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Petter Næss[a]; Teresa Næss[a]; Arvid Strand[b]
[a] Department of Development and Planning, Aalborg University, Aalborg East, Denmark [b] Institute of Transport Economics, Oslo, Norway

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Oslo's Farewell to Urban Sprawl

PETTER NÆSS*, TERESA NÆSS* & ARVID STRAND**

*Department of Development and Planning, Aalborg University, DK-9220 Aalborg East, Denmark,
**Institute of Transport Economics, 0349 Oslo, Norway

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Abstract *Sustainable mobility has been an important concern in urban planning and development in Oslo Metropolitan Area since the 1990s. The period has been characterized by concentrated and compact urban development, especially within the municipality of Oslo. This has contributed to a reduction in growth in car traffic. Analyses of selected land use and transport plans and policy documents, professional journal articles and interviews with key actors show that there has been a high degree of consensus about this spatial development strategy. Considerable investments have been made in public transport as well as in road development; the former based on broad consensus. Road capacity increases have been contested among professionals but widely supported by politicians.*

Introduction

Since the publication of the UN report "Our Common Future" (World Commission on Environment and Development, 1987), the issue of sustainable development has been a common challenge for all nations. Following the discourse about sustainable development based on this report, important challenges of a sustainable urban development policy in wealthy nations are to mitigate climate change, limit energy consumption, reduce pollution, protect natural areas and arable land and provide a safe and healthy environment for their citizens, in particular the most vulnerable groups. The research study on which this paper is based has focused on a particular aspect of sustainability, namely the ways planners and decision-makers in Oslo Metropolitan Area have understood, interpreted, formulated policies and finally acted in relation to the challenge of sustainable mobility during the period since the 1990s (Næss *et al.*, 2009). Sustainable mobility is understood as mobility in accordance with the general principles of sustainable development, involving, among other things, a volume of physical mobility, a modal split and a transport technology that meet basic mobility needs in an efficient way, take care of ecosystem integrity, limit emissions to an environmentally sustainable level and are safe and consistent with human

Correspondence Address: Petter Næss, Department of Development and Planning, Aalborg University, Fibigerstraede 13, DK-9220 Aalborg East, Denmark. Email: petter@plan.aau.dk

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health (Center for Sustainable Transport, 2002; CIENS, 2006). The Oslo study is part of a larger research project funded by Volvo Research and Educational Foundation, also including the metropolitan areas of Copenhagen in Denmark and Hangzhou in China. This paper concentrates, however, on Oslo Metropolitan Area, which could be considered as being close to "best practice", seen from the perspective of sustainable mobility.

According to several authors, metropolitan-level decentralization of workplaces and residences is a strong and more or less general tendency in Europe. For example, Breheny (1995, p. 87) holds that decentralization is the inevitable outcome of the expressed location preferences of people and firms. According to Sieverts (1999), new development in German urban regions typically takes place in the "Zwischenstadt", i.e. in the areas between the cities, and not within or immediately adjacent to the cities. In Sieverts' view, cities can no longer be fitted into a hierarchic system according to central place theory. Similarly, Bruegmann (2008, p. 6) writes that virtually the entire history of modern cities is the history of the spreading outward of urban activity at ever lower densities, where every period of economic growth has allowed a new group of people to move out. Empirical data show that population densities were reduced between 1980 and 1990 in a number of large European cities (Newman & Kenworthy, 1999). According to the European Environmental Agency (2006, p. 5), urban sprawl is now a common phenomenon throughout Europe. In the post-communist East European countries, urban sprawl is proceeding "at a pace which leaves anything experienced in the west far behind" (Schwedler, 1999). Seen from the perspective of sustainable mobility, such urban development is highly problematic (Næss *et al.*, 1996; Newman & Kenworthy, 1999; Næss, 2006a, 2007, 2009; Zegras, 2010).

However, actual urban developmental trends in Europe are far more nuanced than what has been claimed by the most "decentralization-deterministic" debaters. In Sweden and Norway, a long period of spatial urban expansion since the 1950s has been succeeded by a trend of re-urbanization during the latest couple of decades (Statistics Sweden, 1992, 2002; Larsen & Saglie, 1995; Statistics Norway, 2009a). Between 2000 and 2005, the average population density of all Swedish urban settlements above 200 inhabitants increased slightly (by 1%), and on average for the 10 largest Swedish cities, the number of inhabitants per hectare of urbanized land increased by 2.5% in this period (Statistics Sweden, 2009). In Norway, the average population density of all urban settlements above 200 inhabitants increased by 1.7% from 2000 to 2009, and for the 10 largest cities, there was an average population density increase of 4.6% during these 9 years (Statistics Norway, 2009a). A considerable renewal of older housing areas and transformation of derelict and underutilized industrial and harbour areas have taken place, resulting in a substantial growth in the number of workplaces and dwellings in inner-city areas.

Oslo, the capital of Norway, had in the beginning of 2009 about 877,000 inhabitants within the continuous urban area, of which 573,000 in the municipality of Oslo and the remaining 304,000 in nine surrounding municipalities in the county of Akershus. In the beginning of 2009, the Oslo Metropolitan Area (defined as equal to what Statistics Norway includes in its Oslo region) had 1.2 million inhabitants, of which more than 90% living in urbanized areas. The city of Oslo as well as the metropolitan area has had a relatively strong population growth during the latest couple of decades. For example, the continuous urban area of Oslo increased its population from 755,000 to 877,000 between 1998 and 2009. Similar to many European cities, Oslo has undergone a process of deindustrialization and has today a trade and business structure dominated by service and knowledge enterprises.

Research Questions

The case study on which this paper is based has sought to shed light on the following research questions.

1. How has the spatial urban structure (in terms of built environment, land use and transport infrastructure) developed since the 1990s, and how well does this development comply with criteria for urban development conducive to sustainable mobility?
2. How has the challenge of sustainable mobility been dealt with in relevant land use and transportation infrastructure plans?
3. How has the general concept of sustainable development been interpreted by different groups of actors, including urban and transport planners?
4. What kinds of principles, measures and spatial/physical solutions have been advocated by land use and transportation planners as favourable to a sustainable urban development, and to which extent have these principles, measures and solutions gained political support and been implemented?
5. To what extent can sustainability-relevant features of land use and transport infrastructure development in the Oslo region be explained by natural-geographic conditions, social structural conditions, cultural conditions and influential social actors?

Due to the complexity of conditions influencing urban development, theories focusing on different aspects of reality need to be combined in order to throw light on the research questions. The project has therefore taken a clearly interdisciplinary approach, attempting to integrate contributions from theories covering different fields. Theories of spatial development and transformation of cities may contribute to explaining the strategies followed in a particular city in a given period. Theories of path dependency may illuminate the importance of previous strategic decisions on urban spatial and infrastructure development to current planning and decision-making. Theories of political economy may point at the economic interests of local elites as a major driving force for an urban development where governmental authority is utilized to attract growth-inducing investments within its own territory. Discourse theories may illuminate the importance of power, legitimacy and authority on decision-making about urban development. The importance and credibility attached to different types of knowledge may be influenced by power relations and are therefore often contested. Normative theories on sustainable urban development and mobility may be important points of reference for some participants in discourses on urban development. Such theories combine preferred values with substantive theories on the environmental consequences of various land use and transport infrastructure solutions in cities.

Since land use and public investments are usually under public control via legal measures and public funding, we may assume that the public decision-making processes are important factors in explaining the actual outcome. However, we must also seek explanations in market forces and social and cultural changes in civil society.

