of transport. Thus, the aim of this article is to seek to develop an understanding of the differences, when it comes to theories

and models, between transport planning in general and bicycle planning in particular. Moreover, theoretical analysis is used to highlight the complexities and conflicts in urban transport systems. Through the lens of social and critical theory transport modelling and so forth can be criticised. However, the development of key aspects of transport planning as a science has led to a focus on modelling and other rational methods for planning. We examine how, if something similar could be developed for planning for cycling, it could raise the acceptability and status of cycling amongst key stakeholders and politicians. At the same time the rationality within transport planning as a profession and as a science is criticised and a different theory for bicycle planning is proposed.

Cycling as a form of mobility is also very much connected to social relations. While cycling, people can move in cities with relatively minimal impacts on others. Through that they can interact with the public space and other people better than when driving a car for example. Theoretically-informed bicycle planning should take such issues into account. This will be explained more in the next two sections.

2 Power relations in urban transport spaces – the starting point

Spaces in cities often exclude the needs of cyclists and pedestrians (Risser & Wunsch, 2003). When such needs are taken into consideration, however, significant differences can be found between different countries in terms of how they approach planning and policies regarding bicycling and how they encourage bicycling as an alternative mode of transport (Buehler and Pucher, 2012). Such differences can also be seen within countries and at the local and city level. One result of different planning initiatives is that more people bicycle in different cities and countries than in others. It also means that people who do bicycle in cities where planning for cyclists is not considered important are at higher risk of involvement in collisions and must

cycle in an unsafe and insecure environment. However, the share in the modal split of bicycling is not only determined by planning initiatives. Power relations and representation of bicycling in the public sphere and in transport planning play at least an equal role. This issue is developed further, later in the article.

When it comes to power, planning, and transport, the work of Bent Flyvbjerg is essential reading. In his book *Ratinalitet og Magt* (1993) (the English version *Rationality and Power* was published in 1998), Flyvbjerg analysed power relations in planning processes in the Danish town of Aalborg and how power relations affected the planning outcome. The Aalborg project involved major planning processes concerning public transport and urban regeneration and is considered a rather good example of urban planning for social inclusion and ecological sustainability (Flyvbjerg, 1993, 1998). Flyvbjerg shows that power or power relations play a major role in urban planning partly through the construction of what he terms "imaginary rationality" on the part of urban politicians and policy makers. Those with the power to decide and plan also create their own version of reality and this allows them to rationalize their decisions. This means that power defines reality and that people with power rule over the urban reality and, therefore, over people without power. In their role as experts, urban and transport planners can influence politicians and can encourage people to engage in certain behaviours and actions through appropriate urban design and transport planning. The rationalities in transport planning are closely related, he argues, to the shift within research and social science towards more positivistic and rational research. Social research was supposed to deal more with generalisations. Here, Marcuse (2002 [1964]) explains what that shift meant:

> Made into a methodological principle, this suspension has a twofold consequence: (a) it strengthened the shift of the theoretical emphasis from the metaphysical "What is…?... to the functional "How…?, and (b) it establishes a

> practical (though by no means absolute) certainty which, in its operations with matter, is with good conscience free from commitment to any substance outside the operational context. (Marcuse 2002 [1964]:155)

Marcuse clarifies that theoretical research is not important anymore, due to the fact that it does not deal with measureable facts. It can be said that through this scientific shift and the increased "scientisation" of transport planning cycling becomes marginalised because it is much harder to measure (and therefore to model) than motorised transport. In accordance with this rationalisation of thinking, Marcuse considers many of our needs as preconditioned, especially within capitalist societies (Marcuse 2002 [1964]). He explains that one can distinguish between true and false:

> The intensity, the satisfaction and even the character of human needs, beyond the biological level, have always been preconditioned. … We may distinguish both true and false needs. … Most of the prevailing needs to relax, to have fun, to behave and consume in accordance with the advertisements, to love and hate what others love and hate, belong to this category of false needs. (Marcuse 2002 [1964]:6-7)

What Marcuse means is that through this preconditioning, human needs can be seen as historical needs evolved from societal pressure. Marcuse does seem to claim that almost all experienced needs belong to the category of false needs, although he also sees basic needs of, for example, food, as true needs. Here one can of course criticise Marcuse, because who is he to tell us about our needs? However, Marcuse's point is that through society people are preconditioned to, among other things, consumerism, of which motorised traffic is one important part. Thus, Marcuse argues that other aspects of reason and theoretical thoughts have lost their part within the development of societies, because of the fact that only the

measurable aspects count. Hence, the fact that transport planning is dominated by models and measures connected to motorised traffic must be seen in line with the shift from theoretical and metaphysical thinking towards measurable facts and empiricism. Marcuse here touches upon a very important aspects of today's mobile societies, namely that, some modes of transport are very measureable. One could say that cars might also be part of the preconditioned needs of how people should or want to move around in space (Marcuse 2002 [1964]).

The concept of power relations and the idea of "conquering space" are theoretical perspectives that could be applied to planning for bicycling in urban environments. Lefebvre (1991 [1974]) developed the concept of "The production of space". In his eponymous book, he sees space as something produced through social interactions and everyday living. Space is, therefore, not only physically built, but also socially interpreted and produced and re-produced. This has an impact on how people perceive space and how space is experienced, and different people interpret and use space differently. Such differences can significantly influence power relations in cities and urban areas and alter the use of a space from what was originally intended by its planners. Even though space is produced through social relations, planning urban spaces specifically for motorised traffic gives more power to car drivers. In the end, it is about the right to public spaces in cities and about who has access to those spaces and who is excluded (Lefebvre, 1991 [1974]).

