

Article

On the Road to Sustainable Urban and Transport Development in the Automobile Society? Traced Narratives of Car-Reduced Neighborhoods

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Abstract: Worldwide, academics and practitioners are developing ‘planning-oriented’ approaches to reduce the negative impacts of car traffic for more sustainable urban and transport development. One such example is the design of car-reduced neighborhoods, although these are controversial issues in the hegemonic ‘system’ of automobility. Despite the reduction of emissions and frequent recognition as ‘best practice examples’, ‘planning-critical’ research questions the underlying objectives and narratives of such sustainable developments. Our study contributes to this research perspective by improving the understanding of narratives that emerge along with car-reduced housing developments. For this purpose, we analyze two car-reduced neighborhoods in the City of Darmstadt (Germany) by conducting interviews with different actors involved in the planning and implementation processes. Our investigation reveals that the development of car-reduced neighborhoods (i) is consciously embedded in the context of sustainability, (ii) is characterized by power relations, (iii) follows normative indicators, and (iv) does not always correspond to lived realities. Altogether, the traced narratives of car-reduced neighborhoods are embedded in the overarching debate on sustainability, while at the same time revealing the dependence of society on the automobile. Thus, the hegemonic ‘system’ of automobility—although it is beginning to crack—continues to exist.

Keywords: automobile society; car-reduced neighborhood; Darmstadt; inter- and transdisciplinary research; narratives; sustainable city; sustainable development; urban and transport planning

1. Introduction

The negative impact of car traffic on the environment and society (e.g., noise and pollutant emissions, energy and land consumption, etc.), which is well known and numerous documented (e.g., References [1,2]), pose multiple challenges for cities today [3,4]. The recent actions for clean air by the German environmental organization *Deutsche Umwelthilfe* underline once again the existing correlation between transport and climate change, as well as transport and health [5]. Accordingly, both public and academic discourses call for a fundamental shift away from private cars towards more sustainable mobility. Consequently, urban and transport development strategies are increasingly based on the principles of sustainability [6,7]. Overall, “sustainability has become a prominent element in the day-to-day debate on urban policy and the expression of sustainability policy in urban and environmental planning and development decisions” [8] (p. 342).

As the automobile continues to determine an individual’s everyday mobility through its built and non-built persistences, sustainable urban and transport developments are still controversial issues in the hegemonic ‘system’ of automobility [9,10]. Nevertheless, the development of car-free or car-reduced urban neighborhoods pursues the goal of reducing car traffic and increasing quality of life.

Hence, they are seen as one example of sustainable development and, thus, as an integrated urban and transport strategy to create more livable places in the future [11]. However, Mössner [12] argues that they are consciously praised as ‘best practice examples’. Likewise, Freytag et al. [13] claim that with their implementation certain narratives are produced that may stand in contrast to the lived practices of the daily life of the residents of such neighborhoods.

Based on these findings, our study aims to develop a further understanding of the narratives produced along with car-reduced neighborhoods by the various actors involved in the planning and implementation processes. Grove and Freytag [14] subdivide previous sustainable urban development research into ‘planning-oriented’ and ‘planning-critical’ approaches. Our study takes a rather ‘planning-critical’ perspective on a topic of urban and transport planning that has so far been examined more extensively with a ‘planning-oriented’ approach in applied and engineering sciences (e.g., References [6–8,11]). By identifying the narratives of car-reduced neighborhoods, we will uncover how ecologically oriented mobility concepts at the neighborhood scale are discussed, what they are associated with and what expectations are attached to them for their future residents. Thus, this study provides an academic contribution to the existing ‘planning-critical’ state of research on sustainable urban and transport developments (e.g., References [12,13,15–18]). Based on the observation that providing a sustainable built environment remains a key challenge in urban and transport planning [8], we believe that taking a ‘planning-critical’ perspective can reveal decisive factors for sustainable urban development projects, which in turn complement the ‘planning-oriented’ state of research on car-reduced housing areas. Accordingly, the article also provides research results that can be considered for the future development of car-reduced neighborhoods.

Using two case studies, K6-Kranichstein (K6) and Lincoln—two neighborhoods of the City of Darmstadt (Germany)—both developed with a car-reduced concept, but at different times, our study relies on interview data as its primary empirical material. Moreover, our work is embedded in a transdisciplinary research project, QuartierMobil, which focuses on the transformation of urban mobility and the persistent structures in urban neighborhoods. The project is funded by the German Federal Ministry of Education and Research. The members of the project are researchers with a background in human geography, political sciences, and urban and transport planning, as well as practitioners from the local government with a background in urban and transport planning.

Due to the complexity of urban systems, research on sustainable urban development requires cooperation between different academic disciplines and professional fields [19]. Rau et al. [20] (p. 266) emphasize that the “[p]ressure is mounting on many academics to produce societally relevant and ‘usable’ knowledge and to actively engage with non-academic actors”. Similarly, Nowotny [21] argues for the production of ‘socially robust knowledge’ and the establishment of a ‘regime of pluralistic expertise’. Thus, they [20,21] call for inter- and transdisciplinary research that involves both different academic disciplines, as well as non-academic actors.

Our paper is structured as follows. Section 2 discusses the state of the research field. Next, Section 3 elaborates on the research design and introduces the case studies. Section 4 describes the traced narratives of car-reduced neighborhoods, which are then discussed in Section 5 with regard to previous ‘planning-critical’ studies of sustainable developments. Ultimately, the article ends with conclusions related to inter- and transdisciplinary sustainable mobility research.