Research Methods

Empirically, the study has taken a bottom-up approach by first observing the urban development that has actually taken place and then tracing the main actors and mechanisms

behind these events. Such a research design is sometimes called a "backward mapping approach" (Elmore, 1985). When taking this approach, we may, for example, find that decisions outside the government structure are as important as those within. The study is problem-driven rather than theory-driven: the cases and research methodology have not been chosen in order to test a particular, prefixed theory. Instead, there has been a back-and-forth pendulum movement between theory and empirical observations in order to shed light on driving forces behind physical changes in urban structures and on the actions of various actors influencing urban change, as well as to guide the specification of the main research question (see above) into more detailed and theme-specific questions. As mentioned above, several theories appeared to be relevant at the outset, but the emphasis to be laid on each of them became clear during the research process.

Due to time and resource limitations, the description of the overall urban development has been limited to the strategic level, focusing on key indicators such as changes in the number of inhabitants and workplaces, changes in the amount of urbanized land, changes in population and workplace density, location of new development relative to the city centre and public transport nodes and the development of major transport infrastructure (urban highways and main public transport services).

In order to explain the spatial development of Oslo Metropolitan Area, information from previous research studies as well as from new empirical data has been utilized. We have chosen to concentrate on the following empirical data sources.

Plans and policy documents:

- *Municipal master land use plans and relevant regional plans*: the Municipal Plans for the municipality of Oslo adopted in 2000, 2004 and 2008, the County plan for the surrounding Akershus county adopted in 2003 and a particular Regional Agenda 21 plan for the county of Akershus adopted in 1998;
- *Selected strategic transport plans*: the Oslo Packages 2 and 3, adopted in 2001 and 2006. These were agreements between national-government transport authorities, the county of Akershus and the municipality of Oslo about the funding of road infrastructure projects and public transport improvement in Oslo and Akershus;
- The Governmental White Paper "Better Environment in Cities and Towns" (2001–2002).

Articles in professional journals: In order to throw light on the Norwegian professional discourse on sustainable urban development in the fields of land use and transport infrastructure, articles in the journal *Plan* have been investigated. The selected articles cover the period from 1994 to the spring of 2007. Among a total number of some 1000 articles published in the journal during the period, 101 articles dealing with relevant issues (i.e. urban land use and/or transport infrastructure planning, sustainable development and/or the combination of these topics) were included in the analysis.

Interviews: Eleven in-depth interviews were carried out, with interviewees representing different interests, ideological positions and roles in planning and decision-making. The interviewees included three politicians, six bureaucrats, a developer and an NGO representative. One of the politicians was from the Conservatives, one was from the Liberal Party and one represented the Socialist Left Party. Four of the bureaucrats were from different sectors

within the Municipality of Oslo (three land use planners and one transport planner), one from the Ministry of Environment and one from the Ministry of Transport. One interviewee was a manager of a private property development company and one represented an environmental organization.

Several efforts have been made to secure a high validity and reliability of the research. The interviews were semi-structured and were aided by interview guides. All interviews were tape-recorded and transcribed. "Interpretation schemes" were developed to aid the interpretation of interviews and documents, in order to facilitate a linking of the research questions and theoretical concepts of the study with the relevant parts of the transcribed interviews and investigated documents. Similar interpretation schemes were developed and used for the analyses of plans and policy documents and articles in the professional journal *Plan*.

Actual Spatial Development

Urban development in Oslo Metropolitan Area since the 1990s can be characterized as concentrated and compact. Figure 1 shows how urban population densities have developed within the entire Oslo region (below), the continuous urban area of Greater Oslo (in the middle) and within the part of this urban area belonging to the Municipality of Oslo (above) from 2000 until the beginning of 2009. Within the continuous urban area of Greater Oslo, the population density increased from 28.7 to 30.7 persons per hectare between 2000 and 2009. Within the municipality of Oslo, the density increase was substantial. Here, the urban population density increased from 37.9 persons per hectare in 2000 to 42.3 persons per hectare in 2009, i.e. by more than 11%.

The density increase was especially high in the inner city, where the population grew from 167,500 to 196,600 inhabitants between 2000 and 2008, with no increase whatsoever

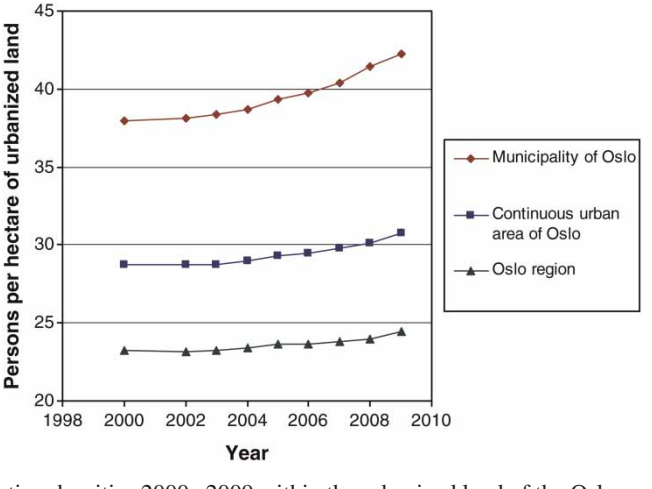

Figure 1. Population densities 2000–2009 within the urbanized land of the Oslo region (below), the continuous urban area of Greater Oslo (in the middle) and within the urbanized land of Municipality of Oslo (above). Persons per hectare of urbanized land
Source: Statistics Norway (2009b,c)

in the urbanized land (Municipality of Oslo, 2008). This implies a population density increase of 17% during these 8 years. (2009 data were not available at the time of writing.) The high amount of inner-city residential development is illustrated on the map to the left in Figure 2, where the construction of dwellings within different parts of the Municipality of Oslo during the period 1995–2006 is shown by means of area-proportional circles.

The increase in population density has been going on since the late 1980s. Before the mid-1980s, spatial urban expansion in Oslo Metropolitan Area was higher than the population growth, especially in the 1960s and 1970s. According to Statistics Norway (1982) and Engebretsen (1993) within the continuous urban area of Oslo, there was a decrease in population density of about 1.4% annually from 1955 until the early 1980s. In the period 1984–1992, the reduction in population density almost came to a halt, with an annual decrease of only 0.1%. Moreover, urban development in the period 1984–1992 took place on average considerably closer to the city centre than in the previous decades. Thus, within the continuous urban area of Greater Oslo, the change in urban development from predominantly outward expansion to densification and re-urbanization seems to have taken place in the early 1980s. The stabilization of population density in the 1980s was then followed by an increase in population density since the early 1990s, especially in the municipality of Oslo.

In the part of the Oslo region not belonging to the continuous urbanized area of Greater Oslo, low-density development continued for a longer time, with a high share of detached single-family houses among the new residences constructed. For the entire Oslo region, detached single-family houses thus accounted for more than one-quarter of the new dwellings constructed in the 1990s. Since 2002, this share has been significantly reduced, especially from 2004 and on (Statistics Norway, 2009d,e).