When people who do want to bicycle feel that they cannot do so because of poor conditions, this leads to the question of whether public spaces are truly open and usable spaces to which everybody has equal access (Smith, N. and Low 2006). Some countries are at the frontier of bicycle planning and of developing policies to increase bicycling by making it safer and more accessible, and by doing so they are creating more equitable urban spaces (Pucher and Buehler, 2009; Buehler and Pucher, 2012). One can extract theoretical knowledge from works referenced

above, but none of them present a theory-based analysis of these differences. Moreover, the conflicts that occur in urban traffic spaces are rarely addressed and analysed from a theoretical perspective.

The exclusion of people from urban development processes is one problem of today's urban politics. Swyngedouw talks about the post-political city and argues that democratic participation and choices about urban futures have been taken away from the city's citizens. Shifting power relations away from citizens toward more technocratic or autocratic regimes of urban politics excludes certain groups, especially marginalized groups, from decision making and, therefore, from the development of cities and urban areas (Swyngedouw, 2008). He states that:

> …the parameters of democratic governing itself are being shifted, announcing new forms of autocratic governmentality. (Swyngedouw, 2008:65)

Such a shift in power structures can also be seen in transport planning. As an example of this, Baeten (2000) has described how marginalised groups were excluded from political processes in the planning of a new highway in Belgium. He argues that elitist groups take over decision making in order to create their own version of a sustainable society. The exclusion from decision-making is in itself one aspect of the problem because it undermines the democratic foundation of, in this case, Belgian society. Both Baeten and Swyngedouw recognise the problems of consensus politics in urban and transport planning. In traffic spaces, bicyclists are often marginalised because cities are not planned with their needs in mind (Koglin, 2013).

Rationality is normally viewed as central to urban and transport planning, but Flyvbjerg argues that as certain societal groups get more power rationality *loses* its importance. Furthermore, his view is that rationality is bound to context. Power in urban politics, policies, and planning is often characterised by stable power relations without open confrontations, yet

power relations are often produced and re-produced throughout urban and transport planning processes (Flyvbjerg, 1993, 1998). Due to this fact, power relations could change if and when the rational planning ideals are built on theories other than those developed for motorised traffic. Power relations in urban spaces have been well documented, as described above. These relations have also had an impact on the marginalisation of cyclists, and some of the factors that have influenced power relations and the marginalisation of cyclists will be touched upon in the next section.

3 Transport planning vs. Planning for cyclists – Theories for motorised transport planning

Authors such as Banister (2005, 2008) and Hanson and Guiliano (2004) have written extensively about sustainable transport planning in general, and this literature also offers some implications for planning for cyclists. Policy goals such as decreasing motorised traffic, shifting car users to public transport, and increasing bicycling are common in many cities in Europe and are aligned with the wider idea of sustainable transport (Banister, 2008). Nevertheless, those goals are often not realised or implemented (Koglin, 2013). However, the earliest aim of transport planning was the fast and efficient transport of people and goods (Johnston, 2004; Wachs, 2004). This meant that in the early days of urban transport as a field, resources were focused primarily on building roads and investing in infrastructure for cars and railway traffic. It was only significantly later that infrastructure projects for cyclists and pedestrians also received significant funding (Taylor, 2004). This has been especially true in the US where public funding has prioritised infrastructure for automobiles and it is only in last few years that projects for cyclists and pedestrians have received a significant amount of funding. Such a lack of resources has made it much more difficult to implement good bicycle planning policies and infrastructure. This, of course, differs from country to country, and some countries invest much

more in such infrastructure – such as the Netherlands, Denmark, and Germany – while others, like the US, do not. However, even in European countries the majority of infrastructure money is still spent on motorised traffic and rail schemes (Taylor, 2004; Guiliano and Hanson, 2004; Buehler and Pucher, 2012).

Transport planning since the early 20th century has mostly involved models and predictions concerned with the increased use of the car, since increased car use was seen for most of the 20th century as synonymous with economic and social progress, and this has contributed to even higher degrees of sophistication in the models and theories within the field of planning for motorised traffic (Iacono et al., 2008; Knoflacher, 2009). This sophistication has led to an increase in the use of these models, which in turn has served to reinforce the emphasis on the analysis of motorised traffic.

This very large element of the transport planning field offers very few considerations for planning for cyclists. The theoretical models within transport planning include the four-stage model of traffic prognosis, traffic flow theory, and models of transport demands. The four-stage model was developed for the prediction of how traffic, especially car traffic, will develop in the future as a way to provide predictions of the impacts of new infrastructure investments in transport planning (Brundell-Freij, 2008). This model can be used to predict, for example, the flow of vehicles on a certain road, the number of trips between two cities, or the number of people transported per kilometre. The important point here is that these theories, and the methods based on them, have traditionally excluded cyclists.

The focus in modelling on motorised traffic becomes even clearer when considering traffic flow theory. With the help of traffic flow theory, one can calculate different traffic delays and, therefore, different traffic capacities. This has been crucially important in justifying the construction of urban highways in order to increase the flow of motorised traffic (Nuhn and

Hesse, 2006). Although traffic flow theory could, perhaps, be transformed to fit bicycle traffic, it is currently almost exclusively applied to the analysis of motorised traffic (Ng, 2012; Treiber and Kesting, 2013). These theories and models are the kind of knowledge that are seen to be very important in transport planning. Here, clear links can be made to the arguments about power and knowledge from Marcuse and Flyvbjerg (see previous section). Through measurable knowledge that builds on positivistic theories, motorised traffic has been prioritised in transport planning. A rationality is developed that comes from the scientification of transport planning in a positivistic vain. This rationality marginalises bicycling in transport planning.