2. Sustainable Urban and Transport Development as a Guiding Principle?

2.1. ‘Planning-Oriented’ Approaches for Sustainable Urban and Transport Development in the Automobile Society

Urban and transport planning—and, thus, also the built environment—are trapped in the path dependency of the automobile, which also influences travel behavior. For example, the development of car-reduced neighborhoods remains a conflict-ridden issue and has not yet been implemented across the board [22]. Referring to this, Manderscheid [9] describes the automobile as a ‘hegemonic dispositive of spatial and settlement planning’. In addition, an individual’s everyday practice is influenced and

shaped by the ‘system’ of automobility [10], which is shown, for example, by the consideration of one’s “own private car [. . .] [as a; note from the authors] normality and part of the package when considering a (new) place to live” [22] (p. 969).

Nevertheless, since the debate on sustainability was introduced at the end of the 1980s and the early 1990s (e.g., Brundtland Report, UN Conference in Rio de Janeiro [23,24]), a rethink in sustainable urban planning and mobility design has taken place based on the three pillars of sustainability (socially just, ecologically and economically compatible) [14,19]. In the course of this, efforts are being put forth to reduce the negative consequences and dependence on the car [6]. The guiding principle of ecological sustainability in transport planning encompasses avoiding, shifting, and improving traffic [25]. In this sense, sustainable transport policy not only aims to counteract the dominance of the private car. In order to ensure mobility and social inclusion, it also strengthens non-motorized modes, public transport and sharing services [26]. Past planning paradigms, such as the ‘car-friendly city’ [27], are giving way to new urban development models, like the ‘city of short distances’ [28], the ‘walkable city’ or ‘compact city’ in Gehl’s [29] vision for ‘Cities for People’. Accordingly, after car traffic had been the focus of transport planning for decades, environmental aspects have increasingly been considered and concepts for traffic-calming [30], pedestrian zones [31], or car-free inner cities (e.g., Oslo [32]), as well as car-free or car-reduced neighborhood design [11], are being elaborated. Furthermore, in the digital age, numerous smart technologies and intelligent devices are being developed to advance the ‘smart transition’ towards ‘smart mobility’ (e.g., References [33–37]).

However, this study deals with car-reduced neighborhoods as an example of sustainable urban and transport development. The public and academic interest in planning the latter started in the late 1980s and early 1990s in Austria, Germany, and Switzerland [11,38]. Although these housing developments have already been academically analyzed for several years, the terms ‘car-free’, ‘car-reduced’, and ‘low-car’ are used inconsistently. Furthermore, there is a lack of a common definition accepted by all [39]. Contrarily, it is clear that these neighborhoods are never completely car-free; there is always an inevitable share of car traffic, which is why we will talk about car-reduced neighborhoods hereafter.

Academic investigations in the research field of car-reduced neighborhoods focus mainly on successfully implemented examples, such as Vauban in Freiburg [11,40]. Mostly, reference is made to the different spatial design and equipment [40,41], as well as the advantages and challenges of implementing such a neighborhood [11,42–45]. From a ‘planning-oriented’ perspective, the success of car-reduced neighborhoods depends on the implementation of both restrictive and supportive measures to reduce the attractiveness of the car on the one hand, and to increase the attractiveness of sustainable modes, as well as to revive the social functionality of the streets on the other hand [11]. Furthermore, the socio-demographic characteristics of the residents and their individual motives for moving into a car-reduced neighborhood are researched, as well as changes in their travel behavior [46,47]. These studies conclude that residents of such neighborhoods travel more often by public and non-motorized modes of transport or sharing services than with a private car. Many households even decide to dispose of their own car after moving to such a neighborhood [46]. However, a comparative study of several European car-reduced neighborhoods shows that there are diverging results in detail, for example, in the proportion of car-free households [47]. This indicates that it is not sufficient to change the spatial and structural conditions in order to change travel behavior in the sense of sustainability. Rather, it means a ‘mental challenge’ and requires the ‘willingness’ of the residents to live car-free or car-reduced [22]. Accordingly, municipalities need to develop “the right concept in the right place” [47] (p. 172) together with the residents [22].

2.2. ‘Planning-Critical’ Perspectives on Sustainable Urban and Transport Developments

Current urban research addresses the sustainable transformation of cities and elaborates a number of different city concepts, such as ‘Eco City’, ‘Green City’, ‘Smart City’ or ‘Sustainable City’; all of which are to be understood as concepts for the ‘city of tomorrow’ [48–51]. Those concepts serve as

models for planning and are increasingly used as labels in city marketing [50]. On the one hand, the associated approaches to sustainable urban and transport development seem worthwhile in terms of compliance with guidelines for reducing emissions. That is why they are often praised as ‘best practice examples’ [12], and are promoted as ‘showcase projects’ [14] or ‘innovative solutions’ [15]. On the other hand, these city concepts are used in an inflationary and interchangeable way, which implies “terminological fuzziness” [51] (p. 26). Furthermore, the gap between the claim and reality of such city concepts “can be insurmountable” [15] (p. 1818). Thus, it is important to develop integrated frameworks with the ability to assess the real effectiveness of reducing CO₂ emissions through the development of sustainable neighborhoods (e.g., Reference [52]), rather than just labeling them sustainable.