There has also been a considerable increase in the number of new workplaces in the inner districts of Oslo, as can be seen on the map to the right in Figure 2. Most of the

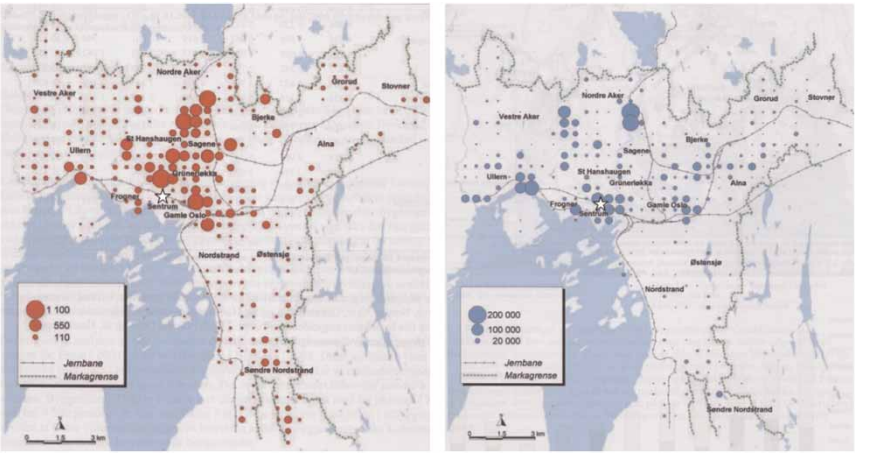

Figure 2. Completed, commenced and approved residential (to the left) and commercial (to the right) development 1996–2006 within different parts of the Municipality of Oslo. The mumber of dwellings and square metres of commercial floor area are indicated by area-proportional circles. The city centre of Oslo is shown with an asterisk and the urban area demarcation by dotted lines
Source: Municipality of Oslo (2007)

growth in the number of jobs during recent years has, however, taken place in the part of the region outside the municipality of Oslo. Between 2000 and 2008, the job growth was 17,600 within the municipality of Oslo and 42,900 in the remaining part of the region. More than one half of this job growth (52%) has taken place in the municipalities to which the region's three main second-order centres belong (Lillestrøm, Sandvika and Skedsmo), most of which close to main public transport lines. Looking particularly at jobs occupied by persons with university education of 4 years or more, there was a growth of 22,000 such jobs between 2000 and 2008 within the whole region. Seventy per cent of this job growth took place within the municipality of Oslo, 21% within the three municipalities in which the main second-order centres are located and only 9% in the remaining parts of the region. According to the Dutch "ABC-principle" for environmentally sound location of workplaces (Verroen *et al.*, 1990), it is especially for this type of workplace that a central location will contribute to reduce car commuting. In contrast, the number of jobs occupied by persons without any kind of university education was reduced by 29,300 within the municipality of Oslo but showed a modest increase of 10,000 in the remaining part of the region. These jobs are generally less specialized than the high-education jobs and are therefore more likely to be occupied by local employees. As the municipality of Oslo has for several decades had a large surplus of jobs compared to the workforce (112,000 more jobs than workforce participants in 2008), the growth in jobs for employees with low- or medium-level education in the outer parts of the region has probably contributed to reduce some of the long-distance commuting among residents in the municipalities in the peripheral parts of the Oslo region (where the education level among the inhabitants is generally lower than that in the municipality of Oslo) (Statistics Norway, 2009f).

The concentrated urban development has contributed to reduce growth in car traffic and must be characterized as favourable from the perspective of sustainable mobility (Næss *et al.*, 1995; Næss & Sandberg, 1996; Engebretsen, 2005; Næss, 2009). The densification of residences has implied that new dwellings have been built on average at a closer distance from downtown Oslo than what would have been the case if the built-up area of Greater Oslo had continued to expand outward like it did until the mid-1980s. In particular, the substantial residential development in the inner districts of Oslo (cf. Figure 2) implies an increase in the population living close to the concentration of workplaces and service facilities found in the central and inner parts of the metropolitan area. This has contributed to reduce the overall amount of motorized travel and in particular travel by car, compared to outward urban expansion. Based on data from 1992, Figure 3 shows how energy use for transport varies among respondents living in 30 investigated residential areas located at different distances from the city centre of Oslo. Controlling for a number of socio-economic variables, energy use for transport within the urban region is nearly four times as high among the respondents living in the most peripheral of the investigated residential areas than among those respondents living closest to the city centre.

Considerable investments have also been made in public transport, notably a metro ring supplementing the existing radial urban rail lines, separate lanes for buses along main roads and new and improved streetcar lines with a higher frequency of departures.

Oslo is of course not unique in having pursued considerable brownfield development during the latest decades. This has been a common strategy in numerous European cities since industries started moving to suburban sites and foreign countries where labour is cheaper. However, in most European metropolitan areas, inner-city densification

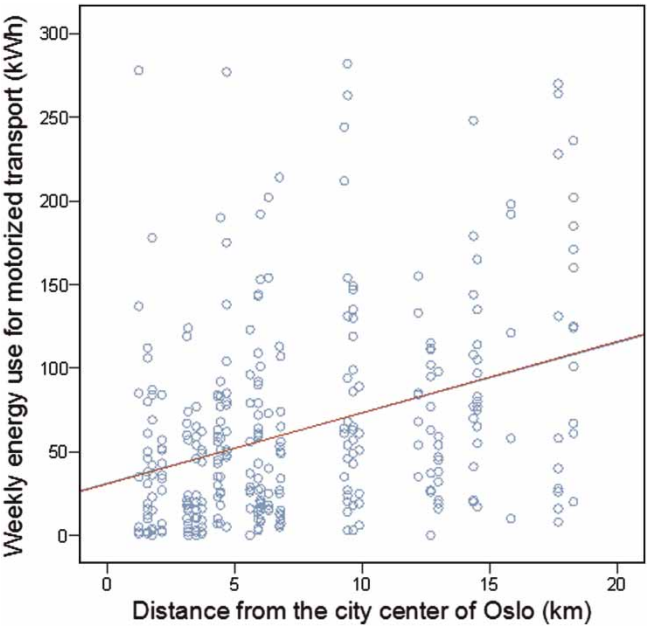

Figure 3. Weekly energy use for motorized transport within the Greater Oslo region among respondents from residential areas located in different distances from downtown Oslo. Official journeys not included. The regression line shows the relationship when controlling for a number of demographic, socio-economic and other urban structural factors. Level of significance for the controlled relationship: 0.0000. $N = 321$ households in 30 residential areas
Source: Næss *et al.* (1995)

has taken place alongside with considerable greenfield development in the outer areas. According to the European Environmental Agency (2006, pp. 5, 13), the extent of built-up areas in 11 selected European countries increased by 8% from 1990 to 2000 while the population increased by only 5%, and there is no apparent slowing in these trends.

Compared to Oslo's development in the post-war period until the early 1990s, and also compared to current urban development in most European cities, Oslo has during recent years managed to combine high growth in population and building stock with low encroachments on natural and cultivated areas and a moderate traffic growth. In spite of the strong population growth, especially within the municipality of Oslo, car traffic in the Oslo Metropolitan Area increased by 29% during the period 1996–2008, compared to 36% for the country as a whole (where the population growth rate was much lower). Adjusted for population growth, the traffic increase during this 13-year period was 7% within Oslo Metropolitan Area as a whole and only 1% within the municipality of Oslo (Nygreen, 2009). For comparison, adjusted for population growth, passenger traffic by car in Copenhagen Metropolitan Area increased by 23% during the 13-year period 1995–2007 (Region Hovedstaden, 2009). Judged against European ideals for sustainable urban development, Oslo can thus be considered as a case of "best practice". In 2003, Oslo received the European Sustainable City Award in competition with 60 other cities, yet another indication of a city showing a high environmental awareness in its planning and

development (Municipality of Oslo, 2007), but of course also due to its natural conditions and beautiful surroundings.