All of these models and the theoretical frameworks that underlie them provide little knowledge for improving the situation for non-motorised traffic, such as bicycling, and have effectively made cyclists and pedestrians invisible within transport planning. Nonetheless, some modelling theories and developments in measuring bicycle traffic have recently made their way into bicycle research and into planning for cyclists. The problem when measuring accessibility for alternative modes of transport such as bicycling is often one of poor-quality data. That could be solved, according to Iacono et al. (2010), by collecting travel behaviour data and land-use data for non-motorised modes of transport. Travel surveys are mentioned as one example for collecting such data. Parkin et al. (2008) have developed a model for relating the proportion of work-related bicycle trips to other relevant factors, such as socio-economic or transport factors. This model provides quantitative forecasting and evaluation of bicycle journeys. These two examples show that a change in methods and modelling toward bicycling has begun, but the field is still quite underdeveloped.

Smith, G.P. (2002) and Yeates (2002) discuss traffic safety issues in relation to planning for bicycling. While Smith talks about the speed of motorised traffic as an objective that can be linked to theories of modernism, Yeats talks about the reduction of those speeds by traffic calming and so-called home zones (Smith, G.P., 2002; Yeates, 2002). This work introduces and

discusses more practical measures – which are backed up by theoretical considerations in the field of traffic safety such as safety by numbers or regression to the mean (Jacobsen, 2003) – but there is a lack of theories when it comes to planning for cyclists in general.

In the literature about bicycling and planning, there are only a few books that are concerned with the details of planning for bicycling. *Planning for Cycling – Principles, Practice and Solutions for Urban Planners* (McClintock, 2002) deals for example with different aspects of planning for cyclists from a practical and policy perspective and from a traffic safety perspective. This is shown in the list of authors involved in the book who are not only researchers, but also planners, practitioners, and consultants. McClintock talks about policy mainstreaming in the introduction chapter, but this chapter still lacks a theoretical view of planning for cyclists. He makes many suggestions for policies for planning for cyclists that involve factors such as road safety, health, and sustainable transport. This is backed up by examples from different cities and countries that have succeeded in increasing bicycling (McClintock, 2002). This is something other authors, such as Pucher and Buehler, have picked up and argued for later (Buehler and Pucher, 2012), and this strengthens the view that much of the previous literature and work on planning for cyclists as something practical, which although very important and valuable, lacks any complementary theoretical underpinning.

It can be argued that investments in transport infrastructure most often equate to investments in motorised traffic or rail, which also triggered the development of theoretical knowledge and models for those modes of transport (Cars et al., 2009; Brown et al., 2009; Taylor, 2004). Furthermore, there was a belief in the post-war period in the power of technology, which also had an impact on the development of our motorised society and the theoretical development in transport planning (Gray 2004). Also, this thinking within planning was mainly introduced by planners and researchers who wanted to create better traffic flows, less congestion, and faster travel for the private car user. The same cannot be said about bicycling (Hall, 2002; Holston,

2002). Although many cities today want to increase bicycling, there is a lack of corresponding theoretical thinking among planners and researchers about planning for cyclists. The focus in the literature that deals with planning for cyclists, as mentioned above, often dwells on best practise and case studies without taking broader theoretical thinking into account (e.g. Pucher and Buehler, 2012, 2009; Buehler and Pucher, 2012). Modernism was a theoretical concept that has had a significant impact on urban and transport planning. The thoughts of becoming a modern society found great acceptance in Sweden among other European and North American countries. Sweden is mentioned here because after WWII Sweden developed very rapidly into an industrialised country due to the fact it was not involved in WWII (Koglin 2013).

With modernism came also a focus on motorised traffic, and it was a general trend that the street should be eliminated and replaced by roads. Streets were seen as old fashioned places where urban life evolved around people meeting each other and where different modes of transport mixed. Roads, on the other hand, were seen as modern arteries of cities where motorised traffic should be able to flow fast without interruptions caused other modes of transport. One could say that the idea was to build highways throughout the cities (Holston, 2002). The focus on modern traffic, - which became synonymous with car traffic - was a common idea in modernistic planning (Hall, 2002). In Sweden, this developed into the so-called SCAFT regulation that included recommendations about how to plan for car traffic in order to make it safer. After the Second World War, with growing car ownership, collisions between cyclists and pedestrians and cars became a problem in many Swedish cities (Koglin 2013). Similar problems could be seen in Great Britain before World War II (Cox 2012). SCAFT included separation of modes of transport and differentiation of speeds within cities (Statens planverk, 1967; Gunnarsson & Lindström, 1970). This was illustrated by Gunnarsson and Lindström in 1970 as shown in Figures 1 and 2.

