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Sustainable suburban mobilities – planning practices and paradoxes

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ABSTRACT

Cities are in transition towards more sustainable mobilities, and many city cores are beyond peak car. However, the suburbs are still largely car based. Although planning principles for compact centres and transit-oriented development have been prevalent since the early nineties, there has been little progress towards more sustainable suburban mobility. This is also the case for the Greater Oslo region. To understand this implementation gap, we have investigated the adoption of the overarching principles of land use and transport planning, as represented in the regional plan for Greater Oslo. In two suburban municipalities, we have focused on key actors in local planning, who are crucial for the implementation of planning principles and strategies to achieve change. We find that the sustainability principles focusing on densification around public transport nodes and in suburban centres are supported. However, essential aspects of social sustainability in the growing suburban towns, have largely been left out. Drawing on the reflexive turn in policies and planning, we argue that this implementation deficit is an unintentional consequence of a too narrow disciplinary spatial planning approach. The implementation of sustainable planning principles requires a broader knowledge base, including the social sciences, in order to take into account peoples' preferences and practices.

Introduction

It is argued that cities have a lead role in the transition towards a low-carbon society (Broto and Bulkeley 2013; Hollands 2008; Mi et al. 2019), particularly with respect to mobility and transport. However, in addressing the challenge of developing sustainable urban mobilities, the main focus in research and policymaking has long been on the metropolitan or main city centres, disregarding the suburban hinterlands. A substantial share of this hinterland is car-based suburbs, making 'sustainable suburban mobility' sound like a contradiction in terms, as sparsely populated areas cannot establish

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

efficient public transport due to a lack of a critical mass of people (Essebo 2011). The lack of focus on solutions for suburbs is surprising, given that substantial parts of cities are suburban, both with respect to area and population. Only recently there has been a shift towards the consideration of the suburban hinterland, city regions and the larger urban metabolism (Filion, Keil, and Pulver 2019).

In this article we scrutinize the on-going ambitions to transform suburbs, initiating a shift towards strategies for local sustainability and sustainable mobility. As mobility constitutes a key factor for regional development (Binder and Matern 2020), the transport system of city regions develops interactively in relation to changes in land use and the built environment (Næss, Sandberg, and Røe 1996; Newman and Kenworthy 1989). Based on an investigation of how the regional land use and transport plan for the Greater Oslo region is interpreted and implemented by local authorities and planners in suburban municipalities, we analyze the opportunities and obstacles for such policies in organizing a transition towards sustainable mobilities. As these planners are key actors and prime movers for creating a sustainable suburban transition, we uncover the contradictions in planning practices within a suburban context.

These planners' views and knowledge utilization serve as indicators for what kinds of planning practices that are developed and will succeed. Highlighting the role of knowledge in planning, was done already by Friedman (1987) in his conceptualization of planning as the process of getting 'from knowledge to action'. As Healey (1997) emphasizes, public policy must draw upon a broad range of knowledge and reasoning from different sources. Implementation deficits in planning can therefore be interpreted partly as problems in the knowledge base, including the diversity and utilization of knowledges. Earlier use of knowledge and path dependencies in decision-making are also of importance, e.g. ' … how events and decisions in the past have shaped the system of planning and patterns of spatial development that can be observed today' (Stead, de Vries, and Tasan-Kok 2015). Unintended consequences of planning, or lack of correspondence between intentions and results, may come from a lack of relevant knowledge representing the variety of interests, experiences and the societal complexity of the specific planning case. Dealing with unintended, and often paradoxical, effects are in many cases presented as the fundamental task for the social sciences (Boudon 1986; Foucault 1980; Giddens 1987; Popper 1963). In particular, this is a key concept for the so-called 'reflexive turn' in policy making and planning, criticizing and dealing with the side-effects of modernist rational planning approaches and the following societal and environmental problems (Beck, Giddens, and Lasch 1994). An additional critique is based on the lack of socially grounded theorizations and approaches sensitive to the diversity of social implications of planning. Healey (2002) has argued for the development of a governance capacity for a debate on multiple place qualities and experiences, as well as an everyday perspective, supplementing an economic and an environmental perspective. However, although this epistemological openness may contribute to the procedural or democratic justice of planning (Fainstein 2010), it may not reveal the distributional injustices associated with access to sustainable transport systems, because democratic openness may serve individual interests contrary to the public good (often termed as the Not In My Back Yard syndrome, or NIMBY'ism).

The question we ask is what potential there is for improvement towards more sustainable suburban mobility practices and patterns through the implementation of regional

land use and transport plans in local suburban contexts. How is the concept of sustainable mobility perceived, conceptualized and implemented by local planners and how are the social aspects related to the needed shift understood? As policies and solutions depend on how problems are defined (Peters 2005), we seek to unravel these implementation gaps and differences. Before addressing our empirical case, we present shortly what is recognized as the suburban problem and policies for sustainable suburban mobilities. With a funnel approach from the empirical case of the Greater Oslo region, we then investigate planning practices in two suburban municipalities in Greater Oslo. These cases are characterized by similarities in overarching planning goals and principles, but with relatively large differences in social and political contexts.

