

How and why planners make plans which, if implemented, cause growth in traffic volumes

Explanations related to the expert knowledge, the planners, and
the plan-making processes

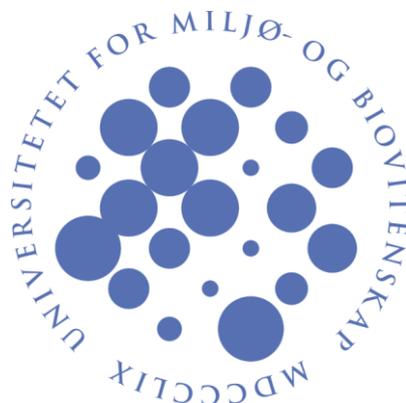
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Abstract

Traffic volumes need to be reduced in order to reduce GHG emissions and avoid dangerous global warming. This is also a means to reduce local health and environment problems, congestion and land take, save energy, make cities more liveable, and more. Despite long standing objectives, knowledge of how to achieve this, and public control of the most important means, land use and transport-systems are continuously planned and developed in ways which cause growth in traffic volumes. In order to be able to change this situation, we need to understand what is causing that traffic-increasing plans are made. The intention of this work has therefore been to contribute to answer the following research question: *How and why are planners making plans which, if implemented, cause growth in traffic volumes?*

Within an understanding of planning processes as complex and involving numerous actors, I have chosen to focus on planners working for public and private actors, how they interact with each other when making zoning plans, and how they apply relevant expert knowledge. Planners are important actors in planning processes, since they possess procedural and substantial knowledge, and since they normally do most of the concrete plan-making. To my knowledge, this angle is not well covered by current planning literature and theory.

Inspired by among others Jacobs, 'how the city works' as well as the plan-making processes have been conceptualised as systems of organised complexity. The research has been strongly influenced by the strand of philosophy of science termed Critical realism, as well as by Flyvbjerg's 'phronetic planning research'. Classical planning theory has been the most influential planning theory.

The planners, my understanding of the state-of-the-art expert knowledge and the plan-making processes have been explored in abstract analyses, disclosing potential causal powers, mechanisms and conditions that can contribute to explaining how and why planners make traffic-increasing plans. The findings have been examined in empirical studies; a survey and two interview studies among planners, as well as a case study of four plan-making processes. More general or transfactual explanations have been developed in the final analysis.

It was found that when a public or private developer initiates a planning process in order to be allowed to implement a project, a number of mechanisms may be activated through which causal powers can act and produce traffic-increasing plans: The objective 'reducing traffic volumes' may not be introduced in or ousted from the plan-making process, the expert knowledge in question may not be introduced in or ousted from the process, or applied wrongly. Whether these mechanisms are activated, and whether traffic-increasing plans are made, depend on a number of contingent conditions.

This regards among others that even if the expert knowledge is good enough to guide planners who aim at making traffic-reducing plans, it has shortcomings. This regards lack of accessible descriptions of the general knowledge and of the methods that are applicable in planning practise, as well as shortcomings of the empirical knowledge. This makes it less usable, and easier to oust. The planners know the expert knowledge in question, but few know it well enough to apply it in complex analyses or in tough debates. Regarding the plan-making processes, the objectives, knowledge and powers of the planners involved matter. It strongly affects which objectives are prioritised in the process and which knowledge is applied, and hence which plan that is made. Recommendations regarding what could be done to change the situation have been suggested.

Sammendrag

Biltrafikken må reduseres dersom vi skal redusere klimagassutslippene og den globale oppvarmingen. Dette vil også bidra til å redusere lokale helse- og miljøproblemer, arealforbruk, kø og forsinkelser, spare energi, gjøre byene triveligere og mer. Til tross for langvarige målsettinger, kunnskap om hva som skal til, og offentlig styring av de mest sentrale virkemidlene, utvikles arealstrukturen og transportsystemene stadig i retninger som gir vekst i biltrafikken. Hvis vi skal bli i stand til å endre denne situasjonen, må vi forstå hva som forårsaker den. Intensjonene med dette arbeidet er derfor å bidra til å svare på følgende spørsmål: *Hvordan og hvorfor lager planleggerne planer som, hvis de blir gjennomført, gir vekst i biltrafikken?*

Under en forståelse av at planprosesser er komplekse og involverer en rekke forskjellige aktører, har jeg valgt å fokusere på planleggerne, hvordan de samhandler med hverandre når de lager reguleringsplaner, og hvordan de bruker relevant ekspertkunnskap. Planleggerne er viktige aktører i planprosessene. De har prosess- og substanskunnskap, de leder planprosessene, og de gjør mesteparten av den konkrete planlæggingen. Denne vinkelen er ikke godt dekket i planleggingsteorien og -litteraturen slik jeg kjenner den.

Inspirert av blant annet Jacobs har jeg definert hvordan byen 'virker', så vel som planlagingsprosessene, som systemer av typen 'dobbel organisert kompleks'. Arbeidet er sterkt påvirket av en gren av vitenskapsteorien som kalles kritisk realisme og av Flyvbjergs 'phronetisk planforskning'. Klassisk planteori har også vært innflytelsesrik i arbeidet.

Planleggerne, min forståelse av state-of-the-art ekspertkunnskapen og planlagingsprosessene ble utforsket gjennom abstrakte analyser for å finne frem til hvilke kausale krefter, mekanismer og forutsetninger som kan bidra til å forklare hvorfor og hvordan planleggerne lager trafikkskapende planer. Funnene ble undersøkt i empiriske studier; en spørreundersøkelse og to intervjuundersøkelser blant planleggere, samt en case-studie som omfattet fire planlagingsprosesser. Mer generelle forklaringer for hvordan og hvorfor planleggere lager planer som gir vekst i biltrafikken ble så utviklet i den overordnede analysen.

Jeg fant at når en offentlig eller privat utbygger initierer en planprosess for å få tillatelse til å gjennomføre et prosjekt, kan en rekke mekanismer aktiveres slik at det lages en trafikkskapende plan: Målsettinger om å redusere biltrafikken kan ikke bli introdusert eller bli skjøvet ut av andre målsettinger, og ekspertkunnskapen kan enten ikke bli introdusert, bli skjøvet ut av annen slags kunnskap eller brukes feil. Hvorvidt disse mekanismene blir aktivert og bidrar til at det lages en plan som gir vekst i biltrafikken kommer an på en rekke betingede forutsetninger.

Dette gjelder blant annet at selv om ekspertkunnskapen er god nok til å lede planleggere som vil lage trafikkreduserende planer, så har den svakheter. Dette gjelder mangel på tilgjengelige beskrivelser av den generelle kunnskapen og av metoder for å bruke den som er brukbare i praktisk planlegging, samt mangler ved den empiriske kunnskapen. Dette gjør kunnskapen mindre brukbar og lettere å skyve ut. Planleggerne kjenner generelt til deler av denne ekspertkunnskapen, men få kjenner den godt nok til å bruke den i komplekse plananalyser eller harde diskusjoner. Når det gjelder planlagingsprosessene, spiller målsettingene, kunnskapen og makten til de involverte planleggerne en viktig rolle. Dette påvirker hvilke målsettinger som prioriteres i prosessen og hvilken ekspertkunnskap som brukes, og dermed planene som lages. Det er utviklet forslag til hva som kan gjøres for å endre på situasjonen.

Preface

When I started this work, I was sure of one thing – my research question. As a planner, advisor and researcher I had been working with land use and transport planning for reduced traffic volumes for thirteen years. I had observed that land use and transport-systems were planned and developed rather differently from what state-of-the-art expert knowledge recommended in order to contributing to reduce traffic volumes. I had also experienced that traffic volumes continued to grow, and that objectives regarding to reducing GHG emissions and a number of other defined objectives were not achieved. I wondered how this happened, and why. I wanted to isolate and open the black boxes in plan-making processes in order to figure this out.

I chose to focus on planners, expert knowledge and planners' use of expert knowledge in plan-making process, within a rather non-relativistic approach. This is rather un-fashionable. It assumes that planners are important actors and experts in plan-making processes, that there can and do exist general knowledge about how certain developments of land use and transport-systems affect traffic volumes, and that planners apply or should apply such knowledge when making plans.

This may be perceived as to stepping back to the extreme instrumental rationalism from the 1960s and 1970s. I do not find this to be an appropriate critique. From my own experiences I know and understand planning processes as communicative and deliberative, involving a number of different kinds of actors with different kinds of objectives, knowledge and powers, struggling to achieve what are important to them and their employers. My experience is also that planners - working for various public and private actors - are still the ones that in the end *make* the analyses, plans and recommendations. They strongly influence how the problems are set, which alternatives are considered and how they are assessed and presented. Their knowledge is valuable and necessary in the creative *and* analytical processes required in plan-making. I also knew that planners are diverse in several respects, and that they disagree on various kinds of issues in plan-making processes. Further, my understanding is that the planners need knowledge of the case matters, of causes and effects, in order to be able to make plans that may contribute to change the present situation in certain directions, as well as to assess which kinds of consequences certain actions may have.

I had been looking for literature that could help me shed light on these questions for some time, without much luck. I found few works discussing what *planners do* when they interact in processes of *making plans* – and how and why the plans become what they are. My conclusion was that the planners, their substance expert knowledge and the making of plans are almost invisible in planning theory. I was on my own.

As one can see from the thesis, I have had much help from planning theory and literature anyhow. The dissertation did, however, become far more exploratory than I had expected and wanted. I have spent more time than I anticipated on conceptualising, deciding which of the many available kinds of axes to organise the discussions around, what to discuss first and last, and on defining terms and conceptions. There have been frustrations.

I knew I would use this opportunity to explore complexity theory, which I had been curious about since first time I read Jacobs' 'Death and life of Great American Cities'. I was unsure how I could apply this in research. When I become aware of critical realism, I soon found

that it represented a well described epistemology for discussing problems of organised complexity. To me this was also compatible with phronetic planning research which had been an inspiration for years. The combinations of these approaches, together with classical planning theory, helped me find ways to sort out some of the many variables involved in plan-making and to isolate and open the black boxes I was most interested in.

I wanted to study concrete plan-making processes, at the level where the decisions are made which define how land use and transport-systems actually are developed. This meant that I needed to study zoning plan processes. In order to describe how and figure out why these processes produce traffic-increasing plans, quite detailed and close-up studies were necessary, where many actors and aspects were included. The combinations of using the above mentioned theoretical approaches which all call for a strong focus on 'how', to study concrete zoning plan processes, to focus on the complex issue 'land use and transport planning for reduced traffic volumes' and to allow for the complexity to show, caused many variables, long descriptions and much text. I have cut a lot, but it is still much to read.

My inquiries may be understood as a critique against the planners. This is true. I am critically discussing the planners, their knowledge, how they act and their role in the plan-making process. This is, however, not a disrespectful or top-down critique. I am a planner, and I ask what *we* can do better. Planners deserve to be understood as the very important actors they are in plan-making, and hence to be critically examined.

When asking myself, in retrospect, what I would have done differently, I cannot come up with much. I wish I had found more relevant and helpful (for me) literature, and that I did not have to develop so much of the analytical framework myself. I also wish I was able to express my new insights and findings in clearer, crisper and easier to understand ways that could be relevant for more. Hopefully I will be able to do so in future articles.

I would, however, not have changed the research question, the selection of explanatory factors, or the choice of complexity theory, critical realism and phronetic planning research as scientific and methodological approaches. I still think my approach was useful and worthwhile, not least because it allows for clearer and more concrete recommendations regarding what planners and planning researchers can do in order to contribute to a less car dependent and a less traffic-increasing land use and transport development.

I have learnt a lot! I had been working with land use and transport planning for several years before starting this work, as a planner and as a researcher. When I asked my research question, I did not know the answers. The *kinds* of discoveries regarding plan-making processes, planners and our expert knowledge have often differed from what I expected. Planning is such an interesting profession - there is always more to learn and to understand.

Further, I have learnt much about research. Being trained as an engineer and planner, theory of science was not a strong topic of mine. The readings in critical realism, complexity theory and phronetic planning research have opened doors of understanding that I did not know existed. The same regards the readings in planning theory. Being a researcher has become far more interesting. Now I see ways of handling difficult research questions that previously would leave me helpless.

Aud Tennøy
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How and why planners make plans which, if implemented, cause growth in traffic volumes

1. Introduction

1.1 Traffic volumes need to be reduced

1.1.1 An unsustainable development

The problem of climate changes ranks high on the agenda. According to IPCC (2007), greenhouse gas (GHG) emissions need to be reduced by 50 to 80% by 2050 in order to avoid dramatic and irreversible climate changes which may have severe negative impacts on the lives of future generations on earth. So far, we have not been successful. Worldwide GHG emissions¹ increased by about 70 % from 1970 to 2004, and by 24 % from 1990 to 2004 (Barker et al. 2007). In Norway, GHG emissions increased by 8 % from 1990 – 2010, and by 4,8 % from 2009 – 2010 (Statistics Norway 2011). This is not a sustainable development.

‘Sustainable development’ is here understood more or less in line with how the Brundtland Commission defined it (World Commission on Environment and Development 1987). This includes that human activity must take place within the planet’s ecological capacity, and that global development should be more fairly distributed in time and space. In time this means that present generations cannot consume and pollute in ways and to degrees which cause the planet to offer fewer or poorer opportunities to future generations than it does to us. In space it means that those who consume and pollute most need to reduce their consumption and pollution most, in order to allow the poorest in the present generations to improve their standards of living.

Sustainable development could hence be described as a development that is just in an intra- as well as in an inter-generational perspective (see e.g. Arler 2010 or Parfit [1984] 1987 for more thorough and insightful discussions regarding this). The non-anthropocentric perspective - that it is not ethically justifiable for humans to reduce the opportunities and qualities of life for non-humans - is another important perspective.

The present inhabitants of the rich parts of the world consume and pollute far more than our share, given that the ecological capacity of the Earth is not to be exceeded. Environmentally sustainable development in such countries is therefore understood here as a development towards reduced consumption of non-renewable resources, reduced loss of biodiversity, reduced GHG emissions and other pollutants. At present, we are moving in the opposite direction, and fast. GHG emissions are increasing, bio-diversity losses are higher than ever, and we exploit non-renewable resources at high speed. This unsustainable development, and its double injustice, is recognised as a major problem of our times by many leaders, scientists, and inhabitants worldwide.

1.1.2 Reducing GHG emissions from road transport is necessary

Road transport is a large and growing source of GHG emissions. Hence, in order to reduce the total GHG emissions sufficiently, emissions from transport need to be reduced. This is acknowledged in numerous relevant policy documents at all political levels in Norway (see for instance Ministry of the Environment 2006, Municipality of Trondheim 2008, Ministry of Transport 2009) as well as in numerous other countries (see Owens and Cowell 2002), and

¹ This includes GHG emissions covered by the Kyoto Protocol.

internationally (e.g. European Commission (EC) 2001, 2001a, 2006, Council of the European Union 2009).

So far, this has not been successful. In 2004, the transport sector was responsible for 23 % of energy-related CO₂ emissions worldwide (Kahn Ribeiro et al. 2007). Over the past decade, GHG emissions from the transport sector have increased at a faster rate than any other energy using sector (*ibid*). CO₂-emissions from road transport counted for 19 % of the GHG emissions in the EU in 2007 (European Environment Agency (EEA) 2010). While total GHG emissions decreased, emissions from transport² grew by 28 % from 1990 to 2007, and transport is described as the most problematic emitting sector (Eurostat 2007, EEA 2010).

Passenger transport by road in Norway increased by 17 % from 1990 to 2000, and by 14 % from 2000 to 2009 (Statistics Norway 2010b). Road traffic counted for 19 % of the GHG emissions in 2008 (Statistics Norway 2010). GHG emissions from road traffic (total) increased by 30 % from 1990 to 2010, and by 3,5 % from 2009 to 2010.

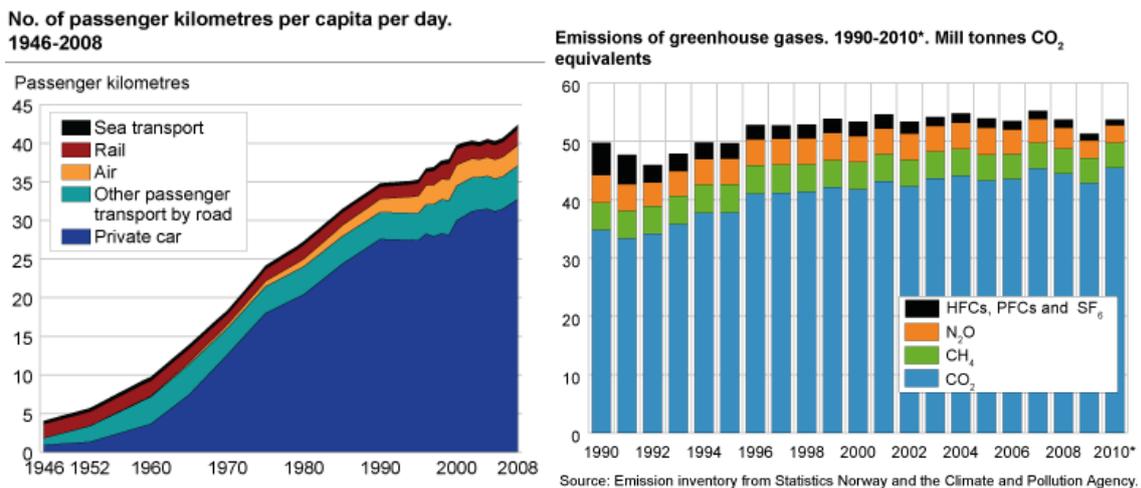


Figure 1: The figure at left shows development in passenger kilometres travelled per person per day with motorized vehicles in Norway, and the figure at right developments of GHG emissions in Norway (figures from Statistics Norway 2010a).

Given the challenges we are facing, the growth in traffic volumes and GHG emissions from transport is an un-satisfactory and un-sustainable development which needs to change.

1.1.3 Two main approaches to reducing GHG emissions from road transport

GHG emissions from road transport are defined as the product of GHG emissions per vehicle kilometre (tons/vkm) and total traffic volumes travelled (vkm):

$$\text{GHG emissions from transport (tons)} = \text{GHG emissions per vkm (tons/vkm)} \times \text{total traffic volumes (vkm)}$$

Hence, there are two main approaches to reducing GHG emissions from road transport. One is to reduce GHG emissions per vkm through 'technical fixes'. The other approach is to reduce total road traffic volumes.

² Except international aviation and marine transport.

Technical fixes have been, and still seem to be, most in fashion in the policy discussions regarding transport and GHG emissions (see e.g. EC 2006 or Kahn Ribeiro et al. 2007). Technical fix is in line with the 'ecological modernisation' doctrine, where the belief in the possibility of decoupling economic growth from negative environmental consequences is a fundamental assumption (see e.g. Hajer 1995, or a critical discussion in Næss and Høyer 2009). This decoupling is supposed to be made possible by technological improvements and by substitution of environmentally harmful production and consumption with less environmentally harmful production and consumption.

In line with this, one could claim that reduction of GHG emissions from road traffic could be combined with continuously increasing road traffic volumes, and hence that reduction of road traffic volumes is not required. The logic would be that if vehicles are made continuously more energy efficient or if fossil fuels are substituted by non-fossil fuels, reduction of GHG emissions per vkm could outweigh the increase in vkm. Hence, GHG emissions from road transport would be reduced even if traffic volumes continued to grow.

However, since cars were invented, there has been an almost continuous effort to improve the energy efficiency of the cars, the motors, the fuels, and the roads. CO₂-emissions per vkm of new cars were reduced by 1,6 % per year in the EU-15 from 1995 to 2000, but slowing down to an average of 1,3 % from 2000 to 2004 (Eurostat 2007). Despite this, GHG emissions caused by transport continued to grow at a rate of 1,6 % per year in the 27 EU-countries during the 1990s and 1,2 % since 2000, since traffic volumes grew at an average of 1,7 % from 1995 to 2007 (Brunvoll et al. 2009).

This example does obviously not in itself rule out the possibility that decoupling between traffic volumes and levels of GHG emissions can occur. There are, however, logical mechanisms which do.

Unless we finally develop the long dreamt about *perpetuum mobile*, there will be a minimum level of energy required for moving a car around, even if the cars, the motors, the fuels, the driving style and the roads are improved. Since GHG emissions per vkm cannot become zero or negative within the fossil fuels technology, road traffic volumes in vkm cannot continue to grow into eternity without causing growth in GHG emissions.

Substituting fossil fuels by non-fossil fuels in cars would allow for decoupling growth in road traffic volumes from growth in GHG emissions. This is, however, only valid as long as the energy used for running cars are not produced in processes which involve burning fossil fuels, or is not bought from a market which includes energy produced in processes requiring to burn fossil fuels (without 100 % cleansing). Otherwise, cars which are fuelled by non-fossil fuels are still indirectly using fossil fuels. At present, there are no non-fossil energy-carriers or energy-production technologies which may be expected to replace fossil fuels in the near future. Hence, increased traffic volumes will contribute to increasing GHG emissions, even if an increasing amount of the cars runs on electricity, for instance.

Hence, in order to actually reduce GHG emissions from road transport, there seems to be no way around actually reducing the total traffic volumes, and quite dramatic too if we are to meet the recommendations from the IPCC (see also Owens 1995 or Banister 2005: chapters 3 and 4 for an interesting discussion). This understanding is in line with the understandings expressed in the de-growth literature. Næss and Høyer's (2009:94) concluded for instance

their discussions regarding growth, decoupling, and capitalism that: “In the rich countries, ecological realities call for a replacement of economic growth with *de-growth*”.

It is assumed here that *both* approaches – reduction of GHG emissions per vkm and reduction of total traffic volumes in vkm – are necessary in order to reduce GHG emissions from road traffic sufficiently (according to IPCC 2007). Only reduction of traffic volumes is, however, considered in this work.

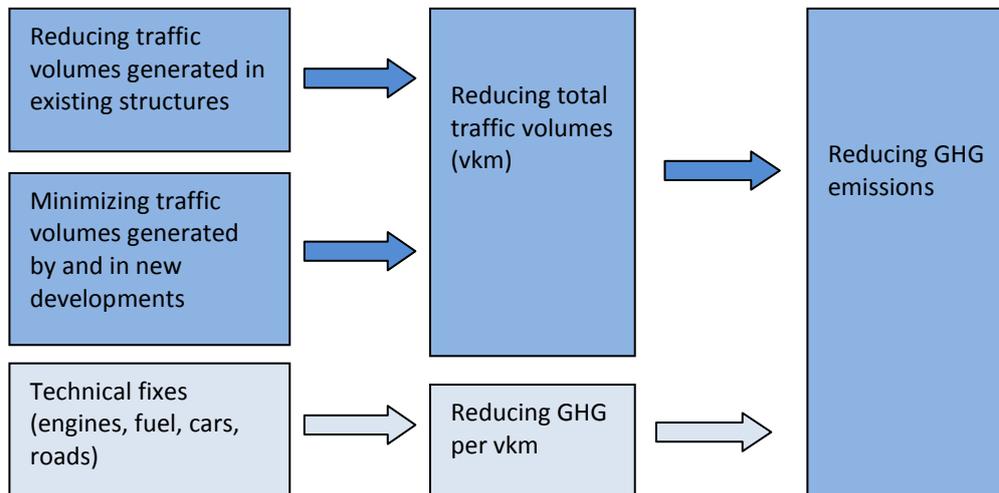


Figure 2: In order to reduce traffic volumes one needs to reduce GHG emissions per vkm, to reduce traffic volumes produced in existing structures and to minimize traffic volumes generated by new developments. Only the latter mechanisms are dealt with in this work.

In order to reduce traffic volumes, two main approaches need to be applied in combination. One is to reduce road traffic produced by people living and working in the existing built environment, while the other is to minimize the traffic volumes generated by new developments. Both are included in this work. Only passenger transport is considered, and urban areas are in focus.

1.2 Reducing traffic volumes through planning and development of land use and transport-systems

1.2.1 Reducing traffic volumes is a long standing objective

Reducing or curbing the growth in especially *urban* road traffic volumes has been a long-standing political objective and an important topic in coordinated land use and transport planning, over decades. The reasons have varied, but in a nutshell concern the desire to reduce negative local impacts on health and on local environment, reduce congestion, reduce land take, secure biodiversity, save energy, improve road safety, make cities more liveable and equitable, achieve cuts in public spending, and (as is in focus here) to reduce GHG emissions (see e.g. Jacobs [1961] 1994, Buchanan 1963, Mishan 1969, Register 1987, Elkin et al. 1991, Ministry of the Environment 1993, Sheller and Urry 2000, Owens and Cowell 2002, Banister 2005, Hull 2011).

This objective is hardly ever spelled out as ‘to reduce total traffic volumes’. Instead one discusses modal shifts and demand-reducing policies (EC 2001, 2006, 2007, World Bank 2002). National and municipal policy documents in Norway formulates this as ‘to improve

competitiveness of the public transport', 'to steer growth in transport demands towards public transport, walking and bicycling', 'to reduce or minimize transport demand', 'to develop land use in less transport demanding directions', 'to reduce GHG emissions from road traffic', and 'to reduce congestion' (Ministry of the Environment 1998, 2002, 2007, Municipality of Oslo 1999, 2008, Ministry of Transport 2002, 2004, 2009).

Even though few major policy documents yet have specifically called for *reduction of total traffic volumes*, documents produced by the bureaucracy (e.g. Ministry of Transport 2004, 2009) and more scientific works (e.g. Owens 1995, EEA 2001, 2007, 2010, Owens and Cowell 2002, Royal Commission on Environmental Pollution 2007, Banister 2008, Næss and Høyer 2009) have become increasingly clear that the growth in road traffic volumes cannot continue. Total traffic volumes need to be reduced in order to reduce GHG emissions from transport, as well as to contribute to a number of other issues, as listed above.

EEA (2010) is very clear that all available measures need to be applied in order to reduce CO₂-emissions from transport, and lists policy instruments to 'avoid', 'shift' and 'improve'. In the National Transport Plan for Norway, growth in traffic volumes and GHG emissions is described as a main challenge (Ministry of Transport 2009). In the governmental programme 'The cities of the future', the 13 largest Norwegian cities have signed a contract with the Ministry of the Environment stating that they will reduce their GHG emissions significantly, and this can hardly be done without reducing CO₂-emissions from transport and hence transport volumes. In 'Trondheim municipality's environmental package for transport' it is a stated objective to reduce total traffic volumes in the municipality by 12 % between 2008 and 2018 (Municipality of Trondheim 2008). In a survey among Norwegian planners, 78 % answered that reducing urban road traffic volumes should be an important objective in Norwegian cities (Tennøy 2005).

Hence, it is assumed here that reducing total traffic volumes, or at least to stop the growth in (urban) road traffic volumes, is a long standing societal objective. This understanding is, however, often not compatible with a number of other political objectives which require growth in road traffic volumes, such as continuous economic growth, increased trade and export of goods, regional development, and others.

1.2.2 Knowledge exists

The long-standing focus among professional planners on reducing or stabilising urban road traffic volumes has caused that knowledge regarding how to achieve this objective has been developed over decades. Obviously, many kinds of factors affect travel behaviour, such as economic development, local climate, habits, culture, and preferences. Nonetheless, it is well documented, theoretically as well as empirically, that how urban land use and transport-systems are organised and developed affect the travel behaviour of the population and hence the traffic volumes (see e.g. Downs 1962, Newman and Kenworthy 1989, Kenworthy 1990, SACTRA 1994, Owens 1986, 1995, Cairns et al. 1998, Strømmen 2001, Noland and Lem 2001, Owens and Cowell 2002, Stantchev and Menaz 2006, Næss 2001, 2006, 2007, EEA 2010, Hull 2011).

Traffic volumes (vkm) are defined by the travel behaviour of the population (vkm/person) and the population size (persons). Travel behaviour (vkm/person) is defined by the travel frequency (how often people travel), the travel lengths (where they travel from and to) and the modal split (whether they choose private car, public transport, walking, bicycling). In order to reduce total traffic volumes, population size, travel frequency, travel lengths and/or

car shares hence need to be reduced. All these factors are affected by how land use and the transport-systems are developed, as well as other factors kept exogenous in this discussion. In order to simplify the discussions, population size is kept exogenous in this dissertation. This means that the discussions here in reality regard reduction of vkm per person.

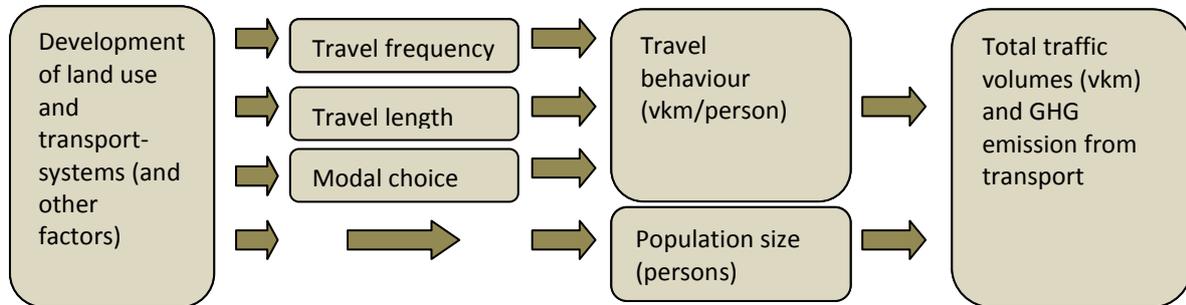


Figure 3: Travel behaviour and population size define total traffic volumes.

There seems to be a relatively widespread agreement on how land use and transport-systems ought to be developed in order to reduce urban road traffic volumes, in the scientific literature as well as in policy and planning documents. This is thoroughly discussed in chapter four, and is referred to as the *expert knowledge* in this work. It may be summarised and simplified as to implement the following means or strategies, preferably in concert (see e.g. Kenworthy 1990, Ministry of the Environment 1993, Næss 1997, 2006, Owens and Cowell 2002, Stantchev and Menaz 2006, EEA 2010):

- to impose or encourage land use as urban densification rather than sprawl, and as 'car-independent' location of new activities
- to impose physical and fiscal restrictions on road traffic
- to improve public transport services
- to improve conditions for walking and bicycling

1.2.3 Public authorities have the power to plan and decide developments of land use and transport-systems

How land use and transport-systems are developed is to a high extent planned and decided by public authorities and political bodies, through the Planning and building act (PBA), through public control of land use planning and through public planning and funding of transport infrastructure and services.

At national level, laws, white papers, policy guidelines etc. are prepared, that are meant to steer spatial planning and decision-making at lower levels. Overall and strategic plans for developments of land use and for transport-systems, such as county plans, municipal land use plans, and national transport plans, are drawn up by public authorities and approved by elected politicians.

When public and private developers initiate projects involving changes of land use or transport-systems, zoning plans or other operational plans need to be prepared and/or assessed by public planning authorities. The plans are presented for the responsible political bodies, which may adopt the plans, reject them or ask for changes. Transport infrastructure is funded through public budgets. Public authorities and political bodies decide grants and quality requirements for public transport services.

Even if these processes are not as structured and tidy as suggested here, public authorities and elected politicians have the power to decide whether land use and transport-systems are developed in ways which contribute to increase or decrease of urban road traffic volumes.

1.2.4 Current developments of land use and transport-systems cause growth in traffic volumes

As things stand, however, land use and transport-systems continue to be developed in directions which cause urban road traffic volumes to increase, in Norway, as well as in other countries. Even if public transport-systems are improved and parts of the urban development take place as densification instead of sprawl, the total picture is a land use and transport development that causes and contributes to growth in car dependency, car use and traffic volumes.

Regarding land use, EEA (2006) discusses urban sprawl as ‘the ignored challenge’. According to them, European cities have expanded on average by 78 % since the mid-1950s, while population growth has been 33 % in the same period. In Norway, built land (covered by buildings) increased by 26 % from 1985 to 2005, and the urban areas expanded by 10 % in the same period (Office of the Auditor General of Norway (OAGN) 2007). The highest growth rates were experienced from 1995 to 2005. It was also found that the share of new buildings located outside existing urbanised areas were slightly higher in the ten year from period 1995 to 2005 (38 %) than in the previous ten years (35 %) (*ibid*).

Næss et al. (2011) discuss the successes of the Nordic capitals Copenhagen and Oslo in reducing urban sprawl, but even in these ‘best case’ cities the size of urbanised land increased by 2 % and 8 % respectively from 2000 to 2008. In the same period, the population growth was 2,8 % and 10,5 % (*ibid*). Furu (2010) found that more than 50 % of new housing and work-places in the period 2000 – 2010 in Akershus, the county surrounding Oslo, came in car-dependent locations.

Road building continues, paving the way for growth in road traffic volumes. In the EU, motorway lengths grew by 70 % from 1980 to 1998, while the length of conventional railway lines and inland waterways decreased by about 9 % (EEA 2001). In the Oslo-area there were built 133 % more km of motorway lanes than railway and metro lines in the period 1996 – 2008, while the numbers were 73 % for Copenhagen (Næss et al. 2011). Data for some countries in EU showed that passenger car transport became 20 to 30 % cheaper relative to public transport from 1980 to 2000 (*ibid*). In Norway, at the other hand, road transport has become more expensive relative to public transport from 1993 to 2007 (Brunvoll et al. 2009).

Consequently, road traffic volumes continue to grow (EEA 2001, Kahn Ribeiro et al. 2007, EEA 2010, Statistics Norway 2010). Owens and Cowell (2002:160) conclude that “traffic-generating development persists”.

1.2.5 Change is needed

In order to break the trend of increasing road traffic volumes, development of land use and transport-systems need to *change* in less traffic-increasing directions.

Every change of urban land use and transport-systems affects traffic volumes and GHG emissions in some way. If future urban land use and transport-systems are to be developed

in less traffic-generating directions, considerations of the traffic-generating potentials of developments need to be included in all planning and decision-making.

This applies to all planning at all levels, in overall and strategic municipal land use planning as well as in operational or zoning planning initiated by public or private developers. It is not enough to give this priority in plans and programmes particularly aimed at reducing traffic volumes or GHG emissions. Decisions regarding development of land use and of transport-systems, which affects whether developments go in traffic-increasing or traffic-reducing directions, are made in almost every City Council meeting.

1.2.6 Many entry points for discussion

More or less all inhabitants, businesses, sectors, administrative levels, political bodies, NGOs etc. are in some way involved in developments of land use and transport-systems, and hence affect it. In this dissertation, those being most influential are defined and grouped as the private and public initiators of projects that affect land use or transport-systems and who need to present operational plans (often zoning plans) in order to be allowed to *carry out* these developments³, the inhabitants, organisations and authorities that are somehow affected and hence *comment on* proposed plans, the planning authorities that are responsible for *organising* planning processes under PBA, *ensure* that the zoning plans are in accordance with overall plans, *assess* the plans and *make recommendations* for the deciding political bodies, and the political bodies that are *making the decision* regarding whether to adopt a proposed plan.

Each of these actor positions offer several possible entry points for exploring how and why the planning and development of land use and transport-systems are going in traffic-increasing directions, and hence what needs to change in order to turn this development.

Further, there are the institution of the planning system, the PBA, other acts, and other institutions and organisations affecting spatial developments. There are power distribution and power constellations. There are globalisation, the economic growth paradigm, and the idea of 'freedom to drive'. These are all factors which affect the planning and the development of land use and transport-systems, and they are interesting entry points that could have been chosen for this study.

1.2.7 Focus on plan-making and planners

Instead, the objects of this study are the processes of making plans and the planners professionally involved in these plan-making processes. The question is how and why they make plans that, if implemented, cause growth in traffic volumes.

1.2.7.1 Planning and plan-making

Definitions of *planning* usually include a future-orientation, and a focus on how to achieving something we want or avoid something we do not want. Further, they normally include application of knowledge in order to assess which actions are necessary in order to achieve certain objectives and which should be avoided, as well as consequences of certain actions. The aim of planning may hence be defined as to bring knowledge into decision-making in

³ Developers may be the public road authorities, a private shopping center developer, the municipality that needs to build a school or a nursing home, the railway authorities who need to develop their lines, a house owner wanting to build or expand her garage etc.

order to improve decision-makers' abilities to make decisions about future actions which contribute to the achievement of their objectives (see for instance Faludi 1973, Friedmann 1987). Byrne (2003:174) discusses planning as "the specification of a proposed future coupled with systematic intervention and/or regulations in order to achieve that future [...] a control parameter – something which can have a profound influence on the future which comes to pass".

The planning referred to in this dissertation is urban land use and transport planning governed by the Planning and Building Act (PBA), with development of public transport services as an important exception.

Plan-making is in this work understood as the parts of a planning process where the plan is actually made: where the problem is defined, where alternatives are developed, assessed and compared, and where analyses, recommendations and plans are the outcomes. This work is mainly undertaken by planners and others professionally involved in the plan-making process. The question is why these analyses, plans and recommendations tend to point in directions which cause land use and transport-systems to be developed in ways which contribute to growth in urban road traffic volumes (in the following often termed 'traffic-increasing plans' for short), and how this happens.

The definition of 'planners' includes here trained planners who are professionally involved in the making of plans which affect development of land use and/or transport-systems. They work in different positions or roles; for planning authorities, other public authorities, public and private initiators of plans, consulting firms, non-governmental organisations (NGO) etc. It is hard to be very strict and clear on who are, and who are not, defined as planners throughout this dissertation, but this somewhat vague definition has turned out to be most usable despite its shortcomings.

In order to allow politicians to adopt plans that cause reduction of traffic volumes (traffic-reducing plans for short), and to reject traffic-increasing plans, planners need to offer traffic-reducing plans or alternatives to the decision-makers, to clarify which plans are traffic-increasing and how, and to make recommendations that allow politicians to understand which plans and alternatives are traffic-increasing and which are not. This means that the plans that planners produce for developments of land use and transport-systems will need to be different from what they have been, and that planners need to do planning differently from before.

1.2.7.2 Other actors work through planners

The planners in question work for the main actors involved in planning and development of land use and transport-systems, as illustrated in figure 4. The main actors are hence understood to interact in the *plan-making* processes mainly *through* the planners. These plan-making processes are, as illustrated, framed by the PBA, the planning systems, and other relevant institutions and organisations. There are often more direct interactions between the 'main actors' in the wider *planning* processes.

The public can work and Planning system, PBA, other institutional and organisational elements developers and the planning authorities here. This is because the developers/ initiators are responsible for organising participation processes and collect comments in hearings in the early phases of planning processes. The planning authorities are responsible for presenting

the planning proposal for the public and others, collect comments and present it for the politicians.

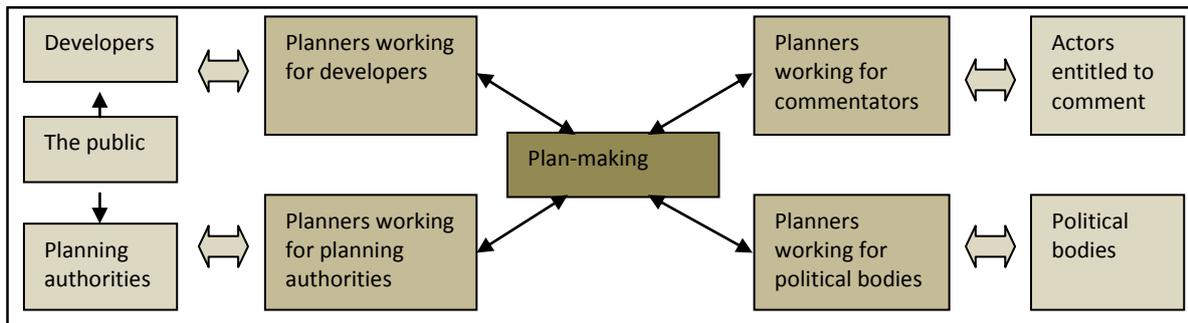


Figure 4: Focus on planners, working for various actors, making plans within the frames of the PBA, the planning system and other institutional and organisational elements.

1.3 Research question

In order to be able to turn planning and development of land use and transport-systems in traffic-reducing rather than traffic-increasing directions, we need to understand what is causing that traffic-increasing plans are made. The main aim of this work is to increase our understanding of this phenomenon. The research question in this dissertation is:

How and why are planners making plans which, if implemented, cause growth in traffic volumes?

I am profoundly curious about how and why planners (like me) make traffic-increasing plans, and which role the expert knowledge produced by planning researchers (like me) play in this. A main intention is to figure out if and how the practice of planners and planning researchers affect that traffic-increasing plans are made, in order to figure out what planners and planning researchers can do to change this development. This work may hence be seen as a kind of reflection on planning and planning research, conducted by me as a reflective practitioner, if borrowing some of Schön's (1983) concepts.

I want to study the making of zoning plans and other operational plans, rather than overall plans. Zoning plan processes are arenas for planning and decision-making leading towards concrete permissions to carry out projects. These processes are therefore arenas where the objective of reducing traffic volumes competes with other objectives; where the knowledge of how to do it competes with other knowledge and rationalities; where the real professional and political debates take place; where the game is played between the many actors and interests involved, and where the objective and know-how of land use and transport planning for reduced urban road traffic volumes seem to be 'losing out'.

This angle is not well covered by existing theory and literature. There are few studies focusing on how planners interact with each other, how they apply expert knowledge, and how and why they produce traffic-increasing plans. Næss (2006:281-282) discusses how environmental and sustainability aspects have not been much in focus in planning theory, and finds that "[t]he detachment of planning theories from the actual subject areas is a common trait of much contemporary planning literature", with reference to Yiftachel and Huxley (2000).

The answers to the research question are sought in planning practice. This work could hence be a contribution to what Friedmann (2003:8) terms as theories about planning or critical planning theories, which “take a critical look at planning as it is actually practiced”. I search for explanations related to plan-making, in order to be able to make recommendations for changes of variables within this system that may contribute to less traffic-increasing plans.

1.4 A problem of double organised complexity

There are several possible approaches for conceptualising the question of how and why planners make plans which contribute to growth in urban road traffic volumes. In this work, the main conceptualisation is that this is a *problem of double organised complexity*⁴.

1.4.1 Theories in and of planning

Planning theory distinguishes between theories *in* planning and theories *of* planning (Faludi 1973, Friedmann 2003)⁵. Theories *in* planning deal with the *objects of planning*, with the problem itself - such as how land use and transport-systems ought to be planned and developed in order to reduce urban road traffic volumes. Theories *of* planning deal with the *processes of planning*, including among others the roles of the various actors involved in the planning processes and the interrelations and interaction between these actors, as well as the laws, institutions and organisations involved in and affecting these processes. It will be argued here that *the problem itself*, as well as *the planning processes*, are systems of organised complexity. We thus have a problem of *double organised complexity*.

1.4.2 Problems of organised complexity

Weaver (1948) discussed science and complexity in general. He distinguished between three kinds of scientific problems: those of *simplicity*, problems that contain few variables which are directly related to each other in their behaviour; those of *disorganised complexity*, problems in which the number of variables is very large, and where the behaviour of the variables is individually erratic or totally unknown, but where one can analyse average properties; and those of *organised complexity*, problems in which a half-dozen or even several dozen quantities are all interrelated and varying simultaneously and in subtly interconnected ways. Changing one entity or part of a system of organised complexity will cause direct and indirect changes of the other entities in the system.

Complex is hence understood as the opposite of independent. This is also the main understanding for later authors discussing complexity, such as Wilson (2006) and Bar-Yam (1997). Byrne (2003) discusses complex systems as open, intersecting and nested.

Hence, in order to change something in a complex system by manipulating one or more of its variables in order to activate mechanisms that bring about a wanted change in another variable, one needs to know how the manipulated variable(s) interact(s) with the variable one wants to change, as well as with other variables in the system, in that specific context. These ‘other variables’ may be directly or indirectly interrelated with the manipulated

⁴ The reasoning in this sub-chapter has been published as a journal article (Tennøy 2009a).

⁵ One could also include theories about planning (Friedmann 2003) or critical planning theories, which critically examines planning at it is actually practiced.

variable and/or with the variable one intends to change. The various mechanisms activated may reinforce, counteract or not affect the effect one is aiming at producing.

This makes it hard to predict accurately and certainly which effects changes of one variable will have on one or several of the others. This does, however, not mean that systems of organised complexity are irrational. Rather, they are logical, understandable and explainable, and even to a certain extent predictable, but explanations and predictions require thorough understanding about how the complex phenomenon at hand 'works', about how its parts are causally interrelated.

1.4.3 Developing urban land use and transport-systems in traffic-reducing directions is a problem of organised complexity

Jacobs ([1961] 1994: 442-462) was among the first to discuss 'the kind of problem' cities are as problems of organised complexity, building strongly on Weaver (1958). Jacobs (*ibid*) analysed the history of city planning, and showed how 'planning theorists' first dealt with the city as a problem of simplicity, and later added ideas based on disorganised complexity. She claimed that combining simplicity and disorganised complexity became the modernist way of perceiving cities and their problems. By understanding the cities as sets of two-variable interrelations which could be statistically analysed and interrelated in larger models, the cities could be 'scientifically' understood and calculated. This way of understanding the city, Jacobs argued, is the reason why many theorists see the city as almost impossible to analyse and predict, as *irrational*.

If one instead understands the city as a problem of organised complexity, she reasons, one would find that: "Although the interrelations of their many factors are complex, there is nothing accidental or irrational about the ways in which these factors affect each other" (Jacobs [1961] 1994:447). She claims that the same is true for all parts or features of cities. Hence, by understanding the city and its parts as systems of organised complexity, we could be more successful in planning and developing the city in desired directions.

Urban land use, transport-systems, travel behaviour and traffic volumes are here understood to be interrelated in a system of organised complexity⁶. Road traffic volumes are defined by the travel behaviour of the population. Travel behaviour is affected by changes in transport-systems and in land use. These are reciprocally interrelated, and also affected by the resulting changes of traffic volumes. The interrelations in the system are direct and indirect, short term and long term, and dynamic, and they form a system of organised complexity. This system is understood as relatively open, since a number of other kinds of factors affect it, such as economy, preferences, culture and local climate.

How urban land use and transport-systems need to be changed or developed in order to reduce urban road traffic volumes, and how certain changes of land use and transport-systems affect traffic volumes, are hence understood as problems of organised complexity. The expert knowledge discussed above is knowledge of how this system of organised complexity works.

⁶ This system is thoroughly described and critically examined in chapter four.

1.4.4 Making planning processes produce traffic-reducing plans for urban land use and transport-systems is a problem of organised complexity

Planning and decision-making processes may appear irrational, both to planning practitioners and to researchers studying planning. This is not least the case when we examine the plans which the planning system produces in light of the long standing (but not achieved) objective of reducing urban road traffic volumes.

The reason for this could be that the planning processes are not recognised as the kind of systems they are - systems of organised complexity. A number of actors are involved, who enter the processes for various reasons and with different objectives and values, who hold and bring different kinds of knowledge and rationalities, and who possess different kinds and strengths of power based on their role in the game. Several sectors and all administrative and political levels are involved. The actors may have competing aims and objectives, and the planning processes often involve real and fundamental conflicts of interests. The rules of the planning processes are defined by the PBA, but the game is played by the actors in order for themselves to achieve *their* objectives, and they act and interact in order to do that.

Hence, planning processes can be understood as systems involving numerous elements, mainly the PBA and a number of different actors with their objectives, knowledge and powers, which each interact strongly with a number of the others. Together this constitutes systems of organised complexity. How the planning processes proceed – which objectives are stated and by whom, which kind of knowledge is introduced, accepted and applied and by whom, the power distribution and how it affects definitions of objectives and true knowledge - affect the interaction between the actors and how the actors act, and hence whether the plans produced by the system are plans which contribute to increase or to decrease traffic volumes.

How planning processes need to proceed in order to produce plans which contribute to reduce urban road traffic volumes, and how certain changes of the planning system and the planning processes may affect whether the plans are causing growth or reduction of traffic volumes, are hence understood as problems of organised complexity.

1.4.5 The planners face a problem of double organised complexity

When aiming at producing plans which contribute to reduce road traffic volumes, planners hence face two intersecting complex systems, and we deal with a problem of *double organised complexity*. The planners need to apply expert knowledge regarding a problem or system of organised complexity in plan-making processes which are systems of organised complexity too. The situation becomes even more complex by the fact that these systems also intersect with other natural and social systems, which are mainly kept exogenous in this discussion.

1.4.6 This double organised complexity needs to be recognised and addressed

These two systems of organised complexity are reciprocally interconnected. The expert knowledge is applied in planning (and decision-making), resulting in plans which when implemented, cause changes of land use and/or transport-systems, and hence of traffic volumes.

These changes of land use, transport-systems and traffic volumes may affect the planning in at least two important ways. First, changes of traffic volumes may create situations which

are recognised and brought into the problem definitions and the objective definitions of the planning processes, and which may cause changes in the framing of problems and objectives.

Second, empirical experiences of how certain changes of land use or transport-systems affect the whole system and the traffic volumes may provide researchers and planners with new knowledge about 'how the system works', and hence to changing the existing expert knowledge in this field. Such reframing of problems and objectives, as well as developments of the expert knowledge, would affect future planning (and decision-making), and hence developments of land use, transport-systems and traffic volumes.

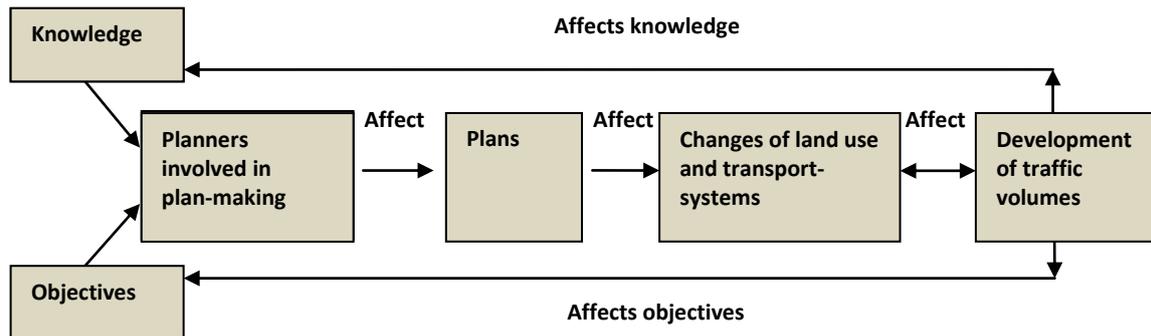


Figure 5: Interrelations between the two systems of organised complexity.

In order to be able to explain how and why plans are made which cause growth in urban road traffic volumes, and hence to be able to change that what is causing this (if society so wishes), this double organised complexity needs to be recognised, acknowledged and addressed by planning research and planning theory. It has been the intentions of this work to do that.

1.4.7 Explanatory factors: Expert knowledge, planners and plan-making processes

The most central explanatory factors hence seem to be the expert knowledge, the planners who apply this knowledge, and the plan-making processes in which they apply it.

If this expert knowledge does not exist, one cannot have qualified ideas about how a certain project or development may affect traffic volumes. Nor about what types of developments, projects and measures are advisable if the objective is to reduce traffic volumes. Further, the planners involved in the actual plan-making process need to possess this knowledge if to actually apply it, and apply it correctly. It is also necessary that the plan-making processes allow this knowledge to be applied and to be influential.

Whether these requirements are fulfilled depends among others on *properties* of the knowledge, of the planners and of the plan-making processes. When searching for explanations, the issues that will be explored are hence:

- Properties of the expert knowledge
- Properties of the planners and how they relate to the expert knowledge
- Properties of the plan-making processes

This does not mean that these factors are understood as sufficient conditions for defining whether traffic-increasing or traffic-reducing plans are made. There are also other factors affecting the planning processes and their outcomes, as discussed.

1.4.8 Decision-makers don't necessarily follow the recommendations provided by planners

Providing decision-makers with knowledge regarding transport related consequences of their decisions does not ensure that they make decisions which contribute to reduce urban road traffic volumes, despite stated political objectives of doing so.

Decision-makers may prioritise other objectives or concerns higher, powerful groups may convince them that other objectives and solutions are more important, the suggested solutions may not be politically acceptable, they may not trust or understand the knowledge presented for them, they may be fed with competing knowledge or there may be other reasons why they make decisions which, according to the knowledge presented for them through planning analyses and planning proposals, will contribute to increase urban road traffic volumes.

For instance, in his study of power and rationality in urban planning in the Danish city Aalborg, Flyvbjerg (1998) found that the Chamber of industry and Commerce, the local newspaper and the police were able to use their joint powers to hinder realisation of the well planned and politically ratified Aalborg project. Flyvbjerg (1998:227) found that “power *defines* what counts as rationality and knowledge and thereby what counts as reality” (italics in original), the ones that have the power define what is valid knowledge. This could be understood as an argument that planning (knowledge production) is a waste of time, since power defines what is to be done anyhow.

Sager and Ravlum (2005) studied whether and how the Parliamentary Standing Committee of Transport and Communications in Norway used information produced through planning analyses. The information produced by planners in their cases was mainly different kinds of project-level indicators, which the decision-makers were supposed to use for prioritising between transport infrastructure projects. These indicators were project-level benefit/cost ratios, sets of economic and physical impact indicators at strategic level, and alternative strategies to facilitate selection of projects corresponding to a certain ranking of goals. Sager and Ravlum (*ibid*) found it hard to detect any effects of the planners' input of information (their choice of words) to the processes of policy-making.

In Oslo and its surrounding county Akershus, the politicians have agreed on a 'transport-package' worth almost NOK 60.000 million, including among others several capacity increasing road projects. These decisions have been made despite analyses conducted for and by the road authorities, which demonstrate that implementation of these road projects will cause a major increase in road traffic volumes⁷ (see e.g. Norwegian Public Roads Administration (NPRA) 2006). The political rationality for doing so is rather unclear, and it varies between the different political parties.

These few examples demonstrate that decision-makers may very well choose to disregard the analyses and recommendations produced by planners when making their decisions. There are, however, also numerous examples of the opposite.

For instance, in studies of two Norwegian municipalities, Saglie and Sandberg (1996 a, b) found that land use in the two case-municipalities to a large degree had been developed according to the overall plans between 1960 and 1990. Falleth et al. (2008) found, when

⁷ For information in English, see http://en.wikipedia.org/wiki/Oslo_Package_3

studying planning and decision-making in the three largest cities in Norway, that zoning plans often were amended during the planning process, mainly through consultancy (hearing) processes. However, only 14 % of the plans were changed in the decision phase, from the point where the planning authorities present the plan for the politicians to the point where the plan is adopted. These were normally minor changes.

Even though politicians, their political rationality and their decision-making obviously are important and interesting issues, and even though the planners' understandings of the political rationality influence the planning and the plans, the political decision-making, the politicians and how they think and act is not a main topic in this dissertation. The same goes with collaboration with the general public. Instead, the focus is on the professional planners and how they interact in plan-making processes and make plans. Even though decision-makers may choose to disregard the planners' work, an assumption in this work is that how planners do their jobs affect whether development of land use and transport-systems may be turned in traffic-reducing directions.

1.4.9 A non-relativistic approach

It should be clarified that I consider that certain developments of land use and of transport-systems *do* tend to cause people to change travel behaviour in ways which cause reduction of road traffic volumes, while other developments do the opposite. I also consider that one *can* have knowledge regarding how this is interrelated, even though this knowledge is developing and changing through time. This means that one can make crude predictions regarding which effects certain developments of land use and transport-systems will have on travel behaviour and traffic volumes. These predictions can seldom be very precise, and they will be quite conditional.

Further, I do think that certain kinds of planners applying certain kinds of knowledge in certain kinds of processes tend to produce plans that are different from what other kinds of planners with other kinds of knowledge in other kinds of processes do. I consider that one can have knowledge regarding main factors causing that one or the other kinds of plans are made. This does obviously not enable precise and certain predictions regarding which plans will be made by a group of planners, but it can indicate what needs to be altered if one aim at changing previous practice and developments.