Figure 1: Principles of Separation
Source: Gunnarsson and Lindström 1970

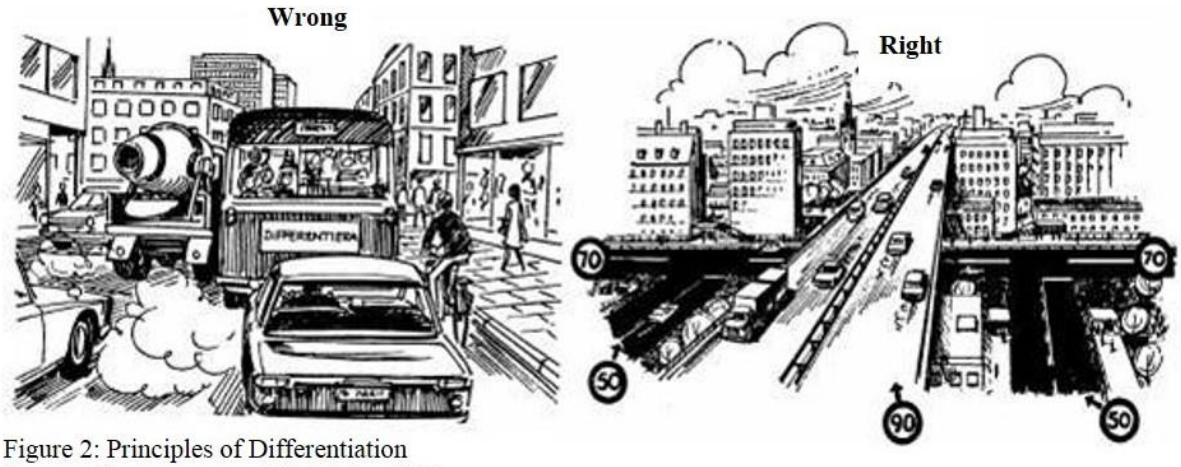

Figure 2: Principles of Differentiation
Source: Gunnarsson and Lindström 1970

This shows the tremendous impact that modernism had on urban and transport planning. It is a theoretical thinking that has shaped our urban transport systems, and because of its emphasis on segregation of modes and the construction of transport infrastructure, it has placed a huge focus on the motor vehicle to the exclusion of bicycling. Therefore, one can conclude that this conception of a modern city with modern traffic – along with theoretical developments in transport planning research – fostered the increase of motorised traffic in cities. With modernistic planning, power were built into the urban infrastructure, which marginalise bicycle traffic. The effects of modernistic planning are visible in urban areas built in the 1960s, 1970s and 1980s. Moreover, similar planning ideas are still at work in transport and urban planning

today. The technological development that modernistic thinking draws on has also had an impact in transport planning and the development of theories and methods for transport planning. Further, it has also legitimised the marginalisation of non-technical modes such as cycling in urban space and in transport planning (Cox and Van De Walle 2012).

4 Mobilities for bicycle planning?

One question that arises from the analysis above is how researchers can approach the problematic power relations in transport planning and the marginalisation of cyclists in public spaces. When considering how theories of modernism, traffic flow and the like have affected the distribution of urban space and helped to create a marginalisation of cyclists, it is worth arguing that a similar theoretical development for cycling could strengthen cycling as a mode of transport and make cycling more important in transport planning.

Here, the concept of mobility can contribute to a deeper theoretical understanding within the field of planning for cyclists and could offer a new approach for analysing transport planning. The "mobilities turn" within sociology was introduced by Urry (2000, 2007). Urry (2000) claims that it is very important to consider mobilities within societies. By this he means that the way people, goods etc. move, both physically and virtually have a very high impact on societies. Mobilities' impact on people's everyday lives and on society are structured by complex social relations. He stresses that the development of sociology as a discipline has been influenced by different forms of social movements, such as the LGBTQ movement, the women's movement or student movements. The movements created fairly new, although sometimes limited, public spaces. Therefore, the "mobilities turn" within sociology can help to analyse social phenomena and power relations (Urry 2000, 2007). Through an analysis of people's movements with the lens of the "mobilities turn" theoretical insights into power relations and the social aspects of

transport are gained, and thus inform the development of transport and bicycle planning in order to include bicycling more into transport planning.

Moreover, there are different forms of mobility, such as automobility, which refers to non-human powered forms of mobility like motorised traffic and which focuses on for example the experience of driving (Urry, 2004), or the social effects of the car. There is also vélomobility, which refers to different aspects of bicycling - for example, the experience of cycling. However, automobility is seen by some researchers as a hegemonic practice of mobility (Aldred, 2010; Beckmann, 2001; Horton, 2006), addressing the problematic development urban transport has gone through in the 20th century. The research on vélomobility touches on issues of bicycling and theorises on mobility from a bicycling perspective. Vélomobile research is theoretically informed by automobility research. The performance of bicycling, problems that arise from the urban transport systems and similar issues (Horton, 2006, 2007; Furness, 2007, 2010; Spinney, 2007, 2010) are covered in its theoretical approach.

The research on mobility and on vélomobility offers theories of the culture, performance, problems, etc. with transport and mobility and this research often has an urban perspective. However, the power relations in transport planning and how these impact on theories of bicycle planning itself are not the central focus in this kind of research. Vélomobility research focuses more on social aspects of cycling and on aspects of identity for example, rather than on more concrete bicycle planning issues. Therefore, although much of the mobility and vélomobility research offers theoretical foundations for analysing bicycling, the politics of mobility, as developed by Cresswell (2010), might offer a more practical theoretical foundation that could be translated into a theory for planning for bicycling. Cresswell (2010) offers the following three political aspects of mobility:

- Physical movement from A to B

- The representation of the movement, which can create a shared meaning
- The practise of movement, which is experienced and embodied

Cresswell views politics in light of social relations and not as political matters handled by politicians, although these matter might be included in is theory. This can be seen as movements that can be measured (Cresswell, 2010), and there is a rationality to this that can be linked to how transport planning evolved in the 20th century. In relation to the development of, for example, SCAFT, traffic flow theory, and the like, the pure focus on moving from A to B has marginalised a broader thinking about mobility. However, physical movement is only the starting point for mobilities and from that Cresswell develops the next step in the politics of mobility, the representation of movement (Cresswell, 2010). The representation of movement is connected to a shared meaning of movements and today it is also often connected with different ideas, such as freedom (Cresswell, 2010). Such a shared meaning can also be seen in bicycling. Some researchers see bicycling as a way to include people in society and to create shared experiences of the effects of cycling or the vélomovement (e.g. Spinney, 2007, 2010; Wray, 2008; Garrard et al., 2012). Creating a shared meaning of movement and developing a new way of thinking about movement could start a different view on how urban transport systems should evolve. In Cresswell's third aspect of the politics of mobility, the practice of movement, the link to bicycling becomes even clearer. Cresswell states:

"Finally, there is practice. By this we mean both the everyday sense of particular practices such as walking or driving and also the more theoretical sense of the social as it is embodied and habitualised (Bourdieu, 1990)." (Cresswell, 2010:20)

As the quotation suggests, mobility involves the meaning of the movement and the practice of moving. Moreover, it also includes the social sense of mobility and it is here that connections to the experience of movements and their consequences can be made. As mentioned earlier, the

transport systems is built for motorised transport and this creates power relations that marginalise cyclists. When approaching transport from the view of the practice of movements, these relations become visible and, therefore, they might also come into the view of planners who have the ability to change those relations. The politics of mobility and the theoretical development in the field of vélomobility can create new insights into how transport systems marginalise cyclists. Even though the last step of applying those theories has yet to be taken, the politics of mobility provides a framework within which this can be developed.