The suburban problem

In the densely built-up cores of cities, the conditions for sustainable transport modes are optimal, because people in general live close to public transport nodes and in areas with short distances between dwellings, workplaces, shops and services. The benefits of developing compact cities in order to reduce car use have long been confirmed by research, internationally as well as in Nordic cities (Holden and Nordland 2005; Kenworthy 2006; McIntosh et al. 2014; Næss, Næss, and Strand 2010; Næss, Sandberg, and Røe 1996; Newman and Kenworthy 1989). In Oslo, as in several other cities, recent trends reveal increased shares of sustainable transport modes (walking, cycling, public transport and shared mobility). Along with a certain degree of re-urbanization over the last decades, a long period dominated by urban sprawl has seemingly come to an end (Næss, Næss, and Strand 2010), and like many other European cities (Gundlach et al. 2018; Nieuwenhuijsen and Khreis 2016) Oslo has undertaken a car-free city centre policy.

Achieving a more sustainable city region depends on the transformation of suburban spaces, infrastructure, practices and cultures (Røe 2014). While further reduction in car use has peaked in the cores of cities like Oslo, for both empirical and political reasons, there are vast potentials in the suburban hinterlands. New policy and planning initiatives thus aim for the development of greener and more sustainable mobility patterns, e.g. through the ongoing densification around public transport hubs and nodes (Papagiannakis, Vitopoulou, and Yiannakou 2021).

Car-based suburbs have long been seen as highly problematic, but not easy to deal with because of the path-dependencies in land use, persistent car use and a lack of political will to halt automobilization as an institutionalized practice and culture (Sheller and Urry 2000). The specific challenges of creating sustainable mobility systems and practices in the suburbs are strongly related to urban sprawl and mass automobilization. While the suburbs, with their abundance of green spaces and networks of small roads, might be seen as particularly pleasant for active mobility, they often lack a comprehensive public transport system, especially serving intra-suburban trips. Although planning increasingly is focused on suburban spaces, there is no single solution for developing sustainable suburbs. The social and spatial diversity of suburbs and the on-going urbanization of suburbs, conceptualized as post-suburbia (Phelps and Wood 2011), pose challenges for mainstream land use and transport planning. The transformation of suburbs should therefore not be solely based on the stereotype of the low-density suburban tract consisting of detached single-family homes. There are challenges related to

different suburban forms, like suburban 'minicities' with an increasing abundance of urban-like functions; ethnically diverse satellite towns; wealthy broadleaf suburbs; low status or poor suburbs; exurbs with few transit options, etc. Increasingly there is an acknowledgement of the need to handle the more diverse and polycentric city regions, to curb climate change mitigation. The attempt to reorganize the relationship between the city and the region and the a shift towards a city-regional governance regime (Filion, Keil, and Pulver 2019), involves enhancing public transport systems, developing transit-oriented nodes, densification of suburban centres, and implementing new smart and flexible mobility systems, all represented in new principles that are overturning current urban and regional planning.

Planning and policies for sustainable suburban mobilities

Planning, understood as a comprehensive approach to deal with current and future societal challenges, and sustainability are closely related. Planning as well as sustainability strategies are multidimensional, and the ex-ante assessment principle of planning parallels the precautionary principle of the sustainability discourse. The main challenge is to facilitate a social, cultural and political transformation which decouples sufficient and satisfactory mobility and accessibility from continuous environmental degradation. This may be especially difficult to achieve in a suburban context, because of the often distinct spatial, demographic, economic and political diversity of suburban areas (Schwanen 2015).

The planning and policy instruments and strategies used to facilitate future sustainable transport systems are rarely direct results of simple decisions, but rather of complex decision-making processes and collaborative work including a variety of policy actors, across sectors and administrative levels, both public and private, collective and individual. However, there is ' … a wide gap between sustainable mobility theory and its implementation in practice' (Foltýnová et al. 2020). This gap might be caused by a lack of integration across the main sustainability dimensions; the social, the environmental and the economic dimensions. There are also conflicting interests amongst the diverse actors involved (e.g. private developers, planning consultancies and public agencies), and difficulties in interpreting and implementing such policies across urban and regional scales.

Recent technological and social innovations within everyday transport may also pave the way for new opportunities in suburban mobility. Electrification, sharing and automation have been highlighted as three ongoing and to a certain degree converging 'transport revolutions'. The convergence of these mobility trends promises to significantly reshape our daily lives and communities. Although an optimistic scenario suggests the realization of social equity, environmental sustainability, traffic safety and urban liveability, some are critical of the societal implications (Fulton 2018; Sperling 2018).

Suburbanization and sustainable mobilities in the Oslo region

As city centres in cities like Oslo seems to have reached a low and satisfactory level of car use, the attention should be directed to develop alternatives to the massive use of private cars in the suburbs. Although several suburban centres in the Oslo region have grown

from small suburban railway towns into walkable 'minicities' with a variety of services and public transport offers (Røe 2014; Røe and Saglie 2011), a large part of the suburban landscape is dominated by low density detached or row housing. In Oslo, like other European cities, traditionally working class suburbs are dominated by multifamily housing (Guttu, Havnen, and Koppen 2008), but a large part of the affluent and middle class suburbs in and outside of the city limits certainly adhere to the dominant vision of detached single-family housing, relying heavily on car use.

The Greater Oslo region currently has more than 1 million inhabitants, while the City of Oslo has reached 700,000. Only one-third of the population in the whole City of Oslo live in the densely built-up inner city. Recent research has found that young families in Oslo mainly follow a classic time–space trajectory from the inner city to the suburbs (Wessel and Lunke 2021). Despite the dominant urban planning principles of transit-oriented development (TOD) and compact city development, low-density and low-rise housing is preferred amongst a high proportion of families with children who seem to have a low tolerance for compact living.