This means that a rather non-relativistic approach has been applied in this dissertation.

1.5 Aims of this work

1.5.1 Changing development of land use and transport-systems in traffic-reducing directions

The main aim of the work is to contribute to change planning and development of land use and transport-systems in traffic-reducing and more sustainable directions.

In line with among others critical realism and phronetic planning research, the main idea is that if we gain knowledge of which structures and mechanisms that cause unwanted events or developments, and how they work, we can critically examine them and replace unfavourable structures and mechanisms with more favourable ones - if society so wishes (see e.g. Bhaskar 1989, Flyvbjerg, 1991a, 1991b, 2004 and Danermark et al. [1997] 2002). By this, we may bring development more in line with stated objectives. The idea is thus that if we gain knowledge of what causes and allows that traffic-increasing plans are made, if we

can explain how and why this happens, *changes* can be made (if society so wishes) which cause a practice which contributes to reduce urban road traffic volumes instead.

The aim is to develop normative recommendations regarding what needs to be changed with respect to the expert knowledge in question, the planners and how they relate to this knowledge, and to the workings of the plan-making processes, in order for plans to be made which contribute to reduction, rather than growth, in urban road traffic volumes.

1.5.2 Bringing the interests of future generations stronger into the planning processes

Planning processes often revolve around actions and non-actions which distribute costs and benefits between generations and between geographical areas. If a new road is built, more people may drive faster to work in the near future or people living along the old road may get better living conditions, but the extra GHG emissions caused by increased traffic induced by the added road capacity may cause problems for future generations. Restrictions on energy consumption may feel as a burden for present generations, but may contribute to better living conditions for future generations.

Obviously, the *present* residents of the planet Earth are much more influential in present planning and decision-making processes than *future* generations. People living here and now may take part in planning and decision-making processes regarding current actions, while future generations and people living elsewhere cannot.

This is probably a main obstacle for achieving a more sustainable development. In order not to worsen the living conditions for people living other places or in the future, the ones who consume and pollute the most today need to restrict our exploitation of the planet Earth. Every person needs to act responsible and just, and/or the authorities need to govern in ways which ensure that society collectively and in sum acts responsible. This governing includes, in our democratic systems, among others planning and decision-making regarding development of urban land use and transport-systems. A main challenge in order to change towards a more sustainable development is hence to bring the interests of future generations, as well as 'other places' into the planning and decision-making processes.

One aim of this work is to disclose what causes that the interest of future generations are not given priority in planning processes, and to arrive at recommendations regarding how this may be changed.

1.5.3 Contribute to developing planning theory

It seems to me that planning theory has taken little interest, at least the last decades, in empirical studies of how planners act when making plans. I have found that what planners do when defining problems, objectives and alternatives, when assessing alternatives, comparing them and presenting their recommendations for the decision-makers in planning proposals has gained surprisingly little attention in planning research and theory.

The interplay between planners of different professional backgrounds and with different roles in plan-making processes – how they communicate and collaborate, which knowledge claims they present, based on which knowledge, which arguments they use and which are found valid, how they agree on what are important objectives and relevant knowledge, and how and why they end up presenting the planning proposals they do, is not well studied either.

Further, how planners apply expert knowledge in plan-making processes, the quality of the expert knowledge applied and how planners involved in planning processes interact when deciding which expert knowledge they apply in order to make plans is hardly studied at all, according to my readings. Given the complex problems, and the need for expert knowledge about causal interrelations when dealing with these complex problems, focusing on the role of expert knowledge in planning practice seems to be an important and potentially fruitful approach.

One aim of this work is hence to contribute to developing theory about how planning is actually practiced. This includes to developing new empirical and theoretical insights regarding how planners act and interact, and how they relate to and apply expert knowledge.

1.5.4 More general application of the research and the findings

A more general version of the question posed here is why society continues to plan and decide actions and non-actions which may cause severe problems for future generations, despite apparently agreed objectives about doing the opposite, and knowledge about how to do it.

This question is relevant in more general terms and for a number of other topics. Why do we continue to produce and use fossil fuels, to reduce biodiversity, to over-exploit fisheries - the list can go on and on.

A humble hope may be that the research conducted regarding this concrete issue may be a contribution to understanding the more general problem regarding what needs to be changed and what can be changed in order to enable society to stop the deterioration of the Earth.

2. Scientific and methodological approach

The overarching planning theory applied in dissertation may be termed 'classical planning theory', which must not be confused with extreme versions of instrumental rationality. I have applied several other planning theories in the various chapters, as a help to understand and explain the structures, causal powers, mechanisms and conditions. These are introduced where they are applied.

2.1 Critical realism and phronetic planning as important inspirations

Problems of organised complexity need to be approached differently from problems of simplicity and of disorganised complexity, according to Weaver (1948). He emphasised that science must learn to deal with problems of organised complexity, since these are ontologically and epistemologically different from other kinds of problems, and cannot be dealt with by techniques and understandings of simplicity and disorganised complexity.

This view is supported by The Royal Commission on Environmental Pollution (RCEP) (2007). They were surprised when they came to understand the complexity of the problems they dealt with, and suggested that the environmental problems of cities for too long have been seen as simple problems which may be solved by simple measures, and not as the complex systems and problems they in reality are. This may be a main explanation why the environmental problems of cities have not yet been solved. If we are fundamentally misinterpreting the phenomenon we are dealing with, it should be no surprise we are not succeeding. This is also Jacobs' ([1961] 1994) main message.

My searches for epistemological and methodological approaches to my problem in complexity theory were not successful. Several authors, such as Byrne (2003), discuss the encouraging possibilities of applying complexity theory in planning theory. Manson and O'Sullivan (2006) have interesting descriptions of the ontology and epistemology of complexity theory, especially with respect to *emergence*, but do eventually turn towards computational modelling. The work of Innes and Booher (2010) could have been relevant in my work, but I became aware of this work just before submitting my work, and was not able to take advantage of it.

Instead, I came across the meta-theory 'Critical Realism'. The ontological understandings of critical realism are quite similar to those embedded in the understanding of systems of organised complexity. Critical realism also has a developed epistemology which is helpful when designing research for studying problems of organised complexity. Further, some critical realist authors have even produced guidelines for design of critical realist research, as well as pointed at and methods which may be useful (Danermark et al. [1997] 2002).

The readings of critical realism authors, especially Bhaskar ([1978] 2008 and [1979] 1989), Sayer ([1984] 1992) and Danermark et al. ([1997] 2002), have inspired the research in this dissertation. These readings have allowed me to gain a deeper understanding about the phenomena I am studying, and about how research ought to be carried out in order to gain knowledge about the phenomena. The readings of critical realism have thus influenced *what* I am doing as well as *how* I am doing it.

My reaction to my first meeting with critical realism (Danermark et al. [1997] 2002) was a feeling of recognition and relief. Bhaskar (in PhD-course lecture) explained that his works

within critical realism to a large degree are attempts to describe 'how researchers do research', including the processes and tasks of social science research. This also includes discussions about how to do *good* social science research (Bhaskar [1979] 1989). One criterion is to deal with the social world 'as it is'. This involves among others inclusion of contextuality and contingency in a *scientific* way. This resonated strongly with my understanding of how my research question needs to be understood and approached.

Critical realism research aims at explaining phenomena, in order to allow us to change what makes unwanted events occur. This is, to me, what planning is about. When asking 'what should we do in order to...?' and 'what are the consequences of...?', which are the main questions when doing planning, this is about understanding what causes something to happen, which mechanisms are at work, which conditions that need to be in place etc. This allows us to prescribe what needs to be done and not done in order for something desirable to happen or something un-desirable to be avoided (such as growth in urban road traffic volumes). Critical realism research may thus deliver a kind of knowledge which can very useful in planning research and practice.

This work is also inspired by 'phronetic planning research', developed by Flyvbjerg (1991a, 1991b, 2004). Flyvbjerg (1991b) demonstrated a problem-driven, critical and empirical planning research. He promotes to focus on 'real problems that matter' and to have ambitions to study 'the truths about what is going on in planning'. This has been an inspiration for asking the questions I do in the way I ask them, and it has strengthened my confidence to do so.

I do, however, not follow Flyvbjerg's advices to focus strongly on power as explanatory factor (even though power is among my explanatory factors). Neither do I avoid theoretical and abstract discussions, far from it, since these are of major importance in critical realism. I do, however, go close to reality, I do case studies and I am inspired by the guidelines offered of how to do phronetic planning research. These involve among others to do quite detailed case studies, to emphasise 'little things' and to focus on 'how' as well as 'why' (Flyvbjerg 2004).

Critical realism and phronetic planning research may be understood as quite opposite approaches. Especially in their expressed relations to theory and to 'the abstract' this is indeed the case. They do, however, both have a non-relativist understanding. They are both focused on describing and explaining what is going on in the real world, and they both accept and include contextuality, causal interdependency and contingency. Further, they both aim at arriving at answers regarding 'what, if anything, we should do about it'.

Hence, when aiming at explaining how and why planners make plans which cause growth in traffic volumes, and to present recommendations for how this could be changed, critical realism and phronetic planning research both seemed to be sensible approaches. Critical realism is, however, the stronger influence on how this work is conducted.

2.2 Ontology – about 'what there is'

Critical realism emphasises the importance of ontology, and that epistemology needs to be seen in relation to ontology. According to Chalmers ([1978] 2006:213), ontology is the study of "what there is". This regards what kinds of entities that are assumed to exist, what the most general features and relations of these entities are, and how the world 'works'.

According to Bhaskar (1989:2), main features of how critical realism conceives the world is “as being structured, differentiated and changing”.

2.2.1 Natural necessity

A core point in critical realism ontology is the understanding of natural necessity in life. Real objects have powers to do things, and these powers are determined by what the object is, by its nature. “There is necessity in the world; objects - whether natural or social – necessarily have particular powers or ways of acting and particular susceptibilities” (Sayer ([1984] 1992:5). Or as Chalmers ([1978] 2006:218) expresses it⁸: “Things happen in the world of their own accord, and they happen because entities in the world possess the capacity or power or disposition or tendency to act or behave in the way that they do. Balls bounce because they are elastic”.

In studies of how cities works and what causes certain traffic volumes or changes of traffic volumes, it is necessary to understand that properties of the city have powers to produce certain traffic volumes. If the properties of the city (in land use and transport planning we focus mainly on properties of the land use and the transport-systems) were different, the traffic volumes produced in the city would be different.

The same goes for plan-making processes. Properties of the actors involved, of the systems for organising the planning processes, and of other systems which interact with the planning and decision-making system (such as how the construction industry or the governmental planning of road infrastructure are organised), and the interplay between all of this, cause the system to produce plans which, if implemented, either contribute to more or less traffic. If the properties of the main elements in the planning processes were different, the plans produced would be different too.

2.2.2 Causality

When critical realist authors discuss causality, they ask why what happens actually does happen. They search for the causal powers inherent in objects, as described above. Sayer ([1984] 1992:104-105) puts this as follows: “causality concerns not a relationship between discrete events (‘Cause and Effect’), but the ‘causal powers’ or ‘liabilities’ of objects or relations, or more generally their ways-of-acting or ‘mechanisms’”. Danermark et al. ([1997] 2002:55) simply state that: “A mechanism is that which can cause something in the world to happen”. Næss (2004:140) discusses “causal powers working through a number of mechanisms”.

When studying cities, the expert knowledge in question regards whether, how and to which degree a certain land use or a certain transport-system, or the combination of land use and transport-systems in a city, *cause* certain travel behaviours and traffic volumes. Likewise, it regards how and with which degree certain changes of land use or transport-systems *cause changes* in travel behaviour and traffic volumes.

When studying plan-making processes, the idea is to search for the causal powers which may produce certain events, such as traffic-increasing plans, the mechanisms through which they work, and under which conditions.

⁸ Chalmers describes this from a purely natural science perspective.

These powers and mechanisms exist whether they are exercised or not. The ball in Chalmer's example has the power to bounce, even when it is not bouncing. Whether a causal power is actually activated, or the mechanism triggered, depends on the specific conditions in the given situation. If and when the mechanism is triggered, the actual effect as well as whether this effect actually produces a certain event, depend upon the present conditions or circumstances in the concrete situation.

The traffic producing potential of a residential area which is car-based located can be triggered and released if the capacity on the main road is increased, causing people working further away to settle in this area. The area does, however, have the traffic producing potential whether it is exercised or not. Likewise, the planning authorities have the power to question the planning proposals proposed by the developers, whether they exert this power or not.

2.2.3 Multi-causality and tendencies

In every concrete situation, a number of objects with their structures⁹, causal powers and mechanisms contribute to the occurrence of a certain event. This means that most events have several causes, they are *multi-causal* (or, one could say, complex).

If and when mechanisms are triggered and causal powers are activated, the resulting *event* depends on the present conditions and on other mechanisms in operation. In most cases there are countless combinations of circumstances which may influence whether a specific causal power will manifest itself as a particular event. The events that are produced are therefore a "complex compound effect of influences drawn from different mechanisms, where some mechanisms reinforce one another and others frustrate the manifestation of each other" (Danermark et al. [1997] 2002:56).

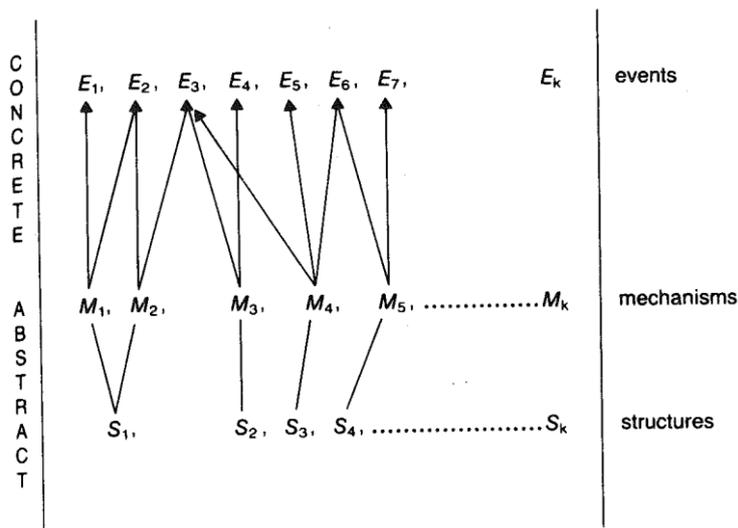


Figure 6: Structures, mechanisms and events. Facsimile from Sayer ([1984] 1992:117).

These contingent conditions do determine whether and how the mix of causal powers and mechanisms will actually produce a certain event, such as a plan which causes growth in

⁹ 'Structure' does here refer to how an object is constructed, and not to structure in relations to agency, which we arrive at soon.

urban road traffic volumes. Sayer ([1984] 1992:108) expresses this as follows: “For any particular set of conditions, the result occurs necessarily by virtue of the nature of the objects involved, but it is contingent which conditions are actually present”.

The structures and their inherent causal powers are hence causing something to happen if the generative mechanisms are triggered. But what actually happens depends on the present conditions and other mechanisms in operation. This means that “a certain object tends to behave or act in a certain way. Whether it will actual act or behave in this way, however, is a completely different matter” (Danermark et al. [1997] 2002:55-56). On basis of this, ‘scientific laws’ should be understood as *tendencies*. Dependent on the conditions present, the same mechanism may produce different events. Different mechanisms or combinations of mechanisms can produce the same event.

The understanding of multi-causality is crucial when doing planning research as well as planning. When discussing what causes a certain traffic volume or changes of traffic volumes, one can hardly ever point at one cause. Several changes which cause changes are going on all the time, and these do reciprocally interact with each other in numerous ways. This is also the case when asking what caused a certain planning process to result in a traffic-increasing plan.

Planning *is* very much about understanding how different structures and mechanisms operate and affects each other, and to coordinate efforts in order to trigger mechanisms which cause for instance reduction of traffic volumes and at the same time hinder to trigger mechanisms which cause growth in traffic volumes. Planning research defined as ‘*in planning*’ is hence much about figuring out how the city works and how it can be manipulated in desirable ways.

Likewise, the studies in this dissertation are about figuring out what causes planners to make plans which, if implemented, contribute to growth in traffic volumes. Causal powers, mechanisms and conditions related to three different, but interrelated issues are studied: the expert knowledge, the planners, and the plan-making processes (and more could have been added). It is expected that the explanations will be multi-causal.

2.2.4 The transitive and intransitive objects of science

According to Danermark et al. ([1997] 2002:200), “The realist element in critical realism indicates that it assumes that an external reality exists, independently of our conceptions of it”. This reality is the *intransitive* object of science. This regards for instance how developments of land use, transport-systems, travel behaviour, and traffic volumes are interrelated – regardless of what we know about it. It also regards how plan-making processes occur and often result in plans which cause growth in urban road traffic volumes – regardless of what we know about this.

Science is about trying to improve our understanding of the world, and to describe reality (the intransitive object) as ‘true’ as possible through theories and notions. These attempts to describe reality compose the *transitive* dimension of reality. The expert knowledge in question is one example of the transitive dimension of reality. This dissertation is an example of an attempt to contribute to improving the description of the plan-making processes and what it is about these processes that causes them to contribute to growth in traffic volumes. The transitive dimension is socially constructed, and changes continuously.

Social science, in contrast to natural science, seeks knowledge about a reality that is both socially *produced* and socially *defined*. When doing social science, we often interpret people's interpretation of the reality. This is often discussed as the double hermeneutics of social science (see e.g. Bhaskar [1979] 1989). Further, the knowledge we produce about the social world (how changes of land use and transport-systems affect traffic volumes, how the ways plan-making processes proceed affects the traffic generating potential of the plans), affect how social agents act, it may cause it to change. Often, as in this dissertation, this is the aim of the work.

2.2.5 Stratification and emergence

Stratification and emergence are central elements in critical realism ontology and epistemology. According to Danermark et al. ([1997] 2002:70) "mechanisms belong in separate hierarchically arranged strata of reality, where each stratum is composed of mechanisms from underlying strata. At the same time, this composition results in the emergence of qualitatively new objects, having their own powers and mechanisms, which cannot be reduced to more basic strata". This means that a phenomena or a mechanism at a certain stratum cannot be reduced to components belonging in lower strata.

This also means that social phenomena are understood as produced by mechanisms within different strata of reality, and that these mechanisms together produce a specific event. According to Danermark et al. ([1997] 2002:63) "What mechanism or mechanisms we choose to concentrate upon is decided by what our study object is, and the purpose of our study. [...] several theoretical perspectives and approaches may be necessary. [...] In many cases, the underlying strata can be taken for granted and our main concern is those mechanisms which constitute the stratum where our own research problem belongs; that is to say we keep to that which is emergent within 'our own' stratum (at the same time we are conscious that there are mechanisms within other strata that also lay down conditions)".

When asking how and why plans are made which cause growth in urban road traffic volumes, the causal powers and mechanisms involved in producing such plans may hence be found in different strata. Since "the objects of social science are relational – they are what they are by virtue of the relations they enter into with other objects" (Danermark et al. [1997] 2002:45), the properties we are looking for in social science are relations between social objects. In this dissertation, causes, mechanisms and conditions will be sought in relation to the three issues 'expert knowledge', 'planners' and 'plan-making processes'. These are all social objects.

The expert knowledge in question regards interrelations between human beings and built structures. Whether built structure can be understood as social structures may be discussed in several ways. This is not a main question in this work, since plan-making processes are the main objects of study, and not how land use, transport-systems, travel behaviour and traffic volumes affect each other. Therefore I simply assume that the land use structures and the transport-systems are social phenomena in my discussions.

2.2.6 Structures and agencies

Critical realism understands structures and agencies (people acting) as belonging in separate strata, hence possessing different properties and power. It is emphasised that one should study the interplay between these, rather than to focus on one or to see one as superior to

the other. This is formalised in “the Transformational Model of Social Activity” (Bhaskar 1989:77).

Danermark et al. ([1997] 2002:180) emphasise the importance of distinguishing between agency and structure: “agency and structure are not two elements of the same process; instead we have to deal with two different phenomena”. The agency is the acting actors, that may set up goals and that may act. A social structure cannot do any of these. Social structures, such as the built environment or the PBA, enable actions, and set limits for what actions are possible.

The actors and the structures are essential for how the other is moulded. “[S]ocial structures are always the context in which action and social interaction take place, at the same time as social interaction constitutes the environment in which the structure is reproduced or transformed” (Danermark et al. [1997] 2002:181). The structure enables and constraints the agents and the agents reproduce and transform the structure. This necessarily involves a dynamic perspective, meaning that the social structures as well as the agencies are constantly changing.

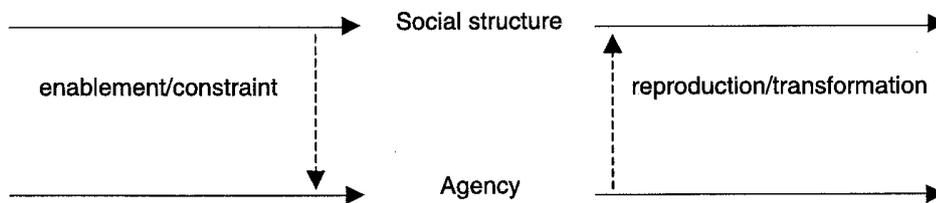


Figure 7: The transformational model of the connection between social structure and agency. Facsimile from Danermark et al. ([1997] 2002:180) referring to Bhaskar (1993:115).

This fits well with how planning theory understands the interplay between the built environment (land use, transport-systems) and the people using them. It also fits well with how the interplay is understood here between the structure defined by the PBA and the formal planning system and the agents acting within these structures and producing plans. These plans will to various degrees cause changes of the structure constituted by the built environment, and which cause that people (agents) act within this structure in ways which cause more or less traffic and GHG emissions.

A challenge when doing planning research is to distinguish clearly between the different structures and agencies involved in the system of double (at least) organised complexity, and at the same time including these in the discussions. I have tried to solve this by conceptualising the problem as ‘a problem of double organised complexity’.

At least three agent – structure relations need to be included when asking how and why plans are made which cause growth in traffic volumes, when focusing on the variables expert knowledge, planners and plan-making processes, as listed below.

The interplay between the built environments and the agents using them:

- i) the spatial structure defined by land use and transport-systems which enable and constraint how agents using these system act and how much traffic volumes and GHG emissions they produce

How and why planners make plans which, if implemented, cause growth in traffic volumes

- ii) agents acting within these structures and causing more or less traffic and GHG emissions (through individual optimizations and decisions), and at the same time changing the structures by their use of them

The interplay between the built environments and those planning changes of them:

- i) the spatial structure defined by land use and transport-systems which enable and constraint which changes the planners can propose
- ii) agents doing transforming the structures of land use and transport-systems through societal planning and implementation of such changes in ways that cause more or less traffic and GHG emissions

The interplay between the PBA and the planning system and those making plans:

- i) the structure defined by the PBA, the planning system and established practices enable and constrain planning and plan-making conducted by the many actors involved
- ii) the agents involved in planning and plan-making acting within the structure defined by PBA etc. and making plans which cause more or less traffic and GHG emissions, and at the same time transforming this structure in ways which may make it help producing plans that cause more or less traffic and GHG emissions

Another intersection regards the agents using the spatial systems and causing changes which those doing societal planning respond to.

The main focus in this work is on how agents cause changes in land use and transport-systems through making plans for concrete changes of these structures, which contribute to cause the agents to change their ways of acting in either traffic-increasing or traffic-reducing ways. Hence, this is a problem of double organised complexity. The understanding of the agent – structure relation in critical realism is potentially very helpful when doing planning research.

2.3 Epistemology – how we can get knowledge about the world

Epistemological questions concern, according to Chalmers ([1978] 2006:213), “how scientific knowledge is vindicated by appeal to evidence, and the nature of that evidence”. This could be understood as the question of how we assume that we can know something about the properties and relations of the entities assumed to exist, and how they work. It follows that the epistemological approach will have implications for which methods we can apply in order to gain knowledge about a phenomenon.

Critical realist authors emphasise that the main task for science is to explain phenomena, to figure out why what happens actually happens. This involve to revealing the causal powers that cause something to happen, the mechanisms through which these powers may act, and under which conditions. They should also include descriptions of how other active mechanisms which may be present in different situation affect the event produced, or in other words, how different mechanisms manifest themselves under specific conditions.

The intention of this work is likewise to be able to *explain* how and why planners make plans which, if implemented, cause growth in traffic volumes.

2.3.1 Three domains of reality

An important understanding in critical realist ontology, which has strong epistemological consequences, is that these causal powers and mechanisms are not directly accessible to us through empirical observations. With reference to Bhaskar (1978), Danermark et al. ([1997] 2002:20) describe ‘the three domains of reality’: the empirical, the actual and the real.

The empirical domain consists of what we experience and observe, including those events that are observed by scientists and thus become empirical data (e.g. measuring changes in traffic volumes). *The actual domain* consists of the events that happen, whether we experience them or not (e.g. the many changes of land use and transport-systems, and the individual changes of location and travel behaviour). *The real domain* also includes that which can produce events in the world, the generative mechanisms, whether these at the moment are activated or not. These three domains could also be understood as our experience of events, the events themselves and that which cause the events.

	Domain of Real	Domain of Actual	Domain of Empirical
Mechanisms	X		
Events	X	X	
Experiences	X	X	X

Figure 8: Mechanisms, events and experiences, and their relations to the domains of real, actual and empirical. The figure is presented in Collier (1994) with reference to Bhaskar (1978).

Critical realism opposes what is called ‘the epistemic fallacy’, the scientific focus on the empirical domain or on ‘event regularities’ as Sayer ([1984] 1992) frequently expresses it. This results in reduction of the three domains to the empirical one, and also “reduces what is to what we can know about it”, according to Danermark et al. ([1997] 2002:21), which continue: “Scientific work is instead to *investigate and identify relationships and non-relationships, respectively, between what we experience, what actually happens, and the underlying mechanisms that produce the events in the world*” (italics in original).

2.3.2 Open and closed systems

The discussion of *open and closed systems*, and hence the *possibility of experiments* in natural sciences and social sciences respectively, is a key to understand the ideas of critical realism (Collier 1994). In order to conduct an experiment to for example test Newton’s law of universal gravitation¹⁰, a closed system needs to be established where other forces than gravity (such as air or wind) are removed. The hypothesis of the law of gravity cannot be tested in a natural existing (on earth) open system. If it was, it would have been wrongly falsified. This is because of the multi-causality of almost all events; other causes and

¹⁰ Every point mass attracts every other point mass by a force pointing along the line intersecting both points. The force is directly proportional to the product of the two masses and inversely proportional to the square of the distance between the point masses: $F = G (m_1 m_2 / r^2)$, where F is the magnitude of the gravitational force between the two point masses, G is the gravitational constant, m_1 is the mass of the first point mass, m_2 is the mass of the second point mass, and r is the distance between the two point masses.

mechanisms would have affected the experiment and caused a different event than if only gravitation was affecting it.

According to critical realism, social science can never perform experiments the way this is done in natural sciences, since one cannot (for a number of reasons) create closed systems where experiments of social sciences may take place. Instead of experiments, critical realism claims that the focus in social sciences should be on *conceptual abstraction* (Danermark et al. [1997] 2002:40).

That the generative mechanisms in open systems may or may not produce certain events, and the fact that the generative mechanisms which cause events are located in the real and not in the empirical domain, are the main arguments why critical realism claims that the search for event regularities will not be helpful when aiming at explaining phenomena in the world.

If planning research is organised as searches for event regularities, exactly these problems arise. This goes for studies of how land use and transport-systems affect traffic volumes, as well as for how plan-making processes are carried out and how this affects which kinds of plans that are made.

2.3.3 Generalisation

Scientific *generalisation* in critical realism refers to transfactual conditions, to “the more or less universal preconditions for an object to be what it is” (Danermark et al. [1997] 2002:77), and which are found in the domain of the real. The scientific work in critical realism research is oriented towards revealing this, to isolate what is the basic constituent of an object, what is necessary for something to be what it is and have the causal powers it has, what *in general* explains why something happens.

This could for instance regard *what it is about* urban land use and transport-systems which enables them to produce certain traffic volumes, and why certain developments of urban land use and transport-systems cause growth in urban road traffic volumes while other changes cause reduction. It could also be what it is about plan-making processes which enable them to produce plans that contribute to either growth or reduction of urban road traffic volumes, and how certain changes of entities of the plan-making processes may contribute to either more or less traffic-generating plans being made. The aim of this work is to isolate the transfactual conditions causing that traffic-increasing plans are made.

2.3.4 Predictions

Knowing this will, however, not enable us to make accurate and reliable *predictions* about the occurrence of concrete future events. In order to be able to predict a future event, knowledge regarding the transfactual conditions causing certain events (‘general knowledge’) in certain contexts and under certain conditions is necessary. In addition, precise and detailed knowledge about the concrete context and condition at hand are necessary in order to predict which causal powers and mechanisms will be present, which mechanisms will be triggered, and how these will interact and mediate each other.

Such concrete and detailed knowledge about future contexts and conditions is rarely available. This lack of empirical knowledge about the future together with the complexity of the real world, are the main reasons why accurate and reliable predictions about social objects are hardly possible. Some social systems may be understood as partially closed

systems, where the chances of knowing more or less certain what will happen in the future is higher than in totally open systems.

However, by providing general knowledge about structures, mechanisms and interactions between these, about the necessary conditions for the existence and the activation of the mechanisms, and in some cases about the way conditions mediate their effects, important tools are provided for guiding our actions in order to achieve or prevent defined future events. This is exactly how such knowledge is (or is supposed to be) used in planning.

2.3.5 The emancipatory potential of social science

Within critical realism, the emancipatory potential of critical social science is emphasised, see e.g. Bhaskar (1989:2) or Danermark et al. ([1997] 2002). The main idea is that what happens in the world is caused by structures¹¹ and mechanisms which are not directly perceivable. Only if we gain knowledge of the existence of these mechanisms and structures and how they work, we can critically examine them and replace unfavourable structures and mechanisms with more favourable ones.

Even if not all scientific work needs to have explanation as aim, “it is the very possibility of determining causal conditions, or causal relations, underlying various kinds of events, which has been central to science. If we know what underlies a certain course of event, we can also – this is the assumption – intervene and direct future courses of events and make them correspond better with our intentions and purposes in various ways. Alternatively, if we find that we cannot influence the course of events, we can still, by predicting it, better adjust accordingly” (Danermark et al. [1997] 2002:52). This is also compatible with Flyvbjerg’s (1991a, 2004) ‘phronetic planning research’, where the final question which needs to be answered is ‘What, if anything, should we do about it?’

In my case, this means that if we do understand the mechanisms, conditions and underlying structures causing the phenomenon ‘planner make plans which, if implemented, cause growth in traffic volumes’, we may also understand what could be *changed* in order to improve the chances that such plans are stopped or not made. This could cause that plans which contribute to reduction of urban road traffic volumes and GHG emissions were made instead.

2.4 Research design

Critical realism authors argue that in order to reveal the mechanisms hidden in the ‘real domain’, research processes need to move from the concrete to the abstract and back to the concrete. Danermark et al. ([1997] 2002:109-111) have described this research process in six stages, including description, resolution, abduction, retroduction, comparison and concretisation. Their descriptions of the research process and the tasks involved have inspired the research design in this thesis.

2.4.1 Overall research design

The overall research design consists of several parts, and these are briefly presented here. More concrete descriptions of how the actual research is organised is presented in the

¹¹ Referring to structures of natural or societal objects, not the structure discussed under ‘structure and agency’.

following sub-chapter, while the detailed descriptions of which methods are applied and how follows thereafter.

In chapter one, the problem to be solved was described and the research question posed. The problem was conceptualised, arriving at the main ontological understanding of the problem as one of double organised complexity. The three explanatory factors that will be studied were defined.

The scientific and methodological approaches are accounted for in chapter two, and this also includes this description of the research design.

Each of the three selected explanatory factors are abstractly explored in chapters four to six respectively, in order to arrive at potential explanations regarding how causal powers embedded in these structures may contribute to that traffic-increasing plans are made, through which mechanisms and under which conditions. The findings from each abstract exploration are critically examined through empirical research, including a survey among planners, general interviews with planners, and a case study of four plan-making processes. Each chapter is concluded by explanations of how and why properties of this specific structure may contribute to that traffic-increasing plans are made, and proposals for how this can be changed.

Danermark (*ibid*) as well as Bhaskar (in lecture) emphasise that how the research is conducted - how it is approached and which methods are applied – depend on the problem and issue, as well as on where in the research process the topic is. Problems and issues that are well studied and understood need to be researched in other ways than problems and issues that are less studied and explained. The three structures studied here are different, and hence they have been approached differently.

In chapter seven, overall discussions and analyses are conducted in order to arriving at potentially and likely explanations how and why traffic-increasing plans are made, drawing on the analyses and findings in previous chapters. Here, a main aim is to see how the three explanatory factors interact in producing traffic-increasing plans. In chapter eight the findings are summarised as conclusions, and in chapter nine the focus is on what - if anything - should be done about it. Suggestions for further research are presented in chapter ten.

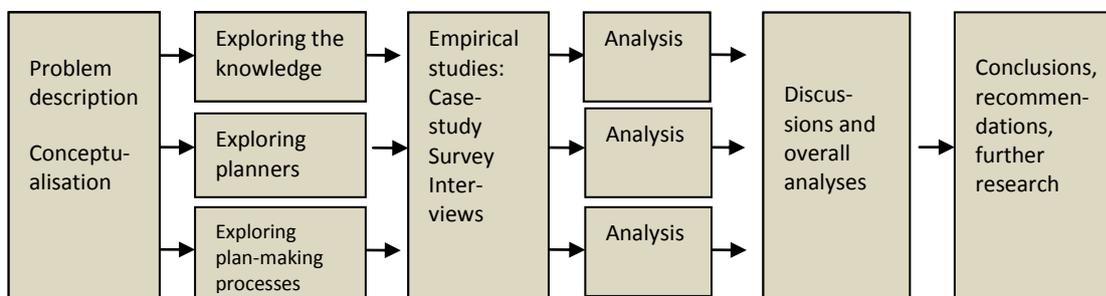


Figure 9: Overall research design.

Description and summary of the interviews are reported in appendix A, the case study in appendix B and the questionnaire for the survey in appendix C.

2.4.2 More about the research carried out

2.4.2.1 Several layers of iterations between the concrete and the abstract

The aim of the studies is to isolate and understand the transfactual conditions causing things to happen; the causal powers and the mechanisms. These are located in the domain of the real, which we cannot experience directly. In order to gain knowledge about the real, the research needs to involve movements between concrete studies of the domains of empirical and actual, and abstract studies aimed at understanding the domain of real. These movements between the abstract and the concrete are going on in all the tasks in this work. Arriving at relevant and good explanations often requires several iterations.

In research processes, as in this one, there are often several layers of this kind of processes. First, the main problem is described and analysed, arriving at potential explanations. These need to be described and analysed through the same kinds of processes, arriving at various properties of the object that need to be studied. These objects need to be described and studied etc. Within each of these steps, we move from the concrete to the abstract and back, and use retrodution, abduction and the like, in order to disclose the structures of the object and how it works (causal powers, mechanisms, conditions).

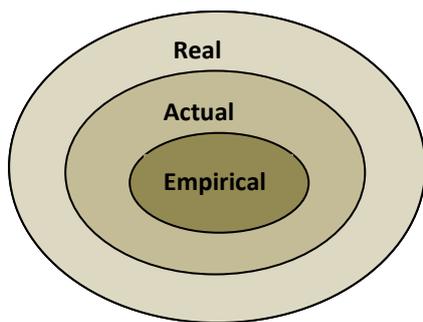


Figure 10: Three domains of reality.

In this research process, there were for instance movements between the concrete research question and the abstract conceptualisation of double organised complexity, and back to concrete factors to study. There are also movements between the more abstract descriptions of these factors in chapter four to six and the examination of these factors with the help of empirical studies. These steps are carried out several times within each chapter.

All chapters have been under development throughout the research- and writing-process, as my understanding of the problem developed. Relevant causal powers and mechanisms were revealed through abstract analyses, and applied when defining frameworks for the case study. The concrete case study provided deeper understandings, which allowed enriched abstract analyses and improved frameworks for the case study, and so forth (see Bergene 2007 or Yin [1994] 2003: 47-53 for arguments why this is a good way of doing case studies). This report does hence not describe my efforts chronologically from start to end. In my experience this is a quite normal procedure for research processes.

2.4.2.2 Problem description, analytical resolution and conceptualisation

Stage one in an explanatory research based on critical realism, is to “describe the concrete and often complex and composite event or situation we intend to study” (Danermark et al. [1997] 2002:109). In the second stage, analytic resolution, “we separate or dissolve the

composite and the complex by distinguishing the various components, aspects or dimensions” (ibid), since “it is never possible to study anything in all its different components. Therefore we must in practice confine ourselves to studying certain components but not others”. In other words, we need to start the conceptualisation from the concrete phenomenon at hand to abstract concepts. The phenomenon is to be divided analytically into a number of imaginable causal components.

This has been done in chapter one. Three main structures to study were distinguished in order to explain how and why traffic-increasing plans are made: the expert knowledge, the planners, and the plan-making processes.

2.4.2.3 Describing, exploring and empirically examining each explanatory factor

Each of these issues were explored, described and analysed in chapter four to six. These explorative and abstract analyses are quite lengthy. Plans are produced in fine-grained processes with many actors applying their objectives, knowledge and powers in a complex interplay. In order to investigate and identify relationships between what we experience, what actually happens and the underlying mechanisms that produce the events (plans which, if implemented, cause growth in road traffic), quite detailed descriptions and analyses are necessary.

Unfortunately, neither the expert knowledge, nor the planners nor the plan-making processes had been described or analysed in ways that I felt I could use directly in my studies, in any of the literature I searched. Hence, I found that I had to produce the descriptions, frameworks and analyses myself.

Describing structures and causes – arriving at potential explanations

The influence of critical realism on this work has caused a strong focus on describing the ontology of the object under study – its structure, the causal powers inherent in this structure, the mechanisms through which these causal powers may work, what the object can do and with what strength, under which conditions and in which contexts. If this is understood, explanations may be produced for how and why certain events occur.

According to Sayer ([1984] 1992:91), the structure of an object can be discovered by asking questions like: “What does the existence of this object (in this form) presuppose? Can it exist on its own as such? If not, what else must be present? What is it *about* the structure that makes it do such and such?” The exploration of each explanatory factor starts out with a structural analysis, in order to describe what it is about this object or structure which may contribute to that traffic-increasing plans are made.

Following from this, causal analyses have been conducted, asking what it is about this structure which may make it contribute to production of traffic-increasing plans. Causal analyses aim at explaining process and change, or how and why what happens actually does happen. Retrodution is an important tool. This is described by Danermark et al. ([1997] 2002:96) as “a mode of inference, by which we try to arrive at what is basically characteristic and constitutive of these structures” and as a “thought operation through which we can move from knowledge of one thing to knowledge about something else”. It is fundamental in retroductive reasoning to asking questions like ‘How is this phenomenon, X, possible?’, ‘What properties must exist for X to exist and to be what X is?’, or ‘What makes X possible?’ We move from knowledge about a concrete phenomenon to transfactual knowledge about what may cause the phenomenon.

By discussing questions like these, with the basis in the concrete phenomenon, the aim is to discover what is causing something to happen; through which mechanisms the powers may act; and what the necessary conditions are for mechanisms to be triggered and causal powers to be released. In our case, this could be translated to: ‘How is production of a plan which cause growth in urban road traffic volumes possible?’ or ‘What properties must exist in order for the plan-making processes to produce traffic-increasing plans?’, or – alternatively - ‘What properties must exist for a plan causing reduction of traffic volumes to be stopped or changed?’ or ‘What makes production of a traffic-reducing plan possible?’

Abduction is often applied in order to bring in alternative theories and knowledge for describing, interpreting and understanding the structure of the object. Concrete, empirical studies are often useful. Through several turns of retroduction, abduction, induction and other kinds of analyses, and often after rejection of numerous new potential explanations (often by applying deduction), we may arrive at a number of more promising explanations.

Concretisation and contextualisation

Having produced and critically analysed a number of relevant explanations, the next stage regards concretisation and contextualisation. This involves to “examining how different structures and mechanisms manifest themselves in concrete situations” (Danermark et al. [1997] 2002:109). The focus is on how mechanisms interact with other mechanisms at different levels and under different conditions. Through this stage one tries to interpret the mechanisms in different contexts, and to contribute to explain the concrete events and processes. It is essential to distinguish between the more structural explanations and the more accidental ones. This stage is stressed as to be of particular importance in applied sciences.

The potential explanations from the abstract analyses of each explanatory factor are examined through various empirical studies in this work; a survey, two interview-studies and a case study of four plan-making processes. Broad and summarising answers are presented to how for instance properties of the expert knowledge in question can contribute to explaining how and why planners make traffic-increasing plans. It is discussed what could be done in order to change the situations towards plans causing reduction of traffic volumes instead of growth.

2.4.2.4 Analyses, discussions, conclusions and recommendations

Based on the abstract and concrete studies, and the findings in the discussions of each explanatory factor, overall discussions and overall analyses are conducted in chapter seven. Here, the aim is to isolate the transfactual conditions embedded in ‘the structure of plan-making’, which cause that planners make plans which, if implemented, cause growth in urban road traffic volumes. This also involves a critical discussion of how planners *frame* the problem, and how this affects whether traffic-increasing plans are made.

In the conclusions, answers to the problem addressed in the research question are presented. Recommendations for ‘what, if anything, we should do about it’ are suggested.

2.5 More about the methods applied

Several different methods were applied in order to explore and analyse the problem at hand and the promising explanations. This is in line with critical realist authors. Danermark et al.

([1997] 2002:41) emphasise that “the nature of the object of study determines what research methods are suitable”.

2.5.1 Structural and causal analyses

Throughout the dissertation, and in almost all chapters, various forms of structural and causal analyses have been conducted. They have been applied when defining which parts of the problem to include in the study, which research question to ask and in which parts of the structures to search for answers. Further, they have been applied when discussing which properties of e.g. the expert knowledge that may be relevant when explaining how and why traffic-increasing plans are made. They have also been applied in different ways in analysing the cases and when doing analyses. Hence, the structural and causal analyses have been important parts of this work. They are described below on the basis of Sayer ([1984] 1992) and Danermark et al. ([1997] 2002).

2.5.1.1 Structural analyses

Why structural analyses are conducted

When studying a social phenomenon, it is necessary to define in which parts of the social reality the explanations for the events we aim at explaining may be found and which are included in the particular study. The objects of social science are relational, and in every given situation there will be a number of different kinds of relations. Structural analyses are conducted in order to isolate the object of study and to ensure that it is likely that relevant answers can be found within our object of study.

Sayer ([1984] 1992:92) defines structures as “sets of internally related objects or practices”. The structure is constitutive for the social phenomenon we are interested. In the structural analysis, the aim is to abstract or isolate the particular structure in which the powers causing a certain event are embedded. The idea is to separate what is characteristic and constitutive of the study object, and which enables it to produce certain effects.

In order to ensure that the particular structure has been found which is related to the nature of the object under study (the expert knowledge, the planners, the plan-making process) and the purpose of the study (explaining how and why plans are made which cause growth in urban road traffic volumes, with special focus on the expert knowledge in question), structural analyses have been conducted.

How structural analyses are conducted

According to Sayer ([1984] 1992:91), the structure of an object can be discovered by asking questions like: “What does the existence of this object (in this form) presuppose? Can it exist on its own as such? If not, what else must be present? What is it *about* the structure that makes it do such and such?”

In structural analysis, one distinguishes substantial relations of connection and interaction from formal relations of similarity or dissimilarity. “Clearly, things which are connected need not to be similar and vice versa”, Sayer ([1984] 1992:87) clarifies. Among the substantial relations, critical realist authors distinguish between internal and necessary relations in the object under study, and external and contingent relations. For the object under study (the expert knowledge, the planners and how they relate to the expert knowledge, and the plan-making process in the present case), the internal relations are the necessary for the object to exist, they define the object.

According to Bhaskar (1989:42), as referred in Danermark et al. ([1997] 2002:46, italics in original), “A relation R_{AB} may be defined as *internal* if and only if A would not be what it *essentially* is unless B is related to it in the way that it is”. The internal relations can be asymmetrical in the sense that the object A in the relation can exist without the other object B, while object B cannot exist without this relation to object A. The internal relations determine, according to Danermark et al. [1997] 2002:187) “what it is that exists”. The external relations are contingent. They “do determine whether and how that which exists will manifest itself” (*ibid*). The distinction between necessary and contingent has, according to Sayer ([1984] 1992:89) “nothing to do with importance or interest – either kind of relation may be insignificant or important”.

The last of Sayer’s questions is: What is it *about* the structure that makes it do such and such? In our context that could be: What is it about this object (the expert knowledge, the planners, the plan-making processes) with their structures which causes plans to be produced which cause growth in urban road traffic volumes? What are the potential causes for this to happen, embedded in this structure? This question is asked for all the three structures, in order to reveal their causal powers to produce or contribute to the production of traffic-increasing plans.

2.5.1.2 Causal analyses

Why causal analyses are conducted

While the structural analysis aims at describing what the object under study consist of and its causal powers, the causal analysis aims at describing how the object *works*, under different conditions. Causal analysis aim at explaining process and change, or how and why what happens actually does happen.

Causality concerns, in critical realism, “the ‘*causal powers*’ or ‘*liabilities*’ of objects or relations, or more generally their ways-of-acting or ‘*mechanisms*’” (Sayer [1984] 1992:104-105, italics in original), and to ask for the cause of something is “to ask what ‘makes it happen’, what ‘produces’, generates,’ ‘creates’ or ‘determines’ it, or, more weakly, what ‘enables’ or ‘leads to’ it”. Causal descriptions are accounts for what produces change.

How causal analyses are conducted

In a causal analysis we search for knowledge of how processes of change work. We want to understand the continuous process by which C(ause) produces E(vent). “This mode of inference in which events are explained by postulating (and identifying) mechanisms which are capable of producing them is called ‘*retroduction*’” (Sayer [1984] 1992:107).

Retroduction is described as an indispensable mode of inference in knowledge production in social science as perceived in critical realism, with its emphasis on transfactual mechanisms and structures. “Social reality consists of structures and internally related objects containing causally operating properties. Knowledge of this social reality can only be obtained if we go beyond what is empirically observable by asking questions about and developing concepts of the more fundamental, transfactual conditions for the events and phenomena under study” (Danermark et al. ([1997] 2002:96). It is fundamental in retroductive reasoning to asking questions like ‘How is this phenomenon, X, possible?’, ‘What properties must exist for X to exist and to be what X is?’, or ‘What makes X possible?’

2.5.2 Survey among planners

How the actors involved relate to the expert knowledge in question and to this specific objective, affect whether the expert knowledge regarding how to develop land use and transport-systems in order to reduce urban road traffic volumes is used in a plan-making process.

Hence, it seemed interesting to map how planners as group relate to the expert knowledge and objective in question. A survey was carried out in order to gain knowledge regarding whether planners see reduction of urban road traffic volumes as a prominent objective, and whether they know and agree with the expert knowledge in question (reported in Tennøy 2005, 2007).

Questions were asked regarding how the objective of reducing urban road traffic volumes is understood and prioritised in relation to other objectives, whether the measures recommended by the expert knowledge is believed to deliver traffic reduction, and who has more and less power in planning processes.

Planners working with land use planning, transport planning or land use and transport planning, for private and public employers, in the three largest cities in Norway (Oslo, Bergen, and Trondheim) were asked to contribute in November and December 2004.

Distribution of questionnaires to relevant professionals was not easy. E-mails with the questionnaire attached were sent to a long list of persons working at planning authorities' offices, at road authorities, consultant firms, research institutions etc., with a call to forwarding the questionnaire to other persons working with land use and transport planning in the largest cities. This worked somehow, and 82 completed questionnaires were received. We cannot know whether this is a representative sample of professionals, since we don't know how 'the universe of relevant professionals' looks. The most typical respondent was a male civil engineer, aged 31 to 50 years, working in the Oslo-area. This corresponds with my pre-understanding of what the typical respondent would be like, and indicates that the sample is quite representative.

Rather simple statistical analysis were carried out, such as frequency distribution, cross tabulation and some regression analysis, using the tool SPSS. The findings from the survey are applied in chapters five and six. The questionnaire is attached in Appendix C.

2.5.3 General interviews with planners

The survey was followed up in 2004 and 2005 with interviews with 12 planners (mainly land use planners, transport planners and land use and transport planners), working for different employers in Oslo and the surrounding county Akershus. The planners had somewhat different disciplinary background possessing different roles and working for different authorities.

As part of the interviews related to the case studies carried out in 2010 and 2011, 22 interviews regarding more general issues related to properties of the planners, the expert knowledge and the objective in question were carried out with planners and other professionals working for different public and private employers in Oslo, Bærum, Trondheim, Skedsmo, Akershus and Sør-Trøndelag.

The interviews have been conducted as semi-structured interviews, mainly at the office of those interviewed. A pre-prepared interview guide was applied, but the conversations were also allowed to follow what the interviewees were interested in and knowledgeable about. The interviewer followed up with critical questions.

Most interviews have been taped. The interviewees have been asked to control and correct the minutes from the interviews. Almost all did so, and their proposals for changes have been obeyed. The interviews have been reported to the Norwegian Social Science Data Services according to Norwegian regulations.

The interviews were analysed in two different sections. In the 2004/2005-interviews, the main headings in the analysis were: Objectives; Measures; Competition between private car and public transport?; Road planning; Do planners and politicians possess the expert knowledge in question?; Which arguments are efficient in order to achieve changes towards reduced urban road traffic volumes; Power; others. In the 2010/2011-interviews, the main headings in the analysis-form were: In the 2010/2011-interviews, the main headings in the interview guide and the analysis were: The planners; Objectives; Knowledge; Is the development going in the right direction.

The findings from the interview study have been used in the discussions and analyses in chapters four and five. More detailed descriptions of how the interviews were conducted, as well as interview guides, the list of interviewees, and the analyses are found in Appendix A.

2.5.4 Case study of four plan-making processes

2.5.4.1 Why a case study was conducted

Critical realist authors strongly recommend to carry out empirical studies, in order to examine how the causal powers and mechanisms discovered through abstract or theoretical research manifest themselves in concrete situations, and under different conditions, and to examine their relative strengths (e.g. Danermark et al. [1997] 2002). The aim is to interpret the meanings of the mechanisms in specific contexts, and to contribute to explaining concrete events and processes. Danermark et al. (*ibid*) emphasise the importance of distinguishing between more structural conditions and accidental circumstances when doing empirical studies. Case studies are recommended as suitable for doing this.

A case study have been carried out in this work in order to examine whether and how the causal powers, mechanisms, conditions and explanations developed through the abstract analyses manifest themselves in concrete planning cases, as well as to study how and why the objective of reducing urban road traffic volumes and the expert knowledge regarding how to do this are either ousted or not included in the plan-making processes.

Flyvbjerg's (1991b) case study of rationality and power in Aalborg has been a strong inspiration for this work. It demonstrated how important understandings of how planning and decision-making are practiced, how and why planning processes turn out as they do, and why the urban structures develop as they do, preferably can be studied with the help of case studies. Flyvbjerg's (2004a) discussions and developments of case studies as method have further inspired the use of case study as method in this work.

According to Yin ([1994] 2003), case studies is an appropriate methodology in studies which aim to answer how- and why-questions, which regard present and on-going practices which the researcher does not control (in contrast to e.g. laboratory experiments). My research

question is definitely a question regarding how and why something causes something else to happen. The cases I study need to be contemporary in order to be relevant. There is no way I could (or should) control the actual behavioural events. My problem and my research question hence call for a case study approach.

Yin (*ibid*) also explains why case studies are recommendable in situations where the boundaries between the phenomena and context are not clearly separated, and where the number of variables is larger than the data points (the cases studied). These characteristics suit my case well. Despite hard work to define boundaries, there are still a high number of variables which need to be included in the study and the analyses. This represents a great challenge in this work, but I have not been able to reduce the number of variables, and hence narrow and sharpen the boundaries, any further.

Neither surveys nor archival analyses or quasi experiments would have been more helpful methodologies when studying the plan-making processes. Archival analyses, for instance of political decisions made regarding planning proposals which influence the development of land use or transport-systems, could have revealed whether politicians do or do not accept proposals which do or do not contribute to increase of traffic volumes. This would, however, not been helpful when trying to explain how and why this happens. Archival records of trends in development of land use structures and transport-systems have already been applied in order to establish that land use and transport-systems are continuously developed in traffic-increasing directions, but this is not helpful in explaining how and why such plans are made.

The previously described survey and interviews were conducted in order to reveal how planners and politicians *in general* relate to the objective of reducing urban road traffic volumes, how they relate to the research based expert knowledge about 'how to do it', whether they hold or understand this expert knowledge and whether they think the necessary strategies and measures for achieving reduced urban road traffic volumes are feasible. The findings in the survey and interviews provided some understanding about what causes the phenomena under study. They also provided important indications of what to look for in the case study. They could, however, not contribute to a deeper understanding of how and why what is going on in the plan-making processes results in plans which contribute to growth in road traffic volumes.

"Quasi experiments" could have been an interesting approach, and in some ways this approach is applied in the cross case analyses (Yin [1994] 2003:8). Here, cases, which are similar or different with respect to presumed important variables, are compared in order to analyse and discuss whether these particular differences or similarities seem to affect the dependent variables in distinct ways. However, the number of variables necessary to include in a study like this (in order to define the relevant contexts) make a pure quasi experimental design not well suited for the research question asked.

Hence, even though several approaches are useful in order to gain insight in the problem under discussion, it seems as in depth case studies is a most appropriate method in order to understand how and why the plan-making processes affect the resulting plans with respect to their traffic generating potential. This approach allows for including several variables, to relate to contextual effects, to apply various methods, and to arrive at good explanations.

2.5.4.2 What kind of case study that is conducted

The purpose of doing the case study was twofold; to describe *how* plans are made which cause growth in urban road traffic volumes, and to explain *why* this happens.

This is hence, in Yin's terminology, an explanatory case study, since the aim is to explain "the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies" (Yin [1994] 2003:15). In Stake's (1995) terminology, this is an instrumental case study, where the aim of the study is to learn something about a phenomenon or problem, rather than to learning more about the particular case.

The study includes four cases, and is hence a multiple case study. A single case study could have been chosen here. However, the pre-understanding was that there are multiple causal powers, mechanisms and conditions contributing to that plans are made which cause growth in urban road traffic volumes, and that it varies which are more influential in different cases. In order to be able to explore the breadth of causal powers, mechanisms and conditions, multiple cases were preferred. In that sense, one could assert that the study to a certain degree also is an exploratory case study.

2.5.4.3 How the case study is conducted

Flyvbjerg (2004:290-302) offers methodological guidelines for planning research. The guidelines emphasise that planning research needs to do concrete and empirical studies of planning practice, to get close to reality, in order to understand what is really going on. Flyvbjerg argues that by studying planning and policy not only as ideas, intentions, formal policy, legal framework and words, but also as actual realised physical, economic, ecologic and social reality, important insights on 'what could be done do about it' may be obtained. Case studies are emphasised as a good and necessary approach for doing so.

When doing case studies, Flyvbjerg (*ibid*) argues that one should emphasise 'little things', ask small questions, get feedback on ones understandings and interpretations, ask 'How ' in addition to 'Why' and always consider context as part of the situation. One should also focus on values, place power at the core of analysis, look at practice before discourse, do narratives, and move beyond agency and structure. I have aimed at following these advices.

2.5.4.4 Which issues that are described

The case study was conducted in order to study the plan-making processes more in depth, and to examine how and with what strength causal powers and mechanisms manifest themselves in different contexts and under different conditions.