But the picture is obviously more nuanced. Although high-density urban development reduces the conversion of natural areas into building sites, especially when channelling a high share of the construction to "brownfield" sites, urban densification is unlikely to take place without any negative effects at all on within-city vegetation and ecosystems. During the period 1999–2004, the "open-access areas" (i.e. areas without buildings, roads, railways, harbour facilities, farmland, graveyards, seas or rivers) within the continuous urban area of Greater Oslo were reduced by 5% (Engelien *et al.*, 2005), for example, in order to make space for new kindergartens or schools in districts where densification has resulted in population increases exceeding the capacity of existing social infrastructure.

Moreover, there has been considerable urban highway development which has facilitated traffic growth and offset some of the effects of densification and public transport improvement. Surely, some of these roads (often in tunnels) have led traffic outside residential or central city areas and thus relieved these areas from noise and local air pollution. But there has been an increase in the overall road and parking capacity. The purpose of road capacity increases has been to combat congestion. This "predict and provide" policy will hardly contribute to achieve transport and environmental policy goals of reducing greenhouse gas emissions and the negative impacts of urban motoring (Næss *et al.*, 2001; Strand *et al.*, 2009).

Why has Oslo pursued such a strong densification policy, while outward urban expansion seems to continue in a number of other European cities? It seems safe to conclude that the change in trajectories of land use and transport development observed in Oslo Metropolitan Area since the 1990s (and within the continuous urbanized area of Oslo as long as since the early 1980s), compared to previous periods, are the results of the combined effects of a multitude of different causal mechanisms. In the following, we shall first take a look at some historical and topographical conditions that may have facilitated or encouraged urban containment. Thereupon, the focus will be directed towards the interpretations of sustainable development among planners and politicians, land use and transport policy priorities, the influence of different actors, barriers and the role of institutional, economic and other social conditions.

Historical and Topographic Conditions

Extensive suburban development in the post-war period had resulted in a region where densities were not very high at the beginning of the investigated period. The potential for densification has therefore been considerable, since the reserves of plots where urban densification could easily take place were relatively large. Due to globalization, manufacturing industries have moved abroad and left large areas vacant for urban transformation. In addition, a long period of outward urban expansion in the three to four first decades after World War II had in itself left considerable space for densification. Oslo's stage of urban development at the beginning of the investigated period (see, e.g. Cadwallader, 1995; Kaplan *et al.*, 2003) may thus help to understand the trajectory followed since the 1990s.

The combination of a relatively low density at the outset, strong economic growth during the period, high in-migration to the city and strong protection of surrounding

areas against urban expansion has facilitated a high pace of development within existing urban area demarcations and hence a rapid increase in the urban population density.

Once commenced, Oslo's densification policy has required renewed investments in technical and social infrastructure in the inner city. This has again made inner-city living and inner-city job locations more attractive, leading to a higher population base facilitating further infrastructure improvements. The densification strategy has thus to some extent been self-amplifying, leading to positive feedback circles and to some extent "path dependency" (Barter, 2004; Imran & Low, 2005). This importance of previous strategic decisions on urban spatial and infrastructure development to current planning and decision-making should still not be exaggerated: when Oslo's spatial development changed from outward expansion to predominantly densification in the 1980s, this represented a breakage from the path followed thus far. This breakage was probably caused by a multitude of cultural, demographic, economic and political driving forces.

This change was also encouraged by the fact that outward urban expansion in Oslo usually requires quite substantial infrastructure costs. In this part of southeastern Norway, rocky terrain often makes greenfield development on areas other than farmland expensive. This is especially the case in the municipality of Oslo with its situation in a "bowl" surrounded by hills. Combined with quite strict national policies introduced in the mid-1970s against conversion of farmland into building sites, this has made densification an economically more favourable option for municipalities in the Oslo region than in cities surrounded by flat terrain. The strict policies against farmland conversion were, in their turn, introduced for national preparedness reasons because farmland is a scarce resource in Norway, covering only 3% of the national territory. The state policies for farmland protection in Norway were especially strict in the period 1975–1993, but have also exerted considerable influence on urban development later.

Plans, Professional Discourses and Stakeholder Opinions

The extent to which adopted land use plans actually shape the spatial development or are mere formalizations of a development that would anyway have been produced by market forces is of course a matter that can be disputed. The land use development that has taken place in Oslo Metropolitan Area is, however, to a high extent in accordance with municipal land use plans as well as national policy documents. The content of these plans, and the prevailing opinions among the planning profession and other actors in planning and decision-making, may therefore throw light on possible causes of Oslo's compact city development as well as its somewhat ambiguous efforts to improve public transport simultaneously with undermining the competitive power of this mode through urban road capacity increases.

Our material indicates that cultural, economic and political conditions, along with the prevailing ideas among planners and policy-makers, are important in order to explain the region's spatial development. Table 1 gives an overview of the answers given by our different sources of evidence to research questions concerning the opinions and understandings of different actors on urban sustainability issues, their views regarding actors and driving forces of urban development, barriers to sustainable solutions, as well as their assessment of the institutional and structural conditions under which urban planning in Oslo Metropolitan Area operates.

Table 1. Overview of the answers provided by different sources of evidence to research questions about interpretations of sustainable development, land use and transport policy priorities, the influence of different actors, barriers and the role of institutional, economic and other social conditions on the possibility for obtaining a sustainable urban development

Research questions	Plans	Articles	Interviews
To what extent is the issue of sustainable development addressed in the investigated sources of evidence?	In all the land use plans, in the White Paper, but hardly in the transport packages	In nearly half of the articles explicitly, and in many of the remaining articles implicitly	As this was a topic of the interview guide, this is obviously touched upon in all interviews
How do the sources of evidence interpret the concept of sustainable development?	Mainly as an environmental challenge and objective, although some plans also mention social and economic aspects	Quite often not specified. When specified, either environmental, or a combination of environmental, social and economic (efficient resource use). None writes about competitiveness as part of the concept	Mostly either environmental or combined environmental, social and economic. But two (both from the transport sector) talk about the concept mainly in economic terms, although not with a focus on local/regional competitiveness
Is sustainability pointed out as the overarching goal or as something that has to be subordinated to or adapted within the frames of a different, competing goal?	In the land use plans, sustainability goals are expressed increasingly prominently in the most recent plans. Environmental sustainability is considered to be beneficial to growth. In the transport plans, the concept is hardly referred to	Not specified in that way	Not said explicitly
Which sustainability problems/issues do the sources of evidence identify as the most important ones to address?	Car dependency and the growth in car traffic is highlighted as a challenge in all plans. Land use plans and the White Paper also address nature conservation, waste, energy in buildings and heritage	Sustainable mobility is identified as a main challenge alone or together with saving nature and urban green structure in nearly two-thirds of the articles addressing the concept. Only a few articles address "closed loops" or focus only on the green structure	Energy use and greenhouse gas emissions are in focus in all interviews. Many point at changing from car to more environmentally friendly transport modes as important, some also talk about curbing the growth in the amount of transport. Protection of natural areas, city attractiveness and social cohesion (avoid segregation) is also mentioned by some

(*Continued*)