The City of Oslo's data on residential mobility reveals that despite an overall population growth during the last decade, the net migration (the difference between in-movers and out-movers) is declining (see Figure 1). The net migration from outer city to other municipalities is large and has been steadily increasing, in contrast to the net migration between inner city and other municipalities, which is almost stable. Although the population of Greater Oslo as a whole is growing, there is a large 'leakage' from the city of Oslo to surrounding suburban municipalities, e.g. due to the lack of affordable low-rise housing
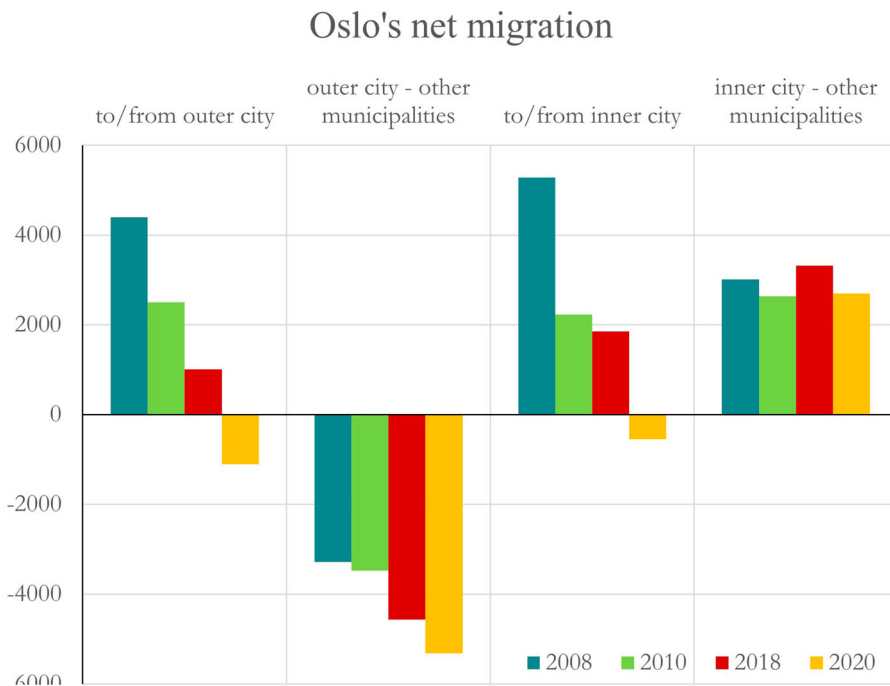
Figure 1. Oslo's net migration 2008–2020. To/from outer city; from outer city to other municipalities; to/from inner city; from inner city to other municipalities Source: Oslo Statistics (own collating).

suited for families within the city limits. This also explains the substantial population growth in municipalities around Oslo, such as Bærum and Lillestrøm (Statistics Norway 2021).

There are considerable geographical differences in mobility patterns and access, between Oslo and the surrounding municipalities. Table 1 shows that there has been a development towards more sustainable mobility patterns especially in Oslo, where there has been an increase in share of the population with no car, and a shift in modal split towards more walking and use of public transport (supported by better access to public transport). In the inner city in 2018, 58% of the population lived in households without a car, and less than one-fifth of daily travels were done by car. For Oslo as a whole, both car ownership and car use have decreased. In 1998, one-fourth of the population lived in a household without a car, and 20 years later this proportion is more than one-third. In the surrounding suburban region of Akershus, there have been less changes over time. Less than 10% of the population lives in a household without a car, and nearly half the population lives in a household with access to at least two cars. Car use and cycling has decreased slightly, in favour of a higher proportion using public transport, apparently related to a substantial improvement of public transport in these suburban municipalities (Ellis, Strætkvern, and Berglund 2021).

In sum there are substantial differences between the city of Oslo and the surrounding suburban region when it comes to car use. In addition to the inner city's apparent advantages for sustainable transport modes, the city of Oslo has promoted sustainable mobility through several policies during the last decade. The mainly car-based mobility practices in the suburban region still need more attention in policy making and planning.

The political and social context of sustainable planning in greater Oslo

Norway has passed significant milestones in the development of daily mobility patterns since the Second World War. Until 1960, private car purchases were restricted and rationed in Norway. Thus, the negative consequences of car traffic were hardly recognized before the 1970s when traffic fatalities peaked, and pollution, congestion and land take gradually became an issue. At the end of the 1970s, urban and transport planning encompassed new ideas, including car-free residential projects and satellite towns (Røe 2015), followed by ambitious plans for the establishment of a coherent bicycle

Table 1. Percentage mobility changes 1998–2018 in Oslo and the surrounding suburban county Akershus, as well as in Oslo inner city in 2018. Measured in percentages (Source: Ellis, Strætkvern, and Berglund 2021).

		The county of Akershus		The (whole) city of Oslo		Oslo inner city
Car ownership	**Share of population that are:**	**1998**	**2018**	**1998**	**2018**	**2018**
	Living in households with no car	8	10	25	36	58
	Living in households with 2 or more cars	44	46	20	17	6
Access to public transport	**Share of population with very good access to public transport**	11	29	70	78	90
Modal split	**Share of trips that are done:**					
	With car (driver or passenger)	66	64	48	32	19
	Walking	17	17	26	30	40
	Cycling	5	3	7	6	7
	With public transport	10	15	17	29	32
Sum	98	98	99	98	97	98

network. Not until the emergence of the sustainability discourse in the late 1980s began to influence transport planning, there was a shift from mainly facilitating car use towards acknowledging the environmental burden. Along came policies considering the transport challenges related to land use development, most importantly the launching of national policy guidelines for coordinated land use and transport in 1993. The recent decades' emergence of climate policies has increased the national expectations towards local and regional planning, focusing on compact urban development and densification around public transport nodes (Bardal, Gjertsen, and Reinar 2020; Nore et al. 2014; Strand, Nenseth, and Christiansen 2015; Strømmen 2001).