Four kinds of issues were observed and analytically described:

- The particular planning process, including what it regards, the main actors, which documents are produced, assumed effects on traffic volumes, the main conflicts, etc.
- The assumed traffic-increasing potential of the project
- The relevant objectives, knowledge and powers of the planners directly involved in the plan-making
- Where, how and why in the plan-making processes the objective and expert knowledge in question were excluded or ousted, and by which and who's objectives, knowledge and powers
- What the planners did, exactly, when making a plan which cause growth in traffic volumes

This also includes assessments of whether the analyses conducted are of high professional standards, whether they are transparent and so forth. Likewise, it was necessary to include descriptions of how the discussions and discourses leading to this way of making the plans - and hence to the planning proposals - is proceeding. This regards how planners debate, reason, analyse, agree, disagree and conclude when applying their knowledge and accomplishing their tasks in plan-making processes.

Not least, it includes describing who is saying what to whom, in which forms and for what reasons. Important here were also which objectives, aims, and concerns, as well as which kinds of knowledge and powers the actors present and apply in order to justify their arguments.

2.5.4.5 Case selection

The units to be studied in each case are plan-making processes of zoning plans and other operational plans. When deciding criteria for case selection, and when selecting cases, an important decision was whether to choose a number of similar cases with respect to certain criteria or to head for cases which are different from each other. By choosing different cases, the case study is made more explorative. Choosing similar cases would allow for more grounded explanations. Since this field of research is quite open, I chose to prioritise to gain knowledge about a wide range of causal powers, mechanisms and conditions which cause planners to make traffic-increasing plans. Hence, I aimed at maximum variation sampling.

The plan-making processes in focus are plan-making processes regarding zoning and other operational plans. The plan-making processes should regard developments in urban areas. The cases need to be on-going or recently adopted, in order to be relevant and in order to allow for the interviewees to remember details of the processes.

The case selection should include planning processes regarding: land use development (preferably including housing, working places, shopping facilities and public facilities); development of transport-systems (preferably road transport - including parking, public transport, bicycling and walking), and; co-ordinated land use and transport development planning.

Preferably, the case selection should include cases which (according to my judgement, based on the expert knowledge as described in chapter four) do and do not contribute to growth in urban road traffic volumes. Since there only is room for a limited number of cases, and since the research question regards how and why plans are made which, if implemented, *cause growth* in traffic volumes, it was decided that only such cases should be chosen. The analyses substantiating that these are traffic-increasing plans are included in each case-description.

Cases where there have been discussions regarding expert knowledge, where there are discrepancies between overall plans and the zoning plan that is studied, or where the zoning plans are clearly traffic-increasing according to the expert knowledge in question, were to be chosen.

Only Norwegian cases should be selected, both because these will be plan-making processes carried out under the same legal regime, because this will make the analyses and conclusions more relevant for the Norwegian context and because of convenience for the Norwegian researcher.

The main criteria for case selection are hence that they were:

- processes regarding plans which will affect development of land use and/or transport-systems, in urban areas
- processes which have resulted in plans which, if adopted, is assumed to cause growth in urban road traffic volumes
- processes which do include or involve discussions regarding the expert knowledge in question
- on-going or recently concluded planning processes
- zoning plans and other operational plans
- processes regarding both land use planning, transport-systems planning , and integrated land use and transport planning
- Norwegian planning processes

The main idea is to explore which causal powers, mechanisms and conditions that in general are involved in causing that traffic-increasing plans are made. Hence, the main criterion for case selection has been that the planning processes hold interesting debates, conflicts or discussions regarding knowledge and objectives with respect to this.

A screening of potential cases resulted in a longer list of promising cases. Several of these were disregarded because they did not meet all the criteria listed above. Among the ones that were still relevant, four cases were chosen. These are:

- Case Tunga: Car dependent office development in Trondheim, where the municipality has stated objectives regarding location of offices in a defined public transport corridor
- Case Økern: Development of the largest shopping centre in Oslo in a semi-central location, where the developer proposed to develop a far larger shopping centre than the planning authorities found optimal with respect to i.a. growth in road traffic volumes
- Case Skedsmo: Car dependent housing development in Skedsmo, despite objectives regarding to develop housing as central densification rather than in car-based locations
- Case E 18: Increased road capacity on urban motorway in Bærum, where the municipalities have stated objectives regarding reduction of GHG emissions

2.5.4.6 Methods for data gathering

Data were mainly gathered through document reviews and through interviews with planners professionally involved in the plan-making processes.

The documents studied were mainly formal documents produced by professional planners as part of the plan-making, such as planning programs, various analysis and prediction reports, environmental impact assessments (EIA), planning proposals, comments to the proposals by various actors, minutes from meetings at political level where the plans are discussed and adopted and so forth. Overall political steering documents, such as municipal land use plans, strategic sector plans, climate plans and the like, were relevant documents as well. More informal documents like minutes from internal meetings and preliminary notes regarding problems and possible solutions could hold interesting data, and were applied when this was useful.

Semi structured interviews with planners professionally involved in the plan-making processes have been an important data source. This regards especially data that may shed light on the interaction between the planners, which causal powers this interaction

possesses, through which mechanisms these causal powers cause that traffic-increasing plans are produced, and how context and conditions affect whether these mechanisms are activated and if they actually produce certain kinds of plans.

The planners who are interviewed are or have been professionally involved making the particular plans, and they are employed by the planning authorities, private or public project initiators, and other public authorities involved.

The interviewees were asked to read the minutes from the interviews, and to comment on and correct them. Normally, the changes suggested by the interviewee were complied with. The interviewees have also been asked to read and comment the case descriptions presented in the case-report, and about a third did. The interviews have been reported to the Norwegian Social Science Data Services according to Norwegian regulations.

Participant observations could have been an interesting method for data collection, but I was not able to apply this method in this project. I have, however, worked as a planner for six years and as a planning researcher and advisor for ten years. Through this, I have developed good insights into how plan-making processes and the interactions between the professional planners involved proceed. This is a strength in this work, but obviously also a potential risk. I needed to take care that my pre-understandings of how plan-making processes proceed did not stand in the way for my perceptions of what is actually going on in the particular cases.

The case study, including lists of interviewees and interview guides, is reported in Appendix B.

2.5.4.7 Internal analyses of each case

Internal analyses were conducted for each case, in order to arrive at an understanding of how, exactly (by which causal powers, mechanisms and conditions), a plan was produced that cause growth in road traffic volumes, and why this happened. The idea was to isolate, for each case, the main transfactual conditions that cause that traffic-increasing plans are made.

The presumably most relevant causal powers, mechanisms and conditions were disclosed in the theoretical or abstract analyses. These were related to three different structures: The expert knowledge in question; the planners directly involved in plan-making; and the plan-making processes.

The internal analyses in the case studies were hence partly a series of explorations of how the causal powers, mechanisms and conditions detected in chapter four to six were working in the various cases, as well as if they worked in the ways that the analyses had suggested. It was also necessary to keep eyes open for relevant and important causes, mechanisms and conditions which had not been discovered through the abstract analyses.

Each case is described with respect to various issues, as previously accounted. Parts of the descriptions that were listed are just as much analyses. This regards:

- The traffic-increasing potential of the project
- Where, how and why in the plan-making processes the objective and expert knowledge in question are excluded or ousted, and by which and who's objectives, knowledge and powers

- What the planners have done, exactly, when making a plan which cause growth in urban road traffic volumes

Based on the descriptions and the analytical descriptions of the cases, two concluding analyses have been conducted for each case:

- Explaining how and why this particular traffic-increasing plan was made in terms of causal powers, mechanisms and conditions
- Discussions regarding the relevance of the previously developed explanations with respect to the expert knowledge, the planners and how they relate to the expert knowledge, and the plan-making processes

This represents the main questions to be asked of the individual case, or level two questions in Yin's ([1994] 2003:74) terminology.

Conducting internal analyses of each case has several advantages (see e.g. Bergene 2007). One is that this produces several independent descriptions how the causal powers work through the mechanisms in different contexts and under different conditions, and hence opens for to gaining knowledge of the transfactual conditions causing certain things to happen (such as production of traffic-increasing plans). These can improve our understandings of the other cases, of the explanatory factors discussed in chapter four to six, as well as contributing to a deeper understanding of the phenomenon.

Another advantage is that the causes, mechanisms and explanations are not separated from the context and conditions, which often would be the case if only cross-case analyses were conducted. Further, one may analyse the cases in more explorative ways, searching for strong explanatory powers, which may contribute to improving our understandings. In comparative studies, one will often rather focus on certain factors and look for similarities and dissimilarities. The internal analyses are reported together in Appendix B.

2.5.4.8 Cross case analyses

After having conducted case studies of four planning processes, and conducted internal analyses as described above, cross-case analyses were conducted as part of the analyses of each explanatory factor and of the overall analyses.

The findings in the abstract studies of each explanatory factor were examined through the case study with respect to the specific factor. The idea was to study how the causal powers, mechanisms and conditions manifest themselves in real situations, and to enhance the understanding of how they work.

The cross case analyses in the overall analyses and discussions were supposed to allow for descriptions of causal powers and mechanisms that *in general* contribute to production of traffic-increasing plans, and especially which conditions that are necessary and important in this process. This was supposed to be an important contribution to the overall analyses regarding how and why plans are made which, if adopted and implemented, cause growth in traffic volumes, based on all analyses and findings. This was also meant to allow for analyses and discussions regarding which changes need to be made in order for plan-making processes to produce plans that contribute to *reduction* of urban road traffic volumes and GHG emissions.

2.6 Literature studies

An important part of this work has been reading. These readings have been grouped in six groups below, which are obviously overlapping. Several sources have been used for several of the tasks described below.

One group of readings is *theory or philosophy of science*. This is useful on its own accord, and trained as an engineer and planner as I am, my knowledge in this field was in need of improvement. As I realised that the explanations of the issues I was exploring, such as clashes of expert knowledge, among others were to be found in differences in ontological and epistemological understandings, the usefulness of readings in philosophy of science became even more important and interesting. Different strands within philosophy of science have been visited, but I have spent most time on critical realism, which I have found to be a very useful tool in my kind of research approach. Phronetic planning research has been another important source of inspiration.

A second group of readings has regarded methodology. This has been readings about case studies, critical discourse analysis, qualitative studies and more.

A third group of readings regards theory *of* planning. Some of the literature has been scanned rather than read, since the main idea was to get an overview of how planning theory has dealt with problems as the one explored in this dissertation. I have been especially interested in readings regarding the roles and knowledge of professional planners, and how they act. I understood that the position I am taking, that expert knowledge needs to gain more influence in planning processes, is controversial in present planning theory. I therefore needed to be able to defend this position, and that required quite some reading.

A fourth topic regards theories and knowledge *in* planning, about the interrelations between urban land use, transport-systems, travel behaviour and traffic volumes, and how certain changes of urban land use and transport-systems contribute to certain changes in traffic volumes. This has been my main field of knowledge, practice and research for 15 years, and I was quite well read on this topic before I started the dissertation-work.

A fifth group is readings about objectives, knowledge and power, as well as properties of planners and of the expert knowledge.

A sixth topic is literature about the understandings, theories, and methods of the planners, as well as of other professions, and how the understandings, theories and methods affect the analyses and the outcomes.

3. A brief introduction to the cases

Findings from the case study are applied when doing empirical examinations of findings in the abstract analyses. This regards how causal powers, mechanisms and conditions manifest themselves in concrete situations and contribute to planners making plans which, if implemented, cause growth in traffic volumes (this is frequently termed ‘making traffic-increasing plans’ for short). The cases are briefly introduced here, in order to make it easier to follow the analyses and discussions. The cases are thoroughly described and analysed in appendix B.

3.1 Case Tunga: Car-based office development

A car-dependent development of area-intensive work-places has been going on for years in the Tunga-area in Trondheim. This is not in accordance with intentions and objectives in overall plans and policies. They recommend that such developments should be located in the defined public transport corridor, in order to minimise growth in urban road traffic volumes and GHG emissions (Municipality of Trondheim 2008, 2009).

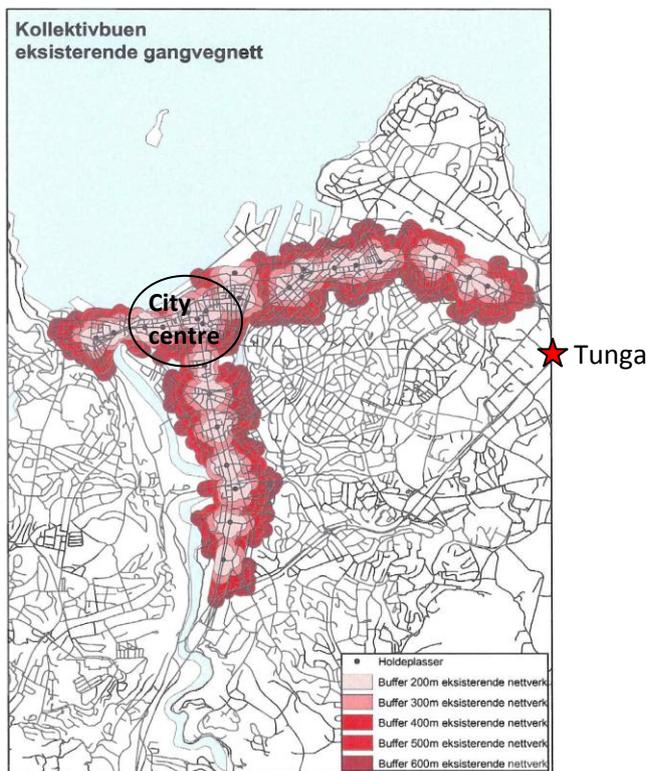


Figure 11: Illustration of the public transport corridor, existing pedestrian networks, and location of the project in question (red star), based on illustration in case-papers (Municipality of Trondheim 2009).

One zoning plan process resulting in a plan for development of a large office development at Tunga has been studied in depth, in order to understand how and why this car-based office development occurs.

When the initiators presented their first proposal, the planning authorities and regional authorities suggested to reducing it. The developers agreed to reduce their project

by about 50 %, to about 4.500 m² and 350 work-places. Nobody suggested to rejecting the plan, which would be the 'traffic-reducing' alternative. The arguments for this were that according to overall plans *most* office developments should be developed in the public transport corridor, and not here. The overall plans as well as the politicians were ambiguous with respect to what could be developed at Tunga. Previous practice has been to allow the initiators to build projects that are about half the size of the proposed projects.

The next zoning plans in the area were met by formal complaints from the County Governor. They called for overall discussions and analyses, and demonstrated that changes of the overall municipal plan were required if this practice was to continue. This process has been briefly studied as well, in order to increase the understanding regarding how and why the car-based office-developments had been allowed so far.

An explanation has been developed. It was found that the main causal power why the planning process was initiated was that the owners and developers wanted to develop the site (for reasons not further discussed in this work). Because of a number of conditions the objective 'reducing traffic volumes' was partly ousted, and a rejection of the traffic-increasing proposal was never suggested by anybody. The conditions regard mainly the combination of a relatively un-ambitious and ambiguous overall plan, competing objectives, political will and practice, and a practice evolved during the years allowing area-intensive developments in this area.

The authorities with power to file formal complaints did not do so. Hence, an alternative that did not contribute to increase road traffic volumes was never proposed, discussed, analysed, assessed or compared to the other alternatives.

The planning authorities recommended the politicians to adopt a plan for a reduced office development, which they did. A plan had hence been made and adopted which, if implemented, will cause more road traffic than if the intentions in the overall plans or recommendations based on the expert knowledge in question had been followed.

3.2 Case Økern: The largest shopping centre in Oslo

The case 'Økern centre' regards the zoning plan process for a large transformation area at Økern in Oslo. The real estate developer proposed to include a large shopping centre (60.000 m²) in the 160.000 m² development proposal. The planning authorities referred to the municipal sector plan for shopping and services, and proposed an alternative which includes 25.000 m² shopping centre (the total project is still 160.000 m²). The planning authorities' main arguments were that the developer's proposal will influence the retail structure in Oslo negatively, that it will contribute to increased road traffic volumes, and that it is not in accordance with overall municipal plans and national guidelines.

The developers needed to demonstrate in the planning process that their proposal was not a regional and car-based shopping centre. If they were not successful in this, public authorities would file formal objections, which could stop the project even if the City Council approved it. This resulted in an interesting battle of knowledge and objectives.

All actors exerted their powers at full force. The developers twisted the objectives as well as the knowledge. They produced in-transparent, biased, confusing and faulty analyses, which they presented in ways misleading readers to understand that the consequences with respect to traffic volumes, GHG emissions and retail structure were less severe than what

their analyses actually showed¹². This is confusing, especially for those not very knowledgeable in this topic. They did lobbying, and they threatened to shelve the project if they were not allowed to build the large shopping centre. The planning authorities presented their own alternative, pointed out problems with the initiators' and recommended the politicians to not adopt the initiators' proposal. The regional authorities warned about and filed formal complaints.

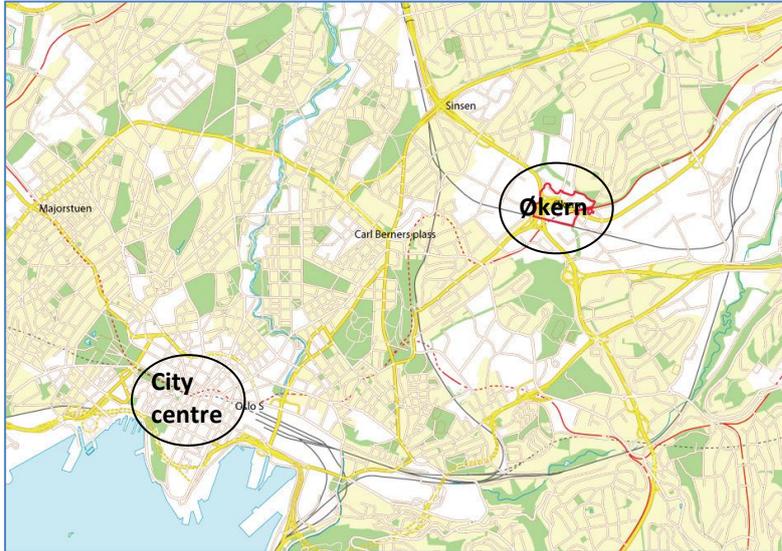


Figure 12: Localisation of the Økern area about four km from the city centre of Oslo, developed on basis of facsimile from Space group et al. (2010).

When explaining how and why the zoning plan proposal including a 60.000 m² shopping centre was made and presented for the decision-makers (the initiators' alternative), the main reason why the planning process was initiated was found to be that the developers (who had bought parts of the land in the area) wanted to develop the site (for reasons not relevant in this discussion).

Because of the conditions (a strong overall plan, knowledgeable planning authorities, a second alternative, warnings of formal complaints), the initiators needed to activate the mechanisms 'ousting the objective' and 'ousting the expert knowledge in question'. They did so by playing on objectives, knowledge and powers in several ways, and to cause confusion. They upheld the plan, and presented an impact assessment that were supposed to demonstrate that their plan was not in conflict with overall plans.

Because of the conditions, the planning authorities could work through the mechanism 'to bring the objective back into the process' and 'to bring the expert back into the plan-making process' by explaining how and why the plan actually is in conflict with the overall plans and by presenting a less traffic-increasing alternative. This allowed other authorities to work through the mechanism 'bring the objective back into the plan' by filing formal complaints.

The initiators succeeded in convincing the City Council, but not the public authorities with expertise in land use and transport planning. As this is written, the City Council in Oslo has

¹² This is well documented in Appendix B.

adopted the plan. Since the regional authorities upheld their complaints, the case was sent to the Ministry of the Environment for final decision.

3.3 Case Skedsmo: Car-based housing development

Despite objectives and strategies regarding to steer land use developments in traffic-reducing directions, the housing development in Akershus is still to a substantial degree taking place as relatively low density developments in car-based locations (see e.g. Furu 2010). This causes growth in road traffic volumes. This car-based development goes on parallel with housing developments as densification in central parts of the municipalities.

In order to figure out how and why plans for car-based locations of housing developments are made in Akershus, the municipality Skedsmo was chosen as case. Three zoning plans, regarding relatively low density developments of seven, 16 and about 450 dwellings respectively in car-based locations, were studied.

The on-going municipal plan process seemed to represent a change in how Skedsmo relates to this issue, and this process was studied briefly as well in order to enhance the understanding of the phenomenon.

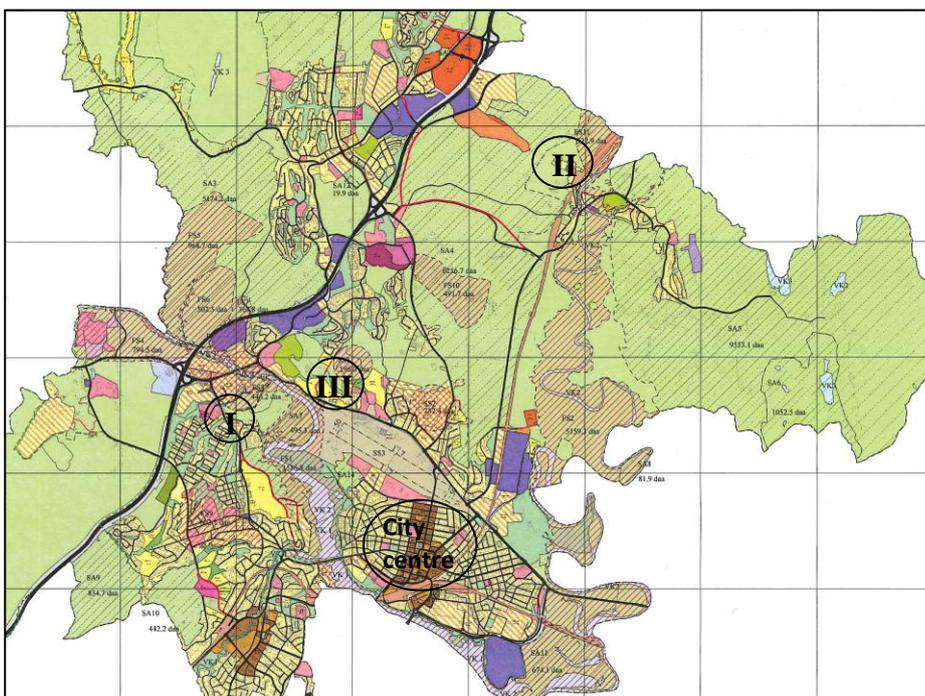


Figure 13: Municipal plan for Skedsmo (2011), where future housing developments are bright yellow. The locations of the zoning plans discussed are labelled I, II, and III.

An explanation was presented of how and why the three zoning plans had been made and adopted. The developers proposed plans for housing developments in car-based locations because this was beneficial for them (for reasons not relevant in this discussion). Because of the conditions, the mechanisms ‘the objective was not introduced’ and ‘the expert knowledge was not introduced’ were activated. Nobody brought the objective ‘reducing urban road traffic volumes’ into the plan-making discussions, nobody applied the expert knowledge in question, and nobody suggested to alter or to stop the plans. Hence, this alternative was not proposed, discussed, analysed, assessed or compared to the proposed projects

The main conditions contributing to this was mainly lack of clear objectives and strategies in the overall plan, that the planning authorities in general did not focus on this, and that other authorities did not focusing on this.

The planning authorities recommended the politicians to adopt the plans, which they did. Hence, plans had been made which, when implemented, will cause more road traffic than if the national guidelines and overall plans or the recommendations based on the expert knowledge in question had been followed.

3.4 Case E 18 west: Increased road capacity on urban motorway

The congestion and environment problems of the trunk road E 18 west of Oslo have been addressed for two decades. The road has today five to six lanes, and the traffic load is almost 90.000 cars per day on the heaviest sections (NPRA 2011a). There are public transport lanes all the way (except at every exit) in direction towards the city centre of Oslo, but only at short stretches in direction out of the city. More than 100 busses per hour are crossing the Lysaker River in the morning and the afternoon, and 10 % of these are regional express buses (*ibid*). The buses carry more passengers than the train at this crossing. Several residential areas are located close to the road.

Alternative ways of dealing with the problem have been discussed in a number of regional plans, large zoning plans and the like. NPRA have worked with plans for increasing the road capacity for at least 15 years. The professional milieus have analysed the problem several times, and every time arrived at the same conclusion: increasing the road capacity on E 18 west will in itself not solve the problems.

NPRA initiated in 2009 a new planning process for E 18 west, and the plan-making in this process is in focus here. New analyses have been presented of the effects of increasing the road capacity, and it has been found that the new road capacity may worsen several of the problems they are supposed to solve, if not correctly mitigated. The alternatives that NPRA work with at present involve to constructing a new road with increased road capacity. The question here is how and why the professional planners produce this planning proposal. The process is on-going.

It was found that the main cause why this plan is initiated is that especially the NPRA (owners of the road) and Bærum municipality (which inhabitants suffer from local environment problems and congestions) find that they have a traffic and environment problem that they need to solve. Because of the conditions, the objective and the expert knowledge in question are ousted in the plan-making process. This lead to that a traffic-reducing alternative is never proposed, discussed, analysed, assessed or compared with the other alternatives, and a traffic-reducing alternative will not be presented. The traffic-increasing alternatives were not challenged and stopped. The politicians will eventually either have to adopt a strongly traffic-increasing plan, or to reject the proposals.

Regarding objectives, NPRA prioritise 'good enough transport quality', especially for the business traffic, the public transport and the through-traffic. The municipal politicians focus on objectives related to improved local environment, and require tunnels. As the plan-making process develops here, these are conflicting objectives to 'reducing traffic volumes'. Since local authorities require tunnels, and the NPRA find that they need increased road capacity if there are long tunnels (for safety-reasons), their prioritised objectives together

require increased road capacity. Increased road capacity will cause and/or allow growth in traffic volumes (as all the involved planners agree). Hence, the actual prioritisation of the objectives caused that the objective 'reducing traffic volumes' in reality was ousted. This was reinforced by the presentation of the results from the transport model analysis claiming that achieving the objectives related to reduction of traffic volumes and GHG emissions are unrealistic.



Figure 14: E 18 west, photo from NPRA (2011).

Regarding the expert knowledge, it was introduced from the start, but ousted quite early in the process when the transport models were chosen as tool, since they were not able to deal with most of the traffic-reducing measures. None of the eight alternatives that were developed could contribute to reduction of traffic volumes. Since no traffic-reducing alternatives were developed and introduced in the plan-making process, and since transport models not dealing with most of the traffic-reducing measures were applied as tool, a traffic-reducing plan could not be developed.

The conditions contributing to this course of action were related to the properties of the expert knowledge, to the knowledge, experiences and roles of the planners involved, and to the plan-making processes. The expert knowledge has weaknesses allowing transport models to appear as the only relevant tool. This is partly because few of the planners involved are well trained in the expert knowledge in question, since it is mandatory to do transport model analyses in NPRA projects, and hence that the NPRA planners in charge of the plan-making process (as initiators) are trained in applying this tool and knowledge. They mainly frame this as an infrastructure-development, which is what they have more control of.

In the process, there were seemingly no planner(s) present who would and/or could and/or was responsible for bringing forward a traffic-reducing and otherwise acceptable alternative. Nobody called - with force - for a traffic-reducing alternative. This is probably also because of the clear signals from the local politicians. On the other hand, one could claim that the politicians have chosen their position partly because they have not been presented for an actual traffic-reducing alternative which also is otherwise acceptable.

4. The expert knowledge

4.1 Introduction

The first explanatory factor to be discussed regards whether and how *properties of the expert knowledge in question* may contribute to explaining how and why planners make plans which, if implemented cause growth in urban road traffic volumes¹³.

When asking the retroductive questions ‘How is conscious and systematic production of plans which cause reduction instead of growth in urban road traffic volumes possible?’ or ‘What properties must exist in order for the plan-making processes to produce traffic-reducing plans and to stop traffic-increasing plans?’, some of the answers are related to properties of the expert knowledge.

A main assumption in this work is that planners need to possess and to apply knowledge in plan-making processes in order to be able to make plans which contribute to reduction of road traffic volumes, and to assess plans with respect to changes of traffic volumes. Several kinds of knowledge are necessary in plan-making, but the focus here is on the *expert knowledge*.

The *expert knowledge* in question is general knowledge regarding how and why developments of land use, transport-systems, travel behaviour and traffic volumes are interrelated. It also includes empirical knowledge regarding how, why and to which extent certain changes of land use or transport-systems tend to result in certain changes of travel behaviour and traffic volumes. This knowledge is necessary in order to allow planners to answer the two main questions in planning: ‘What should we do in order to...?’ and ‘What are the consequences of...?’

This expert knowledge is the object of study in this chapter.

The Compact Oxford English Dictionary (2010) definition of knowledge includes 1) information and skills acquired through experience or education, 2) the sum of what is known, 3) awareness or familiarity gained by experience of a fact or situation. In this work knowledge is understood in line with Rydin (2007:53), who defines knowledge as differing from information and data “in that the specification of causal relationship is central to knowledge”.

The chapter starts out with a description of different kinds of knowledge in plan-making, and a discussion of the role of the expert knowledge in question. This also includes a structural analysis and a causal analysis of what the expert knowledge must be like in order to contribute to that planners make plans which, if implemented, cause reduction in traffic volumes instead of growth (often termed traffic-reducing plans here, for short). This results in a list of presumed relevant properties. These are explored in order to figure out how and why they may cause that traffic-increasing plans are made, through which mechanisms they can work, and under which conditions.

¹³ The main content of this chapter has been presented as paper to the NESS conference (Tennøy 2009) and at the mobil.TUM2011 conference (Tennøy 2011a).

There are different opinions among planning theorists concerning *whether general knowledge is possible* in planning theory (and in social science in general). This issue is discussed first, with basis in a literature study, arriving at a position that general knowledge regarding causal interrelations between development of land use, transport-systems, travel behaviour and traffic volumes is indeed possible. The kinds of general expert knowledge that are understood to be possible and necessary are defined.

This is followed by a description, based on further literature studies, of what is interpreted by the author as the *state-of-the-art expert knowledge* regarding causal interrelations between land use, transport-systems, travel behaviour and traffic volumes, how this system works, and how land use and transport-systems ought to be developed in order to reduce traffic volumes. Examples of theoretical and empirical research which have contributed to develop this knowledge, and which represent 'evidence' within this knowledge, are presented. Weaknesses and contestations are discussed. Agreed recommendations based on this knowledge are presented. This description is later referred to as 'the expert knowledge'.

This description of the expert knowledge is defined as the object of study, and the *scientific quality* and *the practical usability* of the expert knowledge (my description of it) are critically examined. Criteria for scientific sound knowledge according to critical realism are defined with basis in the description of critical realism in chapter two. Criteria for the practical usability of the expert knowledge are developed with basis in literature, on readings of planning documents and on experiences of the author.

Analyses are conducted in order to discover whether the expert knowledge (as described) meets the defined criteria. Shortcomings and features are identified and discussed as potential causal powers. Analyses are conducted in order to isolate the mechanisms through which these causal powers can work, and under which conditions. Relevant explanations are developed regarding how and why properties of the scientific quality and the practical usability of the expert knowledge may contribute to planners making traffic-increasing plans.

The findings from the abstract analyses are examined through the empirical studies. The causal powers are discussed with basis in the interview study. With basis in the case study, it is analysed and described whether and how properties of the expert knowledge have contributed to that planners make traffic-increasing plans in the four cases. Finally, broader conclusions are presented regarding how and why properties of the expert knowledge may contribute to cause that planners make traffic-increasing plans, and what could be done to change the situation.

4.2 Expert knowledge is necessary in plan-making

4.2.1 Different kinds of knowledge

Planning is here understood as to bring knowledge into decision-making in order to improve the decision-makers' abilities to make decisions about future actions which contribute to the achievement of their objectives (see for instance Friedmann 1987 and Faludi [1959] 1973). In this process, planners *apply* knowledge in order to *produce* knowledge.

The planners need different *kinds of knowledge* in order to produce knowledge that can be applied by decision makers. One may distinguish between knowledge about how to carry out planning processes and knowledge regarding substance, e.g. how the city works. Knowledge regarding *planning processes* includes knowledge about the laws and procedures of planning

as defined by the PBA, as well as knowledge regarding how to carry out planning processes. This also includes various approaches to participation in planning processes by citizens, organisation etc. Planners are supposed to possess this knowledge. This process knowledge itself is not a main focus in this work.

The knowledge regarding *the project* itself is important in plan-making. This could regard the problem to be solved or the main objective(s) in cases regarding ‘what we should do in order to...’, or it could regard knowledge regarding a proposed project in cases regarding ‘what are the consequences of...’ This kind of knowledge is supposed to be provided by the employers of the planners; the developers or the politicians. In reality, this knowledge often needs to be produced as part of the planning process and with strong influence from the planners.

When making plans, knowledge regarding the context in which the planning is and the project will be carried out is absolutely requisite. *Knowledge regarding context* includes numerous different issues, such as the physical, political, and cultural context, existing plans and policies, political objectives and so forth. This is also knowledge about existing land use, transport-systems travel behaviour and traffic volumes, about what are considered important problems and aims, about which other projects and changes are going on, about the political milieu, the history of the place, and more (see e.g. Rydin 2007).

This knowledge needs to be collected for every planning case. Numerous different instances and persons hold relevant knowledge regarding context. It is often regarded sensible and wise to ask broadly which contextual aspects are important to regard in the planning process. In Norway, it is mandatory to inform widely that the planning process is initiated in order to get input about what needs to be assessed in the process. Hence, knowledge regarding context is supposed to be produced in a dialogue between many voices.

4.2.2 Expert knowledge in plan-making

The planners also need *general knowledge regarding the causal interrelations* between land use, transport-systems, travel behaviour and traffic volumes in order to be able to analyse which effects certain changes of land use and transport-systems (that are proposed in a plan, or defined as an objective) will have on travel behaviour and traffic volumes. They also need such knowledge if to propose strategies and measures to apply in order to affect the system in certain ways and producing for instance reduction of urban road traffic volumes. Further, they need *empirical knowledge* regarding whether, how and with which strength changes of certain elements of land use and/or transport-systems have affected travel behaviour and traffic volumes in various contexts and combinations.

To providing general and empirical knowledge for planning practice and practitioners is among the main tasks of planning research. These kinds of knowledge regarding other issues, such as pollution, aesthetics, housing or biodiversity, are necessary in order for planners to make plans that contribute to achieving other aims and objectives. In this work, the focus is on knowledge that enables planners to make traffic-reducing plans.

In order to make analyses regarding ‘what should we do in order to...’ and ‘what are the consequences of...’, the planners need to apply general knowledge and empirical knowledge together with knowledge regarding context, the project and the objectives in analyses with the help of defined and transparent methods. Hence, *methodological knowledge* is needed as well.

The general and the empirical knowledge are together termed ‘*expert knowledge*’¹⁴ in this work. This is because it cannot be expected that others than planners (the experts) possess this knowledge to the degree necessary to apply it skilfully. Methodological knowledge could have been included in this term as well, but is kept out because this fits my analyses better. It is the expert knowledge, and to some degree the methodological knowledge, which is in focus here.

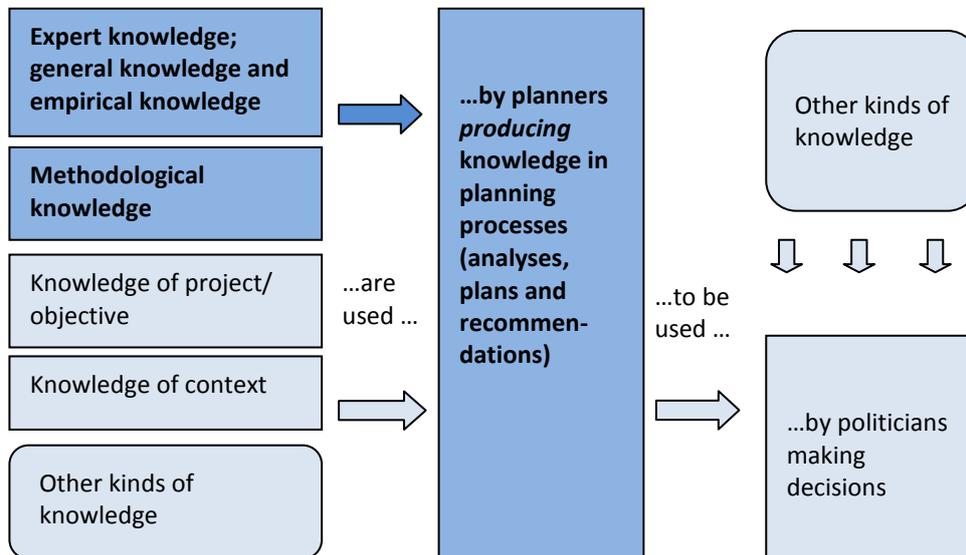


Figure 15: The discussion in this chapter regards how properties of the expert knowledge in question and the methodological knowledge affect whether planners make plans that, if implemented, cause growth in traffic volumes.

‘Expert knowledge’ as the term is applied here is understood rather similar to how Mazza (2002:12) defines ‘technical knowledge’: “not specific methods and techniques, but a formalized knowledge that is linked to defined theoretical frameworks and leads and affects practice”.

Producing expert knowledge and methodological knowledge are mainly the responsibility of planning research and planning researchers. Schön (1983:309) states that “A most important kind of research has to do with the methods of inquiry and the overarching theories of phenomena, from which practitioners may develop on-the-spot variations”. In his discussions, Schön (1983:317-318) concretises that “By methods and theories fundamental to practice, I mean those that some practitioners have learned to use as spring-boards for making sense of new situations which seem, at first glance, not to fit them. In this sense, an overarching theory and a generic method of inquiry which is inseparable from it are used to restructure a situation so that, eventually, one can validly say that the theory fits the situation”.

4.2.3 The planners produce knowledge

The planners (who are the experts in the plan-making processes) *apply* the expert knowledge together with the other kinds of knowledge in plan-making processes. The planners *produce* knowledge in the form of analyses, plans and recommendations. The

¹⁴ Other terms, for instance ‘scientific knowledge’ or ‘general and empirical knowledge regarding land use and transport planning for reduced traffic volumes’, could have been chosen instead.

knowledge that planners produce is not termed expert knowledge in this work, in order to distinguish between the knowledge planners apply and the knowledge they produce.

4.2.4 What application of the expert knowledge in ways that contribute to making traffic-reducing plans presupposes

In the structural analysis we ask what application of the expert knowledge in ways which can contribute to conscious and systematic production of traffic-reducing plans *presupposes*.

In order for the *expert knowledge itself to exist*, there need to be researchers producing research and developing the expert knowledge (and a large structure enabling researchers to exist and to produce knowledge, which is excluded here) and a reality that the knowledge is supposed to represent (being part of a larger reality which is excluded here). Further, in order for the *expert knowledge to be applied*, there need to be planners who apply it and processes to apply it in. Hence, there are substantial (real) relations between the research, the expert knowledge, and the planners.

There are asymmetrical internal relations between the researchers and the expert knowledge. The expert knowledge cannot exist without researchers producing it. The researchers would not be researchers unless they produce knowledge, but they could be researchers without producing this *specific* knowledge. This means that the properties of the expert knowledge they produce is external and contingent.

There are also asymmetrical internal relations between the expert knowledge and the planners. The expert knowledge may exist whether the planners exist or not and whether they apply it or not. The planners (as defined here) cannot exist without expert knowledge, since planners are constituted as planners by their possession and application of (among others) this kind of expert knowledge when doing analyses and making plans. On the other hand, the expert knowledge cannot be *applied* in plan-making processes unless the planners are able to and choose to apply it. In that sense, the relation between the *application* of expert knowledge and planners is internal and necessary.

The constituent structure hence consists of the research (representing the reality and the researchers), the expert knowledge itself and the planners applying it (or not). Without these relations, the expert knowledge in question cannot exist and be applied in plan-making.

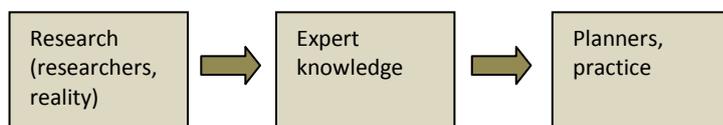


Figure 16: The structure of the expert knowledge and application of the expert knowledge, consisting of the internally related research (representing researchers and the reality), expert knowledge and planners applying it in plan-making practice.

Whether the expert knowledge contributes to production of plans that cause growth in urban road traffic volumes depend on the conditions. Important conditions are properties of the planners and of the plan-making processes. Properties related to the expert knowledge itself will be explored in this chapter, while properties related to the planners and to the plan-making processes will be explored in later chapters.

4.2.5 Properties of the expert knowledge affect whether it can contribute to making traffic-reducing plans

In order to disclose the causal powers inherent in the expert knowledge that may cause production of traffic-increasing plans, critical realist authors recommend to asking retroductive questions like ‘what is it about this structure which may make it do such and such?’ Or in this case – what is it about the expert knowledge which may make it contribute to production of traffic-increasing plans? One may also turn the question around, and asking what is necessary in order for the expert knowledge to contribute to conscious and systematic production of plans which cause traffic reduction instead of increase.

First, the expert knowledge needs to exist. Researchers need to have studied how changes of land use and transport-systems have affected travel behaviour and traffic volumes in ways which allow for understanding the causal interrelations, the strengths of the effects, and of the necessary and mediating conditions. If the expert knowledge does not exist, planners and other don’t have a tool for to systematically and consciously produce plans which contribute to reduction of traffic volumes.

Second, in order to be helpful, the expert knowledge needs to represent reality relatively correctly. It needs to describe how land use, transport-systems, travel behaviour and traffic volumes are interrelated, how the mechanisms work, what triggers them and what mediates them in ways that are close to reality. If the expert knowledge describes reality in other ways, the knowledge cannot be applied for producing traffic-reducing plans. Rather, it could contribute to traffic-increasing plans accidentally being made.

Third, the expert knowledge needs to be scientifically sound in order to guide planning and planners when making plans. It also needs to be accepted as scientifically sound in order for planners to choose to apply it in plan-making, and for others to accept analyses, recommendations and plans made on the basis of the expert knowledge as valid.

Fourth, the expert knowledge needs to be usable in planning practice. If lack of practical usability of any kind cause that the expert knowledge is not applied in plan-making, the knowledge cannot contribute to making less traffic-increasing plans. This also includes that qualities of the expert knowledge make planners choose to apply *this knowledge* when confronted with competing knowledge in plan-making.

Necessary, but not sufficient, conditions for the expert knowledge to contribute to conscious and systematic production of plans that do not cause growth in urban road traffic volumes can hence be summarised as:

- the expert knowledge can and do exist
- it represents reality relatively correctly
- it is scientifically sound
- it is usable and used in plan-making

Whether the expert knowledge actually contributes to production of plans that cause growth in urban road traffic volumes depends also among others on properties related to the planners and to the plan-making processes.

4.3 Which kinds of general expert knowledge that are possible

4.3.1 Lack of focus on expert knowledge in planning theory of the last decades

The understandings of the role of expert knowledge in urban planning have shifted through the times. The various understandings are closely related to among others changing ideas on the possibilities of planning and governing, democracy and democratic practice and the perceived problems at hand. The debates have among others revolved around what kind of knowledge is relevant, who holds the relevant knowledge, which and who's knowledge is valid, who defines which knowledge is valid, whether predictive knowledge is possible and how predictions could be made and are understood.

The main impression from readings in planning theory of the last decades is, however, that it *does not* deal much with expert knowledge regarding the various issues planning deals with or with the role of such knowledge in planning processes. When searching planning theory, among others often referred *readers* (Faludi 1973, Fischer and Forester 1993, Campbell and Fainstein [1996] 2003) as well as much used references in planning theory (Friedmann 1987, Flyvbjerg 1991a, 1991b, 2001, 2004, Healey 1997), the *absence* of debates explicitly regarding planners' expert knowledge and the use of this knowledge in concrete plan-making and planning analyses is striking.

In Rydin's (2007) otherwise interesting discussion and typology of knowledge claims, expert knowledge regarding which measures or strategies to apply or implement in order to change the physical environment or development from a current state A to a desired state B₁, or which consequences particular planned changes or actions may have in relation to this desired state B₁, is absent. Stead and Meijers (2009) do not mention expert knowledge at all in their thorough literature review regarding concepts, facilitators and inhibitors of spatial planning and policy integration. Hull (2005, 2008) mentions knowledge only very briefly in her discussions regarding policy integration for achieving more sustainable mobilities. In Allmendinger's (2002) typology this kind of knowledge seems to be classified as 'exogenous theories'.

It is easy to agree with Davoudi (2006:22) that in the 1980s and 1990s, "[a]ttention moved away from developing the substantive evidence base of planning about how cities function (knowing what) to developing new ideas, such as communicative planning, about the process of planning (knowing how)". In the cases where planning theorists do focus on such expert knowledge, the impression is that they dismiss it as not possible, not relevant or not desirable.

This is also the message from Krizek et al. (2009:460), claiming that "with some exceptions, over the past three decades, planning theory has been absorbed with critiquing expert and scientific knowledge, celebrating local and community knowledge, or pointing out the political nature of planning. Only a few authors have offered substantive approaches for combining planning practice with a new, more diverse and more methodologically advanced base of planning-relevant research".

Mazza (2002:17) argues that planning theory literature tend to "flatten down planning to politics". This, he claims, "marginalizes or cancels the technical knowledge role, as if decisions would be the product of a dialogue in which the technical knowledge and the common knowledge have an equal weight" (Mazza 2002:17). The term technical knowledge is used quite similar to how I use general knowledge. He concludes that "the relative poverty

of the planners' technical knowledge and the difficulties we meet in trying to enrich it, seem to be the main reasons why many planners identify themselves with political scientists and actors[...]" (Mazza 2002:23).

Recent planning theory hence seems to mainly be about theory *of* planning and less about theories *in* planning. Further, the literature there is *of* planning seems to focus very little on the planners and how they apply expert knowledge in planning analyses, which are important parts of the planners' work. The same goes for the interactions and struggles between professional planners regarding how problems should be defined, knowledge of effective and efficient strategies and measures for solving the problems, methods for analysing the problem as well as the different alternative approaches to solve the problem or achieve an objective.

4.3.2 Expert knowledge versus instrumental rationality

Planning theory literature actually dealing with expert knowledge is often negative, suggesting that its influence should be reduced, that its influence is low, or that such knowledge is not possible. This can be understood as a reaction to the ideals of instrumental rationality which dominated planning and planning theory in the 1950's and 1960's.

Sager's (1994) description of synoptic planning may be one example of how this instrumental rationality was understood. It is described as presupposing perfect information, full knowledge of all alternatives, their causal effects and hence their possible consequences. This allows for accurate and certain calculations of what the future will be like if certain actions are carried out. Through quantitative analysis one could hence optimise plans with respect to a defined goal hierarchy, allowing the actors or the society to maximise benefits. This is also how e.g. Innes and Booher' (2010) describe this.

According to Banfield ([1959] 1973), examples of planning and decision-making actually practiced this way are hard to find, and it has probably never been a common way to practice public planning and decision-making. Owens et al's (2004:1950) did not "find many theorists or practitioners of conventional forms of appraisal adhering to the technical-rational model in extreme form [...] or explicitly advocating a closed, expert-driven system: rather they have often accepted in principle, and occasionally sought in practice, a role for public or stakeholder engagement".

Innes (1996) distinguishes comprehensive planning from 'rational' or 'synoptic' planning. While the latter requires to clarify objectives, to list all alternatives and to compare these, that is not necessary in a 'comprehensive plan'. A comprehensive plan is long-range, deals with physical developments of a city, covers it geographically, and addresses functions that make the city work as a physical entity. It is, however not expected that every alternative is evaluated, as rational planning theory seems to require. "A comprehensive city plan is a *package* of policies that can respond to anticipated conditions and work together for the city as a whole" (Innes 1996:461, italics in original).

An example of attempts to do 'rational planning' could be the economic-rational traditions, with their transport models and optimising cost-benefit analyses, which are still applied (see Willson's (2001) description of 'transport planning'). This is *not* the kind of knowledge that is referred to as 'the expert knowledge' in this work.

In Davoudi's (2006) discussion of the call for 'evidence-based planning' in the United Kingdom, she describes and explores a mismatch between use of evidence in the 'real' and the 'ideal' world. She explains this by its roots in a positivist understanding of the interrelations between research and policy. This is based on "three interrelated misconceptions about the nature of evidence, the role of experts, and the influence these can have on policy", and she claims that "the assumptions made under the positivist view of planning in the 1960s and 1970s are similar to those made under the instrumental view of the policy - research interface" (Davoudi 2006:14).

Various forms for 'extreme instrumental rationality' seem to be what many planning theorists have in mind when discussing general knowledge and expert knowledge, and how it is expected to be applied. This is, however, not what is meant in this work when discussing general knowledge and expert knowledge.

4.3.3 Expert knowledge in collaborative or communicative planning

Healey (1992, 1997) is among the most prominent representatives of the strand of planning theory which is often termed communicative or collaborative planning. She seems to be critical to what she terms 'scientific rationalism' (Healey 1992), but she does not dismiss expert knowledge. In a discussion of knowledge and action in communicative practice, she finds that rational-technical knowledge underpin much of the planners knowledge of his city (Healey 1992a). She found, however, that the moral-practical knowledge was most prominent in this planner's work. She concluded that this was an illustration that skilled planners operate across knowledge forms in their daily work.

Instead of strong focus on scientific rationalism, she promotes *dialogue* as a method for reaching agreements. The modern idea of planning "centres on the challenge of finding ways in which citizens, through acting together, can manage their collective concerns, with respect to the sharing of space and time" (Healey, 1992:145). Later she claims that "The mutual understandings and agreements reached for one purpose at one time are thus revisable as the flow of communicative action proceeds" (Healey 1992:151).

In her discussions about what purposes planning should have, Healey (*ibid*) claims that "'Right' and 'good' actions are those we come to agree on, in particular times and places", and that "a communicative approach to knowledge production – knowledge of conditions, of cause and effect, moral values and aesthetic worlds – maintain that knowledge is not pre-formulated but is specifically created anew in our communication through exchanging perceptions and understanding and through drawing on the stock of experience and previously consolidated cultural and moral knowledge available to participants" (Healey 1992:153). This planning would contribute to move on to something better, "without having to specify precisely a goal" (Healey 1992:158).

Several authors have criticised the idea that this way of practicing democracy actually will redistribute power and influence among the participants in more just ways. This is not least the case when also taking future generations into the consideration (Parfit [1984] 1987). Rydin (2007:55) sums up the main objections of communicative planning from planning theory as "a lack of specificity as to how the theory of these processes should be put into practice; doubt as to the abilities of planners to undertake such processes successfully; the potential for powerful interests to subvert the processes; and the inability of such processes to handle conflicts of interests and generate a consensus or agreement in the face of such conflicts".

In a discussion of planning as consensus building, Connelly and Richardson (2004:3) demonstrate that “in any real situation, practical constraints and tensions between different goals lead almost inevitably to compromises in the ideals of inclusivity and non coercion”. Næss (2001) argues that it is unlikely that communicative, goal-less and science-free processes would lead to actions which involve even modest changes in present generations’ way of living in order to ensure better living conditions for future generations.

Owens and Cowell (2002:167) argue that “dialogue may be a good way of dealing with purely local issues, but in the context of sustainability these are probably rare, because many processes shaping economic and environmental change operate at a much broader scale”.

I agree, and find that global and inter-generational problems, such as climate changes, loss of biodiversity and depletion of non-renewable resources, require another approach which includes definition of objectives as well as application of expert knowledge. These problems are characterised by what one generation or people living at a certain place do will affect the lives of people living other places or at other times. Hence, those most strongly affected can often not partake in the collaborations and deliberations. Instead, to protecting their interests need to be included in the objectives, and knowledge regarding how to do it needs to be part of the planning analyses.

4.3.4 ‘Expert knowledge is not important anyhow’

In his work, Flyvbjerg (1991a and b, 2004) repeatedly argues that we should ‘let rationalism go’, since power defines rationality. This could be understood as he finds expert knowledge of the type discussed here irrelevant. In his methodological guidelines he argues that value-rationality should be better balanced with instrumental rationality, and that “there can be no adequate understanding of planning without placing the analysis of planning in the context of power” (Flyvbjerg 2004:292).

I don’t read Flyvbjerg as if he really is letting rationality (or the use of expert knowledge on substantial matters) go. Instead I understand him as arguing for including values and power beside rationality. Where Flyvbjerg (1991b, 1998) focuses on power as the only or main mechanism (or so it can be interpreted) explaining what happened in Aalborg in the 1980’s, another understanding could be that objectives, knowledge and power are reciprocally interrelated. Hence, they are all parts of the explanation how and why urban land use and transport-systems still are planned and developed in ways that cause growth in urban road traffic volumes.

In her critique of evidence-based planning, one of Davoudi’s (2006) arguments is that ‘evidence’ is not very influential in decision-making anyhow. In the messy real-world of policy making, she mentions four powerful competitors to evidence. These are ideology, interests, institutional norms and practices, and prior information.

4.3.5 ‘There cannot exist general knowledge in social science’

In their interesting discussions of ‘the argumentative turn in policy analysis and planning’, Fischer and Forester (1993:1) argue that since “analyst’s ways of representing reality are necessarily selective”, then “the language of policy and planning analyses not only depicts but also constructs the issues at hand”. They refer to the “institutionally disciplined rhetorics of policy and planning which influence problem selection as well as problem analysis, organizational identity as well as administrative strategy, and public access as well as public understanding” (Fischer and Forester 1993:2).

They see planning as an argumentative practice, and argue that the analyses produced by experts applying their expert knowledge on concrete and contextual problems may be understood as arguments too, in a larger debate over planning and policy issues. Fischer and Forester thus accept expert knowledge claims as important inputs to the planning discussions, while they at the same time recognise that these claims cannot be taken as 'truths'. However, they don't describe or discuss the practices related to production or application of this expert knowledge.

Sager (1994) re-describes communicative rationality in contrast to instrumental rationality as reflected in synoptic planning theory. He takes as point of departure that "practical planning, dealing with controversial issues, is a compromise between instrumental and communicative rationality" (Sager 1994:257). He describes how planners draw on communicative rationality in various tasks, and he defines that "True knowledge is that on which a consensus is formed among informed people discussing the matter in undistorted communication" (Sager 1994:8). This may be understood as a rejection of the idea of general knowledge in planning. It may also be understood as different kinds of expert knowledge are input to planning processes besides other considerations and knowledge. If that is the case, Sager's statement is not in conflict with the idea of general knowledge in planning.

Rydin (2007) recasts knowledge as knowledge claims, in order to distinguish between knowledge and values brought into the discussions by different voices. A knowledge claim is in her terminology "a claim to understanding certain causal relationships" (Rydin 2007:56). The values brought into the processes may regard the importance of various objectives. The knowledge may regard specific problems or contexts of particular areas, planned but not formally initiated projects, values and interests harmed by a planning proposal, the chances of getting a certain measure approved in the City Council etc. It is important and relevant to bring such values and knowledge into the planning and decision-making processes. Unfortunately, expert knowledge as discussed here is not specified as any of her 'types of knowledge claims' (at least as far as I understand it).

Flyvbjerg (2001) claims that it is not meaningful to talk about theory in social sciences in the way the term 'theory' is used in natural sciences. He claims that social sciences must learn that they cannot develop context-independent theory in the way natural sciences do. Flyvbjerg discusses social science theory against Dreyfus' (1982) six characteristics of 'ideal theory'; that it is explicit, universal, abstract, discrete, systematic and complete and predictive. Dreyfus found that social sciences cannot and should not try to meet these characteristics, especially the requirements of being discrete (context-independent) and predictive.