Table 1. Continued

Research questions	Plans	Articles	Interviews
Which among the policy measures mentioned in the sources of evidence are described as responses to the challenge of a sustainable urban development?	In the land use plans and the White Paper: densification and development close to public transport nodes. In the transport packages: improving public transport	Compact city development, development close to public transport nodes, improved public transport. Some authors stress that an overall densification strategy must be practiced with prudence so that intra-urban green areas and housing qualities can be secured	Densification and concentrating development close to public transport nodes, improving public transport, improving bike path network, securing urban green areas, restrictions on car use
To what extent do the sources of evidence support the compact city model or are critical to this model?	Strong support of the compact city model in all land use plans and the White Paper. The transport packages are consistent with this but do not focus on spatial strategies	83% of the articles expressing a standpoint to the compact city model are more or less supportive to this model	The interviewees generally endorse the compact city as a model for future urban development in the Oslo region. Some disagreement as to the degree of monocentric vs. polycentric densification
Do the sources of evidence make references to any causal influences of land use on transport? Are any of the relationships that exist according to state-of-the art research denied?	All land use plans and the White Paper make explicit reference to land use–travel relationships, these references are in accordance with state-of-the-art knowledge. No mentioning of such relationships in the transport packages	One-sixth of the articles deal explicitly with land use–transport relationships, but many more have such relationships as parts of the premises for their arguments. About 80% of the articles dealing with such relationships demonstrate or refer to their existence	All interviewees assume that densification rather than sprawl is preferable in order to reduce car travel. Most of them also assume that a central location of dwellings and offices is favourable. One interviewee still holds that workplace decentralization reduces commuting distances

(*Continued*)

Table 1. Continued

Research questions	Plans	Articles	Interviews
To what extent do the sources of evidence support road capacity increases, restrictions on the use of cars in urban areas and/or increased investments in public transport services?	All plans, packages and the White Paper support increased public transport investments, and at least six of them support urban highway development. The White Paper and the Akershus environmental plan seem to presuppose road development without explicitly supporting. Bike path improvements are addressed in the White Paper but much less, or not at all, focused in the remaining documents	Only 2 of the 101 investigated articles support road development and then combined with improved public transport in order to lead traffic outside neighbourhoods. Among articles taking a standpoint on transport infrastructure development, two-thirds go for public transport improvement and one-third support road pricing, limited parking and/or a halt on road development	All interviewees support increased public transport investments. Four are more or less positive to road capacity increases, six are against and one does not state clearly. Four interviewees support road pricing, some also other restrictions
Do the sources of evidence make references to any causal influences of transport infrastructure investments on transport? Are any of the relationships that exist according to state-of-the art research denied?	Most of the plans implicitly assume that better public transport reduces the growth in car traffic. None of the plans mentions the traffic-generating effect of road capacity increases in congested areas, except the Akershus environmental plan	Only one article deals explicitly with such influences, referring to induced travel due to road building as well as reduced traffic due to transit improvement	Some of the six interviewees who are skeptical about road capacity increases say that this will lead to increased traffic, whereas one of them says that this is uncertain. The other opponents to road building probably also assume that widening urban roads leads to more traffic, but they do not explicitly say so
Do the sources of evidence include policy measures influencing the spatial content of urban development that are not discussed in relation to the challenges of sustainability? In case, which measures?	All plans except the Akershus environmental plan include some issues not discussed in relation to sustainability: road building and the growth in the building stock	Less than half the articles dealing with urban spatial development discuss this explicitly in relation to sustainability. Many of the remaining articles discuss highly sustainability-relevant issues and recommend solutions in accordance with widely held sustainability principles	This question is not relevant to the interviews

(*Continued*)

Table 1. Continued

Research questions	Plans	Articles	Interviews
Do the sources of evidence mention any barriers to the achievement of a more sustainable urban development? In case, which barriers?	Barriers are not much in focus in the documents. Fragmented land ownership is mentioned as a possible barrier to densification, the need to maintain a delicate consensus as a barrier to changing the Oslo Package 3 and lack of state transit funding as a barrier against Akershus municipalities' motivation for densification	Four out of 10 articles mention barriers. Lack of coordination (horizontal and vertical), increasing influence from market forces, planners' lack of skills and knowledge are mentioned. Few, if any, address uneven power relations as a barrier	Especially lack of coordination, but also lack of political willingness and contested knowledge claims are mentioned
Do the sources of evidence indicate an aim at a high or low growth in the metropolitan population and/or building stock? Is the desirability of growth being questioned?	The plans assume, and apparently approve of, a high population growth, resulting in growth in the building stock. *Per capita* growth in floor area is not mentioned, except in the Akershus environmental plan where this is mentioned as a part of a general topic of sustainable consumption to be addressed by the Ministry of Finance	Only a few articles from the first part of the period question the desirability of growth, and only three of these deal with growth in the building stock	None of the interviewees regards growth in the population and/or the building stock as a problem
To what extent are the sustainability measures mentioned in the plans and policy documents linked with measures for implementation?	The land use plans protecting Marka and local green areas (municipal plans and local development plans) are legally binding. The transport packages include funding mechanisms	Not relevant	Not relevant

(*Continued*)

Table 1. Continued

Research questions	Plans	Articles	Interviews
To what extent do the sources of evidence focus on the influence of institutional frameworks in promoting or counteracting a sustainable urban development?	The Oslo municipal plans call for better coordination with surrounding municipalities, Akershus plans mainly for better coordination across sectors. The transport packages are themselves results of attempts for more vertical and horizontal coordination (although criticized for being insufficient)	One-third of the articles deals with institutional frameworks to some extent, all except one call for more coordination, mostly horizontal. Some articles address plan–market relationship, most are critical to increased market influence, a few take a more adaptive stand. Culture and civil society are addressed in very few articles	Several interviewees call for better regional coordination of land use development. Also, the need for better coordination between land use and transport authorities is addressed
Do the sources of evidence include proposals for changes in institutional frameworks, or reflect recent such changes?	The cooperation on the transport packages was proposed in previous municipal and county plans. The Oslo Package 3 and the latest Oslo municipal plan propose a new regional decision-making body	Several articles ask for changes in institutional frameworks, but none of them includes concrete proposals for new solutions	Some interviewees propose binding land use plans for the entire region, regulating the distribution of new development and a regional decision-making body to maintain this
To which extent do the sources of evidence mention economic, structural driving forces of urban development? If mentioned, how are such driving forces assumed to influence urban development?	In the more recent plans, challenges presented by economic globalization are addressed. In the municipal plans and the White paper, compact city development and protection of local environmental qualities are seen as conducive to growth. In the transport packages, mobility enhancement (also along the roads) is seen as crucial	Quite few articles address this, pointing at these impacts of economic forces: centralization, densification, mobility-enhancing policies and a weakening of planning institutions	Several interviewees hold that market forces during the latest decade or two have pulled in the same direction as public densification policies. Some also hold that compact city development will make cities more attractive and hence boost growth

Interpretations of Sustainability

Sustainable development is an issue that is to a high extent addressed and discussed in the investigated plans and articles and among the interviewees. The sustainability agenda has to a high extent penetrated the urban planning discourse in Norway, although the concept is not always mentioned explicitly. The issue of sustainable development has been addressed in all the investigated land use plans and in the Governmental White Paper on better urban environment, but hardly in the transport packages.

In the Norwegian planning discourse, the concept of sustainable development has usually been interpreted mainly as an environmental challenge and objective. This is especially evident in the professional journal articles. Some documents and interviewees also include social and economic aspects, the latter aspects especially among interviewees from the transport sector. The social aspects are usually about social integration and cohesion and the economic about efficient resource use. Local economic competitiveness is not claimed to be part of the concept of sustainable development. The aspects focused most on within the environmental dimension are greenhouse gas emissions and protection of green areas.