Alongside a certain degree of re-urbanization and immigration, the population increase is related to the national policy to intensify urban areas and already built-up spaces. The principles for environmentally sustainable urbanization and sustainable mobility in Norwegian cities have mainly been based on densification and increasingly polycentric urban regional development, focusing on the existing centres and towns best served by public transport. This includes the planned transformations of suburban and exurban landscapes of the greater Oslo region. Most significantly, this is recognized in the current 'Regional Plan for land use and transport for Oslo and Akershus', adopted December 2015 (Akershus county/Oslo municipality 2015), which is the point of departure for our investigation of how the principles of sustainable mobility are interpreted and adopted in a suburban policy context. The plan aims at presenting common guidelines and a specific plan for the land use and transport development in the region, and to serve as a platform for further cooperation between the state, counties and municipalities, businesses and other actors.

The regional plan focuses on public transport-oriented development, designates specific 'regional towns' or suburban centres for development (housing, workplaces, services, institutions, etc.), and indicates the spaces for prioritized development and growth within and adjacent to these regional towns and along a densely built up urban corridor, due to its particularly strong public transport capacity in the Oslo metropolitan area. Six regional towns or suburban centres in six different municipalities were identified, all regional hubs with railway stations that are part of the suburban and intercity train network in this region (Bergsli and Harvold 2018).

Case selection and methods

In order to investigate how the regional plan has been interpreted in a suburban context, we have chosen two of the regional towns close to Oslo: the suburban town of Lillestrøm (in Lillestrøm municipality) and the suburban town of Sandvika (in Bærum municipality). The two regional towns are located in the eastern and western suburbs respectively, in the Greater Oslo region, as illustrated in the map in Figure 2. The map also shows the percentage of environmentally friendly mobility (walking, cycling and public transport) versus car use, and confirms the substantial difference in sustainable mobility between the central part of Oslo versus the urban periphery.

'Lillestrøm' is a regional town and administrative centre, as well as the name of the municipality. It borders the municipality of Oslo in the south, and is located halfway from Oslo centre, towards the Oslo airport at Gardermoen. It is a busy node and transport hub, with a main bus station and a railway station for local trains, as well as the main
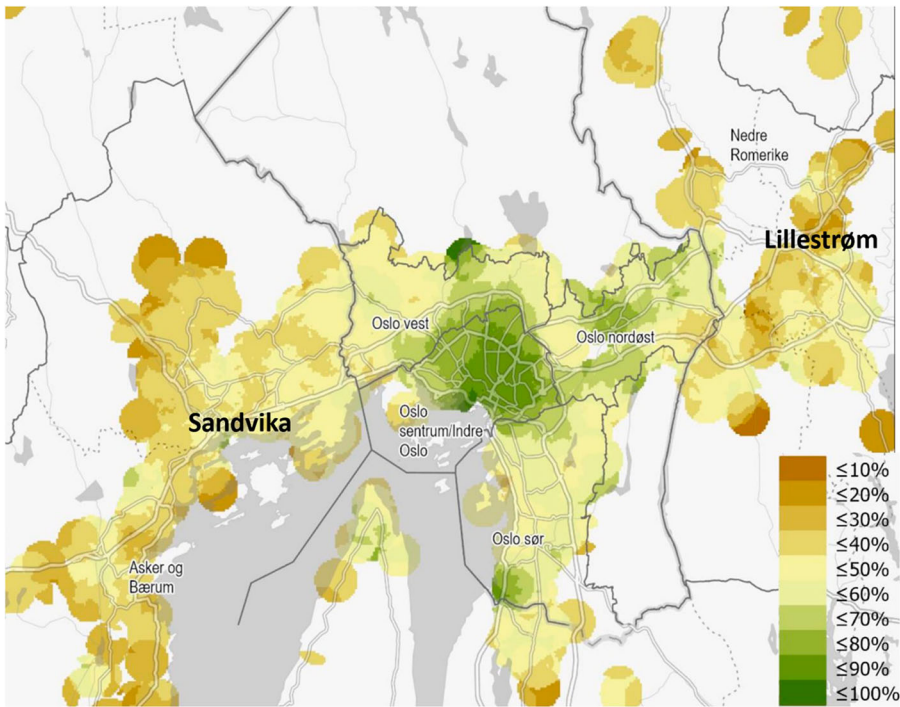
Figure 2. Sustainable mobility as a proportion of total mobility (percentage of travels by walking, cycling, or using public transport versus car based transport) in the Greater Oslo Region. Source: Ellis, Strætkvern, and Berglund (2021).

rail line between Oslo and Trondheim and the airport express. A 10-minute train trip from the centre of Lillestrøm to Oslo central station makes Lillestrøm an exceptionally accessible suburb to and from the metropolitan centre of Oslo. The recent development of the regional town of Lillestrøm has been characterized as a transformation from a 'dormitory town' to a 'regional town' (Pirotee 2019), and sets its mark on the built environment characterized by an increasing number of high rise buildings and apartment complexes. Its flat terrain favours biking, which is promoted by the city council. The population of the municipality of Lillestrøm scores low on some socio-economic indicators, compared to the municipalities of Oslo and Bærum. It has on average a lower percentage of people with education above high school level, higher dropout rates from high school and a higher percentage of low-income groups (9%). The town also has a relatively large share of non-western immigrants (Pirotee 2019).