4.3.6 The understanding of general expert knowledge in this work

This is in many ways the same problem as critical realism addresses. The point of departure is that one cannot produce accurate and certain predictions in social science, because what actually happens in a concrete situation always will be context dependent in an open system. Critical realism still claims that one can develop *general* knowledge in social sciences. This is the transfactual knowledge regarding causal powers and mechanisms which was described in chapter 2. This allows for having and producing general knowledge about phenomena, but not for being able to produce certain and accurate quantitative predictions.

Næss (2004:162) criticises in a discussion about the possibility of predictions in planning¹⁵ that normative planning theories have been developed, “according to which scientific knowledge within the field dealt with in the plans is either completely rejected or put on the same footing as lay assumptions”. Næss (2004:163) questions “how planning based on this perspective could deal with questions where causal relationships are complex and not immediately visible” and “how planners and decision-makers adhering to this perspective could act in situations of dispute about the consequences of a proposed measure”. He exemplifies this with planning situations where the initiators of a local development plan claim that their proposed project will cause no increase in traffic volumes worth mentioning, and claims that “the consensus emerging in ‘collaborative’ planning processes is prone to be a consensus on the premises of the most powerful actors” (*ibid*).

Næss further argues that if the planners’ use of their scientific knowledge of causal interrelations and consequences of alternatives and actions is rejected, “the planners are also deprived of their most important political resource in discussions with other players in the decision-making process”, and concludes “The planning theories developed on this epistemological foundation deny the possibility of goal-oriented public planning. They thereby also block the possibility of choosing effective policy instruments in order to change undesired situations and processes in society” (Næss 2004:163).

In a discussion about a polycentric approach for coping with climate change, in contrast to ‘waiting for the total, global solution’, Ostrom (2009) found it necessary to update the theory of collective action (from economics) when applied on the climate change problem. She found that actions for reducing GHG emissions could be, should be and are taken at all scales. She found that among the most important variables that increase the likelihood for cooperation in social dilemma situations are among others (and listed first) that “(1) reliable information is available about the immediate and long-term costs and benefits of actions” (Ostrom 2009:12). Such information can only be produced by experts in the field in question. Without scientific knowledge we would for instance not know that our burning of fossil fuels causes climate changes which may have severe consequences for future generations on Earth.

The understanding applied in this work is in line with critical realism authors like Sayer ([1984] 1992), Danermark et al. ([1997]2002), and Næss (2004). An underlying and fundamental assumption is that in order to take planning and development of land use and transport-systems in traffic-reducing directions, expert knowledge regarding causal interrelations between development of land use and transport-systems and traffic volumes need to exist and to be applied. The existence of such knowledge does not guarantee that planning and development go in traffic-reducing directions, and it could go in such directions by chance or in order to achieve other objectives. However, in order to take planning and development of land use and transport-systems consciously and systematically in traffic-reducing directions, expert knowledge regarding which kinds of developments which contribute to this (and not) needs to exist and to be applied.

This is not a non-contextual expert knowledge which can deliver quantitative, certain and accurate predictions. Instead, this expert knowledge concerns causal interrelations between

¹⁵ Næss (2004) refers to qualitative and crude predictions of aggregate levels effects resulting from certain urban development strategies, and explicitly not to quantitative, accurate and certain predictions.

development of land use and transport-systems (because this is what land use and transport planning deals with and may influence) and urban road traffic volumes (which need to be reduced). It offers transfactual explanations for how and why certain changes of land use and transport-systems tend to affect traffic volumes in certain ways. This knowledge can be applied together with other knowledge (regarding problems or objectives, context etc.) for making crude and mainly qualitative predictions about 'what we should do in order to...' and 'what are the consequences of...'. These which can be useful in planning and decision-making aiming at reducing urban road traffic volumes.

4.4 The expert knowledge in question

Having described what kind of general expert knowledge that is understood to be possible, it is now time to describe this knowledge. The following chapter presents what is understood by the author as the state-of-the-art expert knowledge regarding how land use, transport-systems, travel behaviour and traffic volumes are interrelated, the most relevant mechanisms, how this system of organised complexity works, and how land use and transport-systems ought to be developed in order to contribute to reducing traffic volumes. Agreed recommendations based on this knowledge are presented.

Examples of theoretical and empirical research which has contributed to develop this knowledge, and which represent 'evidence' of this knowledge, are presented. The main weaknesses and the main contestations are discussed as well. This is hence also a discussion of whether the expert knowledge represents reality relatively correctly.

The description is based upon the works of a number of authors. The most important are Downs (1962), Owens (1986), Newman and Kenworthy (1989), Næss (1997, 2006), Cairns et al. (1998), Strømme (2001), Banister (2005), and Hull (2011).

4.4.1 A model explaining the general expert knowledge

The model in figure 17 illustrates the understanding used here about how land use, transport-systems, travel behaviour and traffic volumes are causally interrelated and how planning and development of land use and transport-systems affect this system.

In this model, traffic volumes are defined by travel behaviour. In order for traffic volumes to be reduced, travel frequency, travel lengths and/or car shares need to be reduced. Travel behaviour is affected by the quality of the various transport-systems and of the land use, as well as of other factors exogenous to this model. Land use, transport-systems and travel behaviour influence each other reciprocally, and land use and transport-systems are affected by traffic volumes.

Changes in one variable of the system may cause changes in several of the others, and several changes are often going on simultaneously. The changes which occur in this system are both changes of land use and transport-systems consciously imposed through physical planning and development, changes occurring as a result of how people using the structures react to the changes and changes resulting from other factors exogenous to the model, such as economy, work force participation, individuals' needs and preferences and not least changes in population size. These different forms of changes are interrelated, since they belong in different but intersecting systems (see e.g. Byrne 2003).

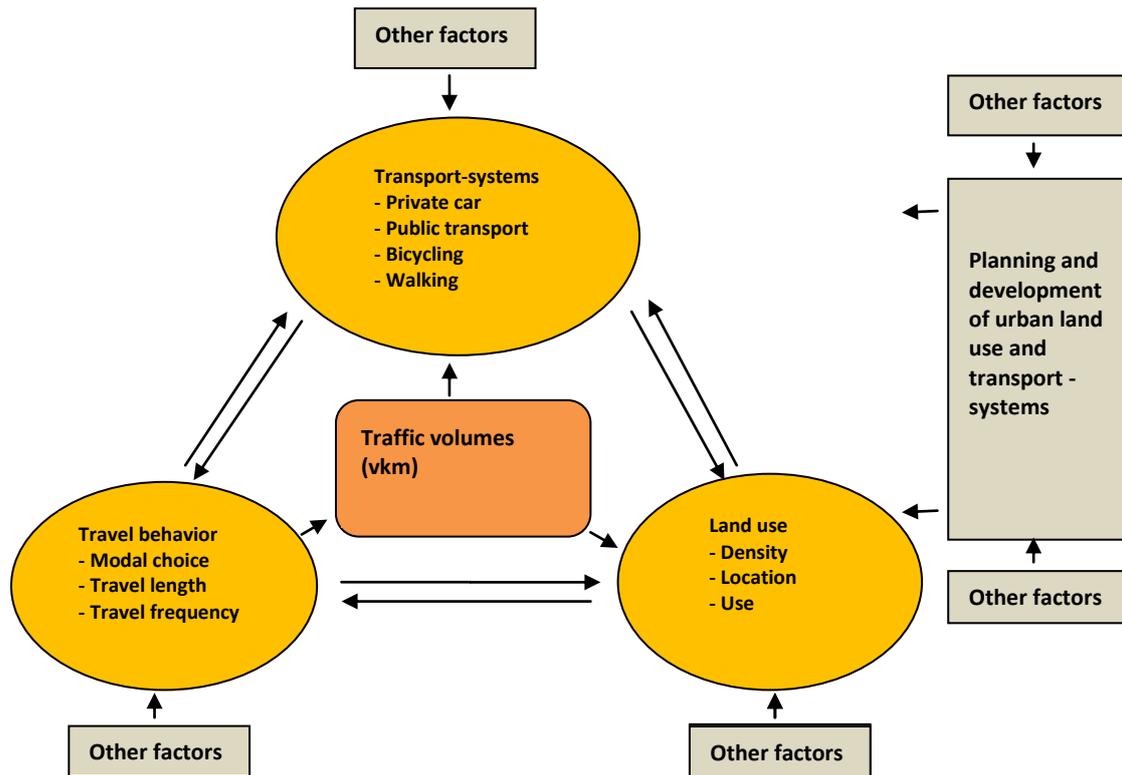


Figure 17: Simplified model of how developments in land use, transport-systems, travel behaviour and traffic volumes are causally interrelated and how planning and development of land use and transport-systems interact with this system.

The changes may reinforce each other, counteract each other or not affect each other with respect to development of traffic volumes. Changes in land use and/or transport-systems may generate simultaneous changes of modal choice, destination and travel frequency. Several dynamic perspectives need to be perceived simultaneously, since the results of some interrelations may be experienced within a short time, while it for others take years before they can be experienced.

The powers causing that people travel; their needs, reasons and desires to travel, are not explicitly included in the model. They are to be found in a number of social structures, like work life organisation, family organisation, organisation of production and distribution of goods, socialising etc. Even though these structures have causal powers to produce traffic volumes, and are necessary for traffic volumes to exist, land use and transport planning do normally not aim at affecting these structures in order to affect traffic volumes. The structures are therefore kept exogenous.

In order to simplify the model, population size is kept constant and exogenous, even though this could be a major factor explaining changes of traffic volumes, and even though it is related to development of land use and transport-system. Other factors that could influence travel behaviour, such as taxes, gas-prices, weather conditions, cultural preferences, crime rates and a number of other variables are kept exogenous in the model too. The same goes for the properties of individuals using the systems; their physical health, economic resources, values and so forth.

The focus is instead on the objects that physical planning under the PBA deal with directly, namely developments of land use and of transport-systems. Important exceptions are changes of public transport services and economic measures like parking prices and road pricing. These are included in the model, but they are not directly affected by planning under the PBA.

4.4.2 The objects in the model

The main objects in the model are traffic volumes, travel behaviour, land use and transport-systems. *Traffic volumes* are defined as total vehicle kilometre travelled per day in a certain area (vkm/day). Since population size is kept exogenous, vkm/day/person can also be applied as definition when suitable.

Travel behaviour regards the population's decisions about whether to travel (how often they travel – travel frequency), where to travel (which destinations they travel between – travel length), and how to travel (private car, public transport, bicycle, walking – modal choice). *Changes of travel behaviour* refer to changes of how often people travel, where they travel and by which mode.

Land use refers to the spatial structure of the built environment, to the location of activities within these structures, and to how people use activities located at different places. *Changes of land use* refers to changes in the spatial structure (that something new is built, whether it contributes to sprawl or to densification, where it is located), changes in location of activities within existing structures (that people move from one residential area to another, that businesses relocate), and changes in how the structures and activities are used (e.g. that the population start using shopping centres instead of the city centre). This way of using the term 'land use', including what is built as well as the activities going on, is somewhat unusual. In order to avoid misunderstandings, care has been taken in the discussions to be precise with respect to what kind of land use and changes of land use that is meant.

Transport-systems refer to the quality of the different transport-systems (walking, bicycling, public transport, and car). *Changes of transport-systems* refers to changes of infrastructure for the various modes (construction of bus lanes, increased or decreased road capacity and number of parking spaces, new subway lines, bicycle paths, the width of pathways etc.), but also to changes of transport services (especially public transport, how often the bus runs etc.), changes caused by how people use the transport-system (increasing traffic volumes resulting in congestion, worsened conditions for walking and bicycling etc.) and to other changes that influence the quality of the transport-systems.

4.4.3 The main mechanisms

The powers causing travelling are, as mentioned, located in societal structures outside the model discussed here. The physical structures defined by the land use and the transport-systems are necessary for the journeys to be made, since they create destinations to travelling between and distances to cover, as well as means for covering these distances. The internal relations between the needs for travel, the land use structures and the transport-systems (and other factors not included) hence cause a certain travel pattern and certain traffic volumes in an urban area. Changes in any of the structures cause changes in travel behaviour and in traffic volumes.

The way in which structures of land use and transport-systems influence traffic volumes, is through directly influencing which choices are *possible* and *preferable* with regard to travel

behaviour. The physical structures (land use and transport-systems) also represent *external* relations which affect *whether and how* that which exists (needs to travel within the existing physical structures) will manifest itself (travel frequency, travel lengths, modal choices). See Næss (2004) for a more thorough discussion of this.

As a result of people's adjustments to their needs for travel, the land use structures and the transport-systems (and other factor kept exogenous here), patterns of travel behaviour and hence traffic volumes emerge. These emerging patterns of travel and traffic volumes do in turn influence the choices the users make with regard to travel behaviour. This is one of example of the many feedback effects in the system.

This understanding of the agent - structure relations seems to be in accordance with how critical realism understanding this, as discussed in chapter two. Bhaskar's (1998) model of 'Society/Person Connection' explains how structures constrain and enable the actions of the agents, and the agents reproduce and transform structures. Even though this theory is developed for social structures and interrelations, it suits the problem at hand well, if the built structures are understood as social structures. In the model described here, land use and transport-systems are seen as structures that constrain and enable travelling. The travellers are the active agents, and they reproduce and transform the structures by using them. When aiming at affecting how and how much the agents travel, it is hence interesting to study the interplay between the actors and the structures.

If for instance there is no public transport service between one's home and work-place, it is not possible to choose public transport as mode for travel to work. If there does exist a public transport service that could be used for this journey, a number of factors would affect whether this was the preferred mode, and whether it was chosen. Those factors would involve among others the quality of the public transport service (frequency, speed, walking distances to and from stops) and the quality of the alternative modes (walking, bicycling, or driving the private car). These factors would depend upon how the land use was organised and the transport-systems developed. How people use the systems affect or even define the systems (and other factors related to the person, to the weather etc.).

Changes in urban land use and transport-systems thus affect traffic volumes by changing the possibilities and preferences for travel behaviour through a number of interrelations or mechanisms, as indicated by the arrows in the model in figure 17. The system has several direct and indirect interrelations, it is dynamic in a number of time perspectives and it is iterative. The effect that a change in the land use and/or the transport-system will have on traffic volumes will thus always be context-dependent. It will vary with the existing situation in which the change is implemented and with the other changes are going on in the system simultaneously. These are changes planned and developed *in concert*, changes planned and developed independent from each other, as well as changes not influenced by planning under the PBA at all.

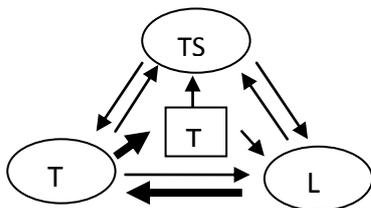
The actors involved in planning and decision-making for development of land use and transport-systems are active agents in this system, by causing changes of land use and transport-systems. They are also affected by the development in the system, since developments of land use and transport-systems constitute the problems the planners are supposed to solve.

4.4.4 Our knowledge about the interrelations and mechanisms in the model

Below, the interrelations or mechanisms indicated by arrows in figure 17 are described and exemplified. The normative recommendations following from the insights are presented, as are the main contestations and the weaknesses of the knowledge, as I know it.

The description of the numerous mechanisms in the model is not complete. I have not done a full literature search for all the mechanisms and interrelations included in the description. The main intention is hence not to offer a full description of all interrelations in the model and our knowledge of them, but rather to describe the system, how it works and its complexity.

4.4.4.1 Changes of land use affect travel behaviour



Land use defines the framework for travel behaviour in a city. Whether urban development takes place as urban sprawl or as densification, and how various activities are located in relation to each other, have direct effects on travel behaviour (modal choice, frequency, travel length/destination).

Overall density

The main mechanism causing dense cities to produce less road traffic per capita is that average travel lengths will be shorter in a dense city than in a city with a more spread out land use pattern. This causes higher possibilities that travels will be short enough to be done by foot or by bicycle, and thus for these modes to be possible and preferable. It also causes higher possibilities that car trips will be short. The density of an urban area also affects conditions for running efficient and competitive public transport services. A dense city can be covered effectively by fewer and shorter public transport lines than a spread out city. The conditions for car use will often be worse in a dense city, since there will be less room for parking and for large road systems, often lower speed limits, more pedestrians in the streets etc.

Newman and Kenworthy (1989) explained these mechanisms, and did a large quantitative comparative study between pairs of variables (such as urban density and consumption of gas for transport) in 44 large cities worldwide, in order to acquire knowledge about how urban land use structures and transport-systems affect travel behaviour and traffic volumes. Among their findings were that there are strong relations between densities of urban areas and gasoline consumption for transport per capita. The annual gasoline consumption of citizens of American cities was about 60.000 MJ/capita in 1980, while the figures for European cities were about a third - 20.000 MJ/capita (Newman and Kenworthy 1989:49). The denser the overall urban structure, the lower is the gasoline use. Næss (1997:63) found the same for Nordic cities.

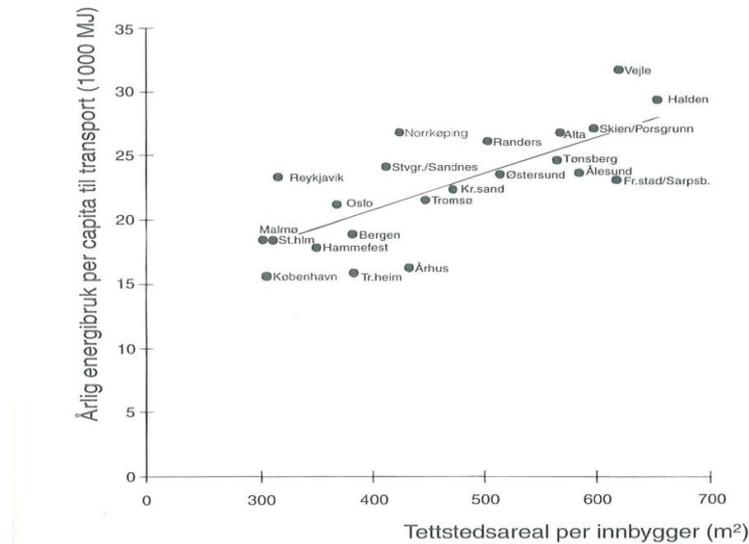


Figure 18: Interrelations between density and consumption of energy for transport, comparison of Nordic cities, facsimile from Næss' (1997). Energy consumption per capita per year is showed at the vertical axis, and urbanised area per capita is showed at the horizontal axis.

Some of the same mechanisms that contribute to less car use in dense than in spread out cities, on a more detailed level also explain how and why the location of various activities in the urban structure affect car use.

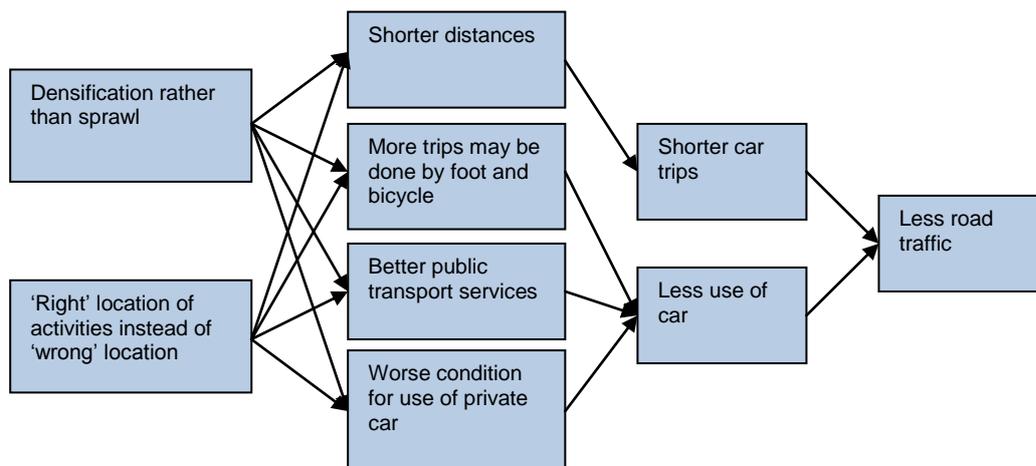


Figure 19: Mechanisms through which certain changes of land use developments cause less road traffic volumes.

Location of residences

Næss (1997, 2004, 2006, and 2007) has conducted a number of quantitative and qualitative works in order to study how location of residences in the urban structure affects the travel behaviour of the residents, and which mechanisms cause these differences to occur. Næss found that average car use (in km/week or km/day) is lower among those living more centrally, due to trip lengths being on average shorter and car use lower.

The main explanation for this was found to be that centrally located residents have access to a larger number of end points (work-places, shopping and service facilities etc.) in walking and bicycling distance than residents located less centrally, and that public transport services are better in the central parts of cities. Further, the average distance to all endpoints in an urban structure will normally be shorter the closer to the city centre an activity is located,

since the city centre often is the most central point in a city. Figure 20 shows that this is the case in cities of different sizes. Copenhagen metropolitan area has about 1,8 million inhabitants, Greater Oslo 0,9 million, Aalborg 160.000 and Fredrikshavn 26.000.

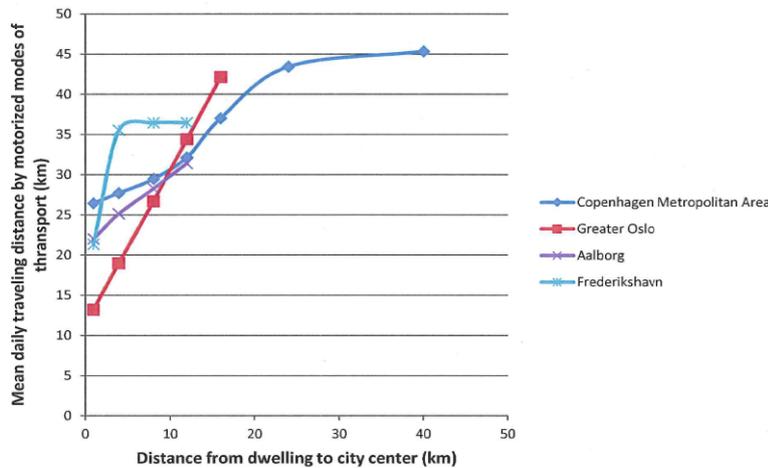


Figure 20: How daily travel lengths by motorised modes vary in relation to the residence’s distance from the city centre in cities of various sizes, facsimile from (Næss 2012 *forthcoming*).

The existence of such relations has been substantiated by a number of quantitative travel surveys. Næss (*forthcoming* 2012) lists, refers and discusses all studies carried out in the Nordic countries regarding the influence of various aspects of urban form and settlement patterns on travel behaviour. He concludes that there are quite overwhelming evidences that such interrelations exist. What matters most are the overall density of an urban area and the location of settlements with respect to distance from the city centre.

Location of work places

A similar relation has been found between location of work-places and car use to and from work. Strømme (2001) did mainly quantitative studies of journeys to and from work among employees in a number of differently located businesses in order to determine how work place location affects travel behaviour on travels to work.

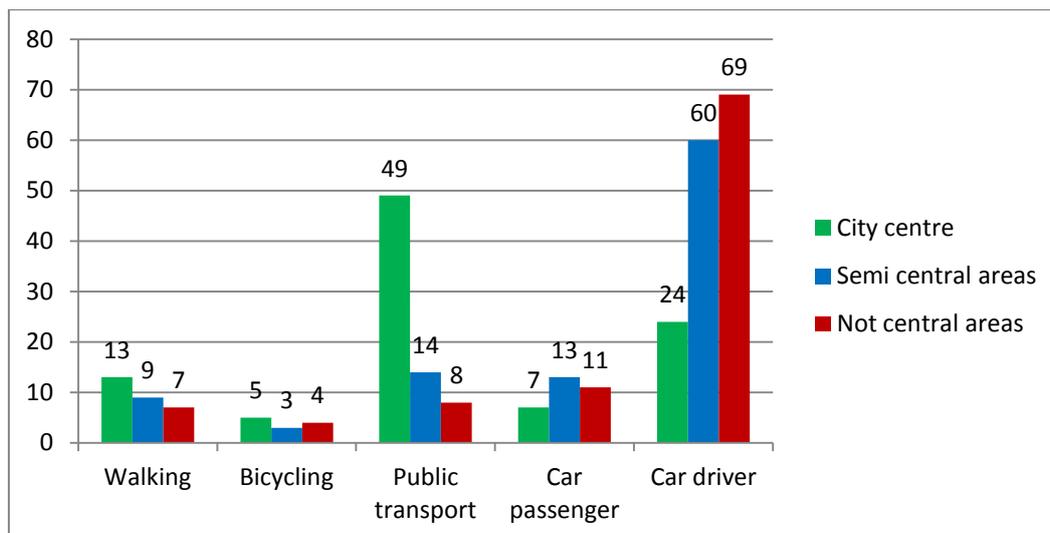


Figure 21: The car shares on travels to work were far lower among those working in the city centre than among those working elsewhere in Trondheim, figure based on data from Strømme (2001).

She found that the car share among people working in the city centre is far lower than among those working elsewhere (*ibid*). This was mainly due to better public transport facilities and worse conditions for car use (especially parking) in the city centre than other places, and also due to the fact that more people were living in walking- and bicycling distances to work in centrally located work-places than other work-places. Travel lengths by car varied in accordance to this. Those working in the city centre area travelled averagely 3,7 km by car per day on travels to and from work, while the figures for other areas in the city were 8,6 and 8,8 km per day.

A travel survey carried out for Oslo Sporveier's (2003) showed clear differences in modal choices on travels to work-places located different places in Oslo and its surrounding county Akershus.

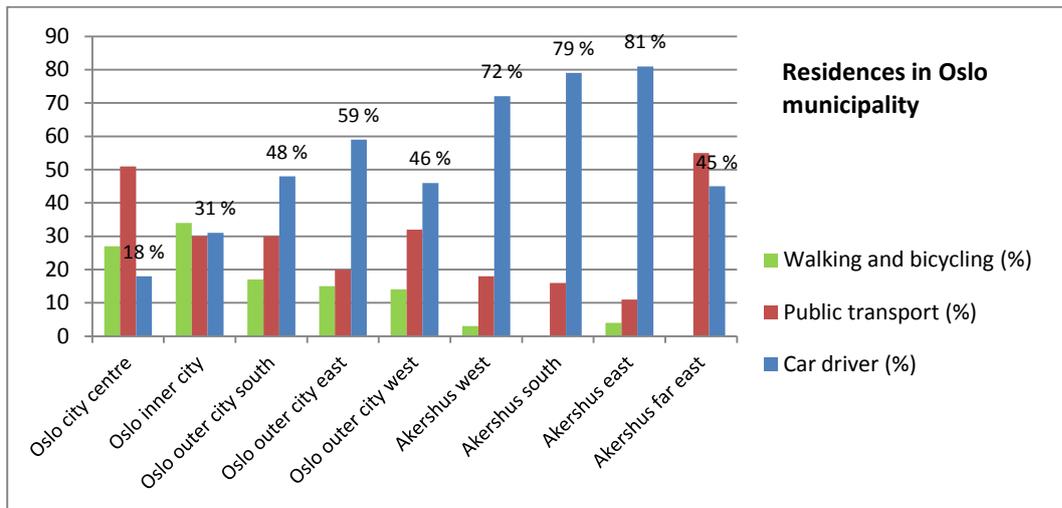


Figure 22: Modal shares on journeys to work-places with different locations in Oslo and its surrounding county Akershus (in per cents), done by residences in Oslo. The figure is produced with basis in data from Oslo Sporveier (2003).

Engebretsen (2006) based his analysis on data from the national travel survey, and found that car use increases when distance between work place location and city centre increases.

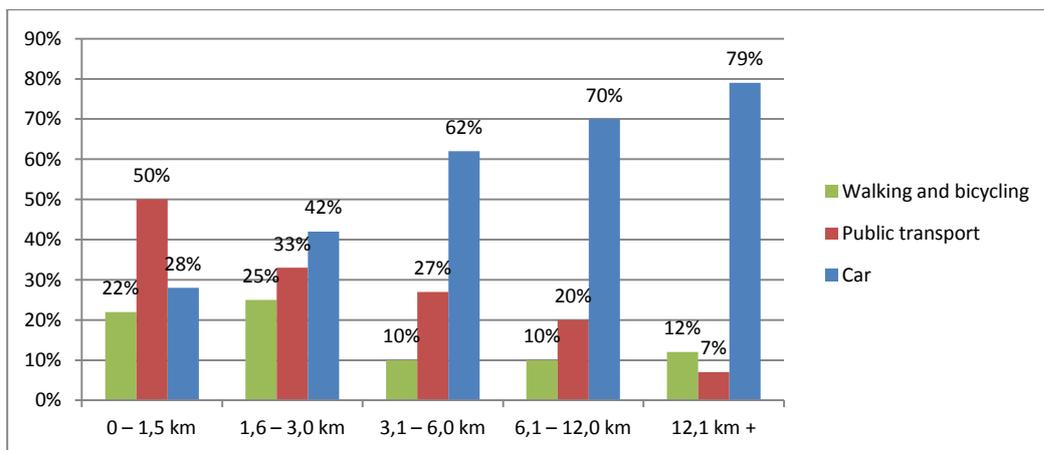


Figure 23: Modal shares on journeys to work-places located in different distance from Oslo city centre. The figure is made with basis in data from the national transport survey presented by Engebretsen (2006).

Businesses which need highly specialised employees tend to draw these from a larger regional area than businesses that need a less specialised work force (Næss 2007). This

makes it more important to locate highly specialised work-places centrally in order to reduce traffic volumes. According to the ABC-principle developed in the Netherlands, area-intensive work-places should be located in the city centre, while businesses dependent on access to motorways or which are not area-intensive should be located further out in the structure. That way, they would not occupy space that could have been used by more area-intensive activities and they do not generate heavy transport in the more central parts of the city.

Location of shopping and services

Location of shopping and services affects travel behaviour on travels to and from such activities. Strømme (2001) found the same patterns here as when studying work place locations; the car shares on travels to centrally located shopping facilities were far lower (18 %) than to such activities located less centrally (65 %).

Engebretsen, Hanssen and Strand (2010) and Engebretsen and Strand (2010) carried out analyses on the basis of the national transport survey of how location of shopping centres affects travel behaviour on travel to the centres. They found clear evidences that car use increases with distance from city centre, and that car use increases with the size of the shopping centre. This could be explained by the fact that larger shopping centres need more customers, and hence need to draw these from larger areas, causing averagely longer journeys which are less likely to be done by foot or bicycle.

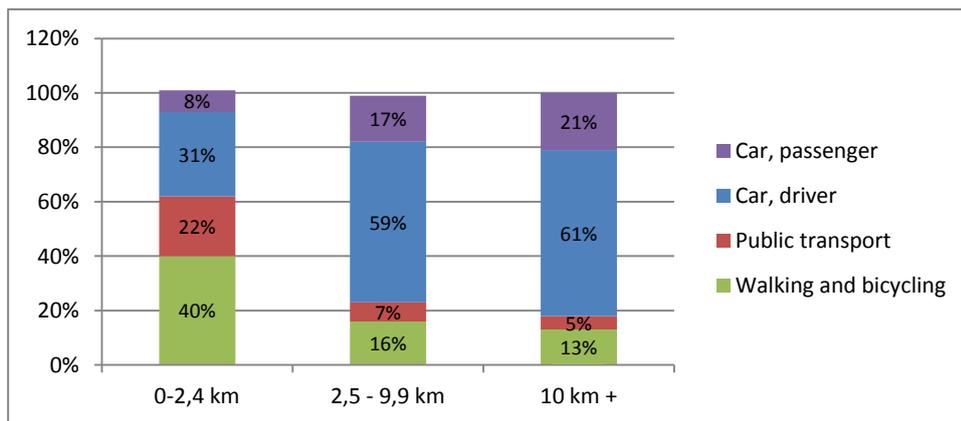


Figure 24: Modal shares on journeys to shopping centres located in different distances from the city centre. Shopping centres located in cities with more than 50.000 inhabitants. The figure is based on Engebretsen, Hanssen and Strand (2010).

A differentiation needs to be done between types of services. In order to make walking and bicycling possible and preferred modes of transport, the distances should be minimised. Hence, activities serving only a certain residential area, such as grocery stores or kinder gardens, should be located in or in the vicinity of these residential areas, as close to the users as possible, rather than centrally.

Changing use of the urban structure

If the inhabitants start using the urban structure differently from before, this may cause changes in travel behaviour. If, for instance, the city decides to make the city centre more attractive, more people may start travelling to the city centre for shopping and leisure instead of to shopping centres. Likewise, if gentrification of parts of the city causes changes of the characteristics of the inhabitants and the facilities, this may cause this part of the city

to become more attractive. Hence, people living in other parts of the city might travel here, and people and businesses may want to locate here.

Normative guidelines

Based on this understanding and such evidences, the normative recommendations for 'traffic-reducing land use development' are that urban development should take place as densification rather than as sprawl, and that central locations of new activities (residential areas, work-places, shopping facilities) are more advisable than more remote locations for most activities. Retail and services meant to and dimensioned for serving a more limited area should be located in or close to this area.

In larger cities, integrated city regions and metropolitan areas, this is more complex than in smaller cities. The normative advice would be to develop secondary centres in the strongest public transport nodes, and in areas which are already densely developed with businesses, housing, services etc.

Contestations

From the literature one gets the impression that there is no real opposition to the idea that these mechanisms exist and that following the normative recommendations about densification and 'right location' would result in lower road traffic volumes than if the opposite was done. There are, however, several debates going on.

Several studies, such as Cervero (2003) and Krizek (2003), have concluded that neighbourhood density in itself does not affect travel behaviour and car use significantly. There is, however, no reason that a dense housing area located alone-standing along a highway should produce less car traffic than a spread out housing area with the same location. Næss (2011a) found that neighbourhood characteristics such as grid patterns, distance to nearest shop etc. co-vary with location in the metropolitan structure in his Copenhagen-data, and hence that it is the location in the overall structures which causes lower car use for instance in neighbourhoods with grid-patterns.

There are also discussions going on concerning non-intended effects of densification which reduces the traffic-reducing effects, such as compensatory travels and self-selection. The first relates to a hypothesis stating that people living in dense cities or in dense areas of cities to a higher degree than others do out-of-the-city journeys during weekends and holidays, so-called compensatory travels (Holden 2007). Næss (2006:105) found, when controlling for other factors than the urban structural variables, that those living in the inner city of Copenhagen travelled less by car in the weekends (72 km) than those living 35 – 50 km from the city centre (82 km).

Self-selection regards whether inner-city inhabitants choose to live there because it matches their travel preferences, and thus that these initial preferences is the explanation for low car use rather than the mechanisms described above. Næss (2009) argues that even though it may be true that people with preferences for low car use choose to live in inner city areas in order to be able to live by their preferences, this is more an evidence that urban land use structure matters for travel behaviour than the opposite.

Finally there are discussions regarding negative effects of densification and compact city development (see e.g. Jenks et al. 1996, Ministry of the Environment 1996). This is important when it comes to urban planning, where a number of objectives and possible strategies and means are discussed simultaneously. Even if one agrees that high densities would result in

lower car use, one could still decide to carry out a more sprawled urban land use development for a number of reasons, such as to reduce building on urban green areas, to reduce the local traffic in inner city areas, to allow land owners at the outer parts of the city to sell land and earn money. These reasons could be rooted in more or less explicit objectives, knowledge or traditions. It also happens that discussions regarding the issue of centralisation versus decentralisation are mixed up with the discussions regarding concentration versus sprawl (discussed i.a. by Høyer 2002).

Weaknesses of the knowledge

The normative guidelines for planners are apparently clear and usable. Still, there seems to be a need of clarification regarding differences between what may be defined as densification and what is land use development with low car dependency. Densification is often defined as increasing the average density in number of people per km² in an area (e.g. Newman and Kenworthy 1989, Næss 1997). This means that all developments which take place within the existing boundaries of the urban area or city are defined as densification, and hence in accordance with the recommendations. There may, however, be many locations within an urban structure which are clearly car dependent and where new developments would cause increased urban road traffic volumes. This implies that the normative recommendations should be refined with regard to what kind of land use development that contributes to reduced urban road traffic demands and volumes.

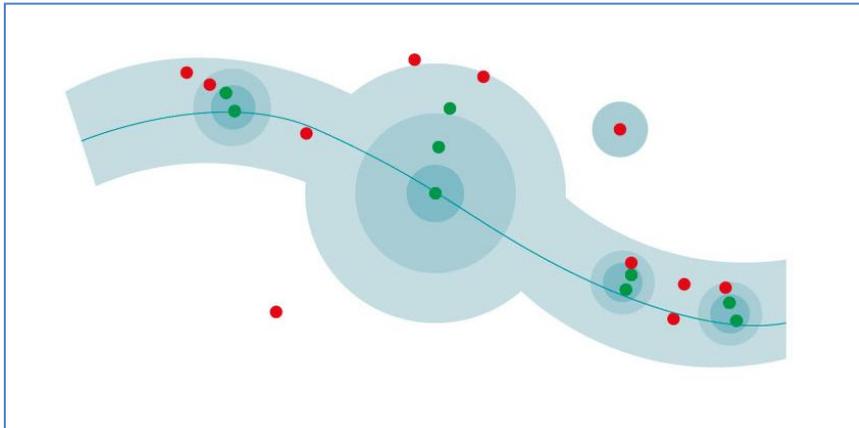
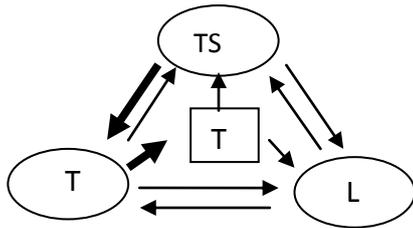


Figure 25: Location within existing urban structures is not necessarily car-independent. Red dots indicate locations which will cause high car use, while green dots indicate locations which are advisable with respect to the objective of reducing urban road traffic volumes (Tennøy 2011).

Further, the empirical knowledge regarding how traffic volumes vary with location of various activities is still insufficient. The existing data are sufficient to establish that the mechanisms exist. They are, however, not comprehensive and detailed enough to enable planning discussions regarding for instance how far from a main public transport node one should allow developments of new work places if one aims at reducing traffic volumes in smaller cities.

4.4.4.2 Changes of transport-systems affect travel behaviour



Quality of transport-systems matter

Even though land use defines the framework for travel behaviour in a city and for the transport-system, absolute and relative qualities of the systems for the different transport modes (private car, public transport, bicycle, walking) affect the possibilities and preferences for different modal choices, choice of destinations (travel length) and travel frequencies, and thus the traffic volumes. Hence, absolute and relative changes in qualities of the transport-systems are here understood as a main mechanism (beside changes of land use structure) causing changes in travel behaviour and traffic volumes.

One would expect that if travel by public transport, bike or foot becomes relatively better; that is faster, cheaper, more comfortable, safer etc., than using the private car, this would influence the competition between the transport modes and hence the modal choice, and result in reduced urban road traffic volumes. The opposite effect would be expected if travel by car became faster, cheaper etc.

Changes of qualities of the various modes would also affect choice of travel destinations, since making one destination more accessible (with all modes or a certain mode) would affect travel choices of travel destinations for e.g. shopping. Changes of quality of transport-systems could also affect travel frequencies, as when improved travels possibilities contribute to reduce the travel resistance and hence to increase the number of trips done.

Improvements of infrastructure for one mode do in some cases reduce the quality of other modes. This may be illustrated by the struggle over limited space in urban streets between car lanes, bicycle lanes, foot paths, bus lanes and parking. Allocating more space to the car would e.g. often reduce the possibilities to facilitate walking and bicycling in order to make these modes more preferable.

Changes of road capacity cause changes of travel behaviour

These mechanisms or interrelations, especially how development of the transport-system for the private car affects the competition between private car and public transport, are explored in various works. Downs (1962) discusses and describes how multiple mechanisms together result in 'the law of peak hour expressway congestion'. He shows why the combination of a) that commuters try to spend as little time as possible on commuting, within the limitations of income, transport costs, location of home and comfort, b) that most commuters continue to do what they have always done, and c) commuters will choose another route if they are convinced that this will reduce their travel time, result in unavoidable peak hour congestions on expressways.

According to Downs (*ibid*), the only way to reduce total travel time is to develop public transport services to be fast enough to compete with the private car, so that commuters choose the fast public transport rather than the private car. New road capacity will only contribute to more commuters choosing the private car and the new and faster route, and

thus that the congestion becomes at least as bad as before. If decline in the number of public transport passengers results in reduced public transport services, this will force public transport commuters to drive, and thus increase the congestion compared to what it was before.

Mogridge (1996) discusses various theories regarding the effects of investments in public transport versus road. He demonstrates, qualitatively as well as mathematically how latent travel demand is activated when congestion is relieved, causing new congestions. He shows that the benefits from investments in public transport are underestimated by standard transport models, because they rely on faulty theories.

Cairns et al. (1998) analysed a number of cases in order to explore what happens when road traffic volumes are *reduced* and hence the conditions for road traffic worsened. They found that reduced road capacity resulted in reduced car use and road traffic on the studied road as well as in the area. Hence, the chaos that usually was predicted did not occur. Reduced road capacity caused reduced traffic volumes, and not chaos. Kenworthy (1990) compared cities which had been developed to be more or less 'car-friendly', in order to explain how means and strategies implemented in concert (with respect to traffic volumes) work through the mechanisms previously described and reinforce each other.

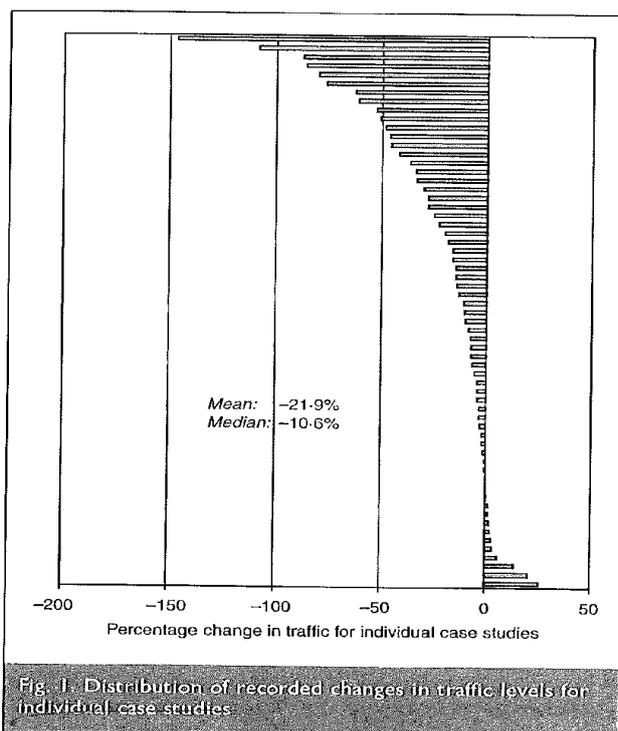


Figure 26: Distribution of recorded changes in traffic levels for individual case studies, facsimile from Cairns et al (2002:18).

Noland and Lem (2002) and SACTRA (1994) used large-scale computer models for analysing what happens if the transport-systems are changed. Litman (2007) lists a number of different studies carried out in different parts of the world with the help of different methodologies. They all found that improved conditions for road traffic result in growth in road traffic.

Parking is an important part of the transport-system for car traffic. It is widely accepted that the access to and price of parking affect car use, and this is also quite logical. Travel surveys in Norway have for instance demonstrated clear relations between parking access at the work place and use of car on travels to work (Denstadli 2002, Vågane et al 2011). The authors do, however, emphasise that there often are co-variations between centrality and good access to public transport services at the one hand and less good access to parking, and hence that they cannot tell how much of the differences can be allocated to the parking access. Madsen (1992) found a 25 % reduction of cars parking and a 10 % reduction of traffic volumes in central Copenhagen after introduction of parking fees in 1990).

Marsden (2006:455) found in his review of the evidence for effects of parking that “the published evidence base is not as strong as it should be”. He too found strong relations between commuting parking policies and use of car on journey to and from work, and he found it hard to separate the effects of parking access from other variables (centrality, access to alternative transport). Regarding effects of parking access for commercial and leisure uses, he found that different kinds of studies in different countries showed different results.

Changes of public transport quality cause changes of travel behaviour

There are also studies showing that access to a good public transport services increases the use of public transport. Nordbakke and Vågane (2007) compared public transport shares on travels to work in Norwegian urban areas among people with access to public transport services of different qualities, and found clear differences. Among those who had what was defined as very good’ public transport services (4 departures per hour, less than one km from residence to public transport stop), 54 % used public transport on travels to work. Among those with access to ‘good’ public transport services (2-3 departures per hour and 1 km between residence and public transport stop, or 4 departures per hour and 1 – 1,5 km between residence and public transport stop) only 27 % used public transport on travels to work.

When one of two lanes in each direction was transformed from car-lane to public transport-lane in the Norwegian city Trondheim, the delays for public transport was reduced by about 20 % in the rush-hours in the affected area. The number of passengers on public transport increased, while the number of cars was reduced. Some traffic found other routes, but it was concluded that the road traffic had been reduced because of the project (Halvorsen 2008).

	Before	After
Cars	3600	2700
Bus passengers	2800	3400

Figure 27: After the public transport lanes were introduced, more public transport passengers than car pass the counting point (Halvorsen 2008).

At the counting point, there were more public transport passenger crossings than car crossings after the public transport lanes were established, while the situation was opposite before (ibid). In a survey carried out two years after the implementation of the project, 67 %

of the inhabitants were positive to the public transport lane, while 33 % were negative (Sentio 2009¹⁶).

Asplan Viak (2007) found that car shares on journeys to and from work were reduced from 59 % to 35 %, while the public transport shares increased from 35 to 61 %, in two areas in Oslo (Storo and Nydalen) which were provided with a new subway line with high frequency (twelve departures per hour). There were no large changes in how the employees in the areas perceived their access to parking. In Storo – Nydalen, 58 % answered that there is always enough free and accessible parking spaces. In 2007, the figures were 54 %.

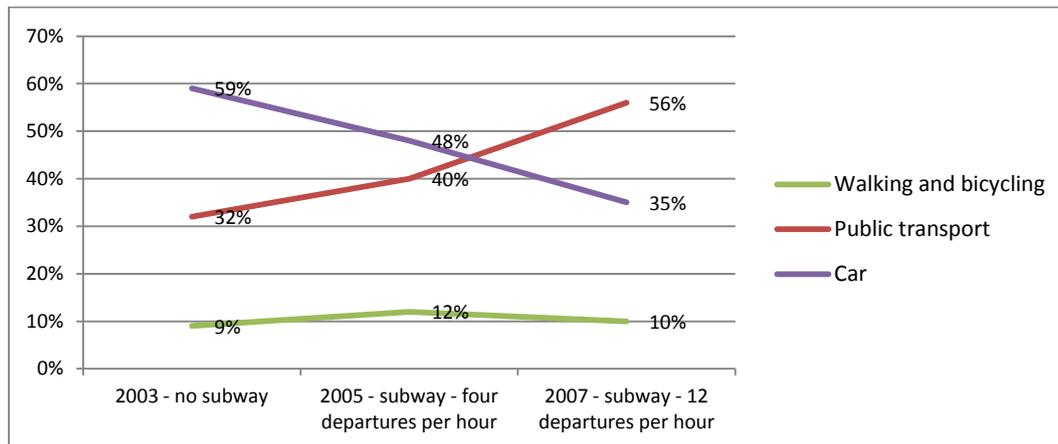


Figure 28: Changes in modal split on journeys to work places changed as the public transport services at Storo and Nydalen in Oslo were improved. Figure based on data from Asplan Viak (2007).

When it comes to more scientific knowledge regarding how the competitiveness of public transport varies with the public transport services, it may seem as the economists are the main producers of knowledge. They focus on the perceived (money) values of various qualities and changes of qualities of public transport, and how certain changes contribute to increasing the patronage (elasticity) (see e.g. Norheim and Ruud 2007). Others focus more on optimisation of the systems and less on their traffic-reducing effects (such as Nielsen et al. 2005).

This means that there is little focus on how public transport needs to be developed in order to compete with, and contribute to reduce, car traffic. It also means that it bases knowledge on responses to surveys regarding potential situations through context-less willingness-to-pay studies and stated preference studies (the preferred methodologies among many economists), rather than on empirical studies of how people actually act in various contexts.

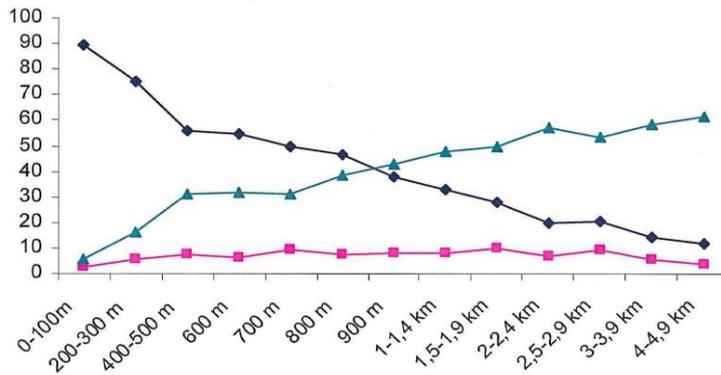
Hence, it may be difficult to find relevant knowledge about how different qualities of public transport-systems affect its competitiveness in different contexts, how public transport-systems need to be developed in order to contribute to reduce urban road traffic volumes, and how land use and other parts of the transport-system need to be developed in order to make public transport more competitive with respect to the private car. These are all relevant knowledge in land use and transport planning for reduced urban road traffic volumes.

¹⁶ See

<http://www.vegvesen.no/Vegprosjekter/bedrebymiljo/Nyhetsarkiv/Folk+mer+forn%C3%B8yde+med+kollektivfeltene.107476.cms>

Improving conditions for bicycling increase bicycling

The scientific and empirical knowledge regarding how changes of land use and transport-systems affect bicycling and road traffic volumes are not impressive. We do know that compact cities and location of activities in ways which creates short distances probably are the most important factors for increasing the modal share for walking and bicycling and to reduce traffic volumes. In her analyses of data from the national travel survey, Vågane (2006) found that the preference for walking drops fast as the distance covered increases. When distances exceed 900 meter, more people choose to drive a car than to walk.



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Figure 29: Percentages of people walking (green line), bicycling (pink line) and driving a car (blue line) on journeys of different lengths (the whole country, all journeys), facsimile from Vågane (2006).

Tennøy and Lowry (2008) found high bicycle shares on travel to work (37 %) in their travel survey among employees at the CIENS-institutes at Blindern in Oslo. They found that the bicycle shares were higher on shorter trips than on longer trips. With an average speed of 20 km/h, a bicycle trip of 15 minutes will be about 5 km and 30 minutes about 10 km. As the figure shows, when distance exceed 10 km, few choose bicycle on travels to work.

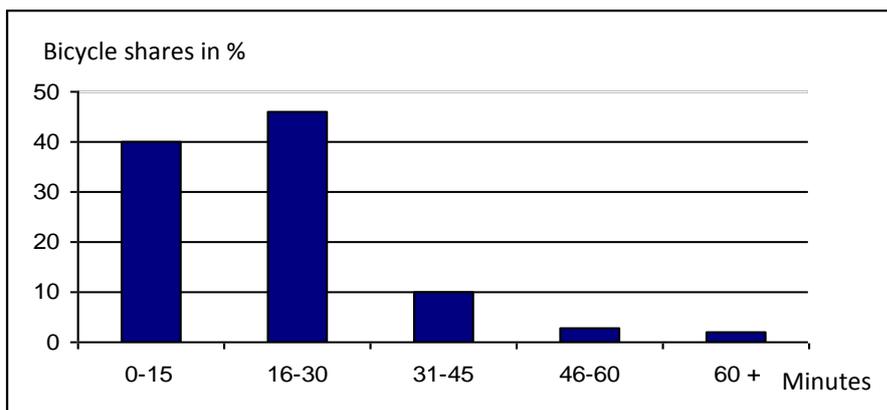


Figure 30: Bicycle shares on work journeys of various travel time, among employees at the CIENS-institutes at Blindern in Oslo, June 2008 (Tennøy and Lowry 2008).

When it comes to how different ways of facilitating bicycling in various contexts affect the competition between the bicycle and the car, there is little empirical knowledge to be found. One example of empirical studies of how facilitating for bicycling affects bicycling is Tennøy (1999), who measured the number of bicyclists in an urban street becoming gradually more bicycle friendly. She found that the number of bicyclists increased by about 300 % in 10 years, as traffic volumes were gradually reduced, bicycle lanes established in the street

where the counting was done and later in 'upstream' streets, the street was being renovated etc. It was not clear from the study how much of the increase that was 'new bicyclists' and how much was bicyclists that changed route to this one, but the study does anyhow show that bicyclists appreciate improved quality of physical conditions for bicycling and chose to use them.

Normative recommendations for development of transport-systems

The normative recommendations for planning and development transport-systems for reducing urban road traffic volumes are, based on these insights, to improve the conditions for using public transport, bicycling and walking, in order to make these possible and preferred modes of transport for a larger percentage of the population and the journeys. Conditions for the private car should, for the same reasons, be developed in ways causing the private car to be a less possible and preferred mode of transport.

Contestations

Generally speaking, there seems not to be any real opposition to the idea that there is competition between the transport modes, and that improvements of one transport mode will make it more competitive in relation to the others, and thus cause changes in the modal split.

Through decades, there has been a discussion going on about so called 'induced traffic', that building new road capacity in itself causes growth in urban road traffic volumes (see summaries in Noland and Lem 2002, Litman 2007, Strand et al. 2009). These days one seldom find academic contributions that do not accept that increased road capacity in pressured transport-systems cause growth in traffic volumes. One may, however, still find discussions regarding whether it is better to increase road capacity in order to reduce congestion and hence to reduce pollution per vehicle kilometre (Knudsen and Bang 2007, Strand et al. 2009). Not least, one finds plans for increasing road capacity on main roads in many Norwegian cities.

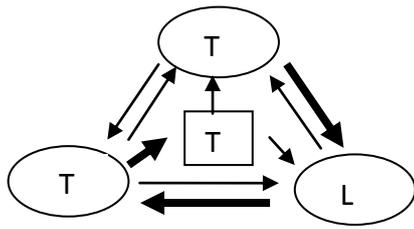
One also finds controversies when it comes to which improvements are most effective and efficient (prices, services, land use etc.) in order to improve the competitiveness of public transport to private car, in general or in specific contexts. Different opinions exist regarding to which degree changes of the transport-systems contribute to change the travel pattern in a city compared to e.g. people's preferences, income levels, general societal development etc.

Weaknesses of the knowledge

The normative recommendations for how transport-systems should be developed in order to reduce traffic volumes seem to be clear and usable at a more general level. However, the empirical research regarding how absolute and relative changes of the qualities of transport-systems affect the competition between the modes, and hence traffic volumes, are rather sparse, not least for smaller cities.

This is especially so when it comes to the detailed and context dependent knowledge planners need in order to make plans which cause reduction, rather than growth in urban road traffic volumes. This opens for ambiguity, disagreements and uncertainties at more detailed levels and in concrete planning situations, which may hamper the implementation of means that would contribute to reduce traffic volumes and open for developments that contribute to the opposite.

4.4.4.3 Changes of transport-systems affect land use and thus travel behaviour



Mechanisms

Changes of the transport-systems cause changes of land use (changes in the built structure and changes in how users use the present structure) which in turn affect travel behaviour and traffic volumes. Two main mechanisms are involved. The first mechanism regards that transport infrastructure and traffic take up a lot of space, and hence pressure the land use outwards. The other mechanism regards how development of transport-systems allows sprawl and un-optimal location with respect to low road traffic volumes.

Roads, traffic and parking takes up a lot of space in urban regions. We also see that large areas in the vicinity of such structures, with their noise and local pollutions, become less attractive for most activities. Public transport infrastructure, especially if designed for high speed, takes up much space as well. This way, development of new transport infrastructure or increase of speed on existing infrastructure contribute to push new land use developments outwards in the urban structure. Further, it may contribute to relocation of businesses and residents from inner to outer parts of the city, and that citizens start using the urban structure differently. This may cause non-optimal locations and use of the city with respect to low road traffic volumes, and hence to changes of travel behaviour and increased road traffic volumes.