Developing a new theoretical grounding is never easy. The three theoretical points made by Cresswell (2010) offer a theoretical foundation for creating a useful and safe infrastructure for cyclists. First of all, cyclists should have the infrastructure to move safely between different points within the city. Creswell's first point creates the theoretical understanding of the importance of movements from point A to point B. Secondly, the representation of the movement, in our case bicycling, could offer the theoretical foundation for promoting bicycling when the infrastructure is ready to be used. Through the shared meaning of bicycling, people who usually do not engage in society could be offered a shared meaning to their movements and through that take part in society. Bicycling groups could help in this kind of work. Moreover, it is important to connect positive meanings to the movement, and bicycling needs to be shown as fun, healthy, safe, etc. Cycling is one of the healthiest modes of transport. Countries with a very low mode share of cycling also have many problems with obesity, such as Great Britain and the USA (Rennie and Jepp 2005; Ogden et al. 2006). Thus if cycling were less marginalised in transport planning and consequently cycle use levels were higher, societies could develop healthier populations. The last point of Cresswell's politics of mobility – practice – offers both practical and theoretical implications for bicycling and for planning for bicycling. People's everyday lives have to function, and this means getting to work, shopping, taking the children to school, etc. A theoretical understanding of the practice of bicycling and movements

could help planners to develop an infrastructure suited to people's everyday lives and practices of movements.

The politics of mobility, or in this case the politics of vélomobility, could be modified in the following way in order to develop a theoretical approach for bicycle planning:

1. Physical movement from A to B – infrastructure for bicycling without obstacles and the creation of free and safe flow for cyclists.
2. Power relations in urban traffic space – this means the consideration of power relations between the different groups that share the urban traffic space and creating spaces where cycling is not marginalised.
3. Positive representations of bicycling – means a representation that is adapted and targeted to different groups of people and that creates a shared meaning of bicycling that goes beyond class, gender, ethnic, and other boundaries.
4. Everyday practice and the experience of cycling – cycling should make the everyday and social lives of people easier, thus infrastructure and bicycle planning must involve aspects of everyday life in order to make the cycling experience more pleasant.

The modification of Cresswell's theory about the politics of mobility might seem trivial. However, we argue that Cresswell's theory lacks an empirical understanding of planning and cycling. The modification above can be applied to empirical studies/applied research made by Pucher and Buehler (2007) and Koglin (2013, 2014). This is done in order to show how the theory of the politics of vélomobility can inform transport and bicycle planning and offer new insights of cycling.

The physical movement of cyclists puts similar demands on the infrastructure as the movement of cars. Modified traffic flow theory could offer a better understanding of cyclists' flows, and from a more practical perspective. Good bicycling infrastructure can be observed in the studies by Pucher and Buehler (2007) and Koglin (2013). One example that both Koglin and Pucher and Buehler take up is Copenhagen in Denmark. The backbone of the cycling infrastructure there is the network of bicycle tracks and lanes. Moreover, bicyclists are often prioritised at junctions in Copenhagen (Koglin 2013). Both Koglin (2013) and Pucher and Buehler (2007) make observations of the bicycle infrastructure and the percentage of bicycling in the modal split of the cities mentioned support their impressions. Thus, according to empirical results the physical movement from A to B builds on the infrastructure, which both Pucher and Buehler (2007) and Koglin (2013) see as important when creating a sound bicycle network in the city and get more people to bicycle. Cox (2008) also raises the issue of infrastructure. He argues that due to new innovations and technologies for cycling and an increase of cycling in many cities the infrastructure needs to be adapted in order to create more sustainable and fair transport systems.

Connected to infrastructure are the power relations in urban traffic spaces. Much space today is allocated to motorised traffic, leaving less space to cycling or other healthy modes of transport. To draw again on Koglin's results from Copenhagen and Stockholm, the power relations in Stockholm are much less in favour of bicycle traffic than in Copenhagen. Copenhagen has allocated more space to cycling than Stockholm and that of course shifts the power relations in urban space in favour of cycling instead. The way the urban space has often been structured by modernistic thinking led to a prioritisation of motorised traffic, thus considerations of power relations in urban space can lead to a change of the focus in transport planning towards planning for cyclists. Koglin also shows that motorised traffic in both cities is seen by cyclists as *the* major problems, which indicates that planners also in bicycle friendly

cities should consider power relation in traffic spaces and try to change these relations in favour of the cyclists (Koglin 2013). Through a theoretical understanding of the politics of vélomobility, the social/power relations in urban traffic spaces can be analysed and affect transport planning in order to create more bicycle friendly cities.

The positive representation of bicycling is important in order to develop an understanding that bicycling is not something odd and to create a shared meaning of the movement that people can attach to. Koglin's empirical case studies of Copenhagen and Stockholm offer deeper insights into how the theoretical knowledge developed from Cresswell's politics of mobility can be grounded in empirical events (Koglin 2013, 2014).

The politics of vélomobility also includes the experience of the movement. This is important for transport/bicycle planning. Planners need for example look at the experiences car drivers and cyclists have when moving in the city. If, for example, driving is always considered more a pleasant experience than cycling, then people will not be willing to shift from motorised modes of transport to cycling. This experience of movement would help to understand the situation of the cyclists (Koglin 2013). The key point here is that the experience of cycling as theorized through velomobility also has to be brought into theories of bicycle planning as this will help planners to understand cyclists' needs. From that the planner can improve their plans for bicycling. Also in Pucher and Buehler's (2007) work the representation of cycling seems to be much more positive in cities with a bicycle friendly infrastructure and where people bike more frequently. Planners therefore, should consider the representation of cycling in their work and aim for a positive portrayal of cycling in all their documents and plans.