'Sandvika' is the administrative centre of Bærum municipality (the fifth largest municipality in Norway in terms of population). The train station is located in the town centre and has several tracks and frequent trains to Oslo, with a travelling time of about 10 minutes. Economically, spatially and socially, the town is strongly influenced by one of Norway's largest shopping malls, 'Sandvika Storsenter', located at the western edge of the town centre. Sandvika is part of the continuous built environment of the populous but relatively low-density suburban municipality of Bærum, which has a polycentric landscape of many smaller suburban centres. The sprawling pattern of settlement in the municipality and the level of affluence are also reflected in high rates of car usage

and high carbon footprints from transport. Bærum has a high share of people with university education, low dropout rates from high school, a low percentage of low-income groups, and a particularly high share of high-income groups (Seehusen 2019; Statistics Norway 2021).

The logic of comparison in our investigation of these two regional towns, is based on similarities with respect to planning and the suburban location next to Oslo and the differences in social and political context. While many of the current place-making strategies are similar, the differences in the socio-economic composition and political economy of these places are quite striking.

The study is based on documents and plans describing the current state and future prospects of mobility practices in the two suburban or regional towns, as well as interviews with politicians, public planners and real estate developers in these towns. We have not included other stakeholders (local business other than developers, NGOs, inhabitants groups, e.g), since our main aim has been to investigate the anchoring and implications of the regional plan for those who were to implement the planning principles. We have aimed to reveal the current policy discourse among key planning actors, through a content-focused interpretation of the planning strategy (Krähmer 2021). Although the two selected regional towns are from the outset rather different in social composition and socio-political traditions, they are part of the same overarching regional plan and policy principles. Investigating the strategies of these two regional towns and municipalities sheds light on how the sustainability perspective is handled and implemented in a contemporary suburban political context.

As preparation for the interviews, plans, policy documents and newspaper articles about the local and regional land use and transport planning strategies were scrutinized – focusing on especially relevant concepts like 'regional plan', 'densification', 'transit-oriented development', e.g. This gave us a first impression on the main issues and tensions in the local reception of the regional plans, to be followed up in the interviews. The interviews themselves were done locally at the interviewees' offices and work places, in some cases with several of the researchers from the research project present. The fieldwork took place in 2018 and 2019. The interviewees were recruited through 'purposive sampling', based on their role and position in the municipal organization or the development company. They were first contacted by email or phone, and informed about their rights according to GDPR rules, including their active consent. Several of the interviews and all transcriptions were done by masters students connected to the research project, in the case of Bærum (Seehusen 2019) and Lillestrøm (Pirotee 2019).

In 'Bærum', 12 interviews were conducted, of which two were group interviews with three people from the same department. In 'Lillestrøm', 12 interviews were held, also here two of the interviews were group interviews, see Table 2. Due to GDPR we cannot quote the interviewees more specifically than these more general characteristics. The interviews are reported to Norwegian Agency for Shared Services in Education and Research (SIKT).

We also organized two workshops with the two municipalities (including several of the interviewees), together with the researchers connected to the research project. These workshops were also part of the field work, as preliminary research findings were presented and commented upon, and as the participants from the case municipalities presented polices and planning strategies. These workshops provided valuable input and feedback for the project's findings.

Table 2. List of interviewees in the municipalities of Bærum and Lillestrøm.

Bærum	Lillestrøm
Public planner 1	Politician
Public planner 2	Politician
Public planner 3	Public planner - County level
Public planner 4	Public transport planner
Public planner 6	Public land use planner
Public planner 7	Public planner head of section
Public planner 8	Private local developer 1
Public planner 9	Private local developer 2
Politician 1	Private local developer 3
Politician 2	Private external developer 1 -
Private developer 1	Private external developer 2
Private developer 2	Private external developer 3
Private developer 3	
Member of neighbourhood association	
Norwegian Public Roads Administration	

Congruence between regional and local planning

The two municipalities both actively utilize the regional land use and transport plan as part of their overall planning strategies, aiming at implementing the overarching principles in their local contexts. The principles of the plan are seen as arguments for a sustainable transition through municipal planning, as both municipal planners and real estate developers in both municipalities express, here represented by statements in three different interviews:

> … the regional plan contributes in clarifying that we need a transition (planner, Lillestrøm)

> … the regional plan has been leading the development we see in Bærum today (planner, Bærum)

> All developers use it (the regional plan), and all developers have it as the baseline (developer, Lillestrøm)

Not only is the regional plan an inspiration and guidance for this transition, it is also confirmed by planners in both municipalities that the local plans for land use and development already were in accordance with the overarching principles, because of the emergence of the land use and transport planning discourse predating the plan itself. In Lillestrøm, this is expressed as follows, by one of the planners:

> Yes, much is contributing in our direction. What we have seen is that regional plans and national guidelines are in favour of places like ours – because of the location and the excellent public transport availability we have. So it is easy to claim for densification, transformation and intensive land utilisation here

In Bærum, the regional plan is more clearly presented as a break with the planning principles of the past in this municipality (as expressed by one of the planners):