Figure 31: Nygårdstangen in Bergen occupy a large area very close to the city centre, photo from www.dialogen.no.

The second mechanism regards how absolute and relative changes of the transport-systems cause changes of the actors' possibilities and preferences for choosing where to travel within the spatial structure, and how to use the urban structure. This affects possibilities and preferences with respect to travel behaviour and hence traffic volumes.

New road capacity does reduce congestion and the relative travel time by car, at least in the short time perspective. This allows households, businesses and work places to locate in ways which cause longer travel distances, as one can travel longer distances without spending more time. They can locate less centrally and more car dependent, since they can rely on accessibility by car. All together this causes a more sprawled and car dependent land use. This is often discussed as region enlargement, and understood as positive and desirable, since it increases the jobs – employees interface.

Such development does, however, cause longer journeys and the private car becoming more competitive, for reasons discussed above. This causes longer car trips and higher car shares, and hence increased road traffic volumes, as illustrated in figure 32. In the long run, the induced road traffic may cause further congestions which again call for increased road capacity. This is a main reason why ‘we cannot build us out of traffic problems’. Manheim (1979) discussed how and why increased travel speeds cause longer journeys, using a similar reasoning.

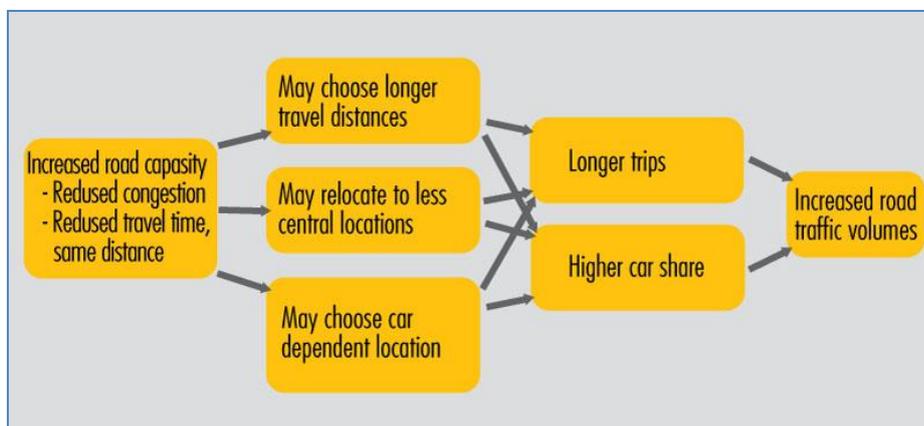


Figure 32: Increased road capacity affects land use developments, causing changes in travel behaviour and changes in traffic volumes (Tennøy 2009).

Improved public transport services may cause regional enlargement and increased travel distances as well. Growth in public transport miles is not a desirable development *per se* in a climate-perspective, since it increases GHG emissions. It is only when passengers use public transport *as an alternative* to the private car that growth in public transport is desirable, in a climate-perspective (and in most perspectives calling for reduction of traffic volumes).

In a system based on travel by public transport, bicycling and walking and with low car use, households, businesses and services would need to locate in ways that allow access by public transport, walking and bicycling. Increased road capacity would be both counter-productive and unnecessary. Instead, it would be wise to improve accessibility by public transport, bicycling and walking. Further, the land use development would need to be dense in order to allow most journeys to be done by foot or bike. This could be the situation in a low-energy future.

Taking another perspective - if the car for some reason was or became the preferred and prioritised mode of transport, and land use was adapted to this, the urban structure would be spread out in order to allow space for large parking spaces and road systems. This would encourage and force people to use car, which would increase traffic volumes, and call for increased road capacity and more parking. This may be experienced in many of today's cities.

Changes of transport-systems cause some destination to become more accessible. This may cause more people to travel to this destination; that they change their use of the urban structure. This may cause simultaneous changes in destination and mode, as if improved public transport services cause more people to travel to the city centre by public transport instead of to travel to a shopping centre by car, or if reduced parking access at the shopping centre does the same.

Normative recommendations

The normative recommendation based on these insights would be that in order to develop the urban structure in ways that contribute to less road traffic, one need to develop transport-systems in ways which stimulate land use to be developed in less car inducing and car dependent ways. This means to improve the conditions for travel by public transport, bicycle and foot, and to worsen the conditions for travelling by car.

Contestations

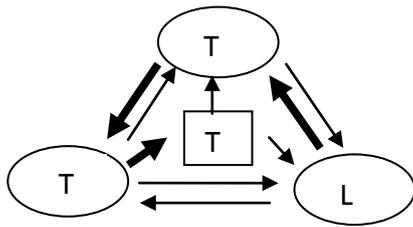
Previously, there have been deep controversies regarding whether increased road capacity contributes to increase road traffic in cities (induced traffic). How one relates to the mechanism discussed here – that development of transport-systems cause changes of land use (where new buildings are built, what is relocated to where, how people change their use of the urban structures) and hence traffic volumes, will affect one's understanding of induced traffic as well. These debates are hardly to be found in academic literature any more. The situation is rather that these mechanisms may be forgotten or downplayed in planning practice, among others because regional enlargements as well as new roads are understood as desirable.

Weaknesses of the knowledge

Regional enlargement is well documented and understood, but there are few (if any) studies actually demonstrating how developments of transport-systems affect land use and hence indirectly travel behaviour and traffic volumes.

This is probably because the mechanisms indirectly causing effects of changes of transport-systems through changes of land use on travel behaviour are difficult to study empirically. It may for instance be hard to define whether land use development caused the need for improvements of the transport-systems, or whether development of the transport-systems triggered, caused or allowed the land use development and hence the growth in traffic volumes. The changes are multi-causal, tiered and happening over a long period of time. It is almost impossible to isolate one or few variables, in order to study the phenomenon 'everything else being the same'.

4.4.4.4 Changes of land use affect transport-systems and hence travel behaviour



Mechanisms

Land use development affects development of transport-systems which in turn affects travel behaviour and traffic volumes. This indirect relation concerns mainly two mechanisms.

One mechanism regards how land use development (density, location, use) affects the competition between the different modes of transport, and thus travel behaviour and traffic volumes. This regards for instance that the conditions for walking, bicycling and public transport are better in a dense than in a spread out city, as previously described. If land use developments, or improvements of for instance the city centre, cause people to travel to destinations that are more easily reached by other modes than car, this could contribute to reducing road traffic volumes, and *vice versa*.

Newman and Kenworthy (1989) explain how and why they suspect that more parking and less people living in the inner city cause low attractiveness of the central city. They do quantitative comparisons of cities with different central area population to parking ratios with respect to human attractiveness rating for the central city. There were clear tendencies that the lower population to parking ratio, the lower attractiveness of the city centre.

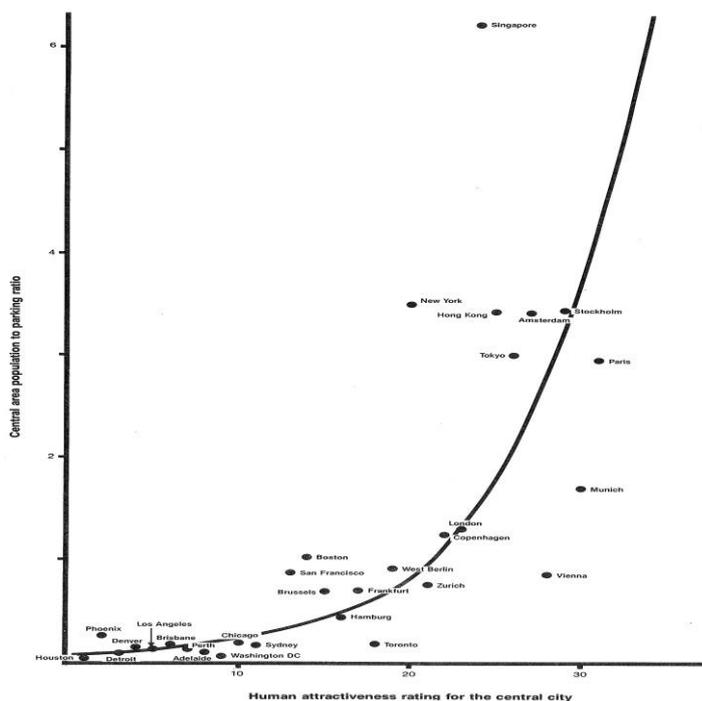


Figure 33: The population/parking trade-off. Facsimile from Newman and Kenworthy (1989:124). The central area population to parking ratio increases along the vertical axis, while the human attractiveness rating factor increases along the horizontal axis.

The other mechanism regards which developments of transport-systems different land use developments require, and how this affects the overall transport-system and the traffic volumes. If e.g. residential developments occur as sprawl, new transport infrastructure and services are needed in order to serve the new area. Whether the new area is served mainly by car or by other modes will affect the traffic volumes generated by the new development, and it could also affect the overall transport-systems. If the new residential development requires new public transport lines, and the budgets for public transport services are not increased, this would imply that public transport services are weakened other places in the urban structure. This could cause an overall increase in traffic volumes.

If, instead, residential developments were located in the dense city, or close to strong public transport nodes which also are centres, more travels could be done by foot or bicycle. There would be less need for development of transport infrastructure and new public transport services.

In rural areas, new residential areas located off existing school bus routes have direct impact on which resources are left to run ordinary public transport.

Normative recommendations

The normative recommendation based on these insights would be that in order to develop the urban structure in ways that contribute to less road traffic, one need to develop land use in ways which require less new transport facilities and services. This means densification rather than sprawl, car independent locations of new developments, and to make locations that are accessible without car more attractive.

Contestations

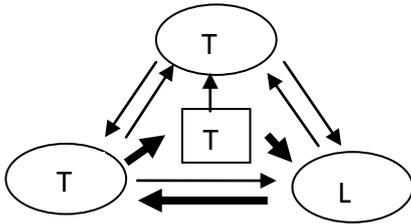
The relation between location of new development and demand for new infrastructure services is well known and understood in planning. Previously, the requirements for transport infrastructure and services because of new land use development were considered the main interrelation between land use development and transport development. In less urbanised areas, this may still be understood as the main relation between the two. What one might not have been aware of is how this affects traffic volumes. This mechanism is not contested in the literature, rather it is overlooked.

Weaknesses of the knowledge

To scientifically discuss the existence and strength of these mechanisms would require to explore e.g. if, why and to which degree the costs of running public transport services are lower in dense than in spread out cities (per capita and per passenger) and if the costs are varying between cities with 'right' locations of various activities and cities with 'wrong' locations. Another angle could be to compare costs connected to serve different types of new developments with public transport. The latter would require qualitative as well as quantitative studies, and include comparative case studies, but would be easier to carry out.

I am not aware of such studies, and have not found any when searching (combinations of public transport, urban density, costs), but I would be surprised if such comparisons have not been carried out.

4.4.4.5 Changes of traffic volumes affect land use and thus travel behaviour



Mechanisms

The main mechanisms causing changes of traffic volumes to cause changes of land use and hence changes of travel behaviour are that changes of traffic volumes and the related noise, local pollution, effects on security and safety, general wellbeing etc. in different parts of the city cause changes in the agents' possibilities and preferences regarding where to build, where to locate (live, locate their shop etc.), as well as how to use the city (where to shop or to spend leisure time). Activities can also benefit from high traffic volumes and a high number of potential customers, such as car-based shopping centres and gas-stations.

Increasing traffic volumes in inner cities and along main roads may make these areas less attractive for location and use, and contribute to urban sprawl by pushing urban structures and activities outwards and apart. Traffic volumes thus affect the probabilities for developing dense cities, for 'right' locations and for people using facilities more accessible by public transport, bicycle and foot.

Even though there evidently is no linear relation between traffic loads and popularity (there is e.g. a lot of traffic on Champs-Élysées in Paris, which also is a popular promenade street), there are numerous examples of urban areas that have been run down by years of heavy traffic loads, and which have changed profoundly as traffic has been relocated (see e.g. Miljøbyen Gamle Oslo 2000). This mechanism is often part of urban planning discussions, where one argues that if to make people want to live in inner city areas (to make this location possible and preferable), then these areas need to be 'nice'. This often includes that traffic volumes need to be low. This mechanism is also part of discussions on making city centres more attractive by reducing traffic loads and developing pedestrian areas.

Another mechanism is that high traffic volumes require space, which may be more plentiful supplied in some parts of the city, shifting the inhabitants' use of the city towards these areas. Increasing traffic volumes call for more parking, which will be easier to facilitate in outer than in inner urban areas, and hence that more people use the outer parts of the city.

Likewise, high traffic volumes on highways and the like, especially close to cities, cause owners of gas stations and car-based shopping facilities to want to locate close to highway intersections. If they are allowed to do so, this causes the city to be more sprawled and car-based, and hence increased road traffic volumes.

Normative recommendations

The normative recommendation based on these insights would be that in order to develop the urban structure in ways that contribute to less road traffic, one need to reduce traffic loads in areas where development and increased activity levels are wanted. This is often

inner city areas and city centre areas. One also needs to hinder car-based activities along the highways at the fringes of the cities, attracted by the high traffic volumes representing potential customers.

Contestations

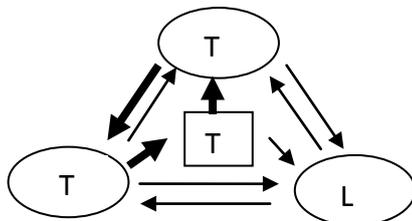
There is hardly any opposition to the understanding that heavy traffic loads in areas and streets make them less attractive for location of many activities, especially housing. There will probably be disputes about how important this effect is. One also finds debates regarding whether the best development for a city centre is to allow cars and parking in order to improve accessibility, or to keep cars and parking out in order to make the city centre more attractive and pleasant. Marsden (2006:456) did, however, find in his review that “those studies conducted to date fail to demonstrate any clear effect of the impact of parking standards on prices on commercial vitality at an aggregated level”.

Weaknesses of the knowledge

In order to study the existence and strength of this mechanism, one would need to study different cities or areas within cities with different levels of traffic loads, and discuss whether differences in popularity (density, prices, pressure, levels of use) may be related to traffic volumes. Another way of studying this is to study areas over time as the traffic load changes, and register changes in development and activity levels.

A number of different mechanisms will act simultaneously and affecting ‘the popularity’ of a city and an area, which means that this relation cannot be studied through quantitative and statistical comparisons alone. More qualitative case studies would be needed. Land use developments along highways and trunk roads, and the processes leading to such developments, could rather easily be studied in retrospective.

4.4.4.6 Changes of traffic volumes affect transport-systems and thus travel behaviour



Mechanisms

Changes of traffic volumes affect travel behaviour through changes of transport-systems. The main mechanism involved is that the traffic volumes affect the absolute and relative quality of the different transport-systems, and hence the possibilities and preferences for travellers to use them.

For instance, when increased traffic volumes make urban streets less comfortable, safe and efficient for walking or bicycling, people may change to other modes. When increasing traffic volumes on trunk roads cause congestions, the private car may become a less preferable mode, causing people to choose other modes. When increased traffic cause that public transport is delayed by congestion, it becomes less competitive.

Likewise, if one route is congested, restricted or made less attractive for any mode, another route may become more preferable, causing changes of route. Destinations reachable only

by using routes becoming more congested, noisy, unsafe etc. by any transport mode may become less preferable, which may cause changes of destinations and travel lengths.

If changes of traffic volumes in general cause changes of travel time and travel resistance, this would affect travel frequency and traffic volumes.

Normative recommendations

The normative recommendations for land use and transport planning for reduced urban road traffic volumes based on these insights are to reduce traffic volumes and speed in urban streets, and to prioritise other modes than the car in congested situations.

Contestations

The opposition to this will probably be about the strength of such effects and whether the recommendations are realistic, rather than about whether these mechanisms exist. Arguments against such strategies are for instance that if traffic is restricted in one street it will choose another street and cause problems there, that reduced capacity and accessibility for private cars in certain areas would create long and polluting tailbacks, and that road traffic continues to grow no matter what we do and hence that we need to provide the necessary road capacity (Tennøy 2004b).

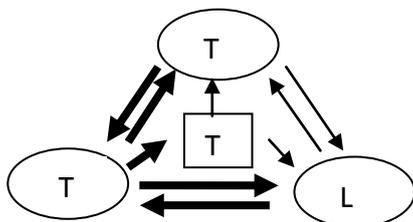
Weaknesses of the knowledge

I am not aware of studies aiming at empirically documenting the specific effects of changes of traffic volumes on travel behaviour for various modes of transport. This may be understood as a weakness of this knowledge.

Such studies could be conducted by asking people how they think they would react to changes of traffic volumes as travellers by different modes. This could be done through surveys, but underlying mechanisms, importance of contexts etc. would probably be better illuminated through interviews.

One could also compare situations that are different with respect to traffic volumes, or study situations where traffic volumes change, and measure the changes with respect to travel behaviour. This could be done in a city, and area or a street, and it could focus on changes of one mode or all. It could however be problematic to distinguish effects of traffic volumes from other effects (lively street, infrastructure etc.).

4.4.4.7 Changes of travel behaviour affect land use and transport-systems and thus travel behaviour



Mechanisms

Changes of travel behaviour do, as described above, affect land use and transport-systems through changes of traffic volumes. Changes of travel behaviour may affect land use and transport-systems in other ways as well and hence affect travel behaviour. A certain travel behaviour in an area, caused by certain cultural attitudes, physical structures, socio-

economic conditions or others, will affect land use and transport-systems. If the travel behaviour for some reason changes, this may cause changes in land use and transport-systems.

If, for any given reason, more people start using public transport, this will affect the public transport-system by bringing more passengers into the system. How this affects travel behaviour depends on the public transport-system itself as well as how responsible authorities react to the changes. If the number of passengers using a bus line increases, the bus line may be congested if the capacity is not increased. If the increase in numbers of passengers is met by an increase in capacity and frequency, this could boost even more passengers to use the line. If the new passengers are former car-users, traffic volumes will be reduced.

Likewise, if more people started using a car, the roads would be congested. Whether the capacity was increased or not would affect whether more people could and would start using the car, or whether they rather start or continue to use other modes.

Travel behaviour and changes of travel behaviour may also affect land use development. If, for any given reason, what is the preferred mode of transport changes, this would affect land use and thus travel behaviour. If people for instance started to prefer using car, more people would start using the externally located shopping centres instead of the city centres, since externally located shopping centres usually are more accessible by car. This could result in a boost in development of externally located shopping centres and a decline of the city centre. Likewise, if car became a less preferred mode of transport, city centres would become more attractive and car-based shopping centres less.

If the destination-preferences change, for instance if people start preferring city centres or centrally located housing before externally located shopping centres or housing, the car would become a less preferable mode of transport. This is because conditions for walking, bicycling and use of public transport are relatively better while travelling to centrally located destinations than to more peripherally located destinations.

Normative recommendations

The normative recommendations for land use and transport planning for reduced urban road traffic volumes based on these insights are to influence the inhabitants' preferences regarding travel behaviour. Changes towards preferences for other modes of transport than car and destinations and locations accessible without car, would cause less car use and traffic volumes.

Contestations

There are probably no contestation regarding that if people changed travel behaviour towards travelling less by car and to destinations accessible without car, this would affect transport-systems and use of land. The contestations would rather concern how one may make such changes of behaviour happen. Campaigns launched in order to make people get more environmentally friendly preferences and attitudes and to make more environmentally friendly choices have been carried out for decades. There is for instance a big campaign going on in order to make more people to travel by bike in Munich in 2011. It is hard to tell which effects such campaigns have. Several authors have described how and why people do not necessarily act according to their stated or perceived attitudes (Ajzen 1991, Brechan 2006, Nesheim 2009), even if such campaigns should be able to change the attitudes.

Weaknesses of the knowledge

I am not aware of studies that have empirically documented the specific effects of changes of travel behaviour on developments of land use or on transport-systems.

4.4.5 Agreed recommendations

Based on the theoretical and empirical knowledge presented above, and the (more or less conscious) understanding of this as a system of organised complexity, normative recommendations for how development of land use and transport-systems ought to be developed in order to reduce traffic volumes have evolved. Variations exist, but the normative recommendations are often summed up and simplified as to implement the following means or strategies, preferentially in concert (see among others Newman and Kenworthy 1989, Kenworthy 1990, Ministry of the Environment 1993, Strømmen 2001, Owens and Cowell 2002, Næss 1997, 2006, Stantchev and Menaz 2006, Banister 2005, Litman 2009, Hull 2011):

- imposing or encouraging land use development as densification rather than urban sprawl and as 'car-independent' location of activities
- imposing physical and fiscal restrictions on road traffic (e.g. capacity reductions or limitations on road capacity and on parking, not increasing road capacity, road pricing, pricing of parking, traffic regulations)
- improving public transport services (e.g. improved frequency and surface coverage, bus lanes, more efficient terminals, land use)
- improving conditions for walking and bicycling (e.g. dense land use, bicycle lanes, sidewalks, traffic regulations, reduced road traffic speed)

These agreed recommendations may be understood as simplified guidelines for planning and development of land use and transport-systems that contribute to reduction rather than growth in urban road traffic volumes.

4.4.6 A system of organised complexity

The descriptions and discussions in the previous sections makes it clear that urban land use, transport-systems, travel behaviour and traffic volumes form a system of organised complexity, and hence that 'how land use and transport-systems should be developed in order to reduce urban road traffic volumes' is a problem of organised complexity. The complexity of the system is caused by the existence of the many direct and indirect relations, and enhanced by the existence of both short term and long term dynamics, and by the iterative nature of the system. If we ask what causes growth or reduction in urban road traffic volumes, in general or related to a specific change of land use or transport-systems, the explanations will be multi-causal.

This could be exemplified by a study carried out by Tennøy and Lowry (2008).

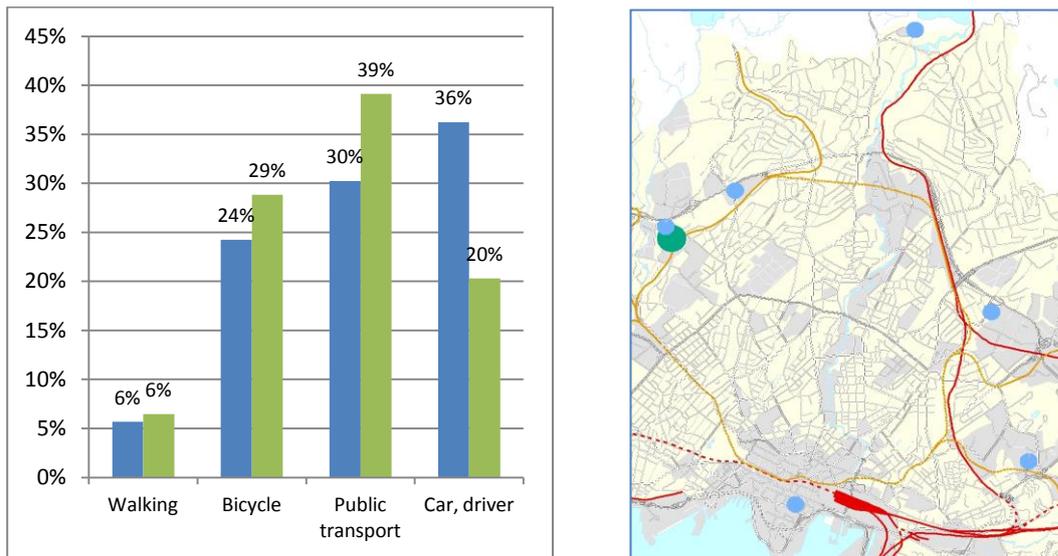


Figure 34: Changes of travel behaviour when eight businesses were relocated (Tennøy and Lowry 2008). Blue bars indicate results from September 2006 before relocation, green bars from September 2007 one year after. The map shows location before (blue dots) and after (green dot) relocation.

They compared (with the help of surveys) travel behaviour among employees before and after their work places were relocated from locations with certain properties regarding the possibilities and preferences for the employees' travel behaviour to another location with different properties. The car use on travels to work was almost halved, from 36 % to 20 %. When discussing what had caused these changes, the answer was the *combination* of more people getting walking and bicycling distances to work, improvements of the public transport services and the parking restrictions. None of the factors could explain it alone, a multi-causal explanation was needed.

The definition of what kind of problem one is dealing with is an important part of the ontological description of a phenomenon. This affects epistemology and research methodology, and also application of the knowledge. The fact that this is a system of organised complexity is a challenge for planning practitioners as well as for planning theorists. If one treats a complex system as a system of simplicity and do not recognise that several mechanisms may be activated when changing one variable in order to affect another, then one may experience that the resulting effects are different from what one expected them to be. Oversimplification by for instance considering only two or few of the variables and interrelations in the system may result in implementation of counteracting means, such as improving both road capacity and public transport-systems.

If, for instance, a new main road is built in order to lead traffic away from the inner city in order to allow land use to take place as densification in the inner city, the effects on traffic volumes of this mechanism may be counteracted by other mechanisms. If the new road involves an increase in road capacity, this would cause growth in traffic volumes, unless the road capacity is reduced correspondingly on other parallel roads, and/or strong restrictions on car dependent land use developments are enforced.

If one treats a complex system as a system of disorganised complexity and reduce this to experienced regularities or to pure empiricism, one may hardly capture the underlying mechanisms producing the phenomena or how context affects the resulting effects. If one for instance implements a measure in order to reduce urban road traffic volumes, and

calculates the expected effects based on average empirical data from a number of other cases where the same measure has been implemented, one may experience that the resulting effects are different from the calculated effect. Both of these approaches may result in the city seeming impossible to analyse and predict, or irrational, as Jacobs ([1961] 1994) expressed it.

This could for instance occur if one applies average and non-contextual data in over-simplified transport model analyses in order to predict the effects of changes of land use or transport-systems.

It is hence is urgent to recognise the problem as one of organised complexity and to understand how the elements are interrelated in order to be able to reduce urban road traffic volumes through land use and transport planning and development. If the problem is understood as a system of organised complexity, means or strategies could be implemented in concert in order to reinforce each other. This would result in larger effects than if the individual means or strategies were implemented alone. If one for instance both e.g. reduces road capacity and improves public transport services, urban road traffic volumes would be reduced more than if one applied only one of these means.

It could be claimed that understanding this as a system of organised complexity is the state-of-the-art way of viewing this system, at least among experts of coordinated land use and transport planning for reduced urban road traffic volumes. The changes from understanding the system as a system of simplicity (where only some variables and their correlation are included) or of disorganised complexity (where average and preferably universal properties are analysed) to understanding it as a system of organised complexity, may be seen as a main feature of the development of knowledge in this field over the last two or three decades. This development will be more thoroughly discussed in chapter five.

4.4.7 The sum is more than the parts – the emergence of car cities and non-car cities

The model, its objects, the interrelations between the objects, and the mechanisms causing the system to work as it does and produce certain traffic volumes, have been described above. What is hard to grasp and to describe, is that the sum is more than the parts. Through the mechanisms described and exemplified above (and probably a number of others), cities and parts of cities become more or less car-based. The land use and transport-systems of different types of cities and parts of cities invite to different uses of the city and to different kinds of further developments of its land use and transport-systems. The cities *emerge* into one kind of city or another kind, and traffic volumes are related to what kind of city this is.

Kenworthy (1990) did an interesting attempt to explaining this by comparing European cities with American and Australian cities. Further exploration is, however, needed in order to achieve a deeper understanding of how and why we find very different kinds of travel patterns in different kinds of cities. The critical realist understandings of emergence could be a helpful tool in such explorations. There is, however, no room for following this line of thought further in this work.

4.5 The scientific soundness of this knowledge

The expert knowledge needs to be scientifically sound in order to guide planning and planners when making plans, in order for planners to apply it in plan-making, and for others to accept analyses, recommendations and plans based on the expert knowledge as valid. In the search for explanations regarding how and why planner make plans which cause growth in urban road traffic volumes, the *quality* of the expert knowledge previously described needs to be explored and discussed. The first inquiry concerns the *scientific quality* of this expert knowledge.

In order for knowledge to be scientifically sound, it needs to have been produced in accordance with acknowledged epistemology and methodology for scientific knowledge production. Critical realism is chosen as scientific approach in this work. Hence, the criteria for sound knowledge production are developed on the basis of critical realist epistemology. Other epistemologies and methodologies could have been chosen, such as popperianism and hypothesis testing.

The object of inquiry is the expert knowledge in question, represented by the previous description of how I understand the state-of-the-art expert knowledge.

First, criteria for knowledge to be scientifically sound within critical realism are defined. These are my interpretations of a small selection of a huge literature and a number of previous and on-going debates. The descriptions are not comprehensive, and the criteria could have been defined differently by other authors.

Second, the expert knowledge (the previous description of it) is critically examined with respect to whether it fulfils the defined criteria. If it is, it is argued, the knowledge may be viewed as scientifically sound. If it is not, it means that the knowledge has weaknesses which implications need to be explored.

Third, it is discussed whether weaknesses with respect to the scientific soundness of the expert knowledge may contribute to explaining how and why planners make traffic-increasing plans, through which mechanisms and under which conditions.

4.5.1 Criteria for the knowledge to be scientifically sound within critical realism

The retroductive discussion of what the knowledge must be like in order to be scientifically sound according to critical realism was conducted in chapter two. The main criteria could - very simplified - be summarised as follows:

- Its ontology includes at least that social systems are open or only partially closed systems, that real objects possess causal powers, that events are multi-causal, that causal powers and mechanisms are not directly observable, and that it is contingent whether a certain mechanism will produce a certain event
- It is able to explain how and why what happens actually does happen, and this includes knowledge about:
 - o the main structures and mechanisms involved in producing a phenomenon, and the necessary conditions for activation of these mechanisms
 - o how specific conditions mediate the effects of the mechanisms in producing concrete events (the strengths of the effects)
- The knowledge has been produced in scientifically sound ways; through methods emphasising explanation rather than statistical event regularities

- The knowledge has generalising claims, expressed as transfactual conditions for an object to be what it is and having causal powers to produce certain effects

The question here is whether the previously described knowledge about how urban land use and transport-systems affect travel behaviour and traffic volumes, and how it should be developed in order to contribute to reduction of urban road traffic volumes, fulfils these criteria.

4.5.2 Analysis of the scientifically soundness

4.5.2.1 Ontological understandings and descriptions

An open system

The critical realism understanding that multiple structures or objects, with their inherent causal powers, are involved in producing events is found in the previously described knowledge system¹⁷. The model includes several structures, with their causal powers and mechanisms, which are working together in a 'system of organised complexity'. They produce certain traffic volumes, which in turn affect the land use and the transport-systems through numerous direct and indirect interrelations.

It is also acknowledged that other structures and mechanisms belonging in other and intersecting systems, which are not included in the model, are involved in producing the event (traffic volumes). The description of the expert knowledge in the previous chapter is hence a description of an open system (or a partially closed system, as I will return to).

Multi-causality

The events (travel behaviour and traffic volumes) are described as being multi-causal. The traffic volumes in an area, or changes of the traffic volumes, would hardly ever be described as mono-causal within the described expert knowledge. The understanding of events as multi-causal is also found in the descriptions of how changes of traffic volumes occur through a number of mechanisms, and in the normative recommendations about implementing changes of land use and transport-systems that tend to cause the same kind of effect (with respect to traffic volumes) *in concert*.

The land use structures, the transport-system structures and combinations of these are described as having causal powers to contribute to produce certain travel behaviours and traffic volumes, and to change travel behaviour and traffic volumes, via a number of

¹⁷ The similarities in the ontological understandings expressed in the description of the knowledge of how planning and development of land use and transport-systems affect traffic volumes and the ontology of critical realism may make one suspect that the knowledge description is written in critical realism terms, and that this explains the similarities. When it comes to some of the terms used, this may be so, but the fact is that this knowledge is frequently described in ways reflecting such ontological understandings, especially with respect to contextuality. This author did for instance describe the interrelations between development of land use structures, transport-systems and traffic volumes in similar ways in her Master of Science thesis, without ever having been exposed to the thoughts of critical realism (Tennøy 1994). Manheim (1979) describes, with a clear transport planning approach, the interrelation of transportation and activity systems, where his main figure consists of the three objects 'transportation system', 'activity system' and 'flows'. Strømme (2001) takes this understanding as point of departure in her dissertation, where she discusses how location of businesses affects traffic generation. Most of the literature referred in the knowledge description, especially the literature produced by land use and transport planning researchers, describes this or similar 'integrated approaches' as a point of departure for the studies.

mechanisms. The causal mechanisms are not necessarily accessible through direct observation.

Focus on changes of land use and transport-systems

In the description of the expert knowledge in question, it is acknowledged that a number of factors affecting travel behaviour and traffic volumes are not included in the explanatory model. This is done as part of the conceptual abstraction (see e.g. Danermark et al. [1997] 2002:42-45), where the phenomenon is analytically divided into a number of causal components. Which are chosen to be explored in a research project should be determined by the problem at hand. Here the problem is how planning and development of land use and transport-systems affect changes of travel behaviour and traffic volumes, and how these should be developed in order to reduce traffic volumes. This is the reason why land use, transport-systems, travel behaviour and traffic volumes are included in the model, while other important factors and structures are not.

Agreements regarding the knowledge

From the description of the expert knowledge, there seems to be a basic and rather agreed understanding regarding which interrelations between the objects that exist, which mechanisms are involved in producing traffic volumes, and how these works. There are, to this authors' knowledge, hardly any disagreements among researchers of land use and transport planning regarding the *main features* of this system.

Re-description in critical realism terms

The knowledge could be re-described in critical realism terms as follows: The *structure* (societal structures causing needs for travel, land use structures, transport-systems structures, the actors using the systems, and the structures they are parts of), has *causal powers* to - if the *generative mechanisms* are triggered (certain possibilities and preferences for travel behaviour defined by the land use and the transport-systems) - produce certain patterns of travel behaviour, resulting in certain traffic volumes.

Hence, these *structures* have *causal powers* to - if the *generative mechanisms* are triggered (changes in land use and/or the transport-system) - cause changes of travel behaviour, resulting in changes of traffic volumes. What actually happens depends on the present conditions defined by the context (the land use, the transport-systems, others), the combination of changes going on and the mechanisms these trigger.

Changes in one variable of the system will cause changes in several of the other variables. The mechanisms at work may reinforce each other, counteract each other or not affect each other, since the system has several direct and indirect interrelations, since it is dynamic in several time perspectives and since it is iterative by nature. Some changes of land use and/or transport-systems trigger generative mechanisms which *tend to* cause growth in urban road-traffic volumes, for instance when reducing travel time by car increases the possibilities and preferences for using the car. Other changes trigger mechanisms which *tend to* cause reduced urban road traffic volumes, for instance when central locations of new residences increases the possibilities and preferences for using other modes rather than the private car.

Whether a certain change in a certain context and in combination with other changes actually causes a certain change in traffic volumes, is a different matter. This means that it is understood that it is contingent whether certain changes of land use or transport-systems actually will produce certain changes of traffic volumes.

In accordance with the criterion

It has hence been found that the ontology of the expert knowledge as it is presented in the description of the expert knowledge is in accordance with critical realism. The system is open (or partially closed), causal powers and mechanisms are not directly observable, and the objects have causal powers which produce events through a number of mechanisms. Hence, phenomena in the real world are multi-causal and it is contingent whether a certain mechanism will produce a certain event.

4.5.2.2 The expert knowledge's ability to explain the phenomenon

Explanatory power

The next question regards whether the expert knowledge is able to explain how and why what happens actually does happen – how and why certain developments of land use and transport-systems cause certain changes of travel behaviour and traffic volumes.

The previous description of the expert knowledge shows that the expert knowledge is developed as an attempt to explain how land use, transport-systems, travel behaviour and traffic volumes are interrelated, how and why the ways they interact with and affect each other produce certain traffic volumes, and hence how and why certain changes in land use and transport-systems tend to cause certain changes of travel behaviour and traffic volumes.

The reasons for developing the knowledge are to understand how the system works, and how it can be manipulated, in order to suggest developments and produce plans which can contribute to produce the desired changes and avoid other changes.

Structure, mechanisms and necessary conditions

The main structures are described (the land use, the transport-systems) in the presentation of the expert knowledge, as are the mechanisms through which the causal powers embedded in the structures work, the effects that are produced, and how they affect each other and produce certain travel behaviour patterns and traffic volumes.

It was explained how and why certain *differences* in land use and/or transport-systems cause different travel behaviour and traffic volumes in specific contexts, and through which mechanisms. It was also described how *changes* of such conditions cause changes of travel behaviour and traffic volumes. The main focus when it comes to 'specific contexts' is often other features of, or changes of, land use variables and transport-systems variables, and how they affect the effects of a mechanisms and the resulting event (traffic volume). These should be understood as main conditions, affecting whether and how the causal powers and mechanisms will cause a certain event.

Strengths of the effects

Few studies are carried out mainly in order to disclosing the strengths of certain causal powers working through mechanisms under certain conditions. There are, however, examples of more focused studies aimed at assessing the strengths of certain effects. Næss (2004) applied multivariate regression analyses, in a theory-informed manner, as an evidentiary tools enabling *assessment* of explanations. He used this tool (in combination with qualitative methods) in order to uncover the *strength* of the relationship between the distance from residences to downtown and weekly travel distance in relations to other investigated factors of influence (socio-economic factors). The multivariate regression analyses helped revealing relationships which were not evident when doing simple bivariate analyses, where the two variables both varied with residential location.

Newman and Kenworthy (1989) applied factor and cluster analysis in order to be able to discuss the strength of the effects as well as which other factors need to be present in order for e.g. dense cities to generate low traffic volumes per capita. It is, however, emphasised in their book that themes and factors were chosen on the basis of a clear conceptual understanding of transport and land use in cities, rather than 'statistical routine'.

Shortcomings exist

Even though the expert knowledge in question explains how the system works, and how and why it produces certain effects, the description of the knowledge revealed that it has shortcomings.

It was found that while some of the mechanisms in the knowledge description seem to be well studied, there seem to be few empirical works exploring other mechanisms. Example of the latter could be how changes of land use affects transport-systems, or how increasing traffic volumes affect the use of bicycle, which seem to poorly described and investigated. Some mechanisms are not described and investigated in ways useful for planners aiming at contribute to planning for reduced urban road traffic volumes, such as how public transport-systems should be developed in order to be more competitive with respect to the private car. Other relations have only been studied in certain contexts, for instance in big cities but not in small cities.

This may cause that these mechanisms are not included in the understanding of how the city works, or that how they work and with which strength are misinterpreted. Both of these may cause that planners and other understand the workings of the system in faulty ways.

Further, there were few references in the description of the knowledge to studies of how *combinations* of measures affect travel behaviour and traffic volumes. This may be relevant, since planners often need to assume that several changes of land use and transport-systems are taking place simultaneously. Coordinated land use and transport planning is about designing packages of measures that together are supposed to contribute to achievements of a number of objectives.

4.5.2.3 The knowledge has been produced in scientifically sound ways

The description of the expert knowledge and the kinds of research on which it has been developed demonstrate that this is research aimed at explaining how and why events occur, rather than to establish event-regularities.

Case studies aimed at developing explanations

Comparative case studies are common when exploring mechanisms and how they work. This is often about interrelations between two or a few variables in a number of either similar or different contexts. The independent variable is most often states or changes of land use and transport-systems. The dependent variable is often travel behaviour or traffic volumes or something which may be derived from this such as gasoline consumption. Such studies do mainly focus on revealing which mechanisms that are at work and explaining how they work, including how they are activated and the strength of the mechanism in the actual context. This also involves describing the structures, the relevant features of the context, which other mechanisms are at work etc.

One example of this is Næss' (2006) studies and analyses of how and why residential location in the urban structure affects travel behaviour and traffic volumes. The theoretical work largely consists of concept clarifications and retroductive reasoning. This leads to

selection of certain kinds of factors to include in the study. Quantitative research was carried out in order to measure the variations in travel behaviour between residents living in different parts of the city. Qualitative studies including interviews with residents were carried out in order to explain why certain locations of residences tend to generate more road traffic than other locations. Multiple regression analysis was applied in order to investigate the strength of the urban structure mechanisms compared to some of the other mechanisms at work.

Together this showed that there are mechanisms related to urban structure causing those living in the outer parts of the city to travel more by car than those living in the inner parts of the city, as well as how these mechanisms work, and why they produce such phenomena. For planning practice, this means that location of new residences in the outer parts of the city or as sprawl causes more road traffic than locating the new residences as densification and in the inner city. It also means that in order to reduce or delimit road traffic, new residential areas should be planned and developed as close to the city centre as possible.

Multiple or single case studies exploring what happens when land use or transport-systems are changed are less common. In such studies, travel behaviour or traffic volumes are measured before and after a certain change is carried out. Such studies are usually designed on the basis of abstract or theoretical understandings of how changes of land use and transport-systems are expected to affect travel behaviour and traffic volumes, and the results are interpreted in relation to this as well. Cairns et al.'s (1998) studies of how, why and how much reduction of road capacity on major roads affected traffic volumes and congestions, and how and why these effects occurred, is one example of such research. Other examples are Asplan Viak's study (2007) exploring how much improvements of the public transport services in an area affected car share and traffic volumes and Newman and Kenworthy's (1989) work including to study the interrelations between urban density and gasoline consumption.

In the knowledge description it is also referred to studies which combine the use of quantitative time series concerning for instance development of average time spent on travels to work the last 20 years, with abstract knowledge about interrelations between development of transport-systems and development of land use (Engebretsen and Vågane 2008).

Few examples of purely theoretical works

There are few examples of purely theoretical works, possibly because planning is a practical profession. Instead, most works combine abstract descriptions of the relations under study with empirical studies. In concrete studies, both intensive and extensive (critical realism terms for what resemble qualitative and quantitative studies) methods are applied. Downs' (1962) work on how and why new road capacity affects traffic travel behaviour, traffic volumes and congestions on highways is an example of a rather theoretical work. This work is mainly an abstract discussion of the phenomenon, even though it is underpinned by references to empirical studies of what happened in situations where road capacity was increased.

A mixture of academic, fiducial and bureaucratic knowledge

One can observe that the selection of research presented represents a mixture of what Hunt and Schackley (1999) term as academic, fiducial and bureaucratic knowledge. The main mechanisms have been explored in academically published studies, but fiducial knowledge

presented in what often is termed 'grey literature' (research reports and the like produced by research institutes and universities, often as commissioned work, which has not been formally peer reviewed) constitutes an important part of the knowledge, among others since it represents a broader diversity of contexts. Bureaucratic knowledge plays an important part in defining relevant knowledge for planning practice. This mixture could be understood as a weakness. It could, however, as Hunt and Schackley (*ibid*) claim, also be understood as a strength which enable development of knowledge which is useful in policy making.

It is concluded here that the expert knowledge in question seem to have been developed in ways that are seen as scientifically sound in a critical realism perspective.

4.5.2.4 The expert knowledge has generalising claims

Generalisation as transfactual knowledge

A necessary condition for making predictions through planning analyses is that knowledge produced at a certain time in a certain context is transferable to other contexts and to future situations – that it has generalising claims. In critical realism, the question of generalisation is discussed as whether the knowledge is transfactual.

Transfactual knowledge regards knowledge about how the mechanisms work if they are triggered. Hence, it regards knowledge about constituent properties, the more or less universal preconditions for an object to be what it is, and which enables it to do what it does. This knowledge is valid in 'all' contexts, even though the strength varies. The question is whether the described expert knowledge has such generalising claims.

The expert knowledge in question has generalising claims

The answer to this question is yes. Land use structures have properties which create distance and proximity between locations, as well as locations to travel between. Transport-systems have properties which create opportunities for moving between locations. Certain combinations of land use structures and transport-systems create certain possibilities and preferences for whether, where to and how to travel, which influences travel behaviour and traffic volumes. Changes of either of these structures cause changes of possibilities and preferences for travelling (whether, where and how), and this may cause changes of traffic volumes – under certain conditions (as previously discussed).

On basis of this reasoning, we could argue that developing cities through densification *in general* tend to contribute to less traffic generation than developing cities through urban sprawl. Dense cities have causal powers to generate less traffic than sprawled cities, and these causal powers are working through a number of mechanisms. Average distances between locations will be shorter in dense cities than in sprawled cities, causing increased possibilities and preferences for travels to be done by bicycle or foot instead of car as well as averagely shorter car journeys. Dense cities can also more easily be well served by public transport than sprawled cities, causing increased possibilities and preferences for travelling by public transport instead of car. Conditions for car use will often be worse in dense cities than in sprawled ones, causing decreased possibilities and preferences for travelling by private car.

These mechanisms may, given the right conditions, contribute to lower traffic volumes per capita if cities are developed through densification than if they are developed as urban sprawl in all cities – that is *in general*. In the same way one could argue that improving public transport-systems *in general* tends to contribute to reduction of traffic volumes, even if does

not always happen. Improvement of the public transport-system do cause increased possibilities and preferences for using public transport instead of car, and hence may contribute to reduced traffic volumes. This could however be counteracted by growth in traffic volumes of other causes. Hence, we are not able to predict exactly how much traffic a certain development will generate, or the differences in traffic generation if we developed the city in one or the other way. Rather, we know that this will vary between cities and between different areas in cities, for a number of different causes and through a number of mechanisms.

The description of the interrelations between the objects in the knowledge description is mainly a description of transfactual conditions, explaining how and why the objects are interrelated and together may contribute to changes of traffic volumes. This suggests that this knowledge represents general knowledge and has *generalising claims* within the critical realism concept of scientific generality.

Some may not accept the generalising claims of the expert knowledge

Within the more quantitative epistemological approaches, generalisation through statistical extrapolation is common. This generalisation regards how knowledge about a limited group may be statistically extrapolated to a larger group of events, people or other phenomena. This is not a common way of generalising within critical realism, and is not emphasised in the research described as the basis for the expert knowledge in question.

This lack of generalisation as statistical extrapolation may be understood as a weakness of this knowledge among those relating more closely to methods that are more focused on event-regularities than on explanation. This may cause that they do not accept the expert knowledge in question as valid and relevant, and hence that they don't support that this knowledge is applied in plan-making.

Statistical extrapolation

Yin ([1994] 2003:32) describes statistical extrapolation as “an inference made about a population (or universe) on the basis of empirical data collected about a sample”. The main tools for doing such generalisation are statistical theory and methods. Categories need to be defined for which the knowledge is supposed to be valid, based on empirical, formal similarities between the members of the group tested and the larger group the knowledge is extrapolated to be valid for. This could for instance be men between 20 and 40 years old, cities with between 50 and 100 000 inhabitants, or residences with access to bus services with four departures per hour.

Statistical methods are used to test the statistical co-variation between the group included in the study and the group the knowledge is claimed to be valid for. If the two groups are similar with respect to the defined criteria, one assume that the finding within the actually tested groups also apply for the larger groups defined by these selected variables.

Few attempts of statistical extrapolation in the expert knowledge in question

From the descriptions of the expert knowledge and the referred studies it seems as if there are few (if any) attempts of empirical extrapolation of findings to larger groups of cities or situations, defined by formal, empirical similarities, such as city sizes, public transport services or densities.

The independent variables in the studies are typically the ones that planning practice deal with, such as land use structures, location of activities, qualities of the different transport-systems, and changes in these variables. The dependent variables are typically modal split and average travel distance by car or other modes, and changes of these. In the description of the knowledge, quantitative studies were referred which are designed to explore co-variations between for instance urban density and gasoline consumption per capita (Newman and Kenworthy 1989), location of businesses within the city structure and modal split on travels to work (Tennøy and Lowry 2008), location of dwellings in different distances from the city centre and average weekly travel distance by car (Næss 2006), transport quality in an area and modal split on travels to and from the area (Asplan Viak 2007) and road capacity and traffic volumes (Cairns et al. 1998).

Several of these are single case studies, comparing a situation before and after a change has taken place or comparing different areas in one city. These are obviously not designed for or suited for statistical extrapolation. Others, for instance (Cairns et al. 1998) and (Newman and Kenworthy 1989), are multiple case studies, and mainly quantitative. Statistical theory and methodology are used to check the statistical validity of the findings, and to control for other factors than the effect-factor. However, none of them attempt to extrapolate their findings to universal or average figures which are valid for larger groups of cities or situations, defined by formal, empirical criteria.

Statistical extrapolation requires that the problem is viewed as simple and disorganised

One reason for this may be that in order to do such statistical extrapolations, the system would need to be understood as one of simplicity *and* of disorganised complexity. Generalisation through statistical extrapolation in the bus-example from the previous discussions could have been claims such as 'doubling of the frequency of a bus line would reduce the traffic volumes in the influence area by 10 %', or having an elasticity of -0,2, in cities with 50 – 100.000 inhabitants.

This would require first that the system needs to be understood as one of disorganised complexity in order to produce an *average number* for how a certain change of the transport-system affect traffic volumes (quantitatively and precisely defined). Further, it needs to be understood as a problem of simplicity, where only two or few interrelations are included.

Statistical extrapolation is exactly how Jacobs ([1961] 1994) describes the attempts of the planning theorists of her time to understand the cities, and which she claims is the reason why they understood the city as almost impossible to analyse or as irrational. The problem is that even if a group of cities are similar with respect to one variable (such as city size), there could be large variations with respect to effects on traffic volumes within that group. This is because the cities could be different with respect to other relevant context variables (quality of the public transport services, quality of the other parts of the transport-system, various variables related to the spatial lay out of the city, others) affecting traffic volumes.

Lack of statistical extrapolation is a strengths rather than a weakness

This discussion has demonstrated that statistical extrapolation is not a good method for generalisation when dealing with these kinds of problems. Hence, the lack of empirical extrapolation in the expert knowledge in question should not be understood as a weakness of the knowledge. Rather, its focus on generality as transfactual knowledge is a strength.

If this feature of the expert knowledge causes that it is not acknowledged by powerful actors and applied or emphasised in the plan-making, or that it is ousted by other kinds of knowledge emphasising statistical extrapolation, it may anyhow be part of the explanation of how and why plans are made which cause growth in urban road traffic volumes. It could cause that the expert knowledge in question is ousted by less informed and useful knowledge, and hence that the chances for making traffic-reducing plans are reduced.

4.5.3 The expert knowledge is scientifically sound – but has weaknesses

The aim of this analysis was to reveal whether the knowledge under discussion does fulfil the criteria defined for knowledge to be scientifically sound within critical realism. The literature referred to in the knowledge description is obviously only a small selection of the literature in this field. One can hardly draw bold conclusion about whether the research carried out in order to discover and explore how and why certain changes of land use and transport-systems affect travel behaviour and traffic volumes in general could be viewed as scientifically sound based on this sample. Still, some features may be extracted and discussed.

The main finding is that the expert knowledge is scientifically sound with respect to the defined criteria. Those relating to a epistemology similar to critical realism (as described here), where ability to explain a phenomenon and generalisation expressed as transfactual conditions are important features of science, would hence probably deem this knowledge as scientifically sound.

If the expert knowledge was analysed with respect to criteria for other epistemologies and methodologies, such as popperiansim and hypothesis testing, it could have been deemed differently.

4.5.4 Relevant explanations related to the scientific soundness of the expert knowledge

It was, however, revealed shortcomings and features of the expert knowledge that may be understood as causal powers that may contribute to planners making traffic-increasing plans. This regards mainly:

- some mechanisms are less studied than others, or studied in ways which are less useful in plan-making, or studied only in some contexts
- there are few studies of how combinations of changes of land use and transport-systems affect traffic volumes
- generalisation within this expert knowledge is related to transfactual conditions rather than as statistical extrapolation

These causal powers may work through a number of mechanisms and cause that planners make plans which, if implemented, cause increased traffic volumes, such as:

- Relevant interrelations may not be included in the understanding of how the system works, causing reduced or faulty understandings of how road traffic is affected
- The strength of the effects may be misinterpreted, causing reduced or faulty understandings of how road traffic is affected
- The expert knowledge in question may be disregarded or ousted by other knowledge

Whether the powers work through these mechanisms in a specific plan-making process depends on the conditions, among other related to properties of the planners involved and the plan-making processes.

4.6 The usability of the expert knowledge in planning practice

4.6.1 The knowledge needs to be usable and to be used in plan-making practice

In order to contribute to conscious and systematic production of plans which cause traffic reduction instead of increase, the expert knowledge in question needs to be applied in plan-making. Whether it is, depends among others on properties of the expert knowledge.

Planning processes often need to be seen as arenas for conflicts and disagreements. Knowledge and knowledge production are among the tools or weapons actors use in these battles in order to convince each other, the public and the decision-makers that their project or solution is beneficial for society, and that the negative consequences are small or at least tolerable.

In these battles, the expert knowledge in question meets competing knowledge. One kind of competing knowledge is knowledge produced with the help of different kinds of econometric and statistical methods. When the expert knowledge in question meets this kind of knowledge, it may be confronted with features which may cause that it is ousted by the competing knowledge, and not applied. This would strongly increase the risk that wrong answers are produced regarding what one can and ought to do in order to reduce urban road traffic volumes, according to the understanding in this work.

This chapter regards whether properties of the expert knowledge *per se* cause that the expert knowledge is not usable and hence not applied in plan-making. It also regards whether properties of the expert knowledge cause that it is ousted when challenged by more quantitatively oriented knowledge. The aim is to disclose whether properties of the usability of the expert knowledge may cause that it is not applied by planners making plans, and if this may contribute to explain how and why planners make traffic-increasing plans.

4.6.2 Requirements for the expert knowledge to be usable in planning practice

Planners need different kinds of knowledge when making planning analyses. Planners always need *knowledge of context* and knowledge regarding the *project or the problem to be solved*. These kinds of knowledge need to be collected for each case.

In order for the expert knowledge to be usable in plan-making, it needs to offer comprehensive, coherent and understandable *general knowledge regarding causal interrelations*, explaining how and why certain changes in land use and/or transport-systems, and combinations of such changes, cause changes in traffic volumes. It needs to offer *empirical knowledge* documenting how certain changes in land use and/or transport-systems have affected traffic volumes in various contexts and combinations. This knowledge is applied both when assessing a situation and searching for alternative solutions, and when assessing a concrete suggestion or proposal.

When dealing with simple planning cases, this knowledge may be sufficient. When dealing with more complex planning problems, the knowledge also needs to offer *methods* for combining general knowledge about causal relations, empirical data, context data and knowledge regarding the project or the problem to be solved in formal analyses. The

methods and the analyses need to be transparent as well as suitable for the problem at hand.

Not everybody involved in planning and decision-making can be expected to have thorough knowledge or understanding about the causal relations of this system. Hence, *guidelines* for traffic-reducing planning and development of land use and transport-systems would be a valuable contribution in making the knowledge more useable.

Occurrences of conflicts sharpen the quality requirements for the knowledge to be usable and used in plan-making. In conflict situations in particular, planners need to *understand* how changes of land use and transport-systems are causally interrelated with changes of traffic volumes. This may enable them to explain their own arguments, to develop traffic-reducing alternatives and to judge and discuss competing arguments. This calls for *comprehensive, understandable, applicable and accessible (for planners) presentations* of the general knowledge, the empirical knowledge and the methods applied.

The outcomes are in planning practice usually expected to be *analyses* explaining what will happen if a certain project or strategy are carried out or what needs to be done in order for more or less clearly defined objective to be achieved, *recommendations* about how to arrive there or *plans*. These are often presented as planning proposals, which also include impact assessments. These need to be concrete, relevant, transparent and understandable in order for decision-makers to be able to understand and assess them and to base their decision-making on them.