Following this impression, more and more studies are applying a ‘planning-critical’ sustainability perspective [14], arguing that these models of ‘green urbanism’ emerge in a political context, and, are thus, characterized by normative indicators [12,15–18]. Mössner [12] (p. 972), for example, sees the promotion of urban sustainability models “as a process of gaining political power to decide, to exclude, to construct hegemonies”. Accordingly, the modelling of Freiburg as a ‘Sustainable City’ takes place as ‘consensual practice’ and suppression of contrary opinions [12]. Moreover, Rink [24] claims that sustainability is often used as a ‘normative pillar’ in spatial planning. Likewise, it is described as an ‘empty signifier’ that “has become a meta-consensual policy term” [18] (p. 1710). Additionally, Rosol et al. [18] (p. 1712) argue that today’s urban politics for sustainable development can be seen as “part of new urban environmental regimes” that are (i) ‘growth-oriented’, (ii) ‘neo-managerial’, (iii) ‘best-practice-driven’, (iv) ‘socio-spatially selective’, (v) ‘city-centric’, and (vi) ‘post-democratic’. Furthermore, Freytag et al. [13] emphasize that the modelling of a ‘Sustainable City’ creates certain narratives. Due to their embedding in neoliberal strategies, they reveal a “gap between the political and societal conceptions of an ideal sustainable urban way of life and its implementation in everyday life” [13] (p. 656). To model Freiburg as sustainable, narratives of (i) ‘construction’, (ii) ‘diffusion’, and (iii) ‘mythical narratives’ are produced [13]. Based on these findings, our study aims to develop a further understanding of the narratives produced along with car-reduced neighborhoods by various actors involved in their planning and implementation processes. Thus, our investigation contributes to the ‘planning-critical’ perspective on sustainable developments, and complements the ‘planning-oriented’ state of research on car-reduced neighborhoods.

3. Research Design

3.1. Narratives

With the advent of the linguistic turn in the 1980s, research on narratives gained importance in social sciences [13]. In this paper, the term ‘narrative’ is not to be understood as a single story, but “as representation” [53] (p. 49) of a story that influences the way the environment is perceived. A narrative is not only a story about something, but it is rather shaped by how and in which social, political and cultural context something is told. Narratives are subject to temporal changes, and they convey values, emotions, and power relations [54], which is why “we must [. . .] bear in mind that there can be a number of different stories to be told” [53] (p. 48). Based on the assumption that a story cannot be separated from its telling [54], researching narratives “links the unknown to the known” [53] (p. 54), and makes it possible to analyze the space-producing effect and the exercise of power by urban transport policies [13].

3.2. Research Methodology

The data collection for this study started with a screening of various documents reporting on both neighborhoods, K6 and Lincoln. Thereby, our aim was to achieve an overview of the stakeholders involved and to assess the planning processes, implementation phases, as well as intervening changes of the political, administrative or social environment. Additionally, informal conversations with residents and on-site visits have been conducted by the authors to explore the neighborhoods.

In order to unveil the different perspectives of the various actors involved in the planning and implementation process of K6 and Lincoln (see Table 1), as well as to explore the narratives of car-reduced neighborhoods, fifteen expert interviews—conducted in fall 2018—are the empirical basis for our enquiry. The audio-recorded interviews were transcribed in their entirety and analyzed using f4analyse, a qualitative coding software. The analyzing process followed the six-step approach of Meuser and Nagel [55], particularly designed for expert interviews “to assess the meaning and significance of the expert’s statements” [55] (p. 35). This is seen as an advantage because “what gains importance is the institutional-organizational context within which the expert’s position is embedded” [55] (p. 35). Further, the narrative passages of the interviews are special key points for the reconstruction of the expert’s orientations. By comparing the content of all interviews, the ‘over-individual-common’ could be identified [56], which is seen as the basis of the narratives of the two car-reduced housing developments.

Table 1. Overview of the interviewees and their professional affiliations.

Group 1: City of Darmstadt (D)	Group 2: Housing Industry (H)	Group 3: Private Consultants and Mobility Service Providers (P)	Group 4: Civil Society and Community Organizations (C)
Building department (D1)	Municipal housing association (H1)	Independent transport planning office (P1)	Neighborhood management Lincoln (C1)
Urban planning office (D2)	Real estate developer (H2)	Architect (P2)	Interest group ‘Living in K6’ (C2)
Urban planning office (D3)	Real estate investor (H3)	Mobility company (P3)	Support association Kranichstein (C3)
Urban planning office (D4)			
Urban planning office (D5)			
Office for economy and urban development (D6)			

3.3. Case Study Approach

This work is based on the two case studies, K6 and Lincoln. Both are located in the City of Darmstadt and designed with a car-reduced concept, but developed in different time periods, which makes the comparison interesting and is key for the selection of the cases. The comparison of two neighborhoods in the same urban context, but with a different time of origin and, thus, a possibly changed political and social environment offers the possibility of looking at temporal changes in their narratives.

3.3.1. The City of Darmstadt

The City of Darmstadt—calling itself the City of Science and the Digital City—is situated in the south-west of Germany (see Figure 1) with a total population of 161,843 (as of March 2019, [57]). As part of the Rhine-Main metropolitan region, Darmstadt’s population grew by approximately 19% between 2000 and 2019 [57,58]. This strong growth resulted in a shortage of housing, as well as an increase in traffic [59]. Car traffic is particularly dominant in the cityscape, although approximately half of all journeys are made by non-motorized modes of transport [60]. As a framework plan for future urban and traffic development, the city is currently developing a master plan ‘DA2030+’ [59]. In 2018, the City of Darmstadt presented a ‘Green City Plan’ after the Deutsche Umwelthilfe filed a lawsuit against the City of Darmstadt and demanded a driving ban in the city. Since June 2019, a diesel ban has been in force [61].