> Bærum has been seen as the green (rural) Bærum, as an affluent suburb to Oslo, at the same time as it is now a part of the regional plan – of urban development strategies, urban growth agreements, and urban status of Sandvika

However, the change towards TOD and avoiding urban sprawl is comprehended by the municipal leadership (represented by the head of planners):

> […]the politicians are in a maturation process when it comes to changes in mobility and mobility solutions … Before it was the same with regard to housing and development. It was supposed to be a green rural area. Now, however, it is approved that we are going to densify along the transport nodes and not sprawl the development

At the same time, the municipal actors are quite aware that the 'urbanization' of these regional towns is not only a result of their own policies and planning, or the regional plan itself. They recognize that the housing market, and the increased demand for apartments, has been favourable for densification in and around these regional towns and transport nodes, as one of the planners (in Lillestrøm) put it:

> When it comes to planning, we see that it follows all the principles of urban development. It is a bit more questionable if we are able to cope with it in practice. However, the market has been with us, and one of the most important drivers the last 15 years, has been that the market has wanted to build dwellings in the centre

Moreover, the real estate developers' willingness to invest and build has been so evident that it has eased the urban transformation of the regional towns, in an urban development regime where most detailed land use and zoning plans are made and presented by private developers and builders (Falleth and Hanssen 2011). Some of the low-density land use and less workplace intensive spaces within these regional towns have been easily transformed and utilized. This is exemplified by one of the planners (in Lillestrøm):

> We have put forward land for transformation; these are areas along the main axis in the transport system, characterised by a mix of businesses and dwellings. Also, before these areas were centrally located, when there was a much stronger proneness to mix various land use aims. This we do not manage so much anymore. These gas stations, garden centres and various industry buildings can no longer defend the (central) spaces they occupy

Tensions in transformation processes

However, we have also revealed tensions between actors and stakeholders in these transformation and densification processes. One tension results from the real estate developers' priority for developing housing as apartments in blocks of flats and quadrangle buildings, with high densities and building heights, in order to maximize land utilization. This emphasis on housing may contradict the planning principles for developing of multifunctional regional towns (with shops, services and work places, in addition to housing) and thus avoid becoming mainly a commuter town or 'bedroom community'. One of the planners (in Lillestrøm) complained about the focus on building for housing, and not for workplaces and businesses:

> The developers occupy the centre with dwellings, in a too high degree. When the densification process started to 'take-off', it was only dwellings the developers wanted to build and dared to launch

The municipal planners stated that they have a clear conception of how the urban structure and building typology should be, as exemplified in this statement (planner, Bærum):

> (We have) managed to be clear about the point that there should be outwardly directed (service) functions in the ground floor and, preferably, combined buildings with offices in

the other floors, not only for housing. When the development is so much characterized by quadrangle buildings, as it is here, it is very difficult to avoid the combined buildings, which is not what the developers want

However, the planners are also critical of quadrangle buildings in these suburban centres because they hamper the openness and accessibility of the urban structure necessary for walkability all over and across the centre, for example to provide important short-cuts for walking, as is the case for Lillestrøm:

I think we will still see the quadrangle buildings, but we have tried to see the possibilities to pass through the blocks, to avoid barriers along the easiest origin-destination routes. It is a fact that pedestrian routes are important to make people walk – it is said that 100 metres of detour corresponds to approx. 1 kilometre of detour on a bicycle (planner, Lillestrøm)

Another tension in these transformation processes is the constraints and path dependencies stemming from old practice-structure relations, based on the dominant style of living in detached houses in relatively remote hillside areas with few services and commercial facilities, and thus mostly car based. These planning practices predating the current concern for transport emissions and energy use were caused by the availability of cheap land in the municipal periphery, and the policy for preservation of arable land.

Another concern, which is neither handled in the regional plan nor in local spatial plans, is the social and demographic composition of the transformed and densified regional towns. Due to the developers' tendency to maximize profit and thereby build expensive apartments, mainly the wealthy, mostly elderly inhabitants can afford and will move into these new dwellings, as is recognized in the municipalities:

Often, the transformation starts with building apartment blocks in the very compact little centre, with the small house areas in close vicinity. When the apartments are built, the widows move into these apartments – and the small house areas are filled with families with children (planner, Lillestrøm)

… What is also challenging in Sandvika is that there are not so many actually living in the centre. There are quite some elderly living close to the Sandvika shopping centre, … So the question is how to get a more balanced population composition, age groups and housing areas (planner, Bærum)

The elderly people are of course dependent on short distances to the multifunctional regional towns and their amenities and services, but it is nevertheless a paradox that these retired and elderly people who represent the least mobile group of the population are least in need of closeness to the public transport node with commuter trains or buses. Along with the large-scale implementation of these transport nodes accompanied by densification, there has been a concern about the social composition in these new dwellings and the demography of the regional towns, in particular the age composition. A renowned architectural critic warns against 'elderly ghettoes', and these quotes from a construction branch article may serve as illustrations (Aga 2019):

The elderly want to live in the new apartment houses by the transport hubs, and outcompete all others in the bidding round when they sell their paid off villas.

Apartment houses on top of a shopping centre by the train station made a closed environment where the elderly stayed on their verandas, while the families with children drove their car to the shopping centre from the small house areas around.

> When the elderly buy, you don't get this urban, vibrant life with people in the streets and a basis for local businesses … What you get is elderly people who stay inside their homes.