The requirements or criteria for the expert knowledge to be usable and used in planning practice can hence be listed as follows:

- It needs to provide general knowledge explaining the main objects, how they are causally interrelated and how the main mechanisms work
- It needs to provide accessible and relevant empirical knowledge regarding the strengths of the mechanisms in various contexts and combinations
- It needs to present transparent and suitable method(s) for doing relevant analyses
- It needs to be able to deliver concrete, relevant, transparent and understandable outputs
- It needs to present comprehensive, understandable, applicable and accessible *descriptions* of the expert knowledge
- Simplified guidelines are desirable

4.6.3 General knowledge regarding causal interrelations and mechanisms

The general knowledge regarding causal interrelations, and mechanisms through which they may work, have been described and assessed in the previous two chapters. It was found that this knowledge is able to explain how and why certain changes of land use and transport-systems cause certain changes of travel behaviour and traffic volumes. Hence, it is concluded that the knowledge is good enough with respect to this.

4.6.4 Relevant and accessible empirical knowledge regarding mechanisms

Another requirement for the expert knowledge to be usable is that it offers accessible and relevant empirical knowledge regarding the existence and strength of the effects of various changes of land use and transport-systems on traffic volumes, in different contexts and combinations. This is necessary both in order to support the claims that such effects exist

and should be included in plan-making, and in order to enable predictions, analyses and assessments in planning practice.

4.6.4.1 Concretisation of general recommendations requires concrete data

In practical plan-making, general recommendations such as ‘future residences should be developed as densification and close to the main centres and regional public transport junctions’ need to be concretised into recommendations about ‘how far from the main regional public transport junction’ one should allow such developments.

This calls for empirical data about for instance how far people are willing to walk or bicycle from their homes to their final destination or to a regional public transport junction for further transport, in different kinds of cities, to different kinds of public transport-systems etc. Such concrete empirical data are also sought when recommending future locations of workplaces, shopping and other facilities, as well as necessary public transport quality, parking restrictions and other traffic-reducing changes of the transport-systems.

Ideally, there would exist empirical data regarding how all kinds of changes of land use and transport-systems affect travel behaviour and traffic volumes, in all kinds of contexts and combinations. In an ideal world, this empirical knowledge would have been systematically assembled and organised in meta-studies, allowing planners to easily find relevant data for their planning problem in the specific context. Further, it would have been widely known among planning practitioners that this assembling of data existed, and it would have been easily accessible.

4.6.4.2 Shortcomings regarding accessible and relevant empirical knowledge

Such concrete data for effects on traffic volumes of various changes in land use and transport-systems in specific contexts (such as ‘small towns’) are not necessarily available. The description of the expert knowledge suggested that it has shortcomings when it comes to concrete, empirical knowledge in specific contexts, and on the level of detail that is necessary when doing planning analyses and when making plans. This may be understood as a weakness of this knowledge, which makes it less usable in planning practice.

Some relations, such as how work-place locations affect traffic volumes, have been well-studied in some contexts (larger cities) but not in others (smaller cities). Some relations, such as how far people are willing to walk to and from public transport stops in various contexts, have been studied, but not in enough detail with respect to context to be satisfactory in concrete planning situations. Some of the relations have hardly been studied empirically at all (according to my readings), such as how traffic volumes or speed in the streets affect the experienced possibilities and preferences for choosing to travel by bicycle or walking. Empirical studies of the effects of changing various variables in the system simultaneously are rare.

This means that more research on the effects of the various changes of land use and transport-systems on traffic volumes would improve the planners’ access to relevant empirical data.

4.6.4.3 A comprehensive and complete database is not realistic

Many different contexts and combinations of changes

The nature of the problem itself suggests that there can hardly ever be developed a comprehensive data base containing accurate and precise quantitative empirical data about the effects on traffic volumes of the many possible changes of land use and transport-

systems. This is because planning situations are very diverse. The contexts differ with respect to a number of variables, among others the existing land use structures, transport-systems, travel behaviour and traffic volumes.

Further, embedded in a term such as 'changes of transport-systems' are among others numerous different kinds of changes of the quality of the public transport-systems, in absolute terms as well as relatively with respect to the quality of transport-systems for walking, bicycling and the private car. The same goes for 'changes in land use'. Knowing how each of these changes, means or measures affects traffic volumes, in numerous different contexts, seems almost impossible. The potential *combinations* of contexts and of changes in land use and/or transport-systems are countless.

For instance, if the public transport services are improved by doubling the frequency on a line, it triggers the mechanism that it makes travelling by bus relatively better than travelling by car on the interrelations the bus line covers. Hence, more people will choose public transport instead of car, and the car use on these interrelations will be reduced. The effect this change of the transport-system actually will have on the road traffic volumes will, however, depend on among others the quality of the existing public transport service in the area (not only frequency, and not only this line), the quality of the transport-systems for car and other modes, the existing travel behaviour, the type of urban structure it is implemented in, the size of the city and a number of other variables, as well as changes in these variables.

Classification with respect to few variables

One could try to classify the situations with respect to different contextual variables such as city size, quality of transport-systems, availability of parking spaces, urban density or others, and to analyse how traffic volumes vary with changes of frequency on a bus line in cities characterised by such variables. However, classifying with regard to only one or two contextual variables (city size or quality of road transport-system) will often be inaccurate. There would often be large and relevant variations among the cities in each group, since other variables not included in the classification often will affect the dependent variable just as much as the independent variable one is testing for.

Classification with respect to sets of contextual variables

Meeting this by combining sets of contextual variables (such as city size, road transport-system, parking access, public transport, density, localisation criteria for various activities) would require definition of numerous groups of contexts – which often still will be to inaccurate. Further, there will be many *possible changes and combinations of changes* in land use and transport-systems (densification, improving public transport services, road toll, etc.) which may happen or be implemented simultaneously. This means that the potential number of groups of combinations of changes and contexts are almost infinite.

No universal quantitative knowledge

This also implies that there will hardly ever be two situations where one could expect a certain change of land use or transport-systems to produce exactly the same effect. Hence, there can be no such thing as *universal quantitative and precise knowledge* regarding how changing one land use or transport-system variable will affect road traffic volumes in various contexts.

Measuring problems contribute to deficiencies in access to usable data

If aiming at gathering figures for how changes of land use or transport-systems (such as doubling the frequency of a bus line) affect traffic volumes, and to classify them in different contexts (city size, good or bad existing services, dense or sprawled cities), there are also numerous problems related to *measuring* of the effects.

A main problem is to single out the effects on road traffic volumes of one variable independently of the effects of all the others changes going on (*ceteris paribus*). Urban development takes place as numerous small steps. Each of these steps, such as doubling the frequency of a bus line, would result in changes of traffic volumes that often are small compared to total traffic volumes and its natural variations. One may find that it is hard (or impossible) to do reliable and precise measurements of the small changes in traffic volumes occurring because of each change.

This is worsened by the fact that other changes than the one we are trying to measure the effect of, cause changes of traffic volumes. This may be other changes of land use and transport-systems, and it may be changes of variables outside our model, such as seasons, weather and population size. This is further reinforced by the fact that most changes of land use and transport-systems have both short term and long term effects. Especially for the long term effects, it will be hard to single out how much of the changes of traffic volumes that may be attributed to the change of a certain land use or transport-system factor. There is also the problem of deciding which geographical area that should be studied when measuring the effects of a certain change of land use or transport-systems, as well as the time horizon. This is worsened by the fact that different changes land use and transport-systems cause on transport volumes work in different geographical areas and time horizons.

Problems related to distinguishing and measuring relevant effects seem to be part of the explanation why there are shortcomings with respect to relevant empirical data.

Comparing states

One way of dealing with the measuring problems is to compare *states* of cities or urban areas with certain characteristics of the land use and transport-systems with respect to the traffic volumes in the areas or cities. This could for instance be studies of traffic volumes or modal splits in cities or parts of cities which differ from each other with respect to factors assumed to be relevant for traffic volumes, as demonstrated among others by Newman and Kenworthy (1989) and in several of Næss' works (see e.g. Næss 1997, 2006, 2011). This is more robust, because differences in traffic volumes and modal splits in such studies may be quite large compared to the changes of the overall traffic volumes or modal splits caused by each change of land use or of the transport-systems.

Comparisons of states could be understood as studies of the sum of many small steps of urban land use and transport-system developments during decades, manifested as the urban land use and transport-system at the time when the measurement is done. It would, however, still be a problem to distinguish the effect of singular factors, since the land use and transport factors are reciprocally interdependent. It would be hard to define whether it for instance is the bad facilities for road traffic, the land use structure or the quality of the public transport services which cause road traffic volumes to be low in a city.

4.6.4.4 Universal quantitative data cannot be produced with the help of statistical methods

Quantitative and universal data is sometimes demanded in planning practice, and apparently provided with the help of statistical methods. Universal, quantitative and precise knowledge regarding how certain changes of land use or transport-systems is however not possible, basically for the same reasons as listed above.

Measurement problems

A statistical methods approach requires precise hypotheses describing which effects a specific change of land use or transport-systems (A) would have on urban road traffic volumes (B). It also requires precise empirical registrations of the effects of A on B in order to establish whether there are co-variations between the variables, as well as the strength of this co-variation (see e.g. Hellevik 1980 [1977]).

If aiming at doing this, all the measurement problems previously discussed occur: How to attribute certain effects (changes of traffic volumes) to certain changes of land use or transport-systems, how to measure small changes of large traffic volumes which also are affected by general background variation and a number of other changes in the system, and the questions about which time perspective and geographical area that are relevant to study. This is the case even if the data are supposed to be used as quantitative input to statistical models.

The main problem is to gather good enough data about the changes that are happening and to attribute the effects to the right causes. Controlling for other factors than the effect-factor could be done by simply comparing the development in the test-area with a similar area where the same changes are not implemented or to inquire whether a trend has been changed. The problem of small changes of large and unstable traffic volumes as would, however, still apply, as would the problem of attributing changes to the right causes.

Different contexts and combinations of changes

Further, which effect a change of one variable in the system will have on traffic volumes, will always be context dependent. If a change or state of variable A cause a positive change in variable B, and at the same time changes in variable C counteracts the effects of A on B, one may measure that there have been zero or negative effects of A on B – even if there actually was a positive effect.

These problems could result in situations where for instance improved public transport services *did contribute to* reduce urban road traffic volumes, but where this was *not registered* as such because small effects on traffic volumes were hidden by natural background variations, or because other simultaneous changes caused increase in road traffic volumes. One could have arrived at totally opposite results of what was actually the case. Statistical models based on such data could thus be totally misleading.

As described above, these problems could be reduced by comparing states of variables (densities, road capacity, public transport services) in different cities or parts of cities rather than *changes* of variables. This would improve the robustness of the data, but probably not enough to enable advanced statistical analyses.

No universal, quantitative, precise figures

Hence, applying statistical methods does not allow us to produce universal, quantitative and precise data regarding how changes of traffic volumes and transport-systems affect traffic volumes either.

4.6.4.5 Average quantitative data is not useful when dealing with a system of organised complexity

Another way of dealing with the many different contexts and combinations as well as the measurement-problems could be to aggregate results from a number of studies regarding co-variation between states of one variable A (such as density) and another variable B (such as traffic volumes), or changes of A and B, and calculate *average* effects.

Treating the problem as one of disorganised complexity

This would, however, involve to treating the problem as one of disorganised complexity, and to disregard the contexts as well as the other changes simultaneously taking place in the system. The fine web of interrelations would need to be reduced to statistical categories and average numbers, or totally disregarded.

Transport economists produce average elasticities

This is, anyhow, done among others in transport economy when defining so-called elasticities. Elasticities (E) are often considered as a simple and comprehensible quantitative measure of the responsiveness of one variable on another. It may in its simplest form be defined as “E = percent change in X / percent change in Y” (Fearnley and Bekken 2005:ii). In a discussion of the relations between short time effects and long-time effects of changes of public transport services, Fearnley and Bekken (*ibid*) found that different empirical studies presented different results regarding elasticities. The differences were large, for one variable (frequency/ vehicle kilometres in local public transport) the highest number (0,57) was almost three times as high as the lowest (0,20).

Based on such results, *average* elasticities were constructed for how patronage on public transport responded to different changes of the public transport services. These were later applied among others in demand-analyses regarding public transport in Norwegian cities (Vibe et al. 2005), in guidelines for public transport planning (NPRA 2009) and in practical planning of a transport and environment package in Trondheim (Municipality of Trondheim 2008a).

Such average number could also be produced for the effects of urban density, parking access, delays on roads, public transport services etc. on traffic volumes, in different contexts and/or in different combinations as well.

Average numbers are not relevant in planning practice

Such average numbers are, however, seemingly not part of or accepted in the expert knowledge in question. None of the research works referred to have made attempts to produce such average number, for instance average figures on how density affects the number of km travelled by day. It could be claimed that there are good reasons for that. One is that such average figures would be irrelevant in planning practice. There is no reason to believe that an *average* effect of one variable on another would occur in a specific context. Very different results from the predicted ones may be experienced if applying such average figures in plan-making.

4.6.4.6 Shortcomings with respect to relevant, empirical data may contribute to traffic-increasing plans being made

It is hence not to be expected that there will ever exist a comprehensive data-base holding data for all relevant land use and transport-systems-changes in all relevant contexts and combinations. Further, there are good arguments why the expert knowledge in question does not aim at producing quantitative, non-contextual, and accurate universal or average knowledge regarding how certain changes of land use and transport-systems affect traffic volumes. This may anyhow have consequences which contribute to explaining how and why planners make plans which, if implemented, cause growth in urban road traffic volumes.

Planners would need to apply less relevant and precise data

In planning practice, if relevant empirical data are not available, planners would need to collect more or less relevant data from different available sources, and use these together with the theoretical and context knowledge in a professional reasoning. This could cause faulty answers regarding how the city ought to be developed in order to achieve reduced car dependency and road traffic volumes, as well as the consequences of implementing particular measures or changes.

Planners may disregard mechanisms for which empirical data are lacking

Faulty answers may also be the result if the planners disregard the mechanisms or effects that they don't have relevant empirical data for. This would affect how they understand the system, which measures and alternatives they propose in a plan-making process, and how they assess proposals with respect to effects on traffic volumes.

The expert knowledge in question may not be included in quantitative analyses

Many processes of societal knowledge production are organized in ways which require quantitative input to quantitative models, such as transport model analyses, GHG-emission calculations and cost-benefit analyses. If the expert knowledge in question does not deliver quantitative data which fit into such calculations, this could cause that knowledge regarding these effects are not being included in the knowledge production, and hence that the calculations deliver faulty answers.

This could be understood as a structural explanation; that the knowledge produced by planning research does not fit into the more quantitative methods of societal decision-making processes, and hence that important and relevant mechanisms and effects known in planning theory are not included in societal analyses affecting development of land use and transport-systems.

Qualitative knowledge may be ousted by seemingly precise and accurate quantitative knowledge

Another response to the lack of quantitative, non-contextual and universal or average knowledge delivered by the expert knowledge in question could be that other professions, with less insight in this complex system, or into the context dependency of the mechanisms and effects, produce quantitative data. It was demonstrated above that transport economics do.

These data may be based on over-simplified or false understandings of this system, by for instance involving too short time horizons or too small geographical areas, by including only some of the mechanisms or by misunderstanding the mechanisms or their strengths (De Jongh 1988). This could result in faulty understandings about the effects of developments of

land use and transport-systems on traffic volumes and GHG emissions, as well as the strengths of these effects. The answers to the questions: 'What should we do in order to reduce urban road traffic volumes?' and 'What are the consequences with regard to traffic volumes and GHG emissions if we do this?' may be answered wrongly.

If the effects and consequences are misinterpreted through such calculations, this could cause means and measures which actually are efficient and effective to be deemed not to be, and *vice versa*. It could also cause consequences of certain actions with respect to traffic volumes being deemed less severe than they in reality turn out to be, as documented by among others Flyvbjerg et al. (2002) and Tennøy (2003). Such quantitative predictions could oust the expert knowledge in question, and hence make this expert knowledge less influential in planning discussions. This may be observed in a number of planning processes (see for instance Tennøy 2004, 2010), where quantitative and seemingly accurate results from transport-model analyses overruled the more qualitative knowledge delivered by planning theory and research.

Decision-makers and others may start to expecting quantitative and over-simplified answers

If decision-makers and others get used to receiving simple and over-simplified quantitative answers to questions regarding complex systems, they may start believing that these are real and good answers to the questions asked. They may start to expect such answers, and disregard the more complex, but also more insightful and 'right' answers they get from planners who take into account the complexity, the iterativity and the multiple time horizons which is necessary if to do anything close to correct predictions in this field. Hence, the expert knowledge in question may be ousted by less relevant and useful knowledge because the decision-makers call for these kinds of answers.

4.6.4.7 Relevant improvements

More research is necessary for several mechanisms and in various contexts

The shortcomings with respect to relevant empirical data is a result of among others shortcomings in empirical research. The knowledge could thus be improved with respect to practical usability if more and systematic research was carried out, documenting how traffic volumes are affected by specified changes and combinations of changes in land use and/or transport-systems in various contexts and combinations.

Making existing data more accessible

Even if planners cannot expect to find accurate and relevant data for every specific planning situation, they may find documentation of how certain changes have affected traffic volumes in many contexts. This may be used in planning analyses. Existing data are, however, often not easily accessible. Many studies which could have been useful in plan-making, such as local travels-surveys, before-and-after studies and evaluations of changes of land use and/or transport-systems, are not published through channels which make them readily accessible.

Making grey literature (not published in peer reviewed journals) more searchable and more accessible would be an improvement. This could be done simple, by establishing a web site for assembling such studies. Together, this would provide planners with access to a wider range of relevant empirical data to be used in their concrete analyses.

Systematic assembling, analyses and dissemination of empirical data

There are also few (if any) attempts to systematically assemble and/or analyse and present such studies in ways that would provide planning practitioners with accessible information about how different changes have affected traffic volumes in similar contexts to their own. Knowing that planners often work within several fields, and cannot be expected to know the literature in all these, it may be expected that planners often will have problems gathering relevant data regarding effects on traffic volumes.

The accessibility and usability of existing data would be substantially improved if existing empirical data concerning effects on traffic volumes of various land use and transport changes were assembled, organised and analysed in meta-studies in ways that make it possible to find data regarding particular changes of land use or transport-systems in particular contexts (where such data exist). This should be published in ways and through channels that are accessible to planning practitioners, with respect to actual physical accessibility as well as with respect to how the data are organised and presented¹⁸.

4.6.4.8 Relevant explanations related to shortcomings of the empirical knowledge

The aim of the analysis above was to reveal the causal powers embedded in the shortcomings of the expert knowledge in question with respect to empirical knowledge, relevant mechanisms through which this may occur, and under which conditions this may cause that traffic-increasing plans are made.

It was found that shortcomings with respect to empirical data may cause that faulty analyses and recommendations are produced, leading to traffic-increasing plans, through a number of mechanisms:

- Planners may have to apply data that they know are less relevant and suitable for the planning situation at hand
- Mechanisms and interrelations that are not well described with respect to empirical data may be excluded from understandings, explanations and analyses
- It may be produced accurate and precise empirical data that are understood and applied as universal and accurate when they in reality are average and in-accurate
- Decision-makers and others may start expecting and calling for over-simplified answers to complex problems

Whether this occurs depends on the conditions, among other related to properties of the planners involved and the plan-making processes.

4.6.5 Transparent and suitable methods for doing planning analyses

In order for the knowledge to be useful and usable, it also needs to offer transparent and suitable methods for doing planning analyses. Methods for doing planning analyses have not been concretely discussed previously in this dissertation.

The method applied need to suit the kind of problem at hand. Understanding the relations between land use, transport-systems, travel behaviour and traffic volumes as a system of organised complexity means that the knowledge cannot be used for making precise,

¹⁸ See Nielsen et. al. (2005) for an example regarding effects of different ways of organizing public transport networks with respect to a number of variables.

accurate and quantitative predictions. The questions ‘What should we do in order to...?’ and ‘What are the consequences of...?’ cannot be answered quantitatively and accurately and without allowing for large uncertainties, for a number of reasons (De Jongh 1988, Tennøy et al. 2006). As is the case for many problems in the social sciences, reality is too complex (Sayer [1984] 1992, Danermark et al. [1997] 2002). Instead, the answers need to be qualitative and crude. It is claimed here that planners normally apply a method that is termed ‘professional reasoning’.

That methods are transparent means that others than the ones that have produced the method and conducted the analyses are able to understand what is done, how and why. This is necessary in order to allow others to judge whether they find the method suitable and valid, and if they agree with how the analyses are conducted. Further, the method would need to be well developed, and widely acknowledged. A well described, well developed and widely acknowledged method would normally be understood as more valid, robust and usable than a method with the opposite features.

4.6.5.1 The need for predictions in planning practice

If planning is about bringing knowledge into decision-making regarding the consequences of decisions about future actions, planners need to be able to make predictions regarding what will happen in the near and distant future with respect to a range of societal and environmental aspects, if certain developments are implemented in certain locations. Næss (2004:162) claims that “If the planners are unable to give well founded answers to questions of whether a proposed measure could be expected to work according to the intentions, decision-making might as well be based on rolling dices as on planning”.

The questions asked in concrete planning situations, and which require predictions in order to be answered, are of various types. At overall planning levels and in the phases where one discusses what one should do, they can be relatively open and include identification of alternatives as well as predictions of effects, assessment of consequences and comparison of alternatives. They may regard ‘How should land use and/or transport-systems be developed in order to reduce traffic volumes and GHG emissions in this region?’ (Tennøy et al. 2009, Strand et al. 2008), ‘Which infrastructure development strategies will cause more people to travel by other modes instead of by car in this city?’ or ‘Which are the best strategy for reducing congestion and environmental problems caused by traffic on this trunk road?’ (NPRÅ 2009a).

They could also be related more directly to predictions and assessments of effects of alternatives as in ‘Which of these four expansion directions for development of new residences in this city would result in least road traffic?’ (Strand et al. 2007) or ‘How far from the main public transport junction should development of work-places be allowed in this city?’ (Tennøy et al. 2009).

At operational planning level, where the project or action already is suggested or decided, the questions asked will regard the consequences of the specific project or action (the concrete changes in land use or transport-systems). These are questions like ‘How many car trips per maximum hour will be generated if this activity, of this dimension, is located here?’, ‘What are the positive and the negative consequences of transforming car lanes into bus lanes on this specific main road?’ or ‘What are the consequences with respect to traffic volumes and transport development if this facility, in this form and size, is allowed to be built in this location – and how can the increase in road traffic be reduced?’.

The analyses will in all cases usually include comparisons between two or more alternative developments of land use and/or transport-systems with respect to traffic volumes. Most often a range of other aspects or objectives are assessed too. The 'do-nothing' alternative is often one of the alternatives.

4.6.5.2 The main reason why quantitative and precise predictions are not possible

Næss (2004) discusses the *possibilities* of predictions in land use and transport planning. His point of departure is the rejection of the possibility of making predictions about social matters as stated by a number of theorists within the critical realism tradition, such as Sayer ([1984] 1992) and Danermark et al. ([1997] 2002). This rejection, he argues, may be caused by the way in which the term 'prediction' is understood.

Næss argues that qualitative and crude predictions of aggregate levels effects resulting from urban developmental strategies are possible, while exact, quantitative predictions on individual level about future events or situations are not. He claims that "not even a crude, aggregate level assessment of the separate ('other issues equal') consequences of a strategy could be made with ambition to high accuracy. In principle, this type of prediction would be qualitative, stating the *direction* of influence (*more* or *less* transport) and perhaps some order of *magnitude*" (Næss 2004:161, italics in original).

Sayer ([1984] 1992) explains that in order to be able to make accurate, precise and quantitative predictions about a future event, abstract or general knowledge about the structure and mechanisms is necessary. In addition, precise and detailed knowledge about the concrete context and conditions would be needed in order to predict which mechanisms will be present and which will be triggered, and how these will interact with and mediate each other.

He claims that this type of concrete and detailed knowledge about the future is rarely available, and that this lack of empirical knowledge about the future is the main reason why accurate and reliable predictions about social objects are hardly possible. Or, as Næss (2004:161) puts it: "The non-exact nature of our knowledge as well as the continual processes of social change imply that it is impossible to make exact, quantitative estimates of, for example, the amount of travel resulting from a certain urban development strategy".

4.6.5.3 Planning analyses through professional reasoning

This lack of aim and ability to produce quantitative predictions in planning does not mean that the knowledge under discussion has nothing to offer when it comes to planning analyses and predictions in planning. Rather, as Sayer ([1984] 1992:135) claims: "By providing information on the necessary conditions both for the existence and the activation of the mechanism, and in some cases on the way conditions mediate its effects, we increase the chances of either removing or changing the mechanisms, preventing its activation or suppressing the damaging effects of its exercise".

Sayer ([1984] 1992:136) describes how this kind of explanatory knowledge may be used in producing explanatory predictions of a very conditional kind: "if mechanism M is present and so are conditions C1 and C2, event E1 will occur, while if C3 is present, E2 will occur". This may be read as a simplified but exact description of how the kind of expert knowledge in question is used in predictions by doing what is termed here as '*professional reasoning*'.

Predictions regarding what to do in order to achieve an objective

In planning analyses aiming at arriving at answers to the question ‘What should we do in order to...?’, the event E will be the goal or objective, for instance to reduce traffic volumes. The aim of the analysis is to define which changes of land use and/or transport-systems that ought to be implemented in order to activate the traffic-reducing mechanism(s) M_{1-n} , in the context defined by existing land use, transport-systems, travel behaviour and traffic volumes that form the conditions C_{1-n} .

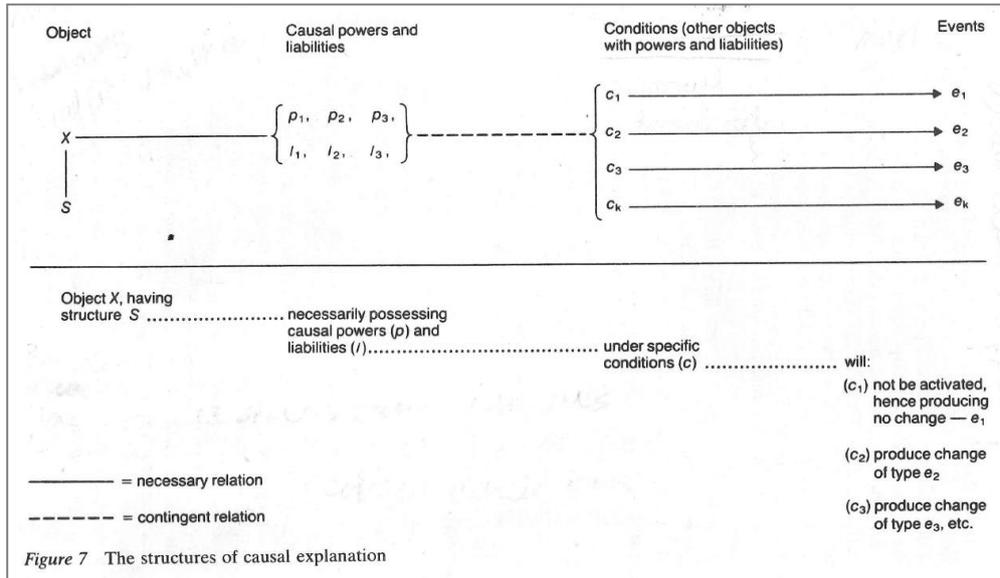


Figure 35: The structures of causal explanation. Facsimile from Sayer ([1984] 1992:109).

An important task in such analyses (professional reasoning) is to define which *other* changes of land use and/or transport-systems (or other changes) which are necessary to implement in order to activate other mechanisms producing the conditions C_3, C_4 etc. which may reinforce the traffic-reducing effects. Further, to identify which changes should *not* be implemented because they will activate mechanism which may counteract the traffic-reducing effects of the suggested changes. The result of the analysis will be a recommendation of which changes of land use and/or transport-systems to implement or to include in a plan, and which to avoid or reject.

For instance, this way of reasoning was used by Tennøy et al. (2009) when doing analyses in order to develop the overall land use and transport concept for reduction of traffic volumes in the ‘Buskerud city’. Based on the defined objectives, on general and empirical knowledge about causal relationships, and with support in the simplified guidelines, a main recommendation from the work was to locate future land use developments (work-places, residences, shopping, social infrastructure etc.) in and close to the main centres of the main cities and towns, which also are the main regional public transport nodes. Furthermore, it was recommended to improve public transport services, implement restrictive measures on car use, and improve conditions for walking and bicycling.

The argumentation for this was an *explanation* why this would cause less traffic than other developments: The existences of mechanisms causing dense cities to tend to generate less traffic than sprawled cities, as well as the mechanisms causing certain locations of activities in the urban structure to generate less traffic than other locations (together quite a few mechanisms, as previously described, but all pulling in the same direction), will, if certain

conditions are present, cause lower traffic volumes than if any of these measures were not carried out.

Recommendations for development of each parts of the transport-system were explained with basis in the same logic. The mechanism causing a certain change of the transport-system to contribute to reduced traffic volumes was explained, and the necessary conditions for it to work were described. These conditions concerned mainly other changes of land use and/or transport-systems in the model.

When explaining why these ways of developing the land use and the transport-systems would cause less traffic than if the recommended measures and strategies were not carried out, it was explained how and why other changes of land use and transport-systems (sprawl, road building etc.) would counteract the traffic-reducing effects of the recommended changes or measures. Further, it was explained how the recommended changes of land use and transport-systems could reinforce the traffic-reducing effects of each other.

Predictions regarding consequences of changes of land use or transport-system

In planning analyses aimed at answering the question 'What are the consequences of...?', defined change(s) of land use and/or transport-systems are suggested, and the planning analyses are carried out in order to predict what the event E will be, for instance with respect to changes of traffic volumes. Based on general and empirical knowledge, the planners have knowledge about which mechanisms (M_{1-n}) that may be triggered by the proposed change(s). The context defines the conditions C_{1-n} , and the expert knowledge in question provide answers to how these conditions may affect the effects of the mechanism(s) M_{1-n} . Hence, they may 'predict' which event E will be the result.

This E will, however, not be a precise and accurate quantitative prediction presented as an exact number, but rather a crude and qualitative prediction about how and why the planned development will affect the traffic volumes or travel behaviour, and possibly about the magnitude of the effects.

4.6.5.4 General knowledge regarding transfactual conditions is necessary in order to do professional reasoning

General knowledge about the mechanisms, combined with empirical data from similar problems and contexts, are used in 'professional reasoning' about which changes of land use and/or transport-systems which ought to be implemented in order to reduce urban road traffic volumes in the specific context, and about the consequences of implementing specific developments in a given context.

A main argument for the transferability of the expert knowledge in question is that this is knowledge about *transfactual conditions*, in critical realism terms. This concerns knowledge about how the mechanisms are working if they are triggered. Hence, it regards knowledge about constituent properties, the more or less universal preconditions for an object to be what it is, and which enables it to do what it does. This knowledge is valid in 'all' contexts, even though the strength varies. We can for instance *in general* claim that dense cities tend to produce less traffic than sprawled cities, since the mechanisms causing this are working more or less in the same ways everywhere – they are universal (more or less).

However, in non-closed systems, other causal powers and mechanisms can cause other events, which reinforce or counteract the effect in focus, and affecting which event that actually occurs. This means that it is the 'other' circumstances which are contingent.

4.6.5.5 We can assume to have some knowledge regarding future conditions and contexts

The main argument against the possibility of predictions from critical realist authors (Sayer ([1984] 1992, Danermark et al. [1997] 2002) is that one cannot have detailed 'empirical' knowledge about future contexts and conditions, and hence whether a certain mechanism will be activated and will cause a certain event. This is of course right, and it is the reason why accurate, precise and quantitative predictions about the future cannot be made through planning analyses.

There are, however, reasons to argue that we can assume to have *some* knowledge regarding the future context when doing planning analyses, and hence that planning analyses make better predictions than rolling dices.

Analytical generalisation in planning practice

This regards among others that planners do '*analytical generalisation*' (Yin [1994] 2003:32) when drawing on general knowledge in concrete planning situations. They compare the case at hand (the problem and the context) with the general and empirical knowledge offered by planning theory in order to determine whether the context and problem at hand are comparable with the general knowledge with respect to the context it was produced in (Næss 2004).

Partially closed systems

Further, this system may be understood as a *partially closed* systems, where the chances of knowing more or less certain what will happen in the future is higher than in totally open systems. Næss (2004: 158) claims that "there may also be reasons to consider the relationships between urban structure and travel as situated in a pseudo-closed system rather than a completely open system [...]. Arguably, the spatial location of urban functions, combined with the time-geographical constraints on everyday-life action, make up such a pseudo-closed system. Hence, the possibilities for research based prediction will be greater than indicated by the critical realist orthodoxy regarding prediction of social phenomena". Since predictions are made about the future, we assume that future structures affecting daily travels will be rather similar to the present ones. This may, of course, be an erroneous assumption.

The future context is to a certain degree consciously planned and decided upon

Developments of land use and transport-systems are to a high degree initiated, planned, and/or decided upon by public authorities. They do not just randomly *happen* (even though some *conditions* do). Decisions are *made* by politicians through democratic processes, often on the basis on analyses and recommendations made by trained planners. This means that future developments of land use and transport-systems to a high degree are controlled by public authorities – one *decides* how land use and transport-systems are to be developed. The idea is to plan and decide coordinated changes or developments of land use and/or transport-systems in ways which contribute to achieve societal goals and objectives.

This does not ensure that the land use and the transport-systems will appear in 10 or 20 years exactly as they are decided in the municipal comprehensive plans, or that the objectives necessarily will be achieved. It *does*, however, mean that developments of land

use and transport-systems, and hence what important parts of the context will be like in a not-so-distant future, is not given by chance. It is instead strongly affected by more or less conscious planning and decision-making, and hence to a certain degree predictable.

Planning analyses regards mainly to figuring out what we ought to do – not to calculate what the future will be like

Planning analyses and predictions are thus not mainly about predicting what will happen in the future. It is more about figuring out what is necessary to do in order to achieve certain objectives or to avoid certain developments, for instance how land use and transport-systems ought to be developed in order to contribute to reduce instead of to increase traffic volumes. The crude and qualitative predictions discussed here are carried out as parts of the professional reasoning about what we ought to do in order to achieve certain objectives in the future.

4.6.5.6 The iterativity and contingency of planning predictions

The planning analyses will seldom be straightforward. Rather, they have an iterative character. When answering the question ‘what should we do in order to...?’ one arrives at one or more proposals. These are analysed in order to crudely predict ‘what are the consequences of...?’ It may turn out that the proposed changes of land use and/or transport-systems necessary in order to achieve the event E (reducing traffic volumes) may have other effects and consequences than the intended ones, on access to certain areas or for certain population groups, infrastructure costs, housing standards, the city centre’s ability to compete, and others.

Some of these effects and consequences may be unwanted and even unacceptable, and call for either mitigating measures or for coming up with alternative changes of land use and/or transport-systems. In both cases new analyses need to be carried out in order to make sure that the desired event E will still occur.

There will often be uncertainties related to whether all the necessary conditions C_{1-n} for the mechanism M to produce the event E will be or come into place. Measures need to be suggested which contribute to make sure that these conditions are in place or that other measures contributing in the same direction will be implemented. The effects of *these* measures need to be analysed as well, and may result in the discovery of other un-wanted consequences or that the desired event E will not occur. This calls for new alternatives which need to be analysed, and so on.

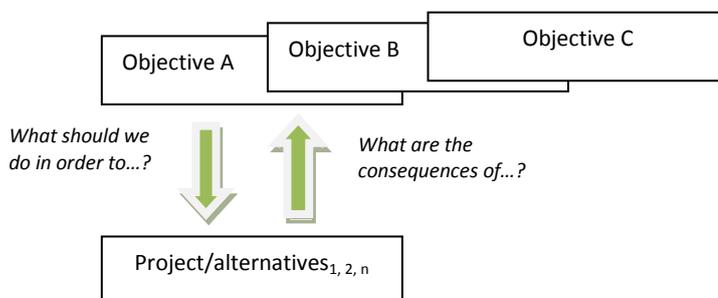


Figure 36: Planning analyses are dynamic and iterative, and need to recognise several objectives.

This iterative process goes on until a satisfactory result is obtained, or until one decides that the most relevant alternatives are analysed, and the ‘best’ alternative can be chosen. There

will often be discussions about whether the 'right' alternatives are analysed, if a satisfactory result is obtained, and what the 'best' alternative is. Different individuals, groups or interests may have different opinions about which goals or objectives are most important and should be weighed highest when deciding which alternative solution should be chosen, which alternatives are possible, acceptable and/or effective, whether the right methods for analyses are applied and so on. These struggles are important parts of the planning processes as well as of the plan-making processes.

4.6.5.7 Non-suitable methods may be applied

When knowing the kinds of questions planning analyses are supposed to answer, and knowing that they are supposed to include comparisons of different alternatives for development of land use and/or transport-systems with respect to resulting changes of traffic volumes (and other aspects or objectives), one can understand why precise, accurate and quantitative predictions would have been an advantage in plan-making.

Quantitative and model-based transport analyses are often not suitable methods

As discussed, this is an open or partially closed system and a system of organised complexity. Hence, such predictions are hardly possible. Quantitative predictions would in practice require that the system is treated as a two- or few-variable system of simplicity. The complex reality would need to be simplified by assuming that only few of the causal powers and mechanisms are relevant and important and including only those. One would also need to apply average figures for effects, which may be not suited for the relevant context. This may result in incorrect and misleading calculations (Flyvbjerg *et al.* 2002, Tennøy *et al.* 2006).

Among others for these reasons, quantitative and model-based transport analyses are often not suitable methods for analysing more complex land use and transport development problems. Even though for instance Manheim (1979) describes processes and systems for transport analyses which at least partly deal with the complexity of this system, transport-models in reality need to over-simplify the system in order to be practically applicable (De Jongh 1988, Tennøy 2004b). Even then, such analyses tend to be data-hungry and resource demanding, and to shift focus in planning processes towards what the model needs instead of the problem to be solved, the main objectives and the possible solutions (Tennøy 2004b). Model-based transport analyses deliver uncertain results which are anyhow often presented as and treated as certain and accurate (Flyvbjerg *et al.* 2002, Tennøy *et al.* 2006).

'Professional reasoning' may be ousted by quantitative model predictions

When challenged by these quantitative predictions, the mainly qualitative and contingent analyses based on the expert knowledge in question, and conducted through professional reasoning, may be overruled or ousted. This may contribute to explaining how and why planners make traffic-increasing plans.

4.6.5.8 Deficiencies of 'professional reasoning' as method

Lack of good descriptions of the method 'professional reasoning'

We have seen that the expert knowledge in question is able to deliver predictions which bring knowledge into decision-making about 'what should we do in order to...?' and 'what are the consequences of...?' with the help of the method termed as 'professional reasoning'. These are qualitative and crude predictions of aggregate levels effects resulting from certain urban developmental strategies, and they are contingent. 'Professional reasoning', as

described here, seems *to be a suitable method* for conducting analyses of systems and problems of organized complexity.

When reading planning documents, it is clear that planning analyses to a large degree are conducted in ways similar to what is described as professional reasoning here. When searching for descriptions of how planning analyses are conducted, in planning theory and in the planning literature, I could however not find relevant descriptions which I could use here, when lecturing or when advising planning practice. Inquiries among knowledgeable colleagues gave no results. It hence seems as there is a *lack of descriptions* of how planners make planning analyses, and of the method 'professional reasoning'.

Very general descriptions of the main elements of planning are easily found, usually summarised as discussion of the problem, defining the main objectives, identification of alternatives, evaluation of alternatives against objectives or ends, comparison of alternatives and, decisions about action (see for instance Banfield ([1959] 1973) or Friedmann (1989)). Based on this, describing the 'professional reasoning' for planning cases where problems are small or simple, or broad and overall, may be rather unproblematic. It can be explained for each case, or it is understood intuitively. In cases where planning problems are disputed, involve a number of possible and simultaneous changes in land use and/or transport-systems, cover large areas, include long time horizons, involve different alternatives which need to be compared or involve several of these characteristics, describing how to do 'professional reasoning' is more necessary and more problematic.

The lack of agreed descriptions of the method 'professional reasoning' (or similar methods for making plans) means that it *is not transparent*. This may affect its usability, its use and its validity.

If the method is not well described, there will be fewer planners applying it because they don't know it or how to apply it. Planners applying the method may conduct faulty and insufficient analyses that are less helpful when aiming at producing traffic-reducing plans. It also opens the way for other methods, such as the quantitative methods discussed above, as well as for less well founded opinions about what needs to be done, to oust 'professional reasoning'.

The lack of descriptions also cause that it is harder for planners to explain how they have arrived at certain recommendations and it is hard for others to understand it. This may cause that the method, as well as the analyses, plans and recommendations produced with the help of it, are understood as less valid. Hence, they may be disregarded or ousted by competing knowledge or opinions. This may contribute to explaining how and why planners make traffic-increasing plans.

The method 'professional reasoning' may be under-developed

The lack of descriptions of the method probably also means that there is a lack of concrete empirical research on how 'professional reasoning' is conducted in planning practice in this field (at least I have not found such research or literature). This would mean that it is insufficiently studied, scrutinised and discussed. This may suggest that this method is not as developed as it ought to be.

4.6.5.9 Possible improvements

The situation would be improved if the method 'professional reasoning' was described, discussed and criticised. This would improve the abilities of the planners to carry out professional reasoning in good ways, even when facing large and complex planning problems. It would also make such analyses more transparent, by referring to described and acknowledged methods. This would increase the understanding and validity of the analyses conducted with the help of 'professional reasoning', also among those that are less knowledgeable in this field. This could cause that quantitative and faulty model predictions were applied to a lesser degree.

The method also ought to be empirically studied, further developed and maybe standardised. By studying the different ways planners do professional reasoning, comparing this and discussing what works and not in different contexts, the method could be developed and become better. This could contribute to better analyses in plan-making, which to a larger degree than today contribute to production of traffic-reducing alternatives and plans and which hinder traffic-increasing plans to be made.

4.6.5.10 Relevant explanations related to methods

The aim of the analysis above was to reveal whether and how causal powers embedded in properties of the methods applied when applying the expert knowledge in planning analyses may cause that planners make traffic-increasing plans, relevant mechanisms through which this may happen, and under which conditions it may occur.

It was found that such causal powers are embedded in the lack of good descriptions of the method 'professional reasoning' and in under-development of the method. These causal powers may cause that planners make traffic-increasing plans, among others through the following mechanisms:

- The planners don't apply the method, but rather less suitable methods
- The planners apply the method in faulty or insufficient ways
- The method, the analyses and the results are not accepted as valid
- The method is insufficient or ineffective with respect to contributing to solving the problem at hand

Whether the powers work through these mechanisms in a specific plan-making process depends on the conditions, among others related to properties of the planners involved and the plan-making processes.

4.6.6 The ability to deliver concrete, relevant, usable and understandable outputs

Main deliveries in plan-making processes are analyses, assessments, recommendations and plans. The outcomes are supposed to be recommendations for what to do and not to do in order to achieve certain things and avoiding others, and plans describing how to go about in order to moving from one state (previous) to a desired other state in the future.

These need to be concrete, relevant for the problem at hand, usable in the plan- and decision-making process and understandable in the sense that it is transparent and allows those reading it to understand what has been assessed, what has been found, and how and why the particular recommendations are given on the basis of these findings.

4.6.6.1 Professional reasoning can deliver concrete, relevant, usable and understandable outputs

Professional reasoning can deliver crude, concrete, relevant, usable, and understandable analyses, assessments, recommendations and planning proposals, if it is done well. In such cases, the main issues will be defined, which kinds of effects that may be expected and which impacts these may have will be explained, as will other factors that are necessary in order for these effects and impacts to occur.

The outputs of this reasoning will be answers formulated as broad strategies (like the agreed recommendations), as rankings of alternatives with regard to traffic volumes, as explanations of what will happen if a certain project is implemented, as recommendations about whether to allow certain developments, or as recommendations about which changes should be made to a plan in order to reduce its contribution to growth in traffic volumes.

4.6.6.2 The outputs may be hard to grasp for non-knowledgeable readers

These forms of outputs require that decision-makers actually do read and try to understand the reasoning and explanations. Alternatively, they can read the summaries, rely on the planners and follow their recommendations. This is, however, often not an option if planners disagree with each other (which often is the case, as I will return to) or when the decision-makers disagree with the recommendations. In cases of conflict, attending or even understanding the discussions require deep insight into the context, the causal interrelations, the empirical evidences and the project/objective.

For those not having these insights, the discussions may seem non-transparent and even irrational. This may cause decision-makers and others to disregard the planners' analyses and recommendations, and rather rely on other kinds of knowledge and rationalities. This could also be the case when the professional reasoning is badly done, or when one instead apply quantitative analyses and aggregated answers which are not understandable or transparent, as Sager and Ravlum (2005) found.

4.6.6.3 Possible improvements

The planners would probably be able to deliver more concrete, relevant, usable, transparent and understandable outputs if the improvements regarding empirical and methodological knowledge called for above were accomplished.

One can, however, not expect planning analyses or assessments to deliver certain, precise and unambiguous answers. This is because we are dealing with problems of organised complexity, and with analyses regarding what will happen in a future where we cannot control all the variables included in these analyses. This is hence not due to weaknesses of the knowledge. It is due to the reality the knowledge attempts to deal with.

In her discussion regarding the comprehensive plan, Innes (1996) refers to Kent's (1964) requirements for explicit reasoning. He argued that a plan should explain its reasoning and identify the contexts of facts and judgements which it builds on. By this it could make a good argument for the suggested policies. Since a plan includes objectives and values and other claims which are not scientifically based, together with more scientific knowledge, explicitness on what are values, what are facts and what are judgements is essential. This may be a good advice when formulating outputs from professional reasoning as well.

4.6.6.4 Relevant explanations related to outputs

The form the outputs from analyses conducted through professional reasoning necessarily has may contribute to cause that traffic-increasing plans are made, through the following mechanism:

- Decision-makers and others may not be able to grasp the output, and either disregard the assessments and recommendations, or choose to rely on other knowledge

Whether the powers work through this mechanism in a specific plan-making process depends on the conditions, among other related to properties of the planners involved and the plan-making processes.

4.6.7 Comprehensive, understandable and accessible descriptions of the expert knowledge

4.6.7.1 Planners need to understand how the system works

In order to contribute to the making of traffic-reducing plans and rejection of traffic-increasing plans, planners need to understand how land use, transport-systems, travel behaviour and traffic volumes are interrelated, and how land use and transport-systems ought to be changed and developed in order to contribute to reduction of traffic volumes.

Planners need to *understand how the system works* when developing questions and answers regarding what should be done in order to reduce traffic volumes in particular contexts, when assessing whether a proposal will cause growth in traffic volumes, when developing competing and traffic-reducing alternative solutions in plan-making processes, and when calling for further analyses. Planners also need this understanding when explaining for others how and why certain developments cause more and less traffic, not least in situations involving conflicts. This may enable them to explain their own arguments, and to judge and discuss competing arguments. This calls for comprehensive, coherent, understandable and referable *presentations* of this knowledge.

4.6.7.2 Lack of applicable descriptions of the expert knowledge

This is reinforced by that planning practitioners need to deal with numerous issues in their daily work. In order to achieve the necessary understanding regarding traffic-reducing land use and transport planning, they need comprehensive, understandable, accessible and applicable description of the system and how it works.

Even if various descriptions exist in the literature (see for instance Manheim 1979, Næss, 1997, Strømme 2001, Næss 2006), they are often either not comprehensive, not presented in ways which are directly applicable in planning practice or not easily understandable. This means that they are not 'accessible' for the planners, in the sense that they are not presented through channels that reach planners or in ways that they find usable.

I don't know of any published descriptions of this system that are comprehensive, understandable, accessible and directly applicable by planning practitioners. If this is the case, this may cause that planners don't know and apply this expert knowledge, that they understand it only partly, and that they understand and apply it in faulty ways.

4.6.7.3 Relevant improvements

A description of whole complex system, its objects, its mechanisms and how it works, that is accessible for planning practitioners and designed in order to be applicable in planning practice, would have been useful. This would be even more so if combined with thorough

descriptions of the existing empirical knowledge about the various relations and mechanisms in different contexts, and of the method 'professional reasoning'.

4.6.7.4 Relevant explanations related to outputs

The lack of comprehensive and understandable descriptions of the expert knowledge that is accessible for planning practitioners and applicable in planning practice may contribute to cause that traffic-increasing plans are made, through the following mechanisms:

- Planners may not achieve or possess the necessary understanding of the system to ensure that traffic-increasing plans are stopped and traffic-reducing alternatives proposed
- Planners may not understand and/or be able to explain to others how and why certain developments affect traffic volumes in certain ways

Whether the powers work through these mechanisms in a specific plan-making process depends on the conditions, among other related to properties of the planners involved and the plan-making processes.

4.6.8 Simplified guidelines exist

Simplified guidelines for traffic-reducing development of land use and transport-systems have evolved within planning theory, based on the theoretical and empirical knowledge referred to above. Variations exist, but as previously described, the agreed recommendations are often summed up and simplified as to implement the following means or strategies, preferentially in concert: Imposing or encouraging land use development as densification rather than urban sprawl and as 'car-independent' location of facilities; Imposing physical and fiscal restrictions road traffic; Improving public transport services; Improving conditions for walking and bicycling. As concluded in the knowledge description, there seems to be a rather broad agreement that these strategies will contribute to reduce urban road traffic volumes.

4.6.9 Discussions of the usability of the expert knowledge

4.6.9.1 The expert knowledge is a usable tool in planning practice, but has shortcomings

It has been found that expert knowledge in question *is* good enough to guide planning practice aimed at reducing traffic volumes. It explains how the system works, and offers empirical knowledge that is usable in plan-making. The knowledge is applied in professional reasoning, arriving at qualitative and crude recommendations regarding what needs to be done in order to reduce traffic volumes, or what the consequences are with respect to traffic volumes. Agreed recommendations regarding how land use and transport-systems ought to be developed in order to reduce traffic volumes have been developed.

Still, the expert knowledge has shortcomings, with respect to accessible and relevant empirical knowledge, description and development of the main method, and accessible and applicable descriptions of the expert knowledge. This may cause that the expert knowledge in question is not applied, that it is applied in faulty or insufficient ways, or that others don't accept the analyses, recommendations and plans that are produced with the help of this knowledge.

4.6.9.2 Competition from other kinds of knowledge

This may be reinforced by the competition from more quantitative kinds of knowledge. It has been claimed that these kinds of knowledge need to understand the system as one of

simplicity and disorganised complexity, and hence that it is not suitable for the problem of organised complexity at hand. It has been highlighted that if applying this kind of knowledge, one may seriously misinterpret how the system works, and arrive at faulty or irrelevant analyses and recommendations.

It was also claimed that these kinds of knowledge present the problem, the analyses and the results in simpler ways than professional reasoning on the basis of the general and empirical knowledge included in the expert knowledge in question. This means that those not being experts in these fields, such as decision-makers and planners who are not specialised in this field, may choose to trust and apply the easier accessible knowledge. Hence, the more reflective and 'correct', but also more complex expert knowledge, may be ousted. This could cause faulty analyses and recommendations, and hence plans that take developments in traffic-increasing directions.

Further, discussions between seemingly experts (even though both sides not necessarily are experts in the field discussed) may confuse decision-makers and others, making them believe that there are large uncertainties in the knowledge, even when it in reality is not¹⁹. This may cause them to disregard professional advices all together, or to choose which professional advice they accept on the basis of what suits their own interests better.

4.6.9.3 Relevant improvements

The inherent complexity of the problem could not and should not be disregarded or attempted simplified too much. It was claimed in chapter one that complexity needs to be recognised and addressed in planning practice and in planning research in order to be able to deal with the problem of increasing road traffic volumes and GHG emissions.

Improvements, as outlined above, would probably enhance the use and influence of this knowledge, that it is understood and applied correctly, and that it is not ousted by other kinds of knowledge. This would increase the probability that urban land use and transport-systems would be developed in ways that cause reduction of road traffic volumes and GHG emissions.

These suggested improvements are mainly related to improving the access to relevant empirical data, developing and describing of the methodological knowledge, and developing accessible and applicable descriptions of the general and empirical knowledge.

4.6.10 Relevant explanations related to the practical usability of the expert knowledge

The aim of the analysis above was to reveal causal powers embedded in properties of the expert knowledge with respect to whether it is usable and used, relevant mechanisms through which these properties may cause that traffic-increasing plans are made, and under which conditions.

¹⁹ For instance when there is a clear and grounded understanding of how the system works (the causes, the mechanisms), but where there is shortage of empirical knowledge regarding strengths of the mechanisms under the specific conditions in that specific context.

It was concluded that the expert knowledge is usable in plan-making, despite shortcomings related to:

- relevant and accessible empirical knowledge
- descriptions and developments of the method termed 'professional reasoning'
- accessible and applicable descriptions of the general and empirical knowledge

These shortcomings may cause that traffic-increasing plans are made, especially when confronted with challenging and simplified knowledge. The causal powers may be working through a number of mechanisms:

- planners don't use the expert knowledge
- planners apply the expert knowledge wrongly
- the knowledge is ousted by other knowledge
- application of data and assumptions of low quality
- other actors do not rely on the knowledge and the analyses

Whether the powers work through these mechanisms in a specific plan-making process depends on the conditions, among other related to properties of the planners involved and the plan-making processes.

4.7 Promising explanations related to the expert knowledge

The research question in chapter four was whether properties of the expert knowledge itself may contribute to explaining how and why planners make plans which, if implemented, cause growth in urban road traffic volumes.

The initial structural and causal analyses arrived at a number of properties of the expert knowledge itself which may be understood as defining what it is and what it can do. These properties affects whether the expert knowledge can contribute to produce plans that cause reduction rather than growth in urban road traffic:

- whether the expert knowledge does exist
- whether it represents reality relatively correctly
- whether it is scientifically sound
- whether it is usable and used in planning practice

The possibility of general knowledge in planning and plan-making has been discussed, arriving at the conclusion that general knowledge in planning is possible. The author's understanding of the state-of-the-art expert knowledge has been described based on thorough readings.

The scientific validity of this knowledge as well as its usability in planning practice has been analysed. It was found that the knowledge is scientifically sound as well as usable in plan-making. Hence, the expert knowledge in question is good enough to guide planners and plan-making processes aiming at making plans which contribute to reduction rather than growth in urban road traffic volumes.

It was, however, found that the expert knowledge has shortcomings and features that may, if the conditions are right, contribute to production of traffic-increasing plans through several mechanisms, as illustrated in figure 37.

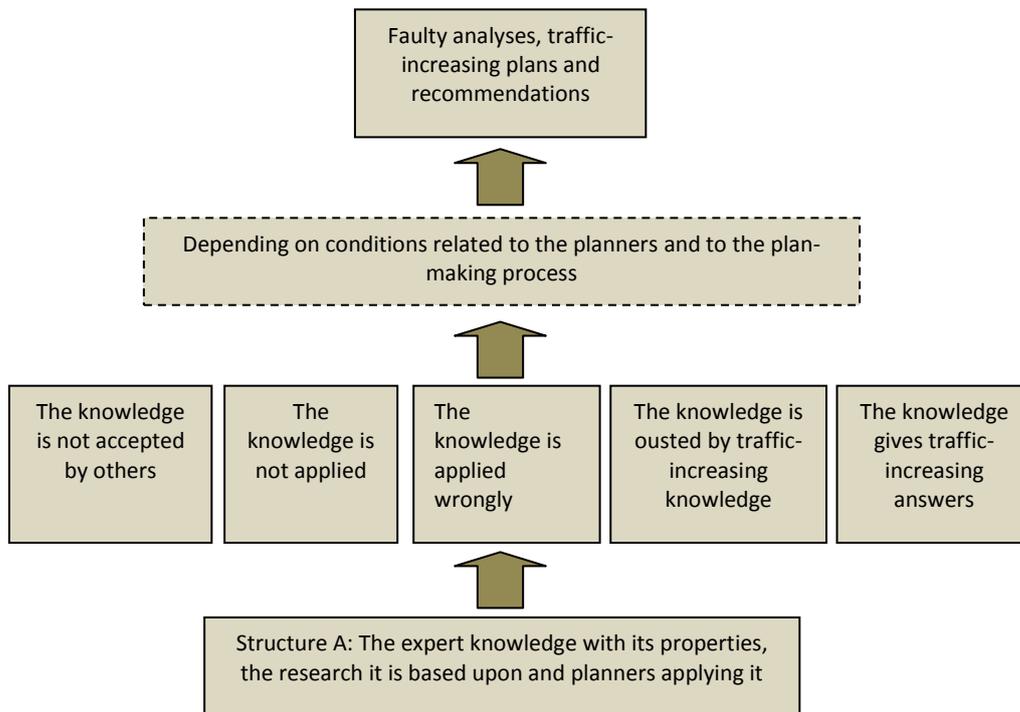


Figure 37: The structure, mechanisms, conditions and possible event forming the explanations related to properties of the expert knowledge.