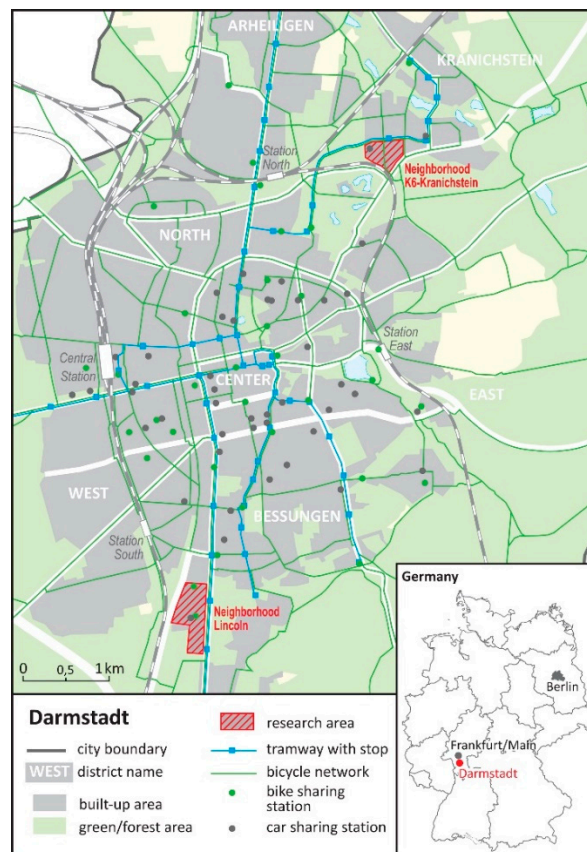


Figure 1. The neighborhoods of K6-Kranichstein and Lincoln in the City of Darmstadt/Germany (Designed by Elke Alban, Department of Human Geography, Goethe-University Frankfurt/Main).

3.3.2. K6-Kranichstein Neighborhood

K6, built between 1998 and 2015, was the latest development in the district of Kranichstein, on the north-eastern edge of the City of Darmstadt, located approximately four kilometers from the city center (see Figure 1). Approximately 750 housing units were to be created in an area of 17 hectares. In accordance with the objectives of the Local Agenda 21 (1997, [62]), the development of the residential area was based on an ecological and social concept, which includes innovative residential forms for various socially mixed population groups. K6 consists of apartment buildings constructed by a variety of architects and cooperative homeowner groups. Some dwellings on the site are low energy and passive houses. In addition to an open space concept, the urban planning principle of mixed-use should at least be applied to a small area. However, nowadays, only residential use exists. Today, 1,254 people live there (as of December 2018, [63]).

Regarding the traffic concept, the main objective was to keep car traffic out of the residential area in order to provide the residents with a quiet living environment in which they are given more space than the cars. Therefore, most car parking space is located in collective garages on the periphery of the residential area, which reduces traffic-related land consumption in the neighborhood and, thus, gives priority to non-motorized road users. Additionally, on-street parking is metered, and home zones, as well as other traffic-calming measures, have been implemented. Residents can sign an annual declaration stating that they do not own a car (Autofreierklärung). Otherwise, as a car owner, you must purchase a parking lot in one of the two collective garages. After the first residents moved to K6, a new tram connection to the city center was opened with a stop directly in the center of the neighborhood. Today, a car-sharing station exists, but no other mobility alternatives to the car are offered by the municipality.

3.3.3. Lincoln Neighborhood

Lincoln is a former US military housing area, built in 1954, and vacated in 2008. Since then, the 25-hectare site on the southern edge of the City of Darmstadt, situated approximately three kilometers from the city center (see Figure 1), is under construction. In 2011, its development was defined in an urban development framework plan [64] and is to be completed by 2025 for an estimated population of around 5,000. Lincoln's master plan combines high density residential and low-energy buildings, as well as passive houses. In 2014, after the subsidiary of the municipal housing association purchased the site from the German Institute for Federal Real Estate, the first residents moved into renovated buildings. Some plots were sold to real estate developers other than the municipal housing association, and others have been sold to cooperative homeowner groups. A small area is zoned for mixed land use. To date, 851 people live there (as of March 2019, [57]).

Regarding the mobility concept, the objectives of the city are (i) to support independence from cars; (ii) to implement the 'city of short distances' idea, thus, to strengthen non-motorized mobility; and (iii) to increase the quality of life in the neighborhood. Accordingly, minimum parking requirements have been reduced from the usual 1.2 car parking spaces per dwelling in the City of Darmstadt to 0.65, and a parking space allocation system (Stellplatzvergabesystem) has been introduced in order to ensure a more just allocation of available parking lots. Otherwise, the available parking lots would have been allocated on a first-come, first-served principle. On-street parking is metered, and traffic-calming measures will be implemented. Furthermore, from the outset, residents are offered a wide range of alternative mobility options to reduce individual car use (e.g., bike- and car-sharing, cargo-bike-sharing, public transport within walking distance). Additionally, a mobility hub on-site provides advice on mobility services. For all these components, the mobility concept of Lincoln has been awarded the National Transport Planning Prize of the German Association for Urban, Regional and State Planning 2018 (SRL e.V.) [65].