Other municipalities around Oslo also experience the same problem; that almost only retired people live in the apartment blocks in the suburban centres close to the public transport node: 'It is the elderly who buy these new-built apartments. In our multifamily building the average age is 70 years' (Aga 2019). It is argued that when predominantly elderly wealthy people with savings and pensions from high salaries can afford these apartments, families with children are excluded. As some of the elderly themselves express, as quoted in this newspaper article (Brochmann 2013):

> We elderly are not commuting, we travel whenever it suits us. So, for our place (the suburban centre) I think the commuter gains are offset; not many in these apartment blocks are in the workforce anymore. There is a discrepancy between regional and local planning, because of the emphasis locally on whom the new housing in the expanding (sub)urban centres are built for, and what kind of social composition these suburban communities or regional towns will have. The regional plan does not give any guidance for solving this challenge. The local planners observe what people really want, but this is not what the developers build anymore.

Municipal planners are also concerned with the qualities of the built environment and the urban liveability framed by the newly built-up, dense and relatively high-rise areas. This concern which, according to the local planners, is caused by the ruling politicians, who are too eager to please the developers:

> The politics was highly opposed by the local people; it turned and took out parts of the small house areas in the original plan that we had started upon. (planner, Lillestrøm)

These changes in the demographic and socio-economic composition of the studied suburban towns resemble the prevalent gentrification processes in central parts of cities, especially new-build gentrification (Davidson and Lees 2010), described as the building of new housing or redevelopment projects in areas with pre-existing affordable housing or in brownfield areas, involving capital reinvestment, social upgrading and the influx of people from the middle or upper class. Such redevelopments may cause displacement of low-income groups as well as families with children, demanding larger homes. One of the planners (in Lillestrøm) stated, however, that new generations may have new values and daily mobility practices:

> The comprehension of car use in such a small – and car dependent – town must grow from a combination of new generations of families with small children that also are not intuitively using cars, but are aiming at car-free daily life.

Local coping strategies

There are possible avenues towards solving some of these unintentional, paradoxical and largely neglected challenges of implementing the overall principles of densification around public transport nodes. One approach to reduce the elderly and upper middle-class 'colonization' of the regional towns, or the new-build gentrification described above, is to keep or provide more town houses, row houses, or small-size single-family detached houses, in existing small-house areas, close to the centre, as one of the municipal leaders recognizes:

> While the principles of coordinated land use and transport have been discussed over the years, these dimensions we are talking about now, are less finished, less described and researched. The new way of thinking is quite contrary to how we have been thinking for so many years. (planner, Lillestrøm)

Moreover, of importance for the local planning is the re-localization of schools and kindergartens, placing them within or close to the suburban centres. This is a modification of former regulations and planning practices of locating the kindergartens and other social infrastructures in the green periphery, due to low cost of land and easy access to greenery, leading to car dependency in delivering and picking up children.

Families with children searching for affordable housing may have difficulties in finding homes with easy access to services and functions, as in suburban towns with increasingly expensive housing (Hoen 2018). This is one reason for the high level of car use in this group, as formulated by this local planner in Lillestrøm:

> And then you happen to not understand the needs of the 'everyday geography' of families with children, where they move; this walkable daily life for the families with children that we are aiming at.

Another type of local planning practice, in preparing for urban development plans, is to create neighbourhoods that include basic services and infrastructure, as expressed by one of municipal planners (in Lillestrøm):

> We have an urban development plan we are working on now, where one of the issues is so-called 'neighbourhood analyses' to see how the town can be divided into different neighbourhoods and functions being placed and based upon public transport use (…) and that functions like kindergartens and local stores are located close to these stations.

The overall intention is to enable people to consider and choose sustainable transport and mobility options so that people find the sustainable solutions as the most attractive.

Overall, the local strategies in our two municipalities are strikingly similar, despite the huge differences in social and political context. One important difference is that the regional plan is presented as a clear break from earlier planning principles in Bærum.

Conclusion: potentials and paradoxes in suburban mobility transition

In this article we have revealed a convergence between the regional land use and transport plan and local municipal planning, in terms of overarching principles, policy goals and intentions of coordinated land use and transport planning. The regionalized upscaling of urban planning and the development of post-suburban strategies (Phelps and Wood 2011) is very much in line with local municipal planning strategies and planners' knowledge base, methods and discourse. These strategies are also adopted and implemented by real estate developers and entrepreneurs, who gain economically from these investments in the built environment (Røe 2014). However, the actual socio-spatial transformations, resulting from the detailed implementation of these planning strategies, reveal tensions and challenges.

First, there is a neglect, or avoidance, of the societal implications of the regional plan, and its prescription for densification around nodes in the public transport system and the development of attractive and multi-functional regional towns. One such implication is

the so-called 'affordability paradox', i.e. that transit oriented principles and amenity-rich development may lead to gentrification and rising property values (Dong 2017). The economic benefits for property owners justifies the high cost of building rail transit infrastructure and may be seen, even if contested, as a gentrification trigger. Sheller (2018) criticizes the kind of placemaking that creates desirable neighbourhoods by also leading to the problematic processes of gentrification and in some cases direct displacement of low-income groups. In addition to this form of suburban new-build gentrification (Davidson and Lees 2010), it leads in the long run to increased socio-spatial segregation by socio-economic status and income. Such developments in the suburban centres of the Oslo region have a tendency to attract the elderly and so-called 'empty nesters', who are selling their detached houses in ordinary suburbs when their adult children have moved out. These are wealthy people, who can afford expensive apartments in densified and newly developed spaces with an urban atmosphere, around increasingly connected public transport hubs. Paradoxically, the elderly are amongst the least mobile groups, and are seldom daily commuters to whom easy access to public transport nodes is of special importance.