The overall interpretation of sustainable development thus seems to be fairly well in accordance with the understanding of the concept in the Brundtland commission (World Commission on Environment and Development, 1987). During the decades that have passed since the Brundtland commission's report was published, the dominating interpretation of the concept of sustainability has in some countries been redefined in such a way that the social dimension is interpreted as a concern not to offend powerful interest groups, the economic dimension as promoting traditional economic growth and the environmental dimension as providing a clean and esthetically attractive local environment, with little concern for global-scale impacts of local consumption levels and emissions, illustrating a situation where the hegemonic discourse somehow "eats up" the new alternative discourse (KoshraviNik, 2006). This does, however, not seem to have taken place to any high degree in the Norwegian planning discourse. In Norway, political focus on sustainable development was strong already since the late 1980s, boosted by the fact that the UN Commission that put the very concept of sustainable development on the international political agenda (World Commission on Environment and Development, 1987) was headed by Gro Harlem Brundtland, who was Norwegian Prime Minister from 1986 to 1989 and from 1990 to 1996.

Sustainable development has gained a status as some sort of overarching goal among land use planners and in land use plans in Oslo Metropolitan Area, but has not achieved the same status in transport planning. In the land use plans, sustainability goals are expressed increasingly prominently in the most recent plans. Environmental sustainability is considered to be beneficial to growth. In the transport plans, the concept is hardly referred to. Environmental problems resulting from growing car traffic, notably greenhouse gas emissions, are the sustainability challenge most commonly mentioned in our investigated plans and policy documents, articles and among our interviewees. Saving nature and urban green structure comes next, whereas there is comparatively less emphasis on energy in buildings, waste, "closed loops", heritage built environment, city attractiveness and social cohesion. The issue of sustainable mobility has thus had (and has) a prominent position in the Norwegian discourse on sustainable urban development.

Many of the investigated professional journal articles seem to take the sustainability agenda as an implicit backdrop without explicitly mentioning sustainability. This may

indicate that sustainability has become so incorporated in the planners' agenda that it is no longer felt to be necessary to explicitly refer to the concept. On the other hand, among most of the plans and policy documents, environmental impacts of road capacity increases and growth in the building stock are not mentioned. Especially growth in the building stock seems to be regarded as a "natural" phenomenon not relevant to include in the environmental discussion.

Strong Support of Compact Urban Development

For a long period, strong outdoor recreation interests have managed to keep the development border against the Marka areas—the very popular forest areas surrounding the city—almost unchanged. Within the municipality of Oslo, this border, which was first introduced in Oslo's 1936 Municipal Master Plan, has remained virtually unchanged during the latest 30 years.

In Oslo's neighbour municipalities too, there have been only few and small adjustments of the Marka border. Already in the mid-1980s, the Ministry of Environment instructed the affected municipalities to incorporate this border in their land use master plans, based on arguments of outdoor recreation opportunity and nature conservation. In 1993, the national government adopted the so-called National Policy Provisions for Coordinated Land Use and Transport Planning, which put increasing pressure on the municipalities to cover their need for development within existing urban area demarcations instead of through outward urban expansion. In Oslo's recent municipal plans, the quest for a transport-reducing and less car-dependent urban development has—in line with the national policy provisions—entered as an additional argument against urban expansion into the Marka areas. Also, the recent county plans of Akershus have given clear signals to the municipalities about the need for a concentrated urban development, especially around main public transport nodes.

Densification and development close to public transport nodes are the main land use measures described in our data material (investigated plans, journal articles as well as interviews) as responses to the challenge of a sustainable development, whereas improving public transport is the dominant transport policy measure. Some sources also emphasize securing urban green areas, improving conditions for biking and restrictions on auto use. There is strong support of the compact city model in all investigated land use plans and also in the White Paper (issued by a centre-right government). For example, according to the latest municipal plan for Oslo, the population is forecasted to increase from 560,000 to 675,000 between 2008 and 2020 alongside a spatial expansion of only 5 km^2, which means that the urban population density will increase from 40 to 48 persons per hectare. The transport packages are consistent with urban densification but do not focus on spatial strategies. Among the 54 *Plan* articles in which a standpoint to the compact city model is expressed, 83% are more or less supportive of compact city development. Only seven articles are clearly negative or skeptical to the compact city model. The interviewees generally endorse the compact city as a model for future urban development in the Oslo region. There is, however, some disagreement as to the degree of monocentric vs. polycentric densification, where some support a decentralization of workplaces to outer-area centres while others want to strengthen the city centre of Oslo as the main workplace concentration.

Thus, there is a strong support of the compact city as a model for urban development in the investigated plans and policy documents, articles and among the interviewees. In Oslo

Metropolitan Area, compact city development is usually interpreted as a combination of inner-city densification based mainly on transformation of harbourfront and derelict industrial areas and densification close to public transport nodes in the second-order centres of the region. This is also evident from the interviewees' evaluation of the spatial development that has been taking place since the 1990s. The strong support of compact city development is in line with the findings of Hoftun (2002), who states that the professional and political discourse on urban sustainability in Norway has evolved around the issue of limiting urban sprawl. Strong discourse coalitions have been formed around the storylines of "save land" and "transportation", which makes it difficult for urban strategies placing less emphasis on these issues to gain foothold among planners and policy-makers.

These sustainability-based arguments are supported by cultural trends and lifestyles. The strong outdoor recreation interests in protecting the Marka areas against urban expansion have already been mentioned. There is a long-standing and strong outdoor recreation culture in Norway emphasizing cross-country skiing and walking. Although the tradition of making a trip on foot or skiing in Marka each Sunday, which was very strong in the decades up to the 1980s, has maybe become a bit weaker during the latest couple of decades, there is still solid popular support of protecting the Marka areas. In addition, there has been an increasing interest among the population for "urban culture" and "café life" (Hellevik, 1996; Sjaastad *et al.*, 2007). This rising popularity for urban living has especially been pronounced among young people and middle-age inhabitants whose children have moved away from home. Moreover, one could also speculate that the increasingly multicultural population of Oslo may have contributed to increase the share of the population who prefer other types of housing than the detached single-family house.

In Oslo Metropolitan Area (and to a high extent in Norwegian larger cities in general), the discourses supporting compact city development have converged into a doctrine for urban development (Faludi & van der Valk, 1994). A doctrine comes close to what is often termed as a "hegemonic discourse" within a field of society (Hajer, 1995). In the Oslo region, an urban containment doctrine has prevailed for a long time before the transportation impacts of outward urban expansion entered the Norwegian planning agenda. According to Laugen (2000), the Marka border has all the time since World War II, and maybe even longer, had the status of a planning doctrine guiding urban development in Oslo and its neighbour municipalities.

Thus, there is a widespread understanding among participants of the Norwegian land use planning discourse that densification rather than sprawl is preferable in order to reduce car travel, and the investigated land use plans and the White Paper are clearly based on this as a key premise. A minority of debaters express counter-claims to the state-of-the-art knowledge, but they have only to a limited extent managed to win through in planning and decision-making. In general, they have not managed to create a sense of doubt about the validity of the claim that densification leads to reduced car travel, compared to sprawl. Had such uncertainty been widespread, it could have undermined the political support of compact urban development, since most people do not favour action if arguments appear to be balanced on both sides and there is a clear doubt (Beder, 1999).

Ambiguous Transport Policy

There has been strong consensus about the need for public transport improvements in Oslo Metropolitan Area, in the form of rail investments, priority lanes, traffic light priority for

buses and streetcars and better funding of operational costs to allow more frequent departures and generally improved service. All the Oslo interviewees support increased public transport investments. In the plans and policy documents, public transport improvements are, however, combined with road building, partly in order to relieve neighbourhoods from heavy traffic but also in order to reduce or prevent congestion. All plans, packages and the White Paper support increased public transport investments, and nearly all also support urban highway development. The White Paper and the Akershus Agenda 21 plan seem to presuppose road development without explicitly supporting it. Bike path improvement is addressed in the White Paper but is much less, or not at all, focused on in the remaining documents.