4. Narratives of Car-Reduced Housing Developments

Three main sets of narratives of car-reduced neighborhoods were identified during the interviews with the experts (see Table 1): Narratives of (i) sustainability and (dis)unity, (ii) sustainable mobility visions and innovative experiments, and (iii) a future between role models and possible failures.

4.1. Narratives of Sustainability and (Dis)Unity

4.1.1. Element of Sustainable Cities

The narratives of sustainability refer to the construction of car-reduced housing developments related to the discourses about a 'Sustainable City'. The urban and transport concept of K6 is linked to sustainable development with a socially just, ecologically and economically acceptable development. The interviewees describe the development of K6 as an opportunity to develop a new neighborhood "on the drawing board" (interview D6; the literal quotations used in this article have all been translated by the authors from German into English, which can be regarded as a first interpretation of the interview material. This may have had an influence on the analysis, the extent of which, however, cannot be estimated) in order to counteract suburbanization and, thus, prevent people from migrating to the surroundings. Furthermore, the concept of K6 is connected with the aim of distinguishing it from previous urban developments in the district of Kranichstein. Thus, for example, the interviewees describe the high-rise housing estate in the older part of Kranichstein as a "problem district" (interview P2) to legitimize the desire to develop K6 contrarily to it. Additionally, the residential area was conceived only shortly after the establishment of a Local Agenda 21 process by the City of Darmstadt in the 1990s. The ecologically oriented traffic concept is, therefore, justified by the interviewees in the context of a paradigm shift away from car-friendly planning, and a nationwide trend towards car-free living in Germany at that time. Hence, the concept of K6 is seen as a decision that responds to the "zeitgeist" or rather the "social trend" (interview C3).

Instead, the development of Lincoln is described by all interviewees as a coerced action, due to the population growth and resulting housing shortage in the City of Darmstadt. On this account, the withdrawal of the US Army is perceived as the “momentum” (interview H1) to develop Lincoln densely, which in turn—at least in the planners’ spirit—justifies the car-reduced concept. They report that due to the housing shortage, Lincoln should be developed for as many people as possible, but as little car traffic as possible should be generated. Likewise, the ‘transport turnaround’ debate is used in their argumentation:

Overall, we are aiming for a ‘transport turnaround’ because after years of car-friendly planning we have too many cars in the city [. . .]. The streets cannot manage the car traffic anymore [and] where so many dwellings are built [. . .], we are literally forced to shift to other modes of transport (interview D1).

This embedding in the sustainability discourse creates legitimacy for the car-reduced concept and serves to convince all stakeholders. Further, the planners link the sustainable development with a “technical argument” (interview D2) documented in the traffic report of the framework plan. It proves the inability of roads to perform, which in turn serves to seize the opportunity to reconsider well-trodden paths of transport planning:

The result was quite clear. If Lincoln had been developed ‘normally’, the surrounding road network would not have been able to cope with the car traffic anymore (interview P1).

Moreover, they argue that there were “simply no alternatives” (interview D4) to developing Lincoln in a car-reduced way in order to meet the obligation to reduce car traffic, both in the neighborhood and the whole city. Thus, out of necessity, alternatives had to be considered. At the same time, the narratives unveil a connection of both obligation and willingness to face the ‘transport turnaround’:

We had to, [. . .] but we also wanted to (interview D1).

4.1.2. (Dis)Unity of Actors during the Construction Process

The narratives of (dis)unity uncover both common and conflicting interests of the various actors involved in the planning and implementation process of car-reduced housing developments. Thus, they exemplify the permanent transition phase in which the change of consciousness to a stronger sustainability awareness by all actors involved in urban and transport development is still underway. In the case of K6, the ‘environmentalists’, convinced of the traffic concept, faced the ‘non-environmentalists’, who were certain that “a life without a car would not work” (interview D2). The rejection of the opponents of the traffic concept went so far that it “was ridiculed” (interview C3).

The construction of Lincoln as a car-reduced neighborhood puts forth different interest groups, but no longer hardened fronts as described for K6. By contrast, the narratives display both conviction and skepticism. In the statements of all actors, (un)certainity, as well as (dis)unity are equally evident:

We see a high marketing risk when selling dwellings without associated parking lots. [. . .] After all, we have to achieve our yield targets. [. . .] But there are of course risks with every project. [. . .] And who knows, the mobility concept may even lead to an increase in the value of the real estate (interview H3).

However, although the antipoles of ‘environmentally’ and ‘non-environmentally’ seem to have blurred over time, the narratives still reveal power relations. On the one hand, the external circumstances—described in the previous subsection—led to the formation of a political will to reduce car traffic, but, on the other hand, they are perceived as a “factual constraint” (interview H1) for developers. As the car-reduced concept arose from the municipal planners, they shaped the process by incorporating their interests. By contrast, the housing companies describe their action as following along and characterize the work of the municipal employees as “perpetrators of conviction”

(interview H3). As a result, they call the mobility concept a “compromise solution” (interview H3) and not, as the City of Darmstadt has stated, a “consensus solution” (interview D6). However, in the statements of the different stakeholders it is ambiguous whether the negotiation of the mobility concept was characterized by persuasion or rather conviction and collaboration because all their narratives show the attempt to appear as a unit that is pulling in one direction:

I believe, however, that we will not really find a better solution (interview H1).