Developing a supportive infrastructure and dealing with people's identities could help planners to develop a better transport systems where cyclists are not marginalised and where people bicycle more frequently. It is important to acknowledge the impressions of infrastructure or

spaces that cyclists have and how cyclists are affected by the infrastructure. What might seem logical and good for some modes of transport might have a completely different effect on the mobility practice of cyclists. Taking a more theoretically informed approach to bicycle planning could ensure that cyclists' experience, and practice of mobility, is more systematically reflected in the infrastructure that is planned and built. Koglin shows how cyclists experience the infrastructure and planning in Copenhagen and Stockholm through survey studies. The results show that cyclists in Copenhagen, a bicycle friendly city with good infrastructure for cyclists, are more satisfied than those in Stockholm, a city that has not such a good infrastructure as Copenhagen has. (Koglin 2013).

5 Conclusions

Throughout this article we have argued that the theoretical basis for planning for bicycling is poorly developed in comparison with transport planning in general and planning for motorised traffic in particular. Within transport planning, many theoretical models and planning theories have been developed that reflect the needs of the car and its driver, and these have in turn reinforced the use of the car in a kind of symbiosis. In planning for bicycling, the literature is dominated by best practice studies of examples of cities that have increased levels of bicycling and by the idea of bicycling as a core part of a sustainable transport systems. Furthermore, many studies focus on detailed measures for improving cyclist safety and for increasing bicycling in cities. The lack of theoretical understanding and modelling within the field of planning for cyclists is important to understand in order to fully grasp the marginalisation of cycling in transport planning. If this gap could be filled, more practical changes for bicycle planning could be triggered because the case for these practical changes would be stronger. In this paper the intention has been to fill this gap through the development of Cresswell's theory "The politics of mobility" into a "Politics of vélomobility". The marginalisation of cycling in transport planning has to be understood as part of a rational autocratic governmentality. Transport

planning is part of a rationality within the planning and scientific contexts and needs to be addressed by theoretical development that takes such aspects into account.

One theoretical aspect that this paper has highlighted as relevant to bicycling was the concept of mobility, which includes the ability to move around, the representation of movements, and the embodiment of movements. This concept could be further developed in order to create better theories within the field of planning for cyclists because it focuses on the ability to move, and this has important implications for the amount of space needed for cyclists to move freely and safely around a city. The politics of mobility in connection with the theoretical development of vélomobility can provide the starting point for creating new insights for planners and new theoretical thinking about sustainable transport systems where cyclists are not marginalised but where they have space and are an important part of the systems.

We have tried to modify the politics of mobility into the politics of vélomobility in order to develop a theoretical framework for bicycle planning. With such a theoretical basis, planning for bicycling might become more scientific as well as lead to a better understanding of the needs of cyclists, of bicycling practise/experience, and of bicycling identities. Furthermore, the framework also covers the issue of power relations in urban traffic spaces, which is very important to understand in order to prevent a marginalisation of cyclists in cities. The point about power relations is lacking in Cresswell's theory. It has been added, because urban traffic space is highly allocated to motorised traffic. This fact has to be part of a theory for bicycle planning in order to highlight its relationship to the marginalisation of bicycling. Ultimately, the arguments presented here are connected to the need for more theoretical knowledge that could provide a more solid base for bicycle planning policy making and implementation in today's cities.

References

Bae, C.H. C. 2004. Transportation and the Environment, in: Hanson, S and Giuliano, G. (eds.) The Geography or Urban Transportation. The Guilford Press, New York, pp. 356-381.

Banister, D. 2005. Unsustainable Transport – City transport in the new century. Routledge, London.

Banister, D. and Hickman, R. 2006. How to design a more sustainable and fairer built environment: transport and communications. IEE Proc. Intell. Transp. Syst. 153(4), 276-291. Banister, D. 2008. The sustainable mobility paradigm. Transport Policy. 15, 73-80.

Baeten, G. 2000. The Tragedy of the Highway: Empowerment, Disempowerment and the politics of Sustainability Discourses and Practices. European Planning Studies. 8(10) 69-86.

Beckmann, J. 2001. Automobility – a social problem and theoretical concept. Environment and Planning D: Society and Space. 19, 593-607.

Buehler, R. and Pucher, J. 2012. International Overview: Cycling Trends in Western Europe, North America, and Australia, in: Pucher, J and Buehler, R (eds.) City Cycling. The MIT Press, Cambridge, pp. 9-30.

Brown, J.R., Morris E.A. and Taylor, B.D. 2009. Planning for Cars in Cities. Journal of the American Planning Association. 75(2), 161-177.

Brundell-Freij, K. 2008. Trafikprognoser [Transport prognoses], in Hydén, C. (ed.) Trafiken i den hållbara staden [Transport in the sustainable city]. Studentlitteratur, Lund, 379-394

Cars, G., Malmsten, B., Tornberg, P. 2009. Bana väg för infrastruktur [Make way for infrastructure]. TRITA SoM 2009-02 Forskningsrapport Kungliga Tekniska Högskola, Stockholm.

Cox, P. 2008. The Role of Human Powered Vehicles in Sustainable Mobility. Built Environment. 34(2), 140-160.

Cox, P. 2012. ”A Denial of Our Boasted Civilisation”: Cyclists’ Views on Conflicts over Road Use in Britain, 1926-1935. Transfers. 2(3), 4-30.