One may say that the structure (consisting of the expert knowledge, the research it is based upon and the planners applying it) has causal powers (embedded in shortcomings with respect to empirical knowledge, the method, and the description of the expert knowledge) to cause that planners make traffic-increasing plans through a number of mechanisms (the planners don't apply the expert knowledge; the knowledge is ousted by other knowledge; the planners apply the expert knowledge wrongly; others disregard the expert knowledge because they don't recognise or accept it as valid and relevant; the knowledge is faulty and gives traffic-increasing answers) if the conditions (related to among others the planners and the plan-making processes) are right.

Explanations related to properties of the expert knowledge for how and why planners make plans which, if implemented, cause growth in road traffic volumes can now be summarised:

- Properties of the expert knowledge may cause planners to not apply it, and hence the planners have no tools for making traffic-reducing plans
- Properties of the expert knowledge may cause that it is ousted by other knowledge that contribute to that traffic-increasing plans are made
- Properties of the expert knowledge may cause that planners apply it wrongly and produce faulty or insufficient alternatives, recommendations and plans
- Properties of the expert knowledge may cause that others don't accept it as relevant and valid
- The expert knowledge may describe reality in-correctly, and hence cause that planning is taken in traffic-increasing directions if the planners apply it

4.8 Empirical findings regarding the expert knowledge

Having discussed and defined a number of relevant explanations, we have arrived at what Danermark et al. ([1997] 2002) term concretisation and contextualisation. This involves to examining how different causal powers and mechanisms manifest themselves in concrete situations.

4.8.1 Interviews with planners confirmed properties defined as causal powers

In the interviews, the planners pointed at several of the properties and features of the expert knowledge that have been identified as potential causal powers in the abstract analyses.

4.8.1.1 More and better empirical knowledge is needed

When asked whether the expert knowledge in question is good enough, the main answer from the interviewees is that they find that it (referred to as coordinated land use and transport planning in the interviews) is. They have few concrete examples of shortcomings of the general knowledge regarding the system, the interrelations and the like.

The planners do, however, often call for improvements with respect to concrete and detailed empirical knowledge, especially for the topics they work with and in the contexts that are relevant for them. This regards for instance how parking restrictions work in small towns, how far from the centre housing can be located without being car-dependent in different contexts, and how facilitating bicycling affects traffic volumes.

This shows that the planners find that there is a lack of relevant and accessible empirical knowledge, among others because some mechanisms are less well studied than others. This could also be understood as an expression that the planners want quantitative and universal/average knowledge regarding the effects of certain changes of land use and transport-systems on traffic volumes.

4.8.1.2 Lack of comprehensive and accessible descriptions of the expert knowledge

The planners were asked to mention references to regarding coordinated land use and transport planning that they use in their practice or that they know of. Most did not mention any academic references, but rather recommendations in overall plans, white papers, policy guidelines and the like. When asked directly, they claimed that they don't know comprehensive and accessible descriptions of the expert knowledge that they can use and refer to in their work, except from existing plans and the like.

This confirms that there is a lack of comprehensive descriptions of this knowledge that is accessible for planners and applicable in plan-making. This is a shortcoming of this expert knowledge.

4.8.1.3 Lack of description and definition of the method 'professional reasoning'

When the planners were asked which methods they use when applying this expert knowledge, and what they consider as good methods in land use and transport planning, they were quite vague in their answers. Some listed the tasks in plan-making (more or less as described in chapter six), but without defining what they do when carrying out these tasks. It seems as they relate first and foremost to analyses and descriptions of positive and negative consequences of the projects when discussing methods, and not for instance to alternative-generation.

Some did eventually refer to analyses that they or others had conducted, and which were similar to what I have discussed as 'professional reasoning'. This included in the interviews to using professional judgment in analyses of whether housing developed in a specific cluster would be car dependent and produce much road traffic, to carry out discussions with basis in the ABC-principle and the like, and qualitative and crude discussions regarding whether and how different packages of transport measures contribute to achievement of defined objectives. It does not seem as the planners normally refer to this as 'methods' or 'analyses'.

None could refer to any descriptions or guidelines of *how to do* such analyses or applying such methods. This confirms the previous finding, that there is a lack of description of the method or 'way of acting' that I have termed 'professional reasoning'. I did, however, come across several good examples of analyses conducted as professional reasoning.

One interviewee explained how the planning authorities had made an analysis in order to demonstrate the consequences in a case where developers, land owners and inhabitants wanted to build more dwellings in a location with hardly no public transport and no activities or services (except from the school). By presenting defined objectives, describing the mechanisms and the context, and do professional reasoning on the basis of this, the planners were able to make the politicians understand the traffic-increasing consequences of allowing further development here. This resulted in that new plans for development in the area were excluded from the municipal plan, and even that some development areas were removed.

The 'methods' for discussing the problem, defining the objectives etc. seem to be some kind of tacit or silent knowledge – they have ways of doing it (methods) and they do it, but they have a hard time explaining what they actually do.

4.8.1.4 Competition from other kinds of knowledge

Several interviewees explained how they use simpler calculations in combination with what I have discussed as qualitative analyses or professional reasoning. Some planners also tell how they or others use the expert knowledge in question in more advanced transport model analyses and in retail analyses. Most agree that quantitative analyses, especially transport model analyses, have weaknesses that make them inaccurate and uncertain. Many still find them necessary and useful.

This may indicate that that the lack of aim and ability of the expert knowledge in question to produce quantitative and precise data and predictions, combined with competition from knowledge which do offer such data and predictions, are properties that allows for other knowledge to oust the expert knowledge in question.

4.8.1.5 These are complex matters

When discussing whether the expert knowledge in question is good enough, several of the planners explained that these are complex or complicated matters. Hence, we probably should have better knowledge of it.

The interviews hence confirmed that most properties of the expert knowledge that were disclosed as potential causal powers in the abstract analyses are understood as relevant in practical plan-making as well.

4.8.2 The case study revealed how and why properties of the expert knowledge caused that planners made traffic-increasing plans

With basis in the case study, the question is now whether these causal powers embedded in properties of the expert knowledge have worked through the described mechanisms and caused that planners have made traffic-increasing plans. Not least is it interesting to explore the conditions involved.

4.8.2.1 Car-based office development at Tunga

In the Tunga-case, a rejection of the traffic-increasing planning proposal was never introduced as an alternative in the plan-making process. This was found to be the main explanation how and why a traffic-increasing plan was made in this case. The planners involved knew and explained that they made and recommended a plan for a car-based and traffic-generating project, and that implementing this project would counteract achievement of the stated objectives related to reduction of traffic volumes and GHG emissions in Trondheim. It was hence found that properties of the expert knowledge in question were not a main explanation in this case.

4.8.2.2 The largest shopping centre in Oslo at Økern

The main discussions in the Økern-case regarded how much traffic and GHG emissions the 60.000 m² shopping centre at Økern will cause, and how it will affect the retail structure in the proximity and in the city. The planners involved applied knowledge as tools when battling over these questions.

The initiators claim that this will be a 'large local centre' that will not cause more traffic than if the activities were located elsewhere, and that it will not have significant negative effects of the retail structure in the area and the city. The planning authorities and other authorities claim that this will be a regional and car-based shopping centre that will draw customers from a large area and cause much traffic, as well as negative and un-wanted effects on the retail structure.

'Twisted' analyses

Several interviewees claimed that the analyses conducted by the initiators were 'twisted' in order to demonstrate that the project was in accordance with the overall municipal plan for retail and services, and hence could be adopted by the City Council²⁰. This was confirmed by the case documents. This twisting regards among others: to design the analyses in ways that make them appear comparable to the planning authorities' analyses when that is not the case; to apply unrealistic and faulty assumptions and data in the analyses; to apply black box analyses which are in-transparent and impossible to assess; to cherry-pick results; to affect the importance of the variables that were assessed; and by claiming that their analyses show something else than they actually do. The causal powers allowing the planners working for the initiators to do so is partly located in features of the expert knowledge itself, combined with competition from other knowledge.

The expert knowledge is attempted ousted by competing knowledge

One may claim that the expert knowledge in question is attempted ousted, or at least challenged, by competing expert knowledge regarding *the retail business* and how it works.

²⁰ All claims in this discussion is substantiated, explained, exemplified and accounted for in the case-description in Appendix B.

This regards especially which kinds of centres the Økern centre will take customers from, and to which degree this will happen. By promoting this competing expert knowledge, the initiators move the discussions towards the logics of the retail business and away from transport consequences and spatial development. This clash of expert knowledge also causes confusion regarding the possibilities for development at Økern as well as consequences of various alternatives. One reason how and why this can be done, is the complexity of the reality that the expert knowledge describes, and hence the expert knowledge itself. Few are able to understand the problem, follow the discussion, and make up their own opinions.

The initiators cause confusion

The ways the initiators produce and present analyses in the process contribute to increase the confusion. For instance, the initiators apply car-shares on travels to the shopping centre that are understood as too low by all knowledgeable actors involved in the process. When arguing why the car-shares they apply are correct, they conducted three different analyses that are all non-transparent, which are based on data and assumptions that are not accounted for, which are dependent on subjective data and assumptions defined by the initiators, and which use elements from the planning authorities' analyses (2 km as the crow flies) as well as common ways of presenting data (that car shares equals car driver shares) in misleading ways. All three analyses showed too low car shares, as substantiated in the case-description in the appendix.

The ways the initiators act make it seem as if there are 'clashes between experts' regarding which knowledge and which answers that are more valid in this case. This allows the political decision makers to choose who they want to rely on. The initiators have presented an explanation the politicians can use when accounting for why they choose to adopt the plan for a project that, according to the planning authorities, the NPRA and the County Council is not in accordance with the stated objectives or the overall plans.

This could be understood as a signal that the expert knowledge in question is not good enough. The initiators' analyses do, however, show the same effects and tendencies as the planning authorities claim. This could therefore rather be understood as a demonstration of the validity of the expert knowledge in question. It is the initiators' interpretation and presentation of the knowledge that may cause an impression of disagreements and doubt in this case.

Deficiencies in general and empirical knowledge allows confusion and faulty application of the expert knowledge

This does, anyhow, reveal that there is a need for more and deeper understandings of how new shopping centres affect existing retail structure, travel behaviour and traffic volumes. If general and empirical knowledge regarding these issues had been more developed and better described, there would be less room for detailed and confusing discussions in zoning plans and at project level.

It is claimed and substantiated in my description of the case in appendix B that the initiators *consciously* apply the expert knowledge and present analyses and answers in ways that they should understand were faulty. The faulty applications of general and empirical knowledge could, however, be caused by weaknesses of the general and empirical knowledge. This could for instance explain why they chose to apply too low car shares in their traffic analyses. It could explain why they chose to discuss the number of people living in certain

distances from the centre 'as the crow flies' rather than real walking distance, and more. As demonstrated in the case-description, the initiators have been made aware of this by several commentators as well as the planning authorities throughout the process. Hence, one may claim that this is more due to properties of the planners involved than the expert knowledge.

Lack of description of 'professional reasoning' allows the initiators to twist their analyses

The planning authorities presented their argumentation concerning how and why a shopping centre of this size located here will be strongly car-dependent, cause large traffic volumes and have negative effects on the existing retail structure, as an exemplary professional reasoning. The outputs were well justified recommendations regarding maximum size of the centre.

The initiators' analyses may give the impression of being well grounded and clear professional reasoning as well, but in reality they are in-transparent and (according to me) consciously confusing. If there existed agreed descriptions of how professional reasoning should be conducted, the initiators' attempts to confuse would more easily have been disclosed.

Explanations related to the expert knowledge

A main explanation how and why properties of the expert knowledge were contributing causes that a traffic-increasing plan was made in this case, was that the complexity of the expert knowledge (and the case matters) allowed the planners working for the initiators to cause confusion and faulty understandings of the consequences of their project through their analyses and their presentations of what they had found.

Another main explanation is that the expert knowledge in question, and the methods for applying this knowledge in professional reasoning, are not described in comprehensive, understandable and agreed upon ways that can be referred to in disputes like this, and hinder that the expert knowledge in question is ousted or misused.

Finally, the lack of empirical data regarding how developments of retail centres of different sizes in different locations in different cities tend to affect travel behaviour and traffic volumes, as well as relevant and usable assembling, analyses, and accessible presentations of such knowledge, opened for confusing discussions regarding for instance how to measure the distance from the centre to the dwellings when discussing the travel behaviour of the future customers.

The situation could hence be improved if there were developed comprehensive, referable and easily accessible description of the system with its objects and interrelations, more, relevant and accessible empirical knowledge regarding the strengths of the mechanisms in various contexts, as well as acknowledged and well described methods for applying the knowledge in relevant and transparent analyses.

4.8.2.3 Car-based housing developments in Skedsmo

The traffic-increasing plans were seemingly not caused by properties of the expert knowledge

In the Skedsmo case, the objective 'reducing traffic volumes' was not introduced in the zoning plan discussions that have been studied. Hence, the expert knowledge in question was not applied. This was seen as a reason how and why the planners made traffic-increasing zoning plans for housing developments. In interviews, the planners at the

planning authorities did not find that this had to do with qualities of the expert knowledge in question.

The new municipal plans improves the access to this knowledge

According to the case-handler for the recently adopted municipal plan, this new plan is better explained and substantiated than former municipal plans have been. The problems, analyses, reasoning, plans and recommendations are clearly expressed and explained in the new municipal plan. This makes it a stronger tool in debates, and not least a better tool for the case-handlers for zoning plans. They can (and shall) now use the reasoning, explanations and arguments from the municipal plan when heading zoning plan processes and commenting on planning proposals.

This allows even those that are not experts in coordinated land use and transport planning for reduced traffic volumes to be responsive to issues regarding car-based location, growth in traffic volumes and in GHG emissions, and to require that this issue is assessed. The expert knowledge has been made more accessible and available, and is hence assumed to be applied and contribute reduction of car-dependent developments of housing.

The previous lack of access to this knowledge was a contributing cause why it was not applied

One may hence claim that the *lack of* a comprehensive, accessible and usable description of the expert knowledge in question was a main explanation how and why the planners made and recommended the three traffic-increasing zoning plans for housing development in Skedsmo.

4.8.2.4 Increased road capacity on E 18

In the E 18 case, main explanations how and why the planners made traffic-increasing plans were that a traffic-reducing alternative was never developed or introduced in the plan-making process, or called for with force by the hearing instances. Further, the expert knowledge in question was only partly applied, among others because transport models that were in-sensitive to most traffic-reducing measures were chosen as the main method for doing analyses. How and why this happened have to do with properties of the expert knowledge in question in several and different ways.

Lack of empirical documentation caused that the expert knowledge was not applied in the analyses

A simplified version of the expert knowledge in question was described in the system analysis (NPRA 2009a). The measures or variables discussed from the start included land use development, parking, pricing of car traffic (road pricing), improving public transport, improving conditions for walking and for bicycling, and access control to the motorway. A clear understanding is expressed, in the documents and in most of the interviews, that a number of other measures than road building need to be implemented in order to improve the conditions in the E 18 corridor with respect to the defined objectives.

Most of these measures were, however, soon excluded from the analyses. The future land use was defined and kept exogenous from the very start. This means that the land use does not vary with varying developments of the transport-systems, which is highly unlikely in reality. The other measures were excluded as the transport model analyses were introduced. It was explained that this is because the transport model is not sensitive to these measures (parking access, conditions for walking and bicycling, most changes of public transport

services and more) (*ibid*). This means that they cause no differences in transport volumes and modal split *in the models*.

In the on-going municipal area plan process, the alternatives vary only with respect to tunnel lengths and - on paper - road capacity. It is explained, in interviews and documents, that traffic reduction measures will be discussed later on when the road capacity and design have been decided.

This exclusion of the expert knowledge has to do with the process, the actors, the objectives and the power distribution. It also has to do with properties of the expert knowledge. The lack of empirical documentation of the existence and of the strengths of effects of the various measures on traffic volumes makes it harder to apply the expert knowledge in question directly and with force, for instance by calling for a traffic-reducing alternative. Further, it makes it harder to develop a traffic-reducing alternative, and easier to disregard the expert knowledge in the plan-making process.

Lack of average and universal quantitative knowledge caused that the expert knowledge was excluded in the transport analyses

The exclusion of the expert knowledge probably also has to do with the fact that the expert knowledge in question does not aim at producing average or universal quantitative knowledge. This means that the kind of knowledge that can be applied in the transport models are not available in the relevant form (average, quantitative) for many of the measures (land use development, conditions for bicycling, etc.), and hence that the effects of such changes of land use or transport-systems cannot be handled by the transport models NPRA apply. It is, however, explained previously in this chapter how and why the conditionality and the contextuality of the reality this knowledge describes are good reasons why such universal and average knowledge cannot and should not be produced.

Properties of the expert knowledge caused that the knowledge was ousted by a transport model analysis and that a traffic-reducing alternative was not produced

The fact that a transport model analysis is chosen as the (in reality) only method for assessing the alternatives and their consequences, can also partly be explained by properties and features of the expert knowledge.

The lack of comprehensive and accessible descriptions of the complex systems and its mechanisms; of how the mechanisms work; the lack of empirical knowledge of the strengths of the effects in different contexts and under different conditions, as well as; the lack of well-defined and described methods for applying this knowledge in analyses and predictions make it hard for the NPRA and others to choose to apply other methods for assessing the alternatives. This leaves the scene open for the transport model analyses, even though it is well known and widely accepted that they are not good tools for these kinds of tasks (Sayer [1984] 1992, De Jongh 1988, Wachs 1989, 1990, Flyvbjerg *et al* 2002, Flyvbjerg *et al* 2003, Tennøy 2004, Næss 2004, Tennøy *et al* 2006).

A main explanation how and why a traffic-increasing plan is made in this case, is that a traffic-reducing alternative was not produced and introduced in the plan-making process. This has to do with exactly the same properties of the expert knowledge. This is probably reinforced by the lack of studies and empirical knowledge regarding how combinations of changes of land use and transport-systems affect travel behaviour and traffic volumes.

It can be added that NPRA actually have done a qualitative and crude analysis of the alternatives with help of the expert knowledge in question in the very start of the plan-making process (NPRA 2009).

The more complex explanations are ousted by the simpler answers

This also has to do with the fact that the knowledge – because of the reality – is complex, and that this expert knowledge is not willing to do the over-simplifications that is necessary in the transport models (as described when discussing transparent and suitable methods for doing planning analyses). There seems, however, to be a pull towards the simpler quantitative methods discussing few measures and arriving at simple answers, instead of the complex and qualitative methods discussing many and different measures and interrelations simultaneously. Since the transport planners and the transport models do this simplification, and come up with such answers, they take lead in the discussions.

The situation can be improved

This analysis demonstrates that the situation could have been different if the quality of the expert knowledge was improved, especially with respect to accessibility to comprehensive descriptions of the knowledge, more, relevant and accessible empirical knowledge, and development and description of good methods for doing analyses.

4.9 Conclusions related to the expert knowledge

Five explanations of how and why properties of the expert knowledge in question may cause that planners make traffic-increasing plans were developed on basis of the abstract analyses. When assessing whether these have been substantiated in the interviews and the case study, the findings can be summarised in the table.

Table 1: Most explanations related to properties of the expert knowledge that were developed in the abstract analyses were substantiated in the case study.

Explanations	Case Tunga	Case Økern	Case Skedsmo	Case E 18
Properties of the expert knowledge cause planners to not apply it, and hence the planners have no tools for making traffic-reducing plans	-	-	X	X
Properties of the expert knowledge cause planners to apply it wrongly, arriving at traffic-increasing plans	-	X (Consciously)	-	-
Properties of the expert knowledge cause that it is ousted by knowledge causing traffic-increasing plans	-	X	-	X
Properties of the expert knowledge cause that others don't accept it as relevant and valid, and hence that traffic-increasing plans are made	-	-	-	X
The expert knowledge describes reality in-correctly, and hence causes that planning is taken in traffic-increasing directions	-	-	-	-

All the explanations were found to be relevant in the case study, except that the expert knowledge describes reality incorrectly. Nobody claimed this in the interviews. Neither did the more abstract discussions find this to be a likely explanation. I hence conclude that this explanation is not a relevant or important explanation. The other explanations were substantiated in different ways and to various degrees. The interviews and the case study reinforced the understanding that these explanations are quite interrelated.

When asking how and why properties of the expert knowledge can contribute to explaining how and why planners make traffic-increasing plans, I can now present a broad and summarising answer, as follows.

Even if the expert knowledge in question is good enough in the sense that it can guide planners that aim at contributing to a traffic-reducing land use and transport development in the right direction, it has shortcomings. These shortcomings are causal powers, which may contribute to produce traffic-increasing plans through a number of mechanisms, as discussed. This may contribute to make the expert knowledge in question less accessible and applicable for planners that have not been trained as specialists in this topic; make it hard to explain the knowledge and how it has been applied in order to arrive at particular recommendations; cause that this expert knowledge is ousted by other knowledge or just disregarded; open for consciously faulty application of the expert knowledge, and not least; cause that traffic-reducing alternatives are not produced, introduced or called for in planning processes. These may all cause that planners make traffic-increasing plans rather than plans that can contribute to reducing car dependency and traffic volumes.

The shortcomings regard especially three features of the expert knowledge. If these shortcomings of the expert knowledge were improved, the chances would increase that land use and transport development was taken in less traffic-increasing directions.

This regards *first* that the expert knowledge in question needs to be described in comprehensive and understandable ways that are accessible for planners and applicable in plan-making practice. This regards how and why developments of land use, transport-systems, travel behaviour and traffic volumes are interrelated, how certain developments of land use and transport-systems affect traffic volumes, and how land use and transport-systems ought to be developed in order to reduce rather than increase car dependency and traffic volumes. Lack of such descriptions was detected as a shortcoming in the abstract analyses, and substantiated in the empirical analyses.

Second, it regards the empirical knowledge of the existence and strengths of the effects of the mechanisms in various contexts and under various conditions. More empirical knowledge is necessary. Further, it needs to be assembled, assessed and analysed, and it need to be organised and presented in ways and through channels that are applicable and accessible for planning practitioners dealing with concrete problems in concrete contexts. This would also be an improvement of the scientific soundness of the expert knowledge.

Third, the method that has been termed 'professional reasoning' needs to be described, to be empirically studied and analysed, and probably to be improved and developed into a referable and acknowledged method.

How and why planners make plans which, if implemented, cause growth in traffic volumes

5. The planners

5.1 Introduction

The second issue regards how and why *properties of the planners and the ways they relate to the expert knowledge in question* can contribute to explaining how and why planner make plans which, if implemented, cause growth in traffic volumes.

'The planners' discussed here are those who are professionally involved in making plans that affect developments of land use and transport-systems. They work in different positions or roles; for planning authorities, other public authorities, public and private initiators of plans, consulting firms, non-governmental organisations (NGO) etc. Several planners are normally involved in a plan-making process.

The chapter starts out by discussing how planners play important roles in plan-making. It is discussed which properties of the planners that may be understood as causal powers that affect how planners relate to the expert knowledge in question. It is further discussed which mechanisms these powers may work through, and contribute to that traffic-increasing plans are made. Promising explanations are developed on the basis of these abstract analyses.

It is further examined how these causal powers, mechanisms and explanations manifest themselves in concrete situations, through empirical studies; a survey, interview studies and a case study. The main conclusions regarding how and why properties of the planners - and how they relate to the expert knowledge in question - contribute to that planners make traffic-increasing plans are discussed and presented. Possible changes are suggested.

5.2 Planners are important actors in plan-making processes

Planners working for the main actors affect the plan-making and the plans strongly. They are heading the planning processes and doing the main parts of the actual work involved in making plans. The planners are those who are supposed to have and bring professional knowledge into the process. This is knowledge of the planning system and the planning processes, but also expert knowledge of 'how the city works', which measures and strategies that may contribute to achieve certain ends, and methods and tools to be used when analysing impacts and effects.

Other actors partake in the knowledge production in planning processes in several ways, such as by defining the project or objectives, and by defining what the context consists of and which parts of it that become relevant in the planning processes. This makes planners what Rydin (2007) terms 'co-producers of knowledge'. The planners are, however, still the ones that bring the expert knowledge in question into the plan-making processes and the ones who do the actual plan-making.

Developers, residents, politicians, experts in other fields and other actors normally either could or would not bring the expert knowledge in question into the discussions. The system is complex, dynamic and iterative. Hence, it is often not obvious or intuitively understandable in planning and decision-making processes which actions should be taken and avoided in order to

reduce traffic volumes in concrete contexts, or which impacts and consequences certain actions may have on the ecological, economic and social systems now and in the future.

Further, planning processes are often struggles where some win and some lose, and they may implicitly regard whether problems occurring here and now should be emphasised rather than possible future problems. This makes planners even more important. Willson (2001:15) emphasises that: “transportation planners are not just facilitators – they articulate economic, social and technical knowledge and represent values that might be neglected by other participants, such as social justice or the interests of future generations”.

Without knowledgeable and capable planners who bring the expert knowledge into the plan-making processes, the plan-making processes could not produce good answers to the questions ‘What should we do in order to...?’ and ‘What are the consequences of...?’ with respect to reduction of urban road traffic volumes.

Whether the expert knowledge is introduced, accepted and applied affect the planning and the plans strongly. How planners and other professionals involved in plan-making processes relate to the expert knowledge influence whether and how it is introduced, accepted and applied in the plan-making processes. This is in turn dependent on properties of the planners. This means that causal powers affecting plan-making and plans are embedded in properties of the planners.

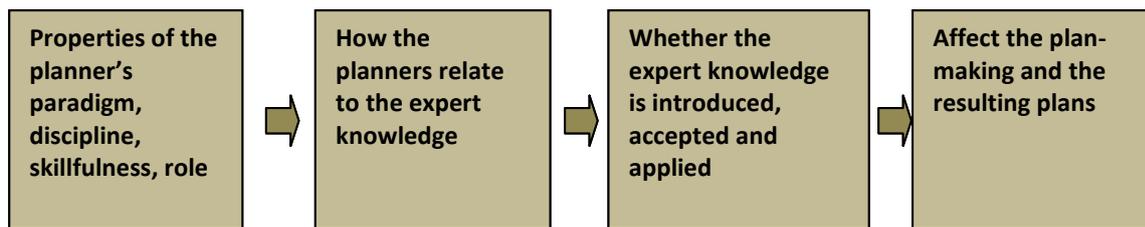


Figure 38: Properties of the planners affect how they relate to the expert knowledge, and hence whether this knowledge is applied in the plan-making processes. This in turn affects the plan-making and the plans.

5.3 Properties of the planners affect how they relate to the knowledge

5.3.1 Relevant properties of the planners

A main assumption in this work is that planners need to apply the expert knowledge in question, and to apply it correctly, in order to be able to consciously and systematically produce plans which cause reduction instead of growth in urban road traffic volumes. This requires among others that the planners possess or know of the expert knowledge in question, are willing to apply it, and able to apply it correctly.

In the structural analysis we ask what existence of planners who relate to the expert knowledge in ways that make them produce traffic-reducing plans *presupposes*, with respect to the planners. A number of properties may be relevant. Properties related to four relevant characteristics of the planners are emphasised in this discussion; discipline, paradigm, skillfulness and role²¹. A planner would not be what she is and do what she does in a plan-

²¹ This means that properties related to the planners as person, with respect to for instance energy, courage, physical strength, moral, beliefs and the like is not included. The same goes for other kinds of characteristics of the planner, such as gender and age.

making process unless her discipline, paradigm, skilfulness and role are what they are. Hence, there are internal relations between the definition of a person as a planner and her discipline, paradigm, skilfulness and role.

The *properties* of her discipline, paradigm, skilfulness and role are, however, external and contingent. The planner will be a planner whether she is an expert in housing supply or in overall land use and transport planning, whether she is experienced or a novice, and independently of which role she has in the particular plan-making process. When we ask what it is about a planner that makes her do such and such, the answer is often related to *properties* of her discipline, paradigm, skilfulness and role:

- What her (main) discipline is
- Which paradigm she belongs to
- How skilful she is
- Her role in the particular planning process

If a planner has a certain combination of discipline, paradigm, skilfulness and role, she may relate to the expert knowledge in ways that cause that she want to and is able to apply it correctly in plan-making. Other combinations of these properties may cause that she does not apply it or applies it in faulty ways.

5.3.2 Discipline and inter-disciplinarity

Inherent inter-disciplinarity

The inherent inter-disciplinary character of urban land use and transport planning means that those professionally involved in plan-making have their basic understandings from and are rooted in several different disciplines. The main professions involved are land use planners, transport planners and land use and transport planners. These may have been educated as planners, engineers, architects, and geographers, as well as economists, political scientists, sociologists and others.

‘Coordinated land use and transport planning for reduced urban road traffic volumes’ requires integration of at least two types of knowledge that traditionally have been seen more independent from each other, namely land use planning and transport planning. Many planners involved in land use and transport planning processes which affect traffic volumes have been trained within one of these, and have only limited knowledge of the interrelations between the two. It may hence be expected that some planners will lean on more mono-disciplinary ways of understanding the problem, where the relationships between development of transport-systems, land use and traffic volumes are not seen as existing or strong, or where this is not an important issue.

Deep disagreements rooted in ontological understandings

There may be deep disagreements between disciplines, rooted in different ontological understandings about ‘how the world works’ and epistemological understandings about how one can gain knowledge about it. This may also regard which methods are appropriate and ethically acceptable.

Howe (1990) takes this as starting point in her critical discussion of normative ethics in planning. She shows how the quantitative tradition of *utilitarianism* was passed to economics, and shaped the normative ethics of this discipline. This has formed the understanding that ‘the right’ and ‘the good’ are that which creates ‘the greatest good for

the greatest number'. A proposed project should, according to this, be approved if it causes more benefits than costs. Howe (*ibid*) is concerned with the shortcomings of this way of understanding world. She doubts the abilities to 'do the calculus right' (see also Næss 2006a for an interesting discussion regarding the problems which occur when applying cost benefit analyses in discussions of road infrastructure investments). Further, she worries that cost-benefit analyses now seem to be taught as an economic technique rather than a form of ethical analysis which it actually is, since value is allocated to different 'goods' and 'bads' for different groups.

The other main approach to ethics discussed by Howe, *deontology*, is concerned with moral rules, with rights and duties. Actions are right or wrong, not because of the good or bad results they bring about, but because they are seen as right or wrong in themselves. This regards for instance issues related to freedom and distributional fairness or justice. This could include that the living-areas of endangered species should not be destroyed even if it could create large benefits or utilities. It could also include that we should reduce GHG emissions dramatically and at once, in order not to cause major problems for people living in the future, even if this means negative utility for the ones living here and now. This perspective also poses difficult questions to the discounting done in cost benefit analyses, which assumes that bad things happening in the future have less negative value than bad things happening today. Whether the one or the other ontology is the basis for a theory will affect the methodology developed on basis of it, as well as which outcomes that are understood as beneficial. This may cause deep disagreements.

Few are experts in this topic

Further, one may expect economists, sociologists, political scientists etc. to have their basis knowledge in their own basis disciplines rather than in land use and transport planning. This may cause them to focus on the bits and parts of the planning system, the planning practice and the plan-making which are most relevant in their context. Economists bring in their expert methodology for doing economic appraisal and comparisons, while the political scientist may be more interested in how the legal and formal systems work. Engineer planners may be expected to be more focused on the city as a system, while architect planners may be expected to be more focused on aesthetics and projects.

Only few will be experts on the dynamic, iterative and complex system of land use, transport-systems, travel behaviour and traffic volumes, as described in chapter four. Hence, only few will be capable and skilful enough to apply the expert knowledge in question correctly on concrete planning problems and produce useful answers which may contribute to take development in traffic-reducing directions.

The inter-disciplinarity of land use and transport planning means that one may expect planners and others professionally involved in plan-making to belong to different disciplines. This may cause that many planners have not been trained in the expert knowledge in question. Hence, they may not know or possess it, or be able to apply it skilfully. They may instead possess other expert knowledge. This may cause that they don't accept the expert knowledge in question, or that they don't want it to be applied.

5.3.3 Paradigm and shifts of paradigms

From predict and provide...

Owens (1995) describes the shift of paradigm within the understandings in transport planning in Britain in the 1990s, from 'predict and provide' to a more holistic understanding

where the interrelations between land use and transport developments are better understood (see also Vigar 2002 for a thorough description and discussion of this process).

The traditional approach to traffic problems like congestion or local environment problems was to build new main roads in order to drain traffic from local streets and to increase road capacity in order to improve traffic flows. The field of competition between the private car and other modes of transport was seen as small or negligible. The reciprocal interrelations between development of land use, transport-systems and traffic volumes were understood in more simple ways, and as weaker as and less relevant than in contemporarily state-of-the-art planning theory.

...to 'coordinated land use and transport planning for reduced road traffic volumes'

The shift of paradigm is towards what may be termed 'coordinated land use and transport planning for reduced road traffic', more or less in accordance with the understanding described in chapter five. This involves a change of focus, aims or objectives towards reducing traffic demand and volumes, towards a change in the understanding of the dynamics of traffic volumes, and a change towards an expert knowledge including a better understanding of the interrelations between development of land use, transport-systems, travel behaviour and traffic volumes.

The theoretical discussions between the 'predict and provide' way of understanding the urban land use and transport-systems and the 'coordinated land use and transport planning for reduced road traffic' ways of understanding this, have been going on for decades. It is, however, fair to say that the latter is now seen as state-of-the-art (Macket 1998, Owens and Cowell 2002).

Policy changes in Norway

We saw this change in Norway as well. The Ministry of the Environment introduced the National Policy Guidelines for coordinated land use and transport planning in 1993. They clearly signalled that there are strong interrelations between development of land use, transport-systems and traffic volumes. They pointed in directions of other solutions than road building in order to solve transport problems. During the 1990s, heads of the National Public Roads Administration (NPRA) started to suggest that road building may not be the only or right solutions to such problems. 'We cannot road-build ourselves out of the traffic problems' was the new parole. Still, they were reluctant to agree that increased road capacity causes induced traffic.

This changed in the National Transport Plan 2006 – 2015 (National Rail Administration et al. 2004: chap 9.2.5, my translation), which claimed that: "While increased road capacity has contributed to less congestion and shorter travel times, it has also helped making the sub-urban areas more attractive for both residential and commercial establishments. Such sprawl may make it difficult to serve the areas well by public transport. Improved access by car has also changed the field of competition with respect to public transport, which has not had similar improvements in the same period of time".

Long way from overall statements to operational plans

However, there may be a long way from rhetoric to reality, from national policy documents to zoning plans, and from planning theory to planning practice. For a start, giving the objective 'reducing urban road traffic volumes' a prominent position in land use and transport planning calls for playing down traditional professional values and objectives. This

may be difficult for a number of reasons. If someone has been trained to and have spent their career on facilitating free flow of ever-growing traffic, it may be hard to start seeing congestion as a useful means and the traffic growth itself as a problem. Further, to include global climate change as a main objective, and to prioritise this over e.g. local benefits, requires a change in ways of thinking which is neither obvious nor easy. Besides, downplaying the old values and objectives also means to devalue the work one has conducted as well as one's expert knowledge.

Further, this shift of paradigms requires many planners to acquire new knowledge. Even if the expert knowledge regarding how to reduce or minimize urban road traffic volumes has been developed over decades, many planners have been educated within the old paradigm of 'predict and provide' as land use planners or transport planners. They may have been trained to see transport problems as something which could and should be solved by building new roads, to handle land use development on new land, and to see public transport as a service for those who don't have a car. Their models, methods and tools are developed within this paradigm, as are the expectations of what kinds of answers one can expect to receive.

Many of the European planning systems, like the Norwegian, were mainly developed for building on 'new land' and not for urban transformation, densification, nodal point developments etc. Many land use planners are educated within this tradition. The expert knowledge embedded in this understanding does on several points differ from the expert knowledge in question, and has different ideas of what is the right framing of problems, which strategies to follow and means to use.

The problem needs to be considered differently

In order for planners educated under the old paradigms to apply the expert knowledge in question, and contributing to making plans which cause reduction rather than growth in urban road traffic volumes, they would need to consider the problem at hand differently from how they are trained to and experienced in. They would need to consider more and other means, strategies and measures, often in unfamiliar combinations, and as alternatives to each other. They would need to apply other theories, methods and models.

Hence, they would need to have obtained and to apply new knowledge in order to be able to contribute to a traffic-reducing land use and transport planning. If they have not done so, this could mean that they do not possess the expert knowledge in question, at least not at a level which enables them to apply it in a skilful way. One may expect that it takes time before all those involved in land use and transport planning, as well as the systems and the tools, are adjusted to the new paradigm.

Different paradigms

The on-going shift of paradigms causes that planners are trained within and belong to different paradigms. This may cause that planners to various degrees see reducing urban road traffic volumes as a prominent objective. Further, that they to various degrees know the expert knowledge in question, that they find it relevant and valid, and that they are able to apply it in skilful ways. It may also cause that some possess expert knowledge belonging to the old paradigms, and prefer to apply this knowledge. This may affect whether they want the expert knowledge in question to be applied.

5.3.4 Skilfulness

Variations in skilfulness

The expert knowledge in question deals with a complex problem. The interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes, and which measures that may be efficient in the particular context in order to reduce urban road traffic volumes, are often not immediately or intuitively understandable. In order to apply the expert knowledge in useful and correct ways, the planning practitioners need to possess a certain expertise in this field. If no-one in the plan-making processes are skilful or have high expertise in applying the expert knowledge in question, one cannot expect the knowledge to be applied in correct and useful ways.

Flyvbjerg (2002 [2001]) discusses competence and virtuosity in human learning, mainly based on Dreyfus and Dreyfus (1986). He explains that people pass through several phases or levels of learning of skills, where 'skills' are understood to range from the technical to the intellectual. The Dreyfus model refers to five levels in the human learning-process: Novice; Advanced beginner; Competent performer; Proficient performer, and; Expert. Novices can only follow the rules they have learnt. As they gather experiences, the performers learn to recognise relevant elements in the situations, as well as how certain actions work in certain contexts. As they travel up the levels, they do become less dependent on rules and more able to act on the basis of intuition and reflection.

According to Dreyfus and Dreyfus (1986), individuals at a given level perform qualitatively better than individuals at the lower levels. Not all people achieve the highest level in a field. Further, it varies between fields whether many or few are able to achieve the highest level, as well as how hard and demanding it is to do so.

Planners have reached different levels of learning

Following from this, one can assume that planners involved in plan-making have reached different levels of learning of the skill 'land use and transport planning for reduced urban road traffic volumes', or for 'urban planning'. One may also assume that planners who have reached higher levels of learning within the field will perform better than planners who have only reached lower levels. This means that some planners are more skilful in doing this work than others. The complexity of the problem itself probably means that it requires much knowledge and experience to become a high level performer, and that not everybody have the capacity to reach the higher levels of learning.

Planners may have worked for few or many years, they may have worked much within this field or less, and their capacity to reach the higher levels of learning may vary. The shift of paradigms and the inter-disciplinarity of land use and transport planning will also cause the skilfulness in the expert knowledge in question to vary between the planners involved. Further, planning practitioners usually work with several issues, and cannot be expected to have reached higher levels of learning, or to have state-of-the-art expert knowledge in all of these.

There are also professionals involved in plan-making which are not educated as planners. They may be working with certain tasks, for instance making zoning plans for small scale housing development. They may be knowledgeable within that field without being trained to consider or analyse the more overall and strategic consequences of the particular developments in a comprehensive context. Hence, one cannot expect all planners involved

in land use and transport planning to be skilful in the expert knowledge in question. Rather, one should expect large variations.

The variations in the property 'skilfulness' among planners involved may cause that some planners will be experts and able to apply the knowledge in plan-making, while others will be less able or not able to do this. If none of the planners involved are knowledgeable and/or skilful, or the ones actually doing the analyses are not knowledgeable and skilful, this may be one explanation how and why planners make traffic-increasing plans.

5.3.5 Role

The role is related to the employers

How the planners think and act will also be affected by the objectives, aims, concerns, and values of their employers, by the knowledge and rationality of their employers, and by the power allocated to them by their role in the game.

Still, the employers usually need to act through the planners in the plan-making processes, and to rely on their expertise. The planners are often the ones developing alternatives as solutions to the problems held by their employers. They transform their ideas into (more or less) valid arguments in the planning process. The planners also assess their proposals and alternative solutions with respect to a number of requirements more or less clearly defined by different actors, and they advise their employers about how to act and what to bring into a planning process. The planners affect what is understood to be 'the problem', which objectives are defined, which alternatives are considered, how these are assessed and compared and which recommendations are given.

The understanding that the planners just 'take orders' from their employers - whether those are City Councils or property developers - may hence often be an over-simplification. Rather, the planners may strongly affect planning processes and their outcomes.

The main actors and roles

The main actors or roles are defined here as public and private initiators of plans, the planning authorities, active bodies entitled to comment (private and public), and politicians. A planner may act and argue differently if she represents a private developer who wants to develop housing as urban sprawl, than if she represents the municipal planning authorities which aim to achieve a stated objective of reducing growth in urban road traffic volumes by developing the city through densification rather than sprawl. Further, her focus may be different if she works e.g. as a project leader with the given objective to implement a project, than if she works with more strategic analyses considering various solutions, in either of those roles.

Consultants working for the various main actors may be hard to place in this system, but they are counted here as the actor they work for in the specific case. According to Moen et al. (2004), who studied urban planning consultants and their roles in the Norwegian planning context, consultants play (important) roles in planning processes. Consultants have several choices with respect to how they act. Moen et al. (ibid) found that the employers don't want to hire 'yes-(wo)men'. Rather, they want genuine advices from individuals who are competent in the issues at hand.

How planners choose to perform their roles also depend on their personal values, moral, personality, courage, responsibility, perseverance, energy and so forth. This will not be dealt with further here.

The logic of appropriateness

March and Olsen (2009:3) explains 'the logic of appropriateness' as a "perspective on how human action is to be interpreted" and a "perspective that sees human action as driven by rules of appropriate or exemplary behaviour, organized into institutions". They find that "rules are followed because they are seen as natural, rightful, expected and legitimate. Actors seek to fulfil the obligations encapsulated in a role, in an identity [...]. Embedded in a social collectivity, they do what they see as appropriate for themselves in a specific type of situation" (ibid).

In their interesting discussion, March and Olsen do not see human action as *determined* by rules. Further, the rules are constantly developing as the members of groups interpret and translate them into actual behaviour, which contributes to cause changes of the rules and so on. One may also suspect that there may be 'clashes of rules' when two or more groups with different kinds of rules meet, and within persons operating in various groups (as most of us do). This is an interesting perspective when explaining how and why planners relate to the expert knowledge in question *per se*, and in concrete plan-making situations (discussed in chapter six).

The various roles of experts involved in planning and decision-making, the 'encapsulated obligations and rules' tied to these roles, and how the planners choose to perform their roles, will influence which objectives they understand as prominent, which expert knowledge they choose to apply, promote and accept, and hence how they relate to the expert knowledge in question. If a planner possesses or knows of the expert knowledge in question, and if she accepts it and is able to apply it, she may still want it not to be applied in the planning process if this expert knowledge will cause problems for the project of her employer or the objective she aims at achieving.

5.3.6 This may cause that planners relate differently to the expert knowledge

The on-going shifts of paradigms, the inter-disciplinarity of land use and transport planning, variations in the skilfulness of the planners and the different roles they play in the game of planning mean that planners often will be different from each other with respect to the properties discussed here. Hence, one may expect them to relate differently to the expert knowledge in question.

Some will be experts and able to apply the expert knowledge in complex analyses, some know the basic agreed recommendations, and some don't know of it at all. They may rely on and accept the knowledge to various degrees, from perceiving this as the one and only way of understanding 'how the city works', to accepting that others understand it this way, to disagree that the city can or do work this way and to rather lean on other knowledge. There will also be degrees of willingness to apply this expert knowledge, from those insisting on doing so, to those accepting it to be applied, to those not accepting it to be applied, and instead insist on applying other kinds of knowledge.

5.4 How the planners relate to the expert knowledge affect whether and how it is applied

When asking the retroductive question what the planners must be like in order to contribute to make traffic-reducing plans, an answer is that they need to: possess or know of the expert knowledge; want to and choose to apply it; be able and willing to apply it correctly, and; agree on applying this knowledge instead of other knowledge in the particular plan-making process. Whether they do, depend on among others which discipline they belong to, which paradigm they relate to, how skilful they are and their role in the plan-making process.

There will normally be several planners partaking in a plan-making process. In order for the expert knowledge to be applied, at least one planner involved needs to know or to know of the expert knowledge in question, and to decide to bring this knowledge into the process. If the knowledge is introduced into the plan-making process, the other planners and professionals involved can dismiss the expert knowledge as non-valid or non-relevant, they can challenge it with other kinds of knowledge, or they can accept it and apply it.

The planners who know this expert knowledge and find it relevant and valid need to convince the other planners to apply and emphasise this knowledge instead of other knowledge (if they don't already agree), in order for the knowledge to be accepted and applied in the plan-making. Whether they succeed in this will depend on how well the planners bringing the knowledge into the process know the knowledge, how well they are able to promote it to the other actors, and (hopefully) on the quality and the relevance of the knowledge itself. It depends not least on the other actors, and how *they* relate to this expert knowledge, as well as how they relate to competing or conflicting knowledge. If there are actors in the process who strongly distrust or disagree with the expert knowledge in question, or who promote other knowledge, the expert knowledge in question may be ousted.

In order for planners who actually apply the expert knowledge when carrying out the tasks in plan-making (such as analysing the problem, suggesting alternative solutions, analysing effects and consequences of alternatives, comparing alternatives, making recommendations) to be able to arrive at insightful and useful answers, they need to apply the expert knowledge correctly. This means that at least one of the planners involved needs to possess deep enough insight in this expert knowledge, as well as in methods for applying it, to be able to apply it correctly. The work needs to be conducted with high quality.

How the planners relate to the objective 'reducing urban road traffic volumes' affect how they relate to the expert knowledge. How the planners relate to this objective is therefore included in the discussions where this is relevant.

Hence, whether and how the expert knowledge in question is applied in plan-making depends on how the planners involved relate to the expert knowledge. This regards whether and to which degrees the planners involved:

- possess the expert knowledge in question
- find the expert knowledge in question relevant and valid for the problem at hand
- possess and rely on other kinds of expert knowledge that they rather want to apply
- want this kind of expert knowledge to be applied
- are capable and skilful enough to apply the expert knowledge correctly
- agree to apply this expert knowledge in this particular plan-making process
- emphasise and focus on the objective 'reducing urban road traffic volumes'

These properties of how the planners relate to the expert knowledge in question may be understood as causal powers that can work through a number of mechanisms and contributing to planners making traffic-increasing plans. Relevant mechanisms are that: planners don't apply the expert knowledge; they apply it wrongly; they apply other kinds of knowledge; they disagree with respect to which knowledge to apply. Whether they do, depend on the conditions.

5.5 Different understandings may cause frame conflicts and clashes of knowledge

One may expect that planners involved in a plan-making process are different with respect to properties of their discipline, paradigm, skilfulness and role, and therefore to how they relate to the expert knowledge. This may cause various kinds of disagreements among planners with respect to expert knowledge. Two are briefly discussed here: clashes of expert knowledge and frame conflicts.

5.5.1 Clashes of expert knowledge

Clashes of expert knowledge refer to situations where different experts or groups of experts hold different kinds of expert knowledge, and disagree regarding which knowledge is more relevant, valid, usable etc. and should be applied in a certain project, analysis, situation or context.

With basis in the discussions regarding properties of the planners, one may expect that such clashes of expert knowledge may be observed between:

- professionals educated within different disciplines
- professionals educated within different paradigms
- experts in land use planning and in transport planning
- experts of method and experts of substance
- the state-of-the-art expert knowledge and the applied knowledge in planning practice

Clashes of knowledge could explain why some of the professionals involved do not know, rely on or want to apply the expert knowledge in question, and why they rather may want other, competing expert knowledge to be applied.

If the result of such clashes of expert knowledge is that the expert knowledge in question is not applied or that other and less helpful kinds of knowledge (with respect to reducing

traffic volumes) are applied in the plan-making, this could be one explanation how and why planners make plans which, if implemented, cause growth in traffic volumes.

5.5.2 Frame conflicts

The properties of the paradigm, discipline, skilfulness and role of the planners involved may affect how they *frame* the problem. The use of the term framing is here inspired by Schön (1983) and Rein and Schön (1993). They describe framing as a way of selecting, organizing, interpreting and making sense of a complex reality to provide guideposts for knowing, analysing, persuading, and acting. Our professional frames transpire partly from whom we are, our educational background and training (what we 'know') and our work life experiences, and will thus vary.

Dryzek (1993:223) explains that the various ways of framing a problem come "complete with both a lens for interpreting the world and procedures for testing its own hypotheses – but not necessarily for testing those generated in other frames". These different framings of problems between disciplines may cause misunderstandings and contests, as described by a number of authors (see e.g. Petts et al. 2008, Owens et al. 2006, Guy 2006, Rein and Schön 1993). One could also suspect that problems may consciously be framed in certain ways by certain actors as a tactic to get ones will through.

The differences with respect to their properties could cause planners to frame the problem differently from each other, and differently from what is embedded in the expert knowledge in question. If that is the case, we have a situation of *frame conflict*, which could be part of the explanation how and why planners make traffic-increasing plans.

5.6 Promising explanations related to the planners

The research question in this chapter is whether properties of the planners and the ways they relate to the expert knowledge in question may contribute to explaining how and why planners make traffic-increasing plans.

The initial structural analyses demonstrated that what the planners are and what they can do are defined by a number of properties of the planners. These properties are contributing causes why they relate to the expert knowledge in question in different ways. Since planners for a number of reasons are different with respect to the properties discussed (paradigm, discipline, role, skilfulness), one may expect that they also relate differently to the objective of reducing traffic volumes and to the expert knowledge.

The properties of how the planners relate to the expert knowledge in question affect whether and how the expert knowledge is applied in plan-making, and hence the plan-making and the plans, by working through a number of mechanisms. The differences in how planners relate to the expert knowledge are probably in themselves contributing explanations to how and why traffic-increasing plans are made, by causing frame conflicts and clashes of expert knowledge.

The most relevant mechanisms were found to be that the planners:

- don't apply the expert knowledge in question
- apply the expert knowledge wrongly
- rather apply different and less useful kinds of knowledge

- disagree on whether to apply this expert knowledge (frame conflicts, clashes of knowledge)

The main explanations how and why plans are made which cause growth in urban road traffic volumes can now be described with basis in figure 39.

The structure (consisting of the planners with their properties) has causal powers (embedded in *properties* of the discipline, paradigm, skillfulness and role of each planner) which define how the planners relate to the expert knowledge in question (whether they possess the expert knowledge; find the expert knowledge relevant and valid; rely on other expert knowledge; want the expert knowledge to be applied; can apply the knowledge correctly; do focus on the objective). This may cause that traffic-increasing plans are made if the generative mechanisms (the planners don't apply the knowledge, they apply it wrongly, they rather apply different kinds of knowledge, or they disagree on whether to apply it) are triggered.

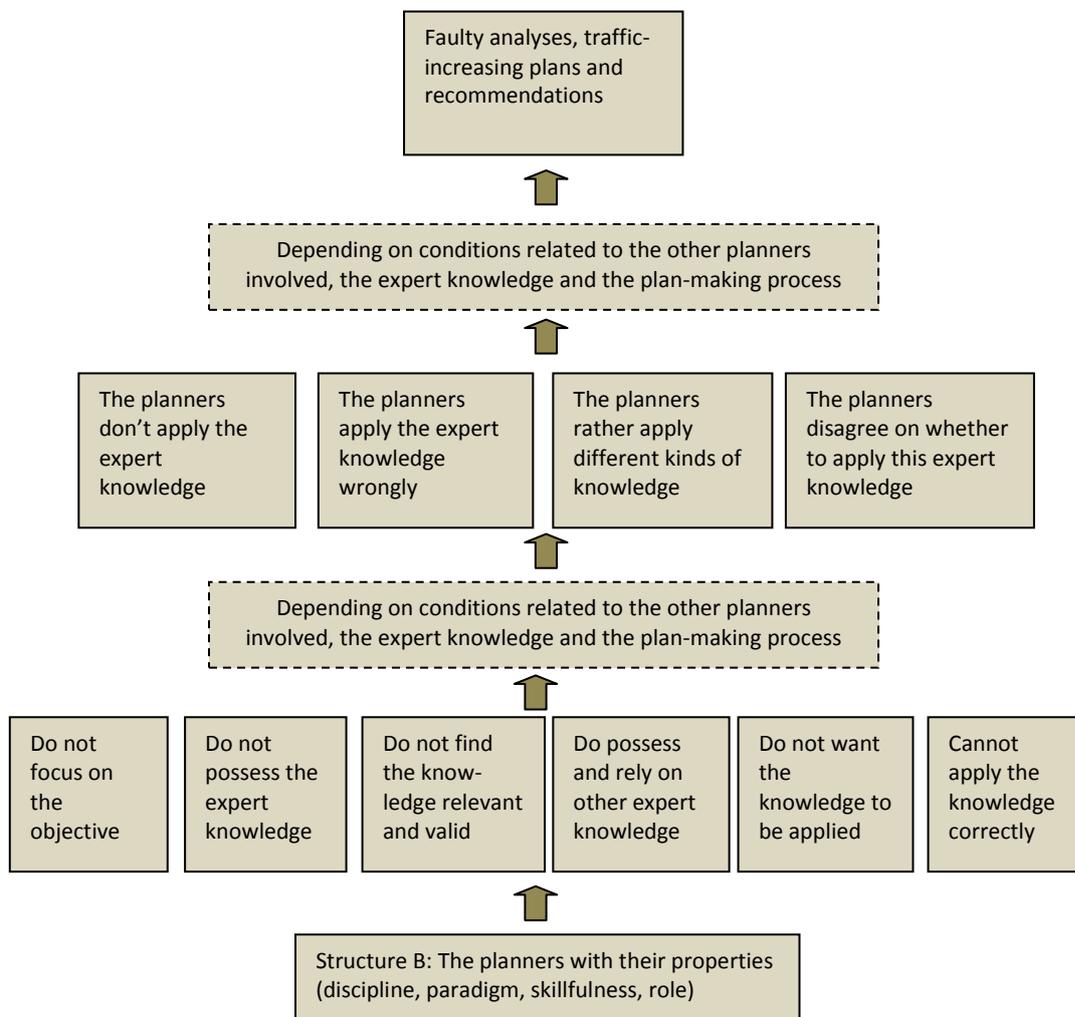


Figure 39: Explanations related to properties of the planners and how they relate to the expert knowledge in question.