4.2. Narratives of Sustainable Mobility Visions and Innovative Experiments

4.2.1. Sustainable Mobility Visions

The narratives of sustainable mobility visions in car-reduced neighborhoods suggest that car traffic will be calmed and reduced, and quality of life will be improved. The initial objective of the ‘traffic concept’ of K6 was to reduce the amount of space required for parked cars and to separate living space from parking space in order to calm car traffic, to promote non-motorized road users, and to “make public space inhabitable” (interview D2). At that time, the vision of the City of Darmstadt was no longer to plan the residential area to be car-friendly, but human-friendly. Its primary goal was to create an advantage for people who might have already been living without a car in their immediate living environment. Although K6 is associated with car-free living and, thus, described as ‘car-free’, ‘car-reduced’, and ‘low-car’, the narratives mainly focus on giving up one’s own parking lot close to one’s own dwelling.

In describing the ‘mobility concept’ of Lincoln, skeptics of this mostly insist in their narratives on the abandonment of the car, even though they describe the neighborhood synonymously as ‘car-free’, ‘car-reduced’ or ‘low-car’. When it comes to describing the various components of the mobility concept, most of the non-specialists in terms of transport and urban planning among the interviewees have only a vague idea of what particular measures are taken. Instead, the description by the mobility experts and advocates among the interviewees is very detailed, and greater emphasis is placed on highlighting the benefits of alternative mobility options to the car in order to balance giving up one’s own car. Thus, they additionally frame the concept as ‘multimodal’ and ‘mobility-enhancing’ (mobilitätsstark). Instead of prohibiting, they rather refer to enabling and the aim of developing a “residential area and not a highway junction” (interview P3), which gives—as with K6—“the public space back to the people” (interview D4). The proponents of the concept strongly agree that the parking regulations, coupled with the availability of alternative mobility options, will lead to less car traffic in the neighborhood, which means fewer emissions and a better quality of life. Further, the urban and transport planners expect the car-reduced development of Lincoln to contribute to a change in travel behavior by its inhabitants, as well as initiate a long-term rethink in the whole city. In this sense, for instance, the following statement creates visibility for the problems of climate change, and addresses everyone collectively to tackle it together. It directly appeals to rethinking one’s own travel behavior if it is based exclusively on the automobile:

We are trying out ways in which we can organize mobility tomorrow. This cannot be unlimited individual motorized transport, but must be a solution based on a sharing economy, local public transport and other alternative mobility services. Because you do not need to be a genius to look at the city and recognize that we can no longer rely on individual, motorized transport in the City of Darmstadt (interview P3).

4.2.2. Innovative Experiments

The narratives of innovative experiments reveal the designation of car-reduced neighborhoods as ‘new’, ‘innovative’, and ‘special’. K6 is seen in the City of Darmstadt as “the first neighborhood of this kind” (interview H2). Its traffic concept was consciously “named [car-reduced; *note from the authors*] for the first time” (interview H2) and was labelled as “innovative” and “new” (interview P2).

As the mobility concept of Lincoln is not based on “Scheme F” (interview H2), its development is linked to “venturing something new” (interview D6). Similarly, Lincoln is described as an ongoing “experiment” (interview P1), a “test field” (interview H3) and a “reality lab” (interview P3), as well as a “playing field for trying out creative solutions” (interview H2). All these examples repeatedly show a distinction to previous urban planning projects. The designation of ‘new’ leads to the fact that the car-reduced concept is not regarded as an accepted standard. Rather, it continues that the consideration of life without a car is something ‘special’ when planning and developing an urban neighborhood. Additionally, the description of the projects as ‘special’ is used to create legitimacy for the long and resistance-driven implementation process:

Everything is a challenge. Nobody has ever done it before. You cannot estimate it. Today or tomorrow it may explode in our faces (interview P3).

Deviations from original objectives—such as that additional underground garages were built at K6—are described as pre-programmed in a planning process. Tough discussions and long negotiations accompanied by controversies are regarded by the interviewees as ‘typical’ of urban development. At this point, the question can be raised whether this is not an all-too-convenient narrative to distract from the true reasons. In the case of K6, however, interviewees conclude retrospectively that many things actually did not go according to plan, such as parking management:

In the beginning, they all parked ‘wildly’ in public space. That was due to the fact that the collective garages were not finished. [...] That it took so long definitely had a negative impact (interview C2).

4.3. Narratives of a Future between Role Models and Possible Failures

4.3.1. Role Model Neighborhoods: Forward-Looking, Modern, and Sustainable

The narratives of role model neighborhoods aim at the designation of car-reduced housing areas as a best practice example for future neighborhood developments, whereby the desired consistency of their mobility concepts is created. The traffic concept of K6 is characterized as “modern” and “forward-looking” (interview P2). This ascription is underpinned by the conclusion from today’s perspective that traffic-calming measures are nowadays ‘standard’:

My impression is that these measures to calm as well as to reduce car traffic in new housing areas are standard today [...]. I mean, everyone wants clean air, no one wants noise, everyone wants their kids to play safely in the streets (interview C3).

K6 is retrospectively termed as a “blueprint for Lincoln” (interview H1) whereby not only its role model character is exemplified, but also the attempt to legitimize the mobility concept of Lincoln, which builds on the experiences of K6. Lincoln “represents modern living” (interview H1), will serve as “a brand” (interview H3) and “best practice” (interview D6) for future urban developments in the City of Darmstadt and elsewhere, and is framed as “the future form of how mobility in cities should be designed” (interview P1). On-site, an advertising banner for selling apartments also shows that “Lincoln is where the future moves in” (see Figure 2).