Cox, P. and Van De Walle, F. 2012. Bicycles Don’t Evolve: Velomobiles and the Modelling of Transport Technologies, in: Horton, D., Rosen, P. and Cox, P. (eds.) Cycling and Society. Ashgate, Hampshire, 113-132.

Cresswell, T. 2010. Towards a politics of mobility, Environment and Planning D: Society and Space. 28, 17-31.

Daley, M. and Rissel, C. 2011. Perspectives and images of cycling as a barrier or facilitator of cycling. Transport Policy. 18, 211-216.

Flyvbjerg, B. 1993. Rationalitet og magt – Et Case-baseret Studie af planlægning, Politik og Modernitet [Rationality and Power – A case study about planning, politics and modernity]. Akademisk Forlag, København.

Flyvbjerg, B. 1998. Rationality and Power – Democracy in Practice. The University of Chicago Press, Chicago.

Freudendal-Pedersen, M. 2009. Mobility in Daily Life – Between Freedom and Unfreedom. Ashgate, Farnham.

Furness, Z. 2007. Critical Mass, Vélomobility and Urban Space. Mobilities. 2, 299-319.

Furness, Z. 2010. One less car – Bicycling and the politics of automobility. Temple University Press, Philadelphia.

Garrard, J., Rissel, C. and Bauman, A. 2012. Health Benefits of Cycling, in: Pucher, J. and Buehler, R. (eds.) City Cycling. The MIT Press, Cambridge, 31-56.

Gray, J. 2004. Heresis – Against Progress and other solutions. Granta Publication, London.

Guiliano, G. and Hanson, S. 2004. Managing the Auto, in: Hanson, S. and Giuliano, G. (eds.) The Geography or Urban Transportation. The Guilford Press, New York, 382-404.

Gunnarsson, S. O. and Lindström, S. 1970. Vägen till trafiksäkerhet [The road to traffic safety]. Rabén & Sjögren, Stockholm.

Haines, A., McMichael, A.J., Smith, K.R., Roberts, I., Woodcock, J., Markandya, A., Armstrong, B:G:, Campbell-Lendrum, D., Dangour, A.D., Davies, M., Bruce, N., Tonne, C. Barrett, M., Wilkinson, P. 2010. Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers. The Lancet. 374, 2104-2114.

Hagson, A. 2004. Stads- och trafikplaneringens paradigm – En studie av SCAFT 1968, dess förebilder och efterföljare [Urban and transport planning paradigm – A study about SCAFT 168, its role models and followers]. Doctoral Dissertation, Chalmers Technical University, Department for architecture and traffic, Gothenburg.

Hall, P. 2002. Cities of Tomorrow. Blackwell Publishing, Oxford.

Hanson, S. and Giuliano, G. 2004. The Geography or Urban Transportation. The Guilford Press, New York.

Holston, J. 2002. The Modernist City and the Death of the Street, in: Low, S.M. (ed.) Theorizing the City – The new Urban Anthropology Reader. Rutgers University Press, London, pp. 245-276.

Horton, D. 2006. Environmentalism and the bicycle. Environmental Politics. 15, 41-58.

Horton, D. 2007. Fear of Cycling, in: Horton, D., Rosen, P. and Cox, P. (eds.) Cycling and Society. Ashgate, Hampshire, 133-152.

Iacono, M., Levinson, D. and El-Geneidy, A. 2008. Models of Transportation and Land Use Change: A Guide to the Territory. Journal of Planning Literature. 22(4), 323-340.

Iacono, M., Krizek, K.J. and El-Geneidy, A. 2010. Measuring non-motorized accessibility: issues, alternatives, and execution. Journal of Transport Geography. 18, 133-140.

Jacobsen, P. 2003. Safety in numbers: more walkers and bicyclists, safer walking and bicycling. Injury Prevention. 9, 205-209.

Johnston, A.R. 2004. The Urban Transportation Planning Process, in: Hanson, S. and Giuliano, G. (eds.) The Geography or Urban Transportation. The Guilford Press, New York, pp. 115-140.

Kenworthy, J.R. 2006. The eco-city: ten key transport and planning dimensions for sustainable city development. Environment and Urbanization. 18, 67-85.

Knoflacher, H. 2009. From myth to science in urban and transport planning: From uncontrolled to controlled and responsible urban development in transport planning. International Journal of Injury Control and Safety Promotion. 16, 3-7.

Koglin, T. 2009. Sustainable Development in general and urban context: a literature review. Bulletin 248 – Lund University, Lund Institute of Technology.

Koglin, T. 2011. Planning for cycling = planning for equity: a response to Cupples and Ridley 'Towards a heterogeneous environmental responsibility: sustainability and cycling fundamentalism' (2008). Area. 43(2), 225-227.

Koglin, T. 2013. Vélomobility – A critical analysis of planning and space. Doctoral Dissertation, Lund University, Department of Technology and society, Traffic and Roads, 2013, Bulletin 284.

Koglin, T. 2014. Vélomobility and the politics of transport planning. GeoJournal. Published first online, DOI 10.1007/s10708-014-9565-7.

Krizek, K.J. and Roland, R.W. 2005. What is at the end of the road? Understanding discontinuities of on-street bicycle lanes in urban settings. Transportation Research Part D. 10, 55-68.

Lefebvre, H. 1991[1974]. The production of space. Blackwell Publishing, Oxford.

Marcuse, H. 2002 [1964]. One-Dimensional Man – Studies in the ideology of advanced industrial society. Routledge Classics, New York.

McClintock, H. 2002. The mainstreaming of cycling policy, in: McClintock, H. (ed.) Planning for cycling – principles, practise and solutions for urban planners. Woodhead Publishing Limited, Cambridge, pp. 1-16.

Miedema, H.M.E. 2007. Adverse Effects of Traffic Noise, in: Gärling, T. and Steg, L. (eds.) Threats from Car Traffic to the Quality of Urban Life – Problems, Causes and Solutions. Elsevier, Amsterdam, pp. 53-78.