Road capacity increases have been contested among professionals but widely supported by politicians. Some interviewees support road capacity increases, but most do not. The interviewees' limited support of road capacity increases is evident from their opinions about desirable future transport policies in the Oslo region as well as from their evaluation of the development that has taken place during the latest decade or two. Different types of restrictions on auto use are advocated by a relatively large minority among interviewees as well as among journal articles. Only 2 of the 101 investigated articles support urban highway construction (in order to lead traffic outside neighbourhoods and only combined with improved public transport). Among articles taking a standpoint on transport infrastructure development, two-thirds go for public transport improvement and one-third support a halt on road development, increased use of road pricing and/or limited parking.

The arguments for public transport improvements as a measure to enhance sustainable mobility implicitly assume that better public transport reduces the growth in car traffic. This assumption is thus a premise in all the investigated plans and policy documents as well as for most of the interviewees, although it is seldom discussed explicitly. Transport planners have sometimes argued that better roads must be combined with road pricing in order to avoid traffic increase leading to new congestion, but this argument has usually been based on assumptions of a general rise in mobility and not by induced travel created by the road improvements themselves. The traffic-generating effect of road capacity increases in congested areas is, however, not addressed in the plans but is mentioned by some interviewees and in one article. None of the sources denies the existence of such relationships, but they are often downplayed or ignored. This knowledge thus seems to have been largely excluded from the dominant discourse. To a higher extent than for relationships between urban structure and travel, the acceptance of knowledge claims about the traffic-inducing influences of road capacity increases in congested areas seems to have been influenced by power relations (cf. Beder, 1999).

Stakeholder Influence

Neither the investigated plans nor the journal articles reviewed say much about actors influencing urban development. In the interviews, however, this issue is addressed. Apart from national planning and environmental authorities, who for a long time have pushed for urban containment, property developers and other market agents have during the recent decades increasingly been interested in urban densification. The interviews show several examples of how land owners and investors sometimes put pressure on politicians in order to have plans adopted that will allow forms of land use that are less than optimal seen from a sustainability perspective. Sometimes, this results in sprawl, but in the

inner city of Oslo, the pressure instead leads to loss of green space and poorer housing quality, especially for families with children.

Among the local authorities of the region, the municipality of Oslo generally promotes a dense and concentrated urban development. While generally looking positively on the principles laid down in the National Policy Provisions for Coordinated Land Use and Transport Planning, local authorities in suburban and outer-region municipalities often aim for a higher proportion of the total regional development in outer parts of the metropolitan area than what would be preferable from the perspective of reducing car travel. They are also prone to yield to pressure from companies wanting to locate at a longer distance from public transport nodes than presupposed in the regional plans. Such competition for inward investment in regions where the functional city is divided between many municipalities is a well-known phenomenon described in urban theory and political economy literature (e.g. Logan & Molotch, 1996). Arguably, economic globalization and increasing influence from neoliberal ideas have in the recent decades led to a stronger emphasis among municipal politicians and bureaucrats on competitiveness.

In spite of widespread goals of reducing car travel, the municipalities have usually also lobbied towards national transport authorities for the realization of local road projects. According to Osland and Longva (2009), a fragmented organizational structure and a funding system encouraging local mobilization for state infrastructure funding have induced the municipalities to place less emphasis on goals of increasing the market shares of public and non-motorized modes. The organizational conditions have played the cards into the hands of those local actors who do not want to subdue the use of cars. Since the costs of building the roads—if lobbying is successful—will be covered by the state, it is easy for those actors to argue locally that there is no risk involved in trying to get national road money allocated to projects in their municipality. Thus, the organizational and funding structure creates good political conditions for the local "road-enthusiastic" parties, at the cost of local actors who would rather prefer a different transport policy.

Whereas there is some disagreement between different parties on transport policy issues (with the left being more negative and the right, especially the right-wing liberalist Progress Party, more positive to road development), there is a much higher degree of consensus about the compact city strategy. Yet, here too, the Progress Party argues for a relaxation, among others in the form of development in some of the areas now protected by the Marka border. The higher emphasis of the political right on facilitation for car travel reflects more individualistic ideologies in general and a higher importance placed on "negative liberty" than on "positive liberty" (Berlin, 1969). For those parties, the freedom of car drivers to drive unrestricted (negative liberty) is considered more important than the freedom of affected groups from negative environmental and other impacts of this traffic (positive freedom).

Different sectors within public administration have also pulled in different directions. The Ministry of Environment and its county-level agencies have strongly promoted compact urban development and advocated public transport improvement, while being less enthusiastic about road construction. The transport authorities, on the other hand, have promoted a higher mobility in general, thus supporting investments in public transport as well as in highways. The Ministry of Transport is generally positive to concentrated urban development, among others because this may reduce the need for investments in infrastructure provision. Notably, the regional agencies of the Highway administration

have protested against municipal plans for residential and workplace development at car-dependent locations. On the other hand, the Ministry of Transport and the Highway administration have facilitated road building leading to "region enlargement" (Engebretsen, 2008) involving longer commuting distances as well as facilitating a more decentralized pattern of development (Strand *et al.*, 2009).

These differences between the two ministries may in part reflect different organizational cultures (Strand & Moen, 2000). In the Ministry of Environment, the staff of the planning department consists to a high extent of planners, geographers, political scientists, law scientists, etc., whereas in the Ministry of Transport, economists have a much more prominent position. The latter tend to favour economic methods for project evaluation, and the recommendations based on such analyses may sometimes deviate from those based on adopted political goals. In general, cost–benefit analyses of transportation investment projects tend to give priority to projects that can in a short term reduce travel times, rather than projects contributing to other social goals (Næss, 2006b).

Environmental organizations have partly endorsed the urban containment policy, but we do not find any strong opposition from the NGOs against car-dependent development projects like out-of-town shopping facilities. There has also been a long-standing trend among environmentalists to oppose densification because it often leads to loss of intra-urban green areas and sometimes makes up a threat to local environmental qualities (view, outdoor areas, etc.). We do, however, not find any strong support among environmental organizations in Oslo Metropolitan Area of anti-urban or "permaculture" models of sustainable settlements.

Barriers and Conditions for Implementation

Oslo's compact urban development has been in accordance with a similar prioritization in the municipal plans over a long period. According to the Norwegian planning legislation, it is forbidden to establish buildings and technical infrastructure (except for agricultural purposes) in areas set aside for non-development in the municipal master land use plan (i.e. the combined land use category of agricultural, natural and outdoor recreation areas). By avoiding to set aside excessively large areas for development and keeping the developmental areas concentrated not allowing for leapfrog development, the municipalities of Oslo Metropolitan Area (in particular the Municipality of Oslo) have used the planning legislation actively to prevent urban sprawl. The National Policy Provisions for Coordinated Land Use and Transport Planning and the ministerial directive requiring affected municipalities to incorporate the Marka border in their master land use plans have both been important instruments for implementing national goals in the plans of the municipalities of the Oslo region. The possibility for county authorities to object to municipal plans violating these national provisions has also been important.

Within the zone set aside for development, the master plans have been more flexible, leaving considerable room for negotiation between the municipal authorities and developers about the content and design of development on specific sites. The latter has been legally regulated through local development plans. An important case in point is, however, that the limited possibilities for urban expansion ensured through the master plans have increased the motivation of developers for embarking on brownfield transformation project.

The transport packages include funding mechanisms securing that they can be followed up in the form of concrete investments.