The innovative and future-oriented design of the mobility concept is confirmed by winning a transport planning prize and being announced as “a nationwide role model in terms of mobility” (interview D1) without knowing yet whether the lived practices of the residents meet these expectations. The association of ‘future’ and ‘modernity’ is additionally linked to the aspect of ‘sustainability’ by saying that Lincoln “is built for the future generation” (interview H1). In addition, it is noted that “the task was to plan for the future without forgetting the people today” (interview H1). As with K6, the concept is reinforced by expressing the opinion that it is not only “forward-looking”, but rather “contemporary” (interview P3). To fend off skepticism, it is said:

At some point, nobody will talk about Lincoln being a car-reduced neighborhood anymore because that will just be the way it is (interview C1).



Figure 2. ‘Lincoln is where the future moves in’ (Photograph taken by Sina Selzer, March 2019).

4.3.2. (Un)Certainties about the Success

The narratives of (un)certainties point out the open question of the success of car-reduced concepts. Sustainable transformation is considered possible and necessary by all interviewees, whereas uncertainty about its social acceptance is emphasized. Thus, the narratives uncover that the objective of car reduction remains problematic, as the overall system still follows the logic of the automobile. In the case of K6, the interviewees report that cars were parked illegally, especially during the construction period, and that, for instance, car owners tried to circumvent the rules of the car-free declaration. Although most interviewees assume that the number of cars has not been reduced and that the cars are just hidden in collective garages, they experience K6 today as a “wanted and embedded neighborhood” (interview P2). One argument that supports this impression is that “the parking problem disappeared” (interview D1) once the residents had accepted the traffic concept.

Regarding the residents’ identification with the mobility concept of Lincoln, the narratives again shed light on the division into convinced and skeptical stakeholders. However, all of them seem to be aware that residents have different mobility needs, which is why they assume that the concept may mean a change in travel behavior for one or the other. This expectation is based on receiving complaints from residents about parking management. In response to the uncertain outcome, the planners claim to have a “living project” (interview P3) that is modifiable. Further, the interviewees raise the question of whether such a neighborhood is still a utopian vision or already part of a social change. For some “the offer of alternative mobility services makes giving up the car normal” (interview D4) wherefore “in 15 years [. . .] Lincoln will have found its peace” (interview H2). For others, the project is indeed “pioneering, but also a risk at the same time” (interview D1), shaped by the following assumption:

To have it all is great, to use it all is definitely the future, but to live without something that is completely normal for you is the disadvantage of this mobility concept. [. . .] Germany is still a car nation [and] [. . .] the car is after all the usual mode of transport for Germans (interview H1).

5. Sustainable Urban and Transport Development: Normative Vision or Common Reality?

The transformation of cities into more livable and ecological places is becoming increasingly important in the pursuit of sustainability [48]. In this sense, car-reduced neighborhood design is regarded as an urban concept of tomorrow because it aims at ecologically sustainable mobility. This indicates that neighborhoods “are increasingly important sources of policy solutions to mitigate and adapt to changing climate conditions” [17] (p. 428) and “are in turn affected by wider changes in urban and global forces” [66] (p. 354).

Firstly, our results show that the narratives of car-reduced concepts at the neighborhood scale are indeed linked to the broader discourses on sustainability [13]. Car-reduced neighborhoods are expected

to perform a positive contribution to sustainable urban and transport development. Thus, they are framed as part of the conceptions of a 'Sustainable City', which is comparable to the 'narratives of construction' identified by Freytag et al. [13] in their work on a neighborhood in Freiburg. As other studies have already observed [15,18], the embedding of urban developments in the context of sustainability can be interpreted as intended in order to legitimize—like in our study—the car-reduced neighborhood design. A comparison of the narratives of both housing areas shows that nowadays the development of Lincoln as a car-reduced neighborhood is increasingly linked to the need to transform the city as a whole, underlining the urgency for action. For instance, a technical argument is used to address a lack of alternatives, which in turn reinforces the need for sustainable planning. This strategy is described by McCann [15] (p. 1819) as "framing debates in technical terms", whereby "elites are able to tamp down, or marginalize, opposition".

Thus, secondly, "it is fruitful to acknowledge that some people have been more influential as 'players in the process'" [16] (p. 589) than others. Although in our comparative study, a strict stakeholders' division weakens over time between the development of K6 and Lincoln, power relations appear to be characteristic of sustainable developments. While for some actors in the housing industry the car is still the center of attention, wherefore they insist in their narratives on the abandonment of the car, urban and transport planners, in particular, try to shift the discussion from prohibiting the car to gaining alternative mobility options. Hence, our results reflect conflicting interests of the various actors involved in sustainable urban developments; especially between actors in the private housing industry and any others. According to the literature, different understandings and interests may influence the outcome of urban development [15]. Rink [24] reports that sustainability, in particular, has so far mainly been a political 'compromise formula' because it combines too many conflicting interests. This, for example, is reflected in the description of the mobility concept of Lincoln as a 'compromise solution' (cf. 4.1.2.). Overall, in our case, it can be concluded that the path dependency of the automobile in the minds of some key stakeholders causes challenges for the implementation of car-reduced neighborhoods. Thus, the narratives expose the conflict-ridden implementing of car-reduced neighborhoods, sparked by the different rationalities of the actors involved.