Minikel, E. 2012. Cyclist safety on bicycle boulevards and parallel arterial routes in Berkeley, California. Accident Analysis & Prevention. 45, 241-247.

Ng, M.W. 2012. Traffic Flow Theory–Based Stochastic Optimization Model for Work Zones on Two-Lane Highways. Journal of Transportation Engineering. 138, 1269–1273.

Nuhn, H. and Hesse, M. 2006 Verkehrsgeographie – Reihe: Grundriss Allgemeine Geographie [Transport Geography – Series: General Geography]. Verlag Ferdinand Schöningh, Paderborn.

Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A., Tabak, C.J., Flegal, K.M. 2006. Prevalence of Overweight and Obesity in the United States, 1999-2004. The Journal of the American Medical Association. 295(13), 1549-1555.

Parkin, J., Wardman, M., Page, M. 2008. Estimation of the determinants of bicycle mode share for the journey to work using census data. Civil Engineering: Journal Articles (Peer-Reviewed) Paper 5 http://digitalcommons.bolton.ac.uk/ce_journalspr/ accessed 2013-04-15.

Pesses, M.W. 2010. Automobility, Vélomobility, American Mobility: An Exploration of the Bicycle Tour. Mobilities. 5(1), 1-24.

Pinder, D. 2013. Cities: Moving, Plugging In, Floating, Dissolving, in: Cresswell, T. and Merriman, P. (eds.) Geographies of Mobilities: Practises, Spaces, Subjects. Ashgate Publishing, Farnham, Surrey, pp. 167-188.

Pucher, J. and Buehler, R. 2007. At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark and Germany. World Transport Policy & Practice. 3, 8-56.

Pucher, J. and Buehler, R. 2009. Cycling for a Few or for Everyone: The importance of Social Justice in Cycling Policy. World Transport Policy & Practice. 15, 57-64.

Pucher, J. and Buehler, R. 2012. Introduction: Cycling for Sustainable Transportation, in Pucher, J. and Buehler, R. (eds.) City Cycling. The MIT Press, Cambridge, pp. 1-8.

Urry, J. 2004. The 'System' of Automobility. Theory, Culture and Space. 21, 25-39.

Rennie, K.L. and Jepp, S.A. 2005. National Prevalence of Obesity – Prevalence of obesity in Great Britain. Obesity reviews. 6, 11–12.

Risser, R. and Wunsch, D. 2003. Pedestrians are second class citizens. In Proceedings of the 3rd Extra ICTCT workshop in Vancouver, Canada, 2003.

Rosen, P. 2001. Towards Sustainable and Democratic Urban Transport: Constructivism, Planning and Policy. Technology Analysis & Strategic Management. 13, 117-135.

Smith, G.P. 2002. Homezones and traffic calming: implications for cyclists, in: McClintock, H. (ed.) Planning for cycling – principles, practise and solutions for urban planners. Woodhead Publishing Limited, Cambridge, pp. 72-85.

Smith, N. and Low, S. 2006. Introduction: The imperative of Public Space, in: Low, N. and Smith, N. (eds.) The politics of Public Space. Routledge, London, 1-16.

Spinney, J. 2007. Cycling the City: Non-Places and the Sensory Construction of Meaning in a Mobile Practise, in: Horton, D., Rosen, P. and Cox, P.(eds.) Cycling and Society. Ashgate, Hampshire, pp. 25-46.

Spinney, J. 2010. Performing resistance? Re-reading practices of urban cycling on London's South Bank. Environment and Planning A. 42, 2914-2937.

Statens planverk 1967. SCAFT 1968: Riktlinjer för stadsplanering med hänsyn till trafiksäkerhet [SCAFT 1968 – Guidelines for urban planning with considerations for traffic safety]. Publikation nr 5, Stockholm.

Svensson, Å. 2008. Gång- och cykeltrafik [walking and cycling], in: Hydén, C. (ed.) Trafiken i den hållbara staden [Transport in the sustainable city]. Studentlitteratur, Lund, pp. 213-242.

Swyngedouw, E. 2008. The Post-Political City, in: BAVO (ed.) Urban Politics Now. Re-Imagining Democracy in the Neoliberal City. NAi Publishers, Rotterdam, pp. 58-77.

Taylor, B.D. 2004. The Geography of Urban Transportation Finance, in: Hanson, S. and Giuliano, G. (eds.) The Geography or Urban Transportation. The Guilford Press, New York, pp. 294-331.

Treiber, M. and Kesting, A. 2013. Traffic Flow Dynamics – Data, Model and Simulations. Springer Verlag, Berlin.

Urry, J. 2000. Sociology beyond Societies: Mobilities for the Twenty-First Century. Routledge, London.

Urry, J. 2004. The 'System' of Automobility, Theory, Culture and Space. 21, 25-39.

Urry, J. 2007. Mobilities. Polity Press, Cambridge.

Van Wee, B. 2007. Environmental Effects of Urban Traffic, in: Gärling, T. and Steg, L. (eds.) Threats from Car Traffic to the Quality of Urban Life – Problems, Causes and Solutions. Elsevier, Amsterdam, pp. 11-32.

Wachs, M. 2004. Reflections on the Planning Process, in: Hanson, S. and Giuliano, G. (eds.) The Geography or Urban Transportation. The Guilford Press, New York, pp. 141-162.

Wray, J.H. 2008. Pedal Power – The Quiet Rise of the Bicycle in American Public Life. Paradigm Publishers, London.

Yeates, M. 2002. Making space for cyclists – a matter of speed?, in: McClintock, H. (ed.) Planning for cycling – principles, practise and solutions for urban planners. Woodhead Publishing Limited, Cambridge, pp. 50-71.

List of figures