While the availability of legal instruments for land use control hardly makes up any barrier to sustainable urban development, the plans, articles and interviews point to other barriers that may prevent the realization of sustainability goals in urban development. Lack of coordination, especially across sectors and municipal borders, is the most often mentioned barrier to sustainable urban development at a metropolitan scale. Such barriers are highlighted in many professional journal articles as well as among interviewees. There is a widespread opinion that the coordination between municipalities as well as between the land use and transport authorities is insufficient. Better coordination between central and local authorities is also called for by some. Some recent planning documents (the Oslo Package 3 and the latest Oslo municipal plan) actually propose a new regional decision-making body; this is also recommended by some interviewees together with a binding regional land use plan. The lack of coordination is considered by our sources to result in environmentally less sustainable land use and transport infrastructure decisions than what would otherwise be the case.

Since lack of coordination is such a widely perceived problem, why are not the necessary coordinating mechanisms established? Arguably, lack of coordination often exists because some actors do not want to take the interests of other entities into consideration. The explanations of lack of coordination must then be sought in power relations, e.g. between ministries. General neoliberal ideas of competition as conducive to efficiency, productivity and economic growth are probably also part of the explanation why there is not a higher degree of coordination, e.g. of land use across municipal borders. In Norway as well as in a number of other countries, downscaling urban governance into lower layers of administrative hierarchy has been pursued as part of liberal reforms of the planning system (Møller, 2003; Næss, 2008). Although certain regulations have been implemented to strengthen the possibilities for implementing national land use policies, our material indicates that considerably stronger coordination—horizontally as well as vertically—would be required in order to meet the requirements of sustainable mobility.

Some sources point at lack of political willingness, increasing influence from market forces, fragmented land ownership and contested knowledge claims as additional barriers. Increasing influence of market agents on land use development is widely thought to counteract sustainability. On the other hand, several interviewees and articles hold that market forces have pulled in the direction of densification during the latest decade or two. In most municipal plans and the White Paper, compact city development is seen as conducive to growth (as is protection of local environmental qualities). This reflects an ecological modernization perspective on urban sustainability (Mol & Spaargaren, 2000). Some articles also consider market forces to contribute to centralization, mobility-enhancing policies and a weakening of planning institutions. The latter will, of course, weaken the capacity for implementing coordinated policies aiming to promote sustainability.

More is Always Better...?

In our investigated data material, the desirability of growth in the building stock is generally not questioned, apart from the Akershus environmental plan where this is discussed as a challenge and three journal articles from the early part of the investigated period. None of the interviewees regards growth in the population and/or the building stock as a problem. The growth of the building stock—in absolute figures as well as in floor area *per capita*—has generally been taken as an assumed good, questioned by virtually no

one. Sustainability efforts in urban development have thus been framed (Kaufman *et al.*, 2003) as a matter of obtaining a (partial) decoupling between growth in the building stock and negative environmental impacts.

As can be seen from the above, such a partial decoupling has been obtained in the Oslo region, as a considerable growth in the building stock has resulted in only a moderate conversion of natural areas and farmland into urbanized land. Yet, the densification policy has had its negative environmental impacts. As mentioned, the intra-urban green areas have been reduced as a result of the compact city strategy, in spite of conscious attempts to channel densification towards areas already marked by technical encroachments. It could of course be argued whether or not a conversion of non-built intra-urban areas necessarily implies a significant loss of environmental qualities. Some authors, e.g. Lund (2001) and Hebbert (2008), have argued that urban districts developed according to modernist planning ideals often include excessively large green areas (especially lawns) of low biological value as well as recreational utility. However, some of the lost urban open-access areas are in the inner parts of Oslo, where greenery is by no means in excess.

Moreover, an important case in point is that many of the urban transformation sites that have made it possible to construct new buildings without making encroachments on natural areas or farmland have been made available because manufacturing industries have moved from Oslo (like most other cities in affluent countries) to poor countries in Asia where labour is cheaper and environmental regulations lax. The partial decoupling between growth in the building stock and negative environmental consequences that has been achieved in cities like Oslo has therefore been conditioned on prior global-scale relocation processes resulting in large encroachments on nature in newly industrialized developing countries. The transport impacts of this development in these countries are also not necessarily favourable, judged against criteria of sustainable mobility.

Growth in transport and mobility has also to a high extent been taken as an unavoidable fact, with sustainability policies aiming at channelling as much as possible of this growth to public transport. Yet, there have obviously also been some efforts to limit—or at least reduce the growth in—the amount of transport. The compact urban development is probably the most salient example of such policies. Economic measures employed so far in order to limit negative consequences of transport (e.g. road tolls in Oslo and some other Norwegian cities and a small carbon dioxide tax on gasoline) have been much more modest.

Concluding Remarks

Oslo has broken a long-lasting trend of spatial expansion and has since the mid-1980s followed a clear urban containment policy. During the latest couple of decades, the city—and especially the municipality of Oslo—has managed to combine high growth in population and the building stock with low encroachments on natural and cultivated areas and a moderate traffic growth. The concentrated urban development in Oslo Metropolitan Area has clearly contributed to more sustainable mobility than what would have been the case with a more sprawling pattern of development.

A strong focus on coordinated land use and transport planning in order to reduce energy use and emissions from transport is an important part of the explanation of Oslo's farewell to urban sprawl. In addition, social and cultural conditions necessary for implementing such a strategy have to a high extent been present. During the whole period since the

1990s, there has been a high degree of professional and political consensus about urban densification as an overall strategy for urban development. Within the Norwegian profession of spatial planners, the compact city has obtained hegemonic status as a model for sustainable urban development. There has also been a considerable market demand for more intensive land use within existing urban areas, especially in the central parts of the region. Market agents have sometimes also pushed for greenfield development at locations poorly served by public transport in the outer parts of the region, but the amount of such development has been moderate. Although competition for inward investment makes up an incentive for outer-area municipalities to accept such location preferences, national and regional land use instruments have been able to limit the establishment of new car-dependent residential and workplace areas. In particular, the greenbelt policy for protecting the forest areas surrounding Oslo (the Marka border) and the National Policy Provisions for Coordinated Land Use and Transport Planning have been important. There is nevertheless a widespread opinion among planners and policy-makers that the regional coordination of spatial development in the Oslo region should be improved.

Whereas land use development has to a high extent been in line with principles of sustainable urban development, the development of transport infrastructure has been more ambiguous, judged against sustainability goals. Along with important improvements in the public transport system (a new metro ring, new streetcar lines and bus lanes, as well as more frequent departures for streetcar and metro trains), there has also been considerable expansion of the road capacity. Seen from the perspective of sustainability, this combined, and quite costly, strategy has been similar to stepping on the accelerator and the brake at the same time. The general level of mobility has been enhanced, but the shares of car drivers and travellers by other modes have remained more or less the same. Whereas public transport improvement has been backed by broad political consensus, road capacity increases have been contested. In particular, there has been skepticism against urban highway development among land use planners, environmental organizations and politicians to the left. Transport authorities and planners involved in transport infrastructure development in the Oslo region have generally considered road development as a measure to combat congestion; the transport planners have, however, at the same time often argued that better roads must be combined with road pricing in order to avoid traffic increase leading to new congestion. During most of the investigated period, road pricing was not on the political agenda, but the latest transport policy deal (Oslo Package 3) opens for higher tolls on urban motoring.

The Oslo region has experienced strong economic growth (for a European city) as well as population growth since the 1990s. Within the fields affected by land use and transport planning, this growth has taken place with relatively moderate impacts on nature and the environment, compared to a sprawling and car-based development. Yet, the decoupling between growth and negative environmental impacts is relative, not absolute. The city is still moving away from important goals of sustainable mobility, albeit at a considerably lower pace than earlier.

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