Second, there is a lack of attention towards providing appropriate and sustainable housing for families with children. Dual working households and families with children seeking relatively large, but affordable dwellings, may have few opportunities in central locations and highly connected suburban towns, and often end up farther away from these centres with public transport nodes, in areas with longer distances to schools, kindergartens, shops and other services these families use frequently. This is of course not only a matter of affordability, but also their choices, because families have a preference for easy access to both public and private green spaces, of which are abundant in traditional low density suburban spaces. This is not least due to suburban green spaces and bicycle/pedestrian tracks, making walking and cycling particularly convenient, safe and pleasant. However, relatively few row houses and town houses have been built[1], although these dwelling types may be ideal for families with children. The principles and recommendations in the regional plan for Greater Oslo omit or neglect these social and demographic implications, also influencing the social acceptance of these strategies, and the actual well-being in the transformed post-suburban landscape (Phelps and Wood 2011). The strategy for developing multi-functional regional towns focuses on physical design and built form, while the social aspects of place-making (Røe 2014) have been downplayed.

The lack of attention towards the social implications of these (post-)suburban densification and transformation strategies may also be related to how the municipal administration is organized and what kinds of knowledges the planning is based on. The regional plan is in its title a plan for land use and transport, and our investigation reveals little concern for the societal issues outside the domain of physical planning and design, although the social implications are substantial. Within the municipal organization, the lack of focus on social issues is acknowledged, and there is an articulated recognition that there is a need for new ways of thinking in order to include the social dimensions of sustainability. In accordance with observers pointing out that regional and urban planning in general has been dominated by physical design and functionalism (Sandercock 2003; Tonkiss 2013), the planning principles we have revealed in our case municipalities focus mainly on spatial, land use and transport infrastructure issues, mainly related to the

environmental dimension. The social dimension has been mostly left out and neglected, with the exception of the aim to create multifunctional and lively urban centres. The plan does little to deal with and handle social implications like socio-spatial inequality, exclusion and unequal access to services and public transport.

A lack of a comprehensive sustainability approach, including all three sustainability pillars, may imply that people's objections to some of the densification development projects, and the ongoing transformation of their 'home towns', should not be dismissed as simple NIMBY'ism. The dominant planning approach does not include strategies for investigating the social and cultural aspects and implications of current strategies for place-making, that could reveal that in several cases people prefer and want their well-established neighbourhoods to be sustained and may resist the demolishing of buildings to accommodate expensive, often high-rise apartments. The trade-off between high building densities and quality of life is also widely recognized in other European city regions (Westerink et al. 2013). Developing multi-functional towns could also facilitate social inclusion, directed at families with children who have a preference for small houses in suburban neighbourhoods with urban qualities, functions and services, or with such qualities within walking distance.

Our study has revealed how urban sustainability principles based on transit-oriented development and densification have been adopted similarly in the two studied regional towns, despite the different social and political context. The lack of contextually sensitive and comprehensive strategies that take into consideration the diversity of social implications of these planning strategies, creates frictions between stakeholders and processes of social inclusion and exclusion. On the one hand, the local planners have accepted and to some extent adjusted the new planning principles, with a high degree of consensus and support from politicians. On the other hand, some of the sustainability dimensions, especially concerning the socio-demographic composition of the new suburban developments and social exclusion and inclusion, seem to have been ignored or downplayed. This is not a result of a conscious neglect by the planners. Rather, this is an unintentional consequence of the disciplinary approaches and practices that still dominate regional and local planning, and the fact that market-based densification strategies are highly profitable for developers. The implementation of the strategies for sustainable land use and transport development is mainly based on non-inclusive, rational and hierarchical planning models, not taking into consideration the societal complexity of the issues at hand. In this case plans and planning do not articulate how re-structuring of the suburban landscape affects the distribution of and access to mobility resources.

A more reflexive approach to urban regional planning in the suburban hinterlands of the city, presupposes a pluralistic knowledge base, as described by e.g Innes and Booher (2004). Top-down planning, characterized by professional and disciplinary specialization, implies less awareness of side-effects, and of the unforeseen, and often unseen, consequences of the chosen strategies. Side effects are usually recognized and treated by other disciplines (Beck, Giddens, and Lasch 1994). Local and regional planning is still dominated by a traditional architectural and engineering approach based on what has been coined as a physical determinism (Franck 1984), i.e the belief that physical design and development unequivocally determine behavioural and social change.

We have also revealed a mismatch between the goals of transit-oriented development and other societal goals. These regional towns are in general not attracting, or are not

affordable for, groups with a significant potential for reduction in motorized transport. Rather they are becoming part of a high-end housing market of apartment condominiums attracting wealthy 'empty nesters' and elderly groups. The pursue of a multidisciplinary approach within planning practices, including social and behavioural disciplines, could enable a better understanding of the preferences of people and families for life-style and life-phase sensitive place-based qualities and mobility resources, in relation to affordability. A broader, interdisciplinary approach should also take local experiences, practices and civil society interests into account. Our study indicates that the local professionals, who arguably are close to their local communities, are quite aware of these discrepancies, or the unintended consequences of planning principles neglecting the social dimensions, and acknowledge that these insufficiencies hamper their endeavours to promote sustainable transitions in suburban areas.

Note

1. Building statistics from Statistics Norway – https://www.ssb.no/en/statbank/list/byggeareal.

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