Hence, thirdly, the analysis of the narratives confirms the normative character of sustainable urban and transport planning that previous studies have already observed [12,15–18]. Based on these findings, the attempt to emphasize the future-oriented role model character of car-reduced concepts can be interpreted as a strategy to promote the ecologically sustainable model. The traffic concept of K6 is used as a 'reference point' for the mobility concept of Lincoln. Lincoln, in turn, is regarded as a best practice example of how mobility should be designed everywhere. This practice is characterized in the literature as "referencescapes", a "sort of narrative framing of evidence", which "is always an ideologically constrained social, spatial, and temporal formation that serves certain interests over others" [15] (p. 1821). Although the effectiveness of sustainability is not known at the time the neighborhood is advertised, the ascription as 'best practice' or 'role model' is not unusual in defining sustainable urban development [24] and is comparable to the 'narratives of diffusion' as exemplified by Freytag et al. [13]. Further, these findings confirm the 'best-practice-driven' nature of urban politics [18].

Fourthly, the narratives reveal the tension between sustainable development goals, on the one hand, and the routines of the automobile society, on the other hand. Thus, the narratives uncover a discrepancy between the claim and reality of sustainable developments, as other studies have already found out [13,16]. For instance, Freytag et al. [13] (p. 657) state that while 'mythical narratives' praise sustainability "as an urban legend", they are "increasingly abstract, if not disconnected from the lived experience" [13] (p. 653). The sustainable developments in our study are also glorified in order to convince all actors, as well as future residents of the sustainable mobility concepts. However, at the same time, uncertainty as to whether or not the ecologically oriented mobility concept will be accepted by the residents also becomes apparent.

6. Conclusions

Building on the work of Freytag et al. [13], this study has shed light on three sets of narratives of car-reduced neighborhoods—as an example of sustainable development—produced by various actors involved in their planning and implementation processes: First, car-reduced neighborhoods as elements of sustainable cities and associated (dis)unity of actors involved; second, as sustainable mobility visions and innovative experiments; and, finally, as possible role models for future urban and transport developments. All in all, the traced narratives of car-reduced neighborhoods are embedded in the overarching debate on sustainability, while at the same time revealing the dependence of society on the automobile. Thus, this study shows that the hegemonic ‘system’ of automobility—although it is beginning to crack—continues to exist. The biggest challenge for the future development of sustainable neighborhoods is, therefore, to resolve the patterns of car dependency. Smart technologies or the development towards mobility-as-service could possibly contribute to this in the future.

One advantage of analyzing narratives in this study is that the focus of our research shifts from describing to exposing underlying objectives and obstacles to car-reduced neighborhoods, which in turn contributes to take a ‘planning-critical’ perspective on the development of car-reduced neighborhoods. Thus, by applying a ‘planning-critical’ perspective, it was revealed that the development of car-reduced neighborhoods (i) is consciously embedded in the context of sustainability, (ii) is characterized by power relations, (iii) follows normative indicators, and (iv) does not always correspond to lived realities. Thus, the narrative analysis makes it possible to comprehend the different realities of car-reduced neighborhoods, which in turn influence the discourses around them. Grove and Freytag [14] (p. 14) conclude that “the implementation of sustainable urban development depends on particular spatial conditions, is locally contingent, and is characterized by changes resulting from technical and social innovations”. Thus, the identified narratives of car-reduced neighborhoods also reflect their relational connection, on the one hand, and their embedding in wider geographical configurations, on the other.

From a ‘planning-oriented’ research perspective, car-reduced concepts are regarded as useful models for contributing to sustainable urban and transport development. However, providing a sustainable built environment and, thus, implementing a car-reduced neighborhood design remains a key challenge in urban and transport planning [8]. As urban and transport planners struggle to find a solution for this in their specific discipline, we integrated ‘planning-critical’ approaches of urban studies with ‘planning-oriented’ experiences from the interviews. Furthermore, our comparative study of two different neighborhoods in the same urban context offers the opportunity to learn from the completed project K6 for the ongoing development of Lincoln and future sustainable developments of the City of Darmstadt, as well as elsewhere. Thus, the findings gained through the ‘planning-critical’ analysis of narratives are equally useful for ‘planning-oriented’ urban and transport planners, as well as other actors involved in sustainable developments. It turns out that understanding the different perspectives of the actors involved in the planning and implementation process of sustainable developments is a prerequisite for sustainable transformation. Moreover, when transferring an ideal model of a sustainable mobility concept to reality, the everyday realities of the residents should not be neglected. In particular, urban and transport planners should take into account the recognition that a gap exists between the claim and reality of sustainable developments. As one of our case studies is not yet completely developed, this discrepancy can still be addressed, for example, by integrating participation processes.

As the narratives are temporally changeable, they are only valid for the respective period of the research. Therefore, it would be interesting to repeat the investigation at a different time in order to be able to compare the results. Additionally, it should be acknowledged that only a selection of experts could be interviewed; others would have produced different narratives. Furthermore, although the narratives already reveal a gap between the claim of sustainable development and the residents’ identification with it, the perspectives of the residents in our work remain open. Thus, as Freytag et al. [13] already maintained, future research should pay more attention to the

residents' perspectives and expectations in order to minimize the gap mentioned between the claim and reality of sustainable developments.

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