Whether the causal powers are allowed to work through these mechanisms and produce traffic-increasing plans depend on the conditions, among others related to properties of the expert knowledge, of the other planners involved, and of the plan-making process.

Explanations for how and why plans are made which cause growth in traffic volumes - related the planners - can be now be summarised.

Properties of the planners and the way they relate to the expert knowledge in question cause that they:

- don't apply the expert knowledge in question and have no tool for arriving at traffic-reducing-plans
- apply the expert knowledge wrongly, and arrive at faulty answers
- rather apply different and less useful kinds of knowledge, which are less helpful, and which do not bring about traffic-reducing answers
- disagree on whether to apply this expert knowledge (frame conflicts, clashes of knowledge), and arrive at applying less helpful kinds of knowledge with respect to reduction of traffic volumes

5.7 Empirical findings regarding the planners

We can now move on to examining how different causal powers and mechanisms manifest themselves in concrete situations, through empirical studies. The findings also invite to a more general discussion of whether and how properties of the planners cause that planners make traffic-increasing plans.

5.7.1 Interviews regarding properties of the planners

In the interview study conducted in 2010 and 2011²², 22 interviewees were asked question related to their discipline, paradigm, skilfulness and role. The interviewees were selected because they worked as planners and were central in the plan-making processes included in the case study. They were more or less directly involved, as initiators, planning authorities or commentators, or as consultants for any of these. This means that they worked with and affected zoning plan processes for development of land use and transport-systems that will affect traffic volumes and GHG emissions. The interview study is reported in Appendix A.

The interviews revealed that that discipline, paradigm, skilfulness and roles varied among the planners interviewed. According to the abstract analyses, this indicates that properties of the planners embed causal powers that may contribute to that the planners make traffic-increasing plans, dependent on the conditions.

5.7.1.1 Disciplinary background: few are trained as land use and transport planners

The disciplinary background of the planners, defined as their main education, varied. Among the 22 interviewees, nine were educated as engineers, six as geographers, three as architects, one as land use planner, and one as economist. Three had other relevant educations. One was economist *and* engineer (this explains why the numbers don't add up).

Among the engineers, three were specialised as land use and transport planners. None of the others claimed to have specialised education in coordinated land use and transport

²² This information was not collected in the interviews conducted in 2004 and 2005.

planning. Four or five of the other planners were more or less specialised in either land use planning or transport planning. Almost half of the professionals had no formal training as planners.

This means that few of those that worked with land use and transport planning in the cases studied here have formal education with respect to how developments of land use and transport-systems affect travel behaviour and traffic volumes.

The understanding in the abstract analysis; that many of those professionally involved in planning is not formally educated as planners, and that only few have been trained as land use and transport planners, was confirmed. One may hence expect that this affects how planners relate to the expert knowledge in question, such as: whether they possess it; are able to apply it in analyses and in problem solving by for instance developing traffic-reducing alternatives.

5.7.1.2 Paradigm: various and ambiguous

When discussing paradigm in the abstract analysis, it was distinguished between those relating more to 'predict and provide' and those relating to 'coordinated land use and transport planning for reduced road traffic'.

The interviews demonstrated that several of the planners were not knowledgeable enough *with respect to this specific topic* to be defined as belonging to any of the paradigms (see 'skilfulness'). Among those that are knowledgeable (according to their own judgements²³) in land use and transport planning, most express an understanding closer to 'coordinated land use and transport planning...' than to 'predict and provide'.

Some few of the planners are clearly located in the 'coordinated land use and transport planning for reduced urban road traffic volumes' paradigm. They see reduction of traffic volumes as a main objective that can be achieved, and they explain and promote that several land use and transport-system measures need to be applied and coordinated in order to achieve results.

Many of the planners are, however, ambiguous and harder to place with respect to paradigm. Even though several hope to stabilise the traffic volumes at the levels we have at present, many doubt and few believe in that the traffic volumes could be reduced (in absolute numbers). Further, all the interviewees express in various ways that planning and development of land use and transport-systems need to be comprehensive and coordinated in order to achieve reductions of traffic volumes as well as other objectives. Most are still knowledgeable only within their specific issue or topic. Those involved in road planning seem to be closer to the 'predict and provide' paradigm than the others. They also emphasise measures that the land use planners seldom mention, such as road pricing and access control.

The main impression is that the planners are closer to 'coordinated land use and transport planning' than to 'predict and provide', but that there are large variations with respect to

²³ I did not do any judgments with respect to whether the planners are skilful with respect to this issue or not. I asked them whether land use and transport planning are among their main specialties, whether they worked much with this issue, whether they had formal training in it etc.

how close to this paradigm they are as well as how conscious they are with respect to these matters. This is also discussed later with respect to findings in the survey.

5.7.1.3 Skilfulness with respect to this issue: varies among planners

Even though many of the planners that were interviewed don't have formal education in coordinated land use and transport planning, and many don't have any formal education as planners, several have worked with land use and transport planning in different ways for many years, and know much about this issue.

All planners seem to be familiar with the expert knowledge regarding coordinated land use and transport planning, but how well and deep they know it varies substantially. Some repeat what they have been told, while others can explain the mechanisms, how they work and how they are interrelated. Most interviewees listed something similar to the 'agreed recommendations', and most could explain the most important causal powers and mechanisms that affect traffic volumes within the topic they work with.

Between eight and ten of the interviewees agree that they are knowledgeable with respect to coordinated land use and transport planning. Several claimed that they are not experts in overall land use and transport planning for reduced urban road traffic volumes, even though they know something about it, but that others at the office are, and that they ask them if necessary.

Six to eight of the interviewees claim that they have no or little knowledge and expertise *with respect to this specific topic*. Some work more as bureaucrats than as planners, meaning that they ensure that the process follows the defined rules and procedures rather than to assessing and discussing the contents of the plans. Others are more knowledgeable with respect to and engaged in the processes and in the more legal aspects of planning and plans. A third group is knowledgeable with respect to either land use or transport planning, but not very knowledgeable with respect to coordinated land use and transport planning for reduced road traffic volumes. The work experience varied among the planners, some had worked with these topics for decades, while others had only few years of experience.

Doing land use and transport planning, and working with ensuring that the land use and transport development are coordinated, are the main tasks for some of the planners. Others claim that they are supposed to be knowledgeable with respect to so many different topics, such as endangered species, accessibility for all etc., and that it is hard to be on top of everything.

When asked to mention their main readings or references for coordinated land use and transport planning, only few mentioned any general or academic literature. Several mentioned overall plans, white papers and the like as references, and some few were quite concrete when listing such references.

This demonstrates that the skilfulness with respect to land use and transport planning varies among planners, as one would expect. It also demonstrates that only few of the planners involved in these plan-making processes are very skilful and knowledgeable with respect to how land use and transport-systems ought to be developed in order to reduce traffic volumes. This may cause that planners make traffic-increasing plans, or do not suggest traffic-reducing alternatives, because they lack the expert knowledge in question or because planners disagree with respect to which knowledge to apply.

When asked whether ‘other planners’ in general are knowledgeable with respect to coordinated land use and transport planning for reduced traffic volumes, the main answer is that yes, this is something all planners know or should know.

One planner, who is well trained in coordinated land use and transport planning, explained that even though we often think we agree when discussing coordinated land use and transport planning, we often find that we actually don’t agree when we concretise this knowledge in concrete plans.

5.7.1.4 Different roles

Of the 22 interviewees, five were interviewed as case-handlers for the plan-making processes at the planning authorities’ office, while seven were working at the planning authorities with overall planning and land use and transport planning. Five interviewees were working for commentators, while three were working for the developers. Two were working more directly for the politicians (one for the District Council, one for the City Council). How these planners acted within their roles, and how that affected the plan-making and the plans, are discussed in the analyses of the planning processes.

The planners did point out that how planners act and what they do are affected by who they work for. This regards what kinds of issues they emphasise, as well as how critically they choose to scrutinise a planning proposal. It was specifically mentioned by several interviewees that one may expect the consultants working for the initiators to produce analyses that more or less consciously present the project in its best light.

5.7.1.5 Potential causal powers embedded in the properties of the planners

The abstract analysis discussed the potential causal powers embedded in properties of the planners’ discipline, paradigm, skilfulness and role, and how these could cause planners to relate to the expert knowledge in ways which may contribute to that planners make traffic-increasing plans. The interviews demonstrated that the planners vary with respect to these properties.

This will affect how each of the planners relate to the expert knowledge in question; whether they possess this knowledge, find it relevant, want it to be applied, are able to apply it correctly, or whether they possess and promote other kinds of knowledge. It will probably often cause that planners involved in plan-making processes vary with respect to how they relate to the expert knowledge in question.

5.7.2 Survey and interviews regarding how planners relate to the expert knowledge

In order to map whether planners more *in general* relate to the expert knowledge in ways that may cause that planners make traffic-increasing plans, a survey was conducted²⁴. It regarded mainly whether planners see reduction of urban road traffic volumes as a prominent objective and whether they know and agree with the expert knowledge in question.

²⁴ The survey was carried out in 2004/2005. Planners working with land use planning, transport planning or land use and transport planning, for private and public employers, in the three largest cities in Norway (Oslo, Bergen, and Trondheim) were invited to contribute in November and December 2004. 82 professionals completed the survey (reported in Tennøy 2005).

Interview studies conducted in 2004/2005 and in 2010/2011 was applied in order to deepen this understanding. The questions asked in the two interview studies vary quite a lot, and they must be understood as supplementary rather than comparative.

The inquiries were not designed for studying how properties of the planners affect how they relate to the expert knowledge. Rather, it was designed to explore how the planners actually relate to the expert knowledge in question and to the objective of reducing urban road traffic volumes, and whether they relate differently to the knowledge and the objective. The findings did nevertheless allow for analyses regarding whether one may claim that the paradigm shift discussed by Owens (1995) has taken place among Norwegian planners.

5.7.2.1 How planners relate to the objective ‘reducing urban road traffic volumes’

Is reducing urban road traffic volumes considered an important objective?

In the survey, a large majority of the planners (78 %) answered yes when they were asked ‘Should it be an important political objective to reduce road traffic volumes in Norwegian cities?’ 9% answered no to this question, and 13% answered that they don’t know.

In order to understand how the planners rate the importance of the objective ‘reducing urban road traffic volumes’ relatively to other objectives, they were asked to state how important they find a number of objectives which are frequently found in planning analyses.

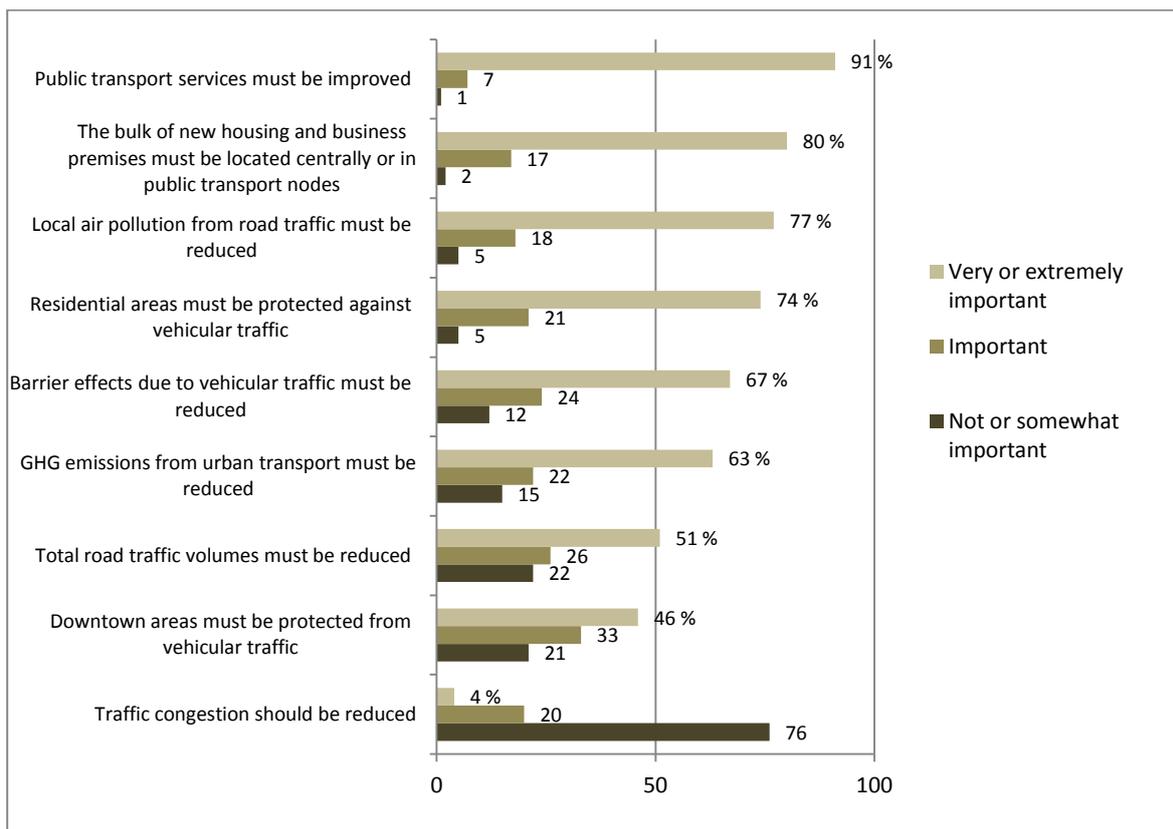


Figure 40: Planners’ responses when asked: ‘How important do you think the following objectives should be for land use and transport planning in larger Norwegian cities?’ The numbers represent the percentages of respondents checking the specified answers.

The most planners checked very or extremely important for the objective ‘public transport services must be improved’ (91 %), followed by ‘the bulk of new housing and business premises must be located centrally or in public transport nodes’ (80%) and ‘local air pollution from traffic must be reduced’ (77%). Reduction of GHG emissions from traffic and reduction

of total traffic volumes are rated as number six and seven respectively of the nine objectives listed. It is, however, interesting to see that a minority of the planners find that reduction of traffic congestion is a very or extremely important objective, while more than half find that reduction of total road traffic volumes is.

One could claim that this is a comparison of different kinds of entities; that objectives and measures are blended, or that objectives at overall and lower levels are compared. This is, however, a common phenomenon in land use and transport planning discussions. What it means to achieve a goal (such as improvement of public transport to reduce the road traffic volumes) is often also a goal in itself. The objectives listed in the survey were chosen because they are frequently mentioned as objectives, and that they are related to land use and transport planning.

Most *interviewees* expressed that contributing to reducing GHG emissions is important for them and their organisation. Still, the planners don't necessarily find that reducing urban road traffic volumes is the main objective in land use and transport planning (even if they may think it should be). Rather, they understand the main objectives being to 'make the city work', to 'develop attractive housing areas, to 'attract developers', to 'make something happen', and to 'improve local environment'. This is especially the case when it comes to concrete projects, where it seems as objectives regarding local and immediate needs and wishes are prioritised.

Is reducing urban road traffic volumes considered an achievable objective?

An equally relevant question is whether the planners think that urban road traffic volumes *can* be reduced. When asked 'Can road traffic volumes be affected?' a majority of the planners (61 %) answered that it can be reduced if the right measures are applied. However, and as the chart shows, a large minority (35%) responded that the *growth* in road traffic can be reduced, but the volume will continue to increase. Only 2% responded that traffic will continue to grow at the same pace as now, no matter what we do.

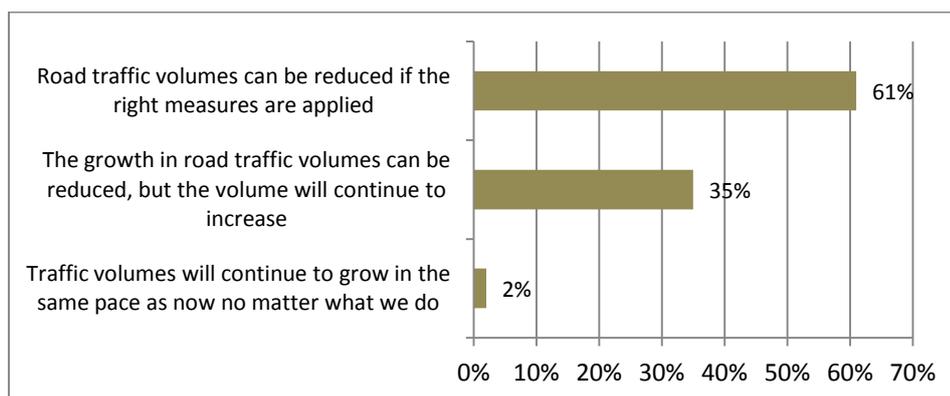


Figure 41: Planners' responses when asked: 'Can road traffic volumes be affected?'

When asked in the 2004/2005- interviews whether the planners find 'reducing urban road traffic volumes' to be a realistic objective, the main impression is that they don't. They explain that economic growth and growth in population and work places will increase transport demand in Oslo. Hence, as long as people are not willing to turn to walking, bicycling and public transport (implicating that they are not), the growth in road traffic will continue. Several argue quite clearly that reducing urban road traffic volumes is unrealistic. Some said that the objective should be abandoned, while one finds it unrealistic but necessary; 'we have to make it!'

The expressed political objective in the Oslo-area at the time was that road traffic volumes should not increase substantially, as a result of public transport taking a higher share of the total traffic. Even though most of the interviewees agreed with this objective, and many argued that there is a potentially large field of competition between public transport and the private car, in reality only a few believed that implementation of the transport-reducing means would reduce urban road traffic volumes. Some found it hard to believe that the trend in growing road traffic volumes could be broken. Others felt that there is a lack of evidence about the precise effects the means would have on road traffic volumes. Some stated that they were unsure whether other agencies and/or politicians were willing to, or capable of, using the necessary means, especially restrictive ones.

The answers were remarkably similar in the 2010/2011-interviews. To keep traffic on the present level is seen as an almost unachievable objective that they anyhow state that we *have to* achieve in order to avoid total traffic chaos (especially in the Oslo area) and increased GHG emissions. The hope is that if the road traffic volumes are stabilised at the present levels while improvements of cars and fuels will ensure that the GHG emissions are reduced sufficiently.

This could have decisive implications for how they perceive their options with respect to strategies and measures. If reducing urban road traffic volumes is not regarded as a realistic objective, objectives concerning reduction of congestions and of local environmental stress normally will require new road capacity on main roads in order to drain traffic from local roads and streets and to improve traffic flow. Hence, they are conflicting objectives with 'reducing urban road traffic volumes'.

5.7.2.2 How planners relate to the expert knowledge in question

A main understanding in this work, as discussed in the introduction chapter, is that there is a relatively widespread consensus among professionals regarding which developments of land use and transport-systems that causes growth or reduction of urban road traffic volumes. The agreed recommendations for traffic-reducing development of land use and transport-systems were in chapter four listed as: imposing or encouraging land use developments that demand less transport and less car use; imposing physical and fiscal restrictions on traffic; improving public transport services, and; improving conditions for walking and bicycling. These should preferably be carried out in concert.

Which measures are efficient?

Since development is taken in directions causing and allowing growth in urban road traffic volumes, one explanation may be that this consensus is not as widespread or deep as assumed. Hence, a number of questions regarding the effects of assumed important measures affecting road traffic volumes were included in the survey. The aim was to figure out whether planners in general do agree with the basic understandings included in the expert knowledge in question regarding which measures are efficient in reducing traffic volumes.

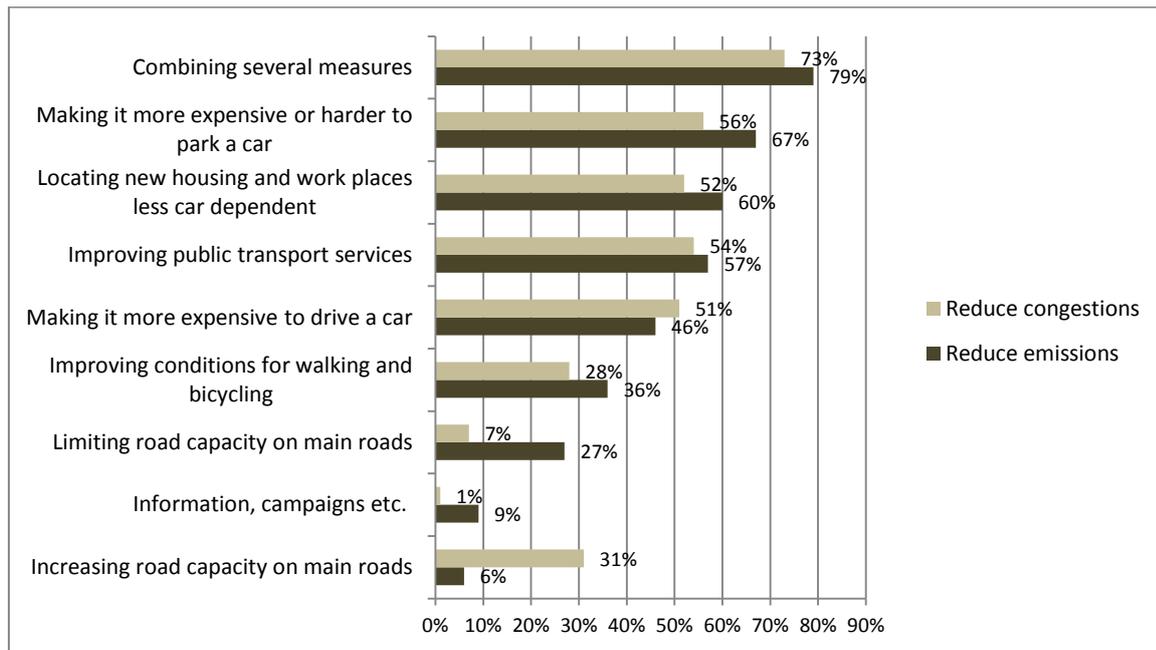


Figure 42: The percentages of planners responding that the listed measures are very or extremely effective when asked: How efficient do you think the listed measures are with respect to reducing emissions from road traffic? How efficient do you think the listed measures are in order to reduce congestions and delays?

We were aware of and interested in possible conflicts between means for *reducing emissions* and for *reducing congestions*. Thus, the planners were asked how effective they think that different measures in relation to both objectives.

For both objectives it is considered most effective to combine several measures (79% and 63%), while the single measure most think are effective in terms of both objectives is to make it more expensive or difficult to park a car (67% and 56%). If we are to reduce emissions from traffic, less transport-demanding land use is understood as the second most effective single measure (60%). Then follow improvement of public transport services, making it more expensive to use the private car, improve conditions for walking and bicycling, limiting road capacity, information, and to increase road capacity.

If the goal is to reduce congestions, the ranking of the measures is almost similar. The exceptions are that improving public transport services is ranked as the second-most efficient single measure, that increasing road capacity is considered more efficient and reducing road capacity less.

Thus, it seems as the planners don't find that reducing emissions from road traffic and reducing congestions are competing or conflicting objectives which require different strategies and measures. The exception is changes of road capacity. It is also clear that the professionals find that the measures in general are more efficient when it comes to reducing emissions than to reducing congestions.

When asked in interviews which means should be applied in order to reduce traffic volumes, most of the planners came up with the whole list of transport-reducing means. No-one mentioned to reduce road capacity, but several emphasised that one should not increase it. They were aware that means need to be used in combination in order to be efficient, and that restrictive means are necessary.

Several expressed a strong belief in the necessity and efficiency of fiscal measures like road pricing and parking fees. Almost all mentioned the necessity of steering land use development in less transport demanding directions. Some of the interviewees (who mainly worked with the transport part of coordinated land use and transport planning) expressed frustrations that land use development seems to go in the wrong directions. Others complained that land use development is 'too much politics' or 'only politics'. All mentioned improvement of the public transport services as an important measure. Some few emphasised that it anyhow is necessary to build roads.

What happens if road capacity is not increased?

Change of road capacity is an interesting issue when discussing why we fail to reduce road traffic volumes. To *increasing* road capacity used to be the way of solving many kinds of transport problems in the past, while more contemporary planning theory understand this as to contribute to growth in urban road traffic volumes. Road building is the main measure of the road authorities in terms of power, money and time.

In the survey, the planning practitioners were asked what they think will be the consequences if road capacity on the main roads are not increased. From the chart we see that the respondents find that people first and foremost will adapt to the situation and travel at other times, to other places, etc. and that they will change to other means of transport. Few planners think that people and companies will move to other areas in order to avoid congestion.

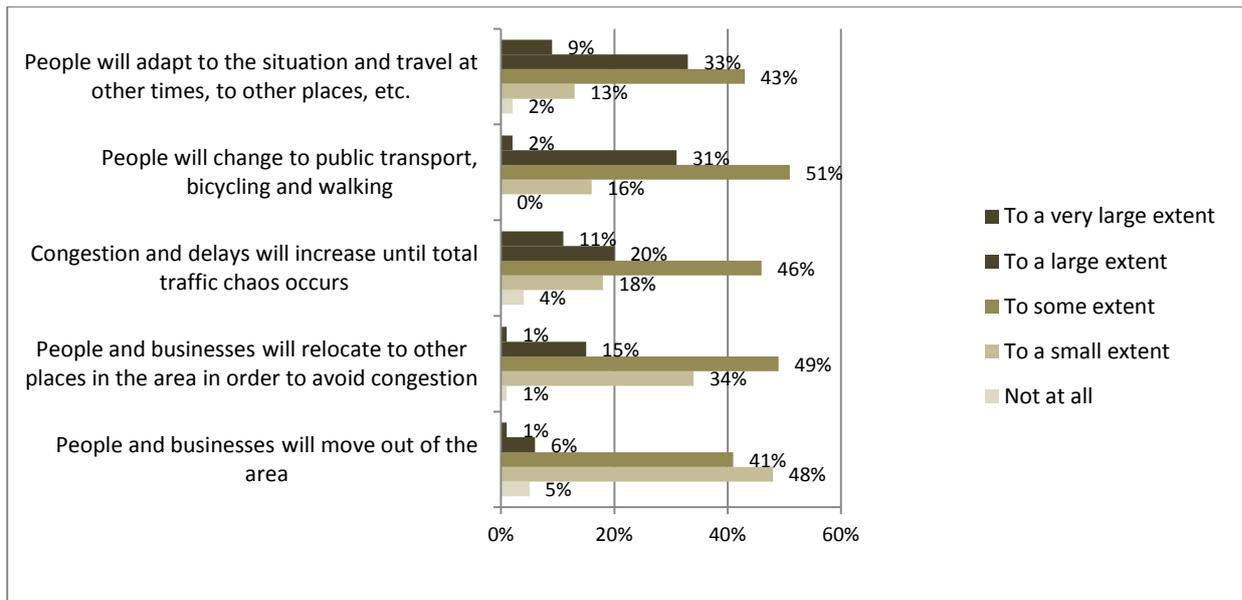


Figure 43: Planners' responses when asked: 'If the capacity of the highway network is not developed, to what extent do you think the following will happen?'

It is, however, interesting to notice that when it comes to the statement 'congestion and delays will increase until the total traffic chaos occurs', the opinions of the planners vary. 22% think that this will not happen at all or to a small extent, 46% to some extent and 31% to a large or very large extent. This means that this is understood as a relevant perspective by many of the planners.

Is increased road capacity beneficial?

Another way of gaining understanding of how planning practitioners relate to road building was to ask them whether increased road capacity is beneficial in cities with congestions and delays, seen in a perspective of five years.

As shown in the chart, 50 % of the planners in the survey agree to a large or very large degree that increased road capacity provides little benefit, because new traffic will fill up the new capacity and the congestions will become as bad as they were. 26 % agree to a large or very large degree that increased road capacity will reduce traffic on local roads, and 16 % that it will reduce delays for the road traffic. Only 10 % agree to a large or very large extent that increased road capacity will remove traffic jams. Even if rather low percentages of the planners agree that increased road capacity to a high or very high extent will be useful, many agree to *some extent* that it will be useful in different ways. Hence, the results could be understood as a planners being quite indifferent when it comes to whether increasing road capacity on main roads is beneficial.

This is confirmed in the 2004/ 2005-interviews. When asked whether one should build more roads, only a few totally dismissed this. A few stated that increasing road capacity is just about the worst thing one could do, since this will cause growth in road traffic. Further, it is an inefficient way of spending money. Several mentioned that the municipality of Oslo had stated that they deny increase of capacity over the municipal border, since they do not want to increase traffic volumes in the city of Oslo. One suggested that surface road capacity should be reduced if the road capacity was increased by new tunnels.

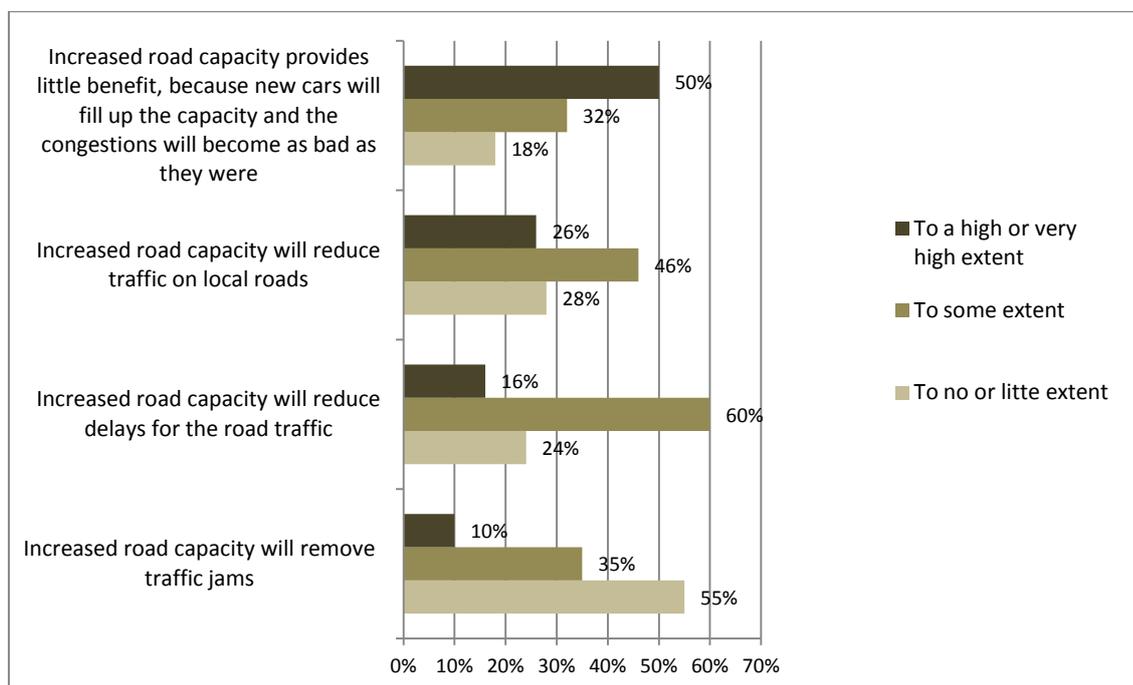


Figure 44: Planners' responses when asked: 'There are different views on how useful it is to increase road capacity on main roads in cities with congestions and delays. To which extent do you agree with the statements below, seen in a five years perspective?'

Even if several of the planners (almost all) stated that we cannot and should not try to 'build our way out of traffic congestion', only a minority saw increasing road capacity as a negative thing in itself. Several argued that are good reasons for building roads.

Several mentioned that building shorter tunnels could free housing areas and centre-areas from through-traffic, and hence improve local environment substantially. This could also improve conditions for walking, bicycling and public transport on the surface. Increasing road capacity on main roads could also contribute to drain road traffic from local streets, which would contribute to local environment improvements as well.

Others argued that increased road capacity will reduce congestions (at least for a while), and hence reduce delays for the private cars as well as for public and commercial transport. Some explained that since the traffic will continue to grow, the congestions would grow into chaos if the road capacity is not increased.

Hence, one could summarise, the planners don't think that road building would solve the traffic problems, but many thinks it could be beneficial in order to reducing local environment problems and make the city more liveable, and that it is necessary in order to keep up a well-functioning road traffic system.

The few interviewees discussing road capacity in the 2010/2011-interviews answered in line with the 2004/2005 interviewees.

Competition between the private car and public transport

In the interviews, all 2004/2005-interviewees answered that there are fields of competition between public transport and the private car, but they seemed to disagree about how large this field of competition is and how easy it is to make people change mode. This is consistent with what was found in the survey. As the figure shows, most planners think that there is competition between the modes. One may, however, be surprised that less than half of the respondents think that such competition exists to a large or very large extent.

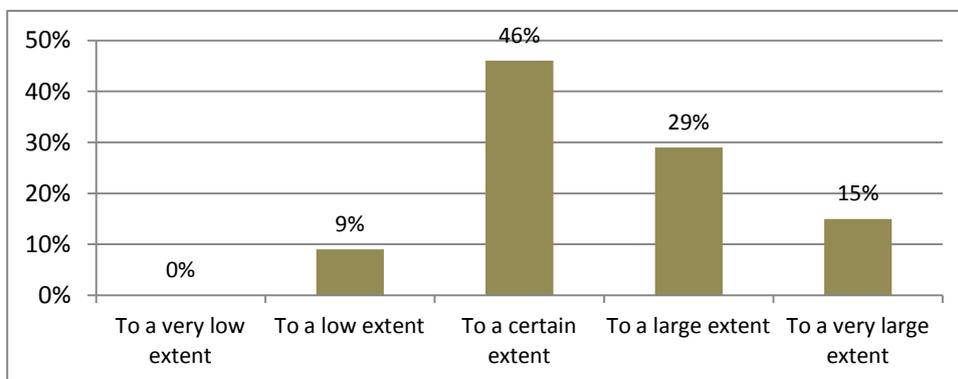


Figure 45: Responses to the question: 'To which extent to you think there are competition between the private car and public transport?'

5.7.2.3 Why are measures not applied?

In the 2004/2005-interviews, the planners were asked why the traffic-reducing measures are not applied (sufficiently). An interesting collection of answers appeared. Some pointed at the politicians, and explained that their decisions cause for instance that the public transport services are insufficient. Further, the politicians don't ask for (or ask clear enough for) traffic reduction. Some mentioned that pulverizing of responsibilities was a main reason. One cannot necessarily rely on that 'the others' can or will do their part. Lack of plans for improvements of public transport services and improving conditions for walking and bicycling was another explanation.

Several mentioned that it is hard to get political acceptance for the negative (but necessary) measures, and some complained about coward bosses who refrained from telling politicians what it actually takes to reduce traffic volumes. They also mention lack of analyses showing the consequences of approving projects, and that the planners are not good enough at telling politicians the consequences of their decisions. It was mentioned that the transport models were not good at handling traffic-reducing measures. One claimed that one can argue that almost all locations in Oslo are in 'nodal points', and be allowed to build there, even when the locations are clearly car-dependent. Further, it was claimed that certain groups involved in plan-making do not possess the necessary knowledge. The police and the architects were mentioned.

Another kind of explanations was related to prioritisation of other objectives. The claims were that measures are not applied because they are not in accordance with considerations regarding local environment and traffic safety. For instance, the aim to reduce the number of people killed or seriously injured in traffic accidents to zero (the zero-vision) is highly prioritised, but it is not climate friendly since it requires measures which increase road capacity. Further, some explained that it is hard to reduce parking accessibility, since parking is seen as necessary in order to sell apartments in development areas, and that cars and parking is seen by some as contributing to lively city centres.

Several of the interviewees expressed in different ways that the many decisions regarding concrete projects do not necessarily comply with the agreed overall strategies and plans. There are inconsistencies between overall plans and what is approved in zoning plans. For each little project, the deviation and its consequences may seem insignificant. However, when summed up, this practice causes a development which is something else than what 'everybody' aim at.

Some of the planners expressed that they don't really believe that any measures could cause reduction of urban road traffic volumes, and claim that we don't know enough about the effects of these means. A few of the interviewees at the NPRA explained that they are responsible for the road system and that it works, and they can affect only this. Others are responsible for land use development, public transport services etc., and one cannot really know whether those responsible for the other measures can or will apply them. Hence, in order to ensure that the NPRA can deal with what their main responsibility (road traffic on main roads), building roads is the only measure they have.

When asked directly whether planners possess the expert knowledge in question, most interviewees answered that this varies. Some meant that there may be differences between the generations, and others that there are several sub-cultures with different understandings. Some mentioned that there sometimes is a lack of understanding that certain projects and actions actually do generate more traffic. A few, working at the NPRA, mentioned a main problem could be that they are not good enough in communicating the knowledge they possess and produce. A few explained that many think they understand how this works, but that when you go a bit deeper or more technical, they are not able to follow the arguments. One explained that nobody can argue against transport model analyses, since few understand anything of them.

5.7.2.4 Which measures planners perceive that politicians are willing to apply

Planners work in a field with multiple objectives, knowledge and powers. The planners may plan, discuss and analyse, but in order for their recommendations to be followed and

adopted, they need to be politically acceptable. In the interviews, the planners expressed that the politicians have the most power in planning and decision-making processes, and this is how it should be.

When aiming at understanding better how planners relate to the expert knowledge in question, we hence wondered how the planners perceive the politicians' willingness to apply different measures. The planners were asked to which extent they find that politicians are reluctant to apply a number of measures. When they answer that they think politicians are reluctant to adopt various means to a great or very great extent, this means that they think that politician will not use these remedies (this question was a bit clumsy formulated).

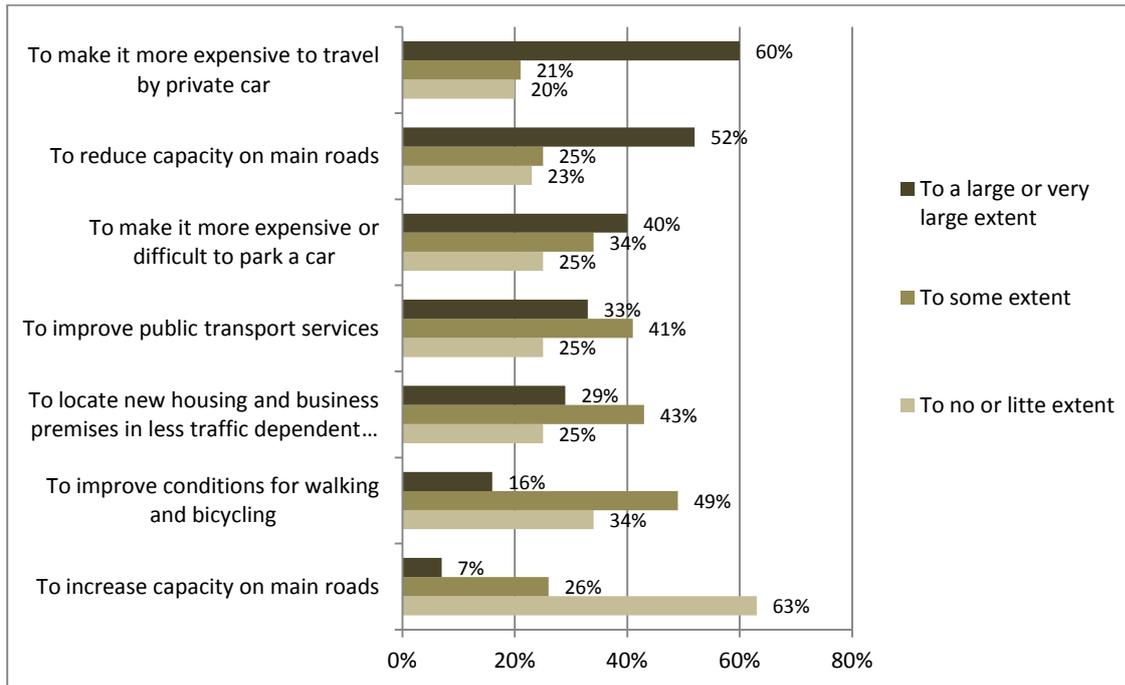


Figure 46: Responses to the question: 'As you perceive it, to which extent are politicians reluctant to apply the measures listed below in concrete cases?'

In general, the respondents find that politicians are reluctant to use restrictive measures against road traffic, such as making it more expensive to drive private cars, to limit road capacity and to make it more expensive or difficult to park. They perceive that politicians are more willing to apply the positive measures which do not limit road traffic directly, such as improving conditions for pedestrian and bicycle traffic, improving public transport services and to locating new housing and business premises less car dependent.

If this gives an accurate picture of how planners perceive politicians' willingness to apply the various measures in concrete cases, this may be an explanation why they present plans to the politicians that, if implemented, cause growth in road traffic.

5.7.2.5 The paradigm shift has taken place, but only partly

An interesting discussion regards whether the paradigm shift discussed by Owens (1995) have taken place among Norwegian planners. In order to discuss this, the findings from the survey are analysed in the table below. A number of claims are presented in the table. These are reformulations of questions in the survey.

If 0-20 % agreed to a high or a very high degree, this is labelled with a *No!* in the table. If 21-44 % agreed to a high or very high degree, the label is *No*, and if 45 – 50 % agreed to a high or very high degree it is *No?*. In the same way, the label is *Yes?* If 51 – 55 % agreed to a high or very high degree, *Yes* if 56 – 80 % agreed *and Yes!* if 81 – 100 % agreed to a high or very high degree. If 50 % agreed to a high or very high degree, this is labelled *Divided*.

Table 2: Analysis of whether the planners relate to the old or the new paradigm, based on the findings in the survey.

Issue/question	Results
Is it possible to reduce urban car traffic volumes?	Yes
The following objectives are important or very important:	
- Reducing urban road traffic volumes	Yes?
- Reducing congestion	No!
- Reducing local environmental problems	Yes
- Reducing GHG emissions	Yes
The following means are efficient or very efficient in order to reduce urban road traffic volumes:	
- Improving public transport services	Yes
- Steering land use developments	Yes
- Make parking less accessible or more expensive	Yes
- Make it more expensive to use the car	No?
- Limitations to road capacity	No
Consequences of not building new road capacity will, to a high or very high degree, be:	
- Congestions and chaos	No
- Change of transport modes	No
Increased road capacity is not useful	Divided (50/50)
Assessment	Belong to new paradigm

Based on the findings listed in the table, we can draw the conclusion that a majority of the planners do relate to the new paradigm. Still, as found in the more detailed figures, far from everybody has taken in or accepted the new knowledge and understanding. This is especially the case when it comes to the effects of changes in road capacity.

5.7.2.6 Planners relate differently to the objective and the knowledge

The previous discussion showed that some planners think that reduction of urban road traffic volumes is an important and realistic objective. Others find it unrealistic and less important. Competing and conflicting objectives exist. Most of the planners interviewed

could describe the knowledge embedded in the expert knowledge in question, and many signal that they agree with it. Still, some do not, and others seem to be confused. This is not least so when it comes to road building and changes of road capacity. We also found that despite many planners thinking that the transport-reducing means could be efficient *per se*, they doubted that the necessary combination of means would be applied in reality.

The main impression from the survey and interviews is thus that planners *relate differently* to the objective and the expert knowledge in question. Hence, the survey and the interviews confirm the theoretical discussions claiming that one may expect planners to relate differently to the objective and the knowledge.

This means that there are reasons to expect that the expert knowledge in question will not be applied or applied correctly in all plan-making processes, or at least that it will be challenged. The survey and the interviews also confirmed that some of the weaknesses of the expert knowledge as revealed in chapter four are real, and that they are experienced by the practitioners applying this knowledge. This is especially so with respect to the lack of empirical knowledge regarding the effects of some mechanisms, especially when several are triggered simultaneously.

These findings could in themselves contribute to explaining how and why traffic-increasing plans are made. If the planners and other professionals involved in plan-making disagree on how to understand and emphasise the objective reducing urban road traffic volumes, as well as which strategies and measures are efficient and relevant to apply in order to achieve it, this could contribute to explaining why plans are made which cause growth in urban road traffic volumes.

It was found that the younger planners in general relate to the expert knowledge more in accordance with the state-of-the-art knowledge in the field than the older. The tendency is clear, but not very strong. Differences between other formal groups were only marginal.

The survey was conducted in 2004/2005, and one would have expected that a higher share of the planners relate to the expert knowledge in ways that are more according to the state-of-the-art now than in 2004/2005 (although the state-of-the-art has not changed substantially). The interviews conducted in 2010 and 2011 did, however, show the same tendencies as the survey and interviews from 2004 and 2005 with respect to this.

5.7.3 The case study reveal how properties of the planners and the ways they relate to the expert knowledge cause that planners make traffic-increasing plans

With basis in the case study, the question is now whether and how properties of the planners and the ways they relate to the expert knowledge can contribute to explaining how and why traffic-increasing plans were made in the four cases in the case study.

5.7.3.1 Car based office development at Tunga

When describing how a plan for a car-based office development at Tunga was made and recommended, the fact that nobody introduced a traffic-reducing alternative (rejection of the planning proposal) was a major factor. When asking why nobody introduced a traffic-reducing alternative, the properties of the planners involved and how they relate to the expert knowledge in question may be important parts of the explanation.

The case-handler at the planning authorities' office is not educated as a land use and transport planner, and she claimed that this was not among her main fields of expertise. She

did, however, explain well why new offices at Tunga would be more car-based and cause more road traffic than if the offices were located in the public transport corridor. She was also quite aware the municipal objectives related to reduction of traffic volumes and GHG emissions, and she knew that office developments at Tunga did counteract this objective. This was the reason, she explained, why the planning authorities suggested to reducing the original proposal by 50 %.

She also explained how proposing a 50 % reduction was a compromise between competing objectives. Despite somewhat ambiguous objectives and regulations in overall plans, this was in accordance with political signals established practice. This was confirmed by others at the planning authorities. One may hence claim that she acted within a 'logic of appropriateness' (March and Olsen 2009).

The interviewee at the County Governor's office is, according to herself, not a specialist in coordinated land use and transport planning either. She did, however, explain well why the office development at Tunga was not in accordance with overall plans. When explaining why they had not filed formal complaints in the zoning plan we discussed, while they did so in the next three zoning plans, she explained that the many cases arriving more or less simultaneously made them realise that an unintended and un-desirable development was going on.

Lack of possession of the expert knowledge and of focus on reducing traffic volumes can be explanations for how and why the practice at Tunga has been allowed to arise and evolve. The County Governor's office and others could have filed formal complaints before. The planning authorities could have signalled to these actors that they needed help to stop the development, but according to the interviewees had no such signals been sent. The planning authorities were quite surprised when they did registrations and understood how many new work-places that had been built in the Tunga-area recently. This means that if anybody at any of the relevant authorities had stronger focus on whether the spatial development contributes to increased road traffic volumes, or if other planners with other properties had been involved, this development could have been stopped before.

One could hence claim that a main explanation why a traffic-increasing plan was made at Tunga, was that the objective 'reducing road traffic volumes' was not prioritised high enough by the planners at any of the most relevant authorities. This was because of properties of the planners (discipline, skilfulness) and because of political signals and an established practice (defining the logic of appropriateness within the roles).

5.7.3.2 The largest shopping centre in Oslo at Økern

Whether the actors are knowledgeable

In the Økern case, neither the case handler at the planning authorities nor the initiators' project leader have been scholarly educated in overall land use and transport planning for reduced traffic volumes. This may have affected the ways the expert knowledge in question has been applied in this case.

The case handler appears knowledgeable in interview, but refers to the overall sector plan in all questions related to underlying understandings of how the system works. She claims to not be very knowledgeable with respect to effects on transport or traffic, but more knowledgeable when it regards effects on existing retail structure. The case-handler at the NPRA is trained in overall land use and transport-planning, and has contributed in questions

related to traffic and transport volumes. NPRA did, together with the County Council's office, file formal complaints against the plan because it is a proposal for 'a car-based regional shopping centre'.

The initiators used various consultants, whereof none that are experts in land use and transport planning (as far as I have been able to find out). The project leader has no formal training as a planner, and has his main competences in civil engineering and project management. This may have caused that the initiators actually didn't understand that they applied the expert knowledge in question in faulty ways, how and why it matters if measuring distances in real walking distance or as the crow flies, the intentions and content of the overall sector plan etc.

One could also ask whether the analyses and conclusions of the initiators could have been disclosed as faulty to a higher degree if the case-handler at the planning authorities were even more knowledgeable and self-confident with respect to this issue. The quality of the professional discussions have probably been of lower quality than they could have been if the involved actors had been even better trained in and knowledgeable about how developments of land use, transport-systems, travel behaviour and traffic volumes are interrelated.

In this case, there was demonstrated a clear will from the initiators to 'twist' data and assumptions, as well as interpretations and presentations of findings, in ways that present the situation differently than if a less twisted application of the knowledge had been chosen. This could be counted as an example of planners consciously applying the expert knowledge in faulty ways in order to make the project appear more acceptable, as several of the planners referred to in interviews. In this case, this is probably because the initiator finds that his role requires to putting the objectives of the developer higher than societal objectives defined in overall plans and the like. It may have been understood as an 'appropriate' way to act within the defined role.

Different objectives and different framings

The public authorities aim at organising and developing the city spatially in ways which contribute to develop a structure ensuring retail and service in walking distance to people's homes, as well as low traffic volumes and GHG emissions. They base their overall plan, their proposal, their assessments and their recommendations on the expert knowledge in question and analyses based on this found in the overall plan. They base their proposal on how much shopping is necessary in order to serve the people living within walking distance.

The developers and initiators aim at realising a project including a large shopping centre in order to earn money and to bring something good to the city and the area. The developers and initiators rely on economic feasibility studies for deciding the necessary size of the shopping centre, various quantitative traffic analyses in order to arrive at the traffic generating effects of the centre, and retail analyses in order to arrive at the effects on the existing retail structure. They base their proposal on how much shopping they need to develop in order to make their project profitable.

This means that they have different objectives and apply different knowledge. Hence, it may not be a surprise that they arrive at different results regarding the optimal size for a shopping centre at Økern. This case demonstrates clearly two *different framings* of the problem.

Clashes of expert knowledge

This may also be seen as a situation with *clashes of expert knowledge*, where the initiators bring in expert knowledge regarding retail development, and claims that this knowledge is more relevant and valid in the case than the expert knowledge regarding land use and transport planning.

Demonstration of almost all causal properties and mechanisms

In this case, one may conclude that properties of the initiators' project leader (his discipline, skilfulness and role) caused that the initiators focused on other objectives than reducing road traffic volumes, that they did not find the expert knowledge in question relevant and valid, but rather competing knowledge, that they did not want the expert knowledge in question to be influential and that they were not able to apply it correctly. This caused that they applied and presented the expert knowledge in seemingly consciously faulty ways (I have argued in the analysis in Appendix B), and that they based their argumentation partly on competing knowledge.

The properties of the case-handler at the planning authorities and her colleagues (skilfulness, role) have caused them to counter this among other by proposing an alternative plan. Properties of the case-handler at NPRA (discipline, paradigm, skilfulness, role) contributed to that NPRA warned and filed formal complaints against the proposal. In this case, it was also demonstrated that *the will* of the actors to actually pursue their objectives have played an important role for how they acted.

The different approaches resulted in (or were results of) clashes of expert knowledge as well as frame conflicts. This means that almost all the elements presented in the figure illustrating promising explanations related to the planners have been demonstrated in this case. It also illustrates that the various causes and mechanisms are strongly intertwined in planning practice, and almost impossible to describe in separated and tidy ways.

5.7.3.3 Car based housing developments in Skedsmo

When plans for three zoning plans for car-based housing developments were made and recommended in Skedsmo, the main explanation was found to be that nobody considered the traffic-increasing location as a relevant aspect, and that nobody proposed a less traffic-increasing alternative (to reject the plans).

The case-handler for zoning plan processes who was interviewed is not educated as planner (but as geographer), and she claimed that overall land use and transport planning is not her special field. There are others at the planning authorities' office who deals with overall planning, localisation, transport and the like, she explained. She does have knowledge of the interrelations between location of housing and the traffic generating potential, but seems to not see this as part of her responsibility when working with zoning plans. Hence, one may expect that the case-handler does not bring the issue into the plan-making process, and that she does not call for application of the expert knowledge in question in order to analyse the traffic-increasing potential of the projects. This is also the case, according to herself and to the planning documents.

None of the relevant commentators called attention to the car-dependent location of the housing developments in any of the zoning plan processes, and none at the planning authorities' office made any notice of it. This may either be because those working at the planning authorities' office did not possess this kind of knowledge, because this kind of

expert knowledge was not acknowledged at the office, or because the consciousness with respect to these issues (location, traffic volumes, and GHG emissions) was low. Another explanation is that this is common and established practice. The two latter suggestions seem, according to the interviews, to be the most relevant explanation.

Even though one cannot blame the case-handlers for acting as they do, one may suggest that if the case-handlers were better trained with respect to knowledge regarding the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes, as well as the interrelations between traffic volumes and problems with respect to the environment and the climate, they may have been more aware and hence brought this issue into the discussions. The same probably goes for the other professionals involved in these processes, and who did not point out the fact that these projects were car-based and traffic-increasing, and hence in conflict with national purviews as well as with regional plans.

One may hence claim that properties of the planners (discipline, skilfulness) caused that they did not focus on this objective, and hence that they found no reason to call for application of the expert knowledge in question.

This was confirmed when discussing how the new municipal plan will change future planning practice. Several of the interviewees assumed that the new focus on the objective 'reducing urban road traffic volumes' and the better descriptions of how to achieve it would cause more focus on this objective at all levels at the planning authorities. They also expected more power to require that the traffic-reducing intentions in the plan are followed at the planning authorities' office and among commentators such as the regional authorities.

5.7.3.4 Increased road capacity at E 18

In the E 18 case, a main explanation how and why the planners make a traffic-increasing plan was that a traffic-reducing alternative was never developed or proposed in the plan-making process. This has to do with properties of the planners, and how they relate to the expert knowledge in question.

None of the involved planners are scholarly trained land use and transport planners, and none were well read in the topic coordinated land use and transport planning and development for reduced urban road traffic volumes. This may indicate that none of them possess deep and thorough enough understanding of how these systems work to be able to present and promote a traffic-reducing alternative.

NPRA have the lead in this plan-making process. Even though they start out with a broad approach, the problem is soon framed as a road building project, and the discussion reduced to road capacity and tunnel lengths. This has to do with properties of the NPRA planners and established practices. They choose to apply a transport model that is in-sensitive to most traffic-reducing measures, meaning that most traffic-reducing measures are excluded from the discussion. This is accepted by those making the plans. If the NPRA planners rather were experts in coordinated land use and transport planning, and decided to apply this knowledge in order to arrive at an acceptable planning proposal that also contributed to reduction of traffic volumes, they would probably have arrived at other proposals for solving the problem.

The NPRA planners also seem to rate objectives related to transport quality on the road before traffic volumes and GHG emissions. In the documents as well as in the interviews, the

NPRA planners explain that even if the increased road capacity may cause increased road traffic volumes, they believe that measures will be introduced (road pricing and access control to the trunk road) that will ensure that will keep the traffic volumes down. They emphasise that this is necessary.

Neither of the two interviewees at the planning authorities define themselves as very knowledgeable with respect to coordinated land use and transport planning. They have also received clear instructions from their politicians to focus on tunnel lengths and local environment improvements. This means that one cannot expect them to come up with a transport reducing alternative.

Several commentators express worries regarding the lack of traffic-reducing alternatives as well as lack of discussions about the traffic-increasing effects of the alternatives that are included in the plan-making. Some indicate measures and solutions that should be included. When none do this with stronger force, and since nobody indicate a comprehensive alternative, I assume that this has to do with the lack of deep knowledge among the planners involved, with the role definition and with the clear and strong political focus on one solution. In order to oppose this political will, the planners would need to come up with a comprehensive alternative that is traffic-reducing, and which also is acceptable with respect to local environment and transport quality.

The situation also has to do with how the planners involved relate to planning analyses and use of planning knowledge. Even though all agree on weaknesses, shortcomings and faults of the transport analyses, they do agree that they are useful and should be applied. They do easily allow the transport analyses to oust all other measures, and they do only rarely refer to the expert knowledge in question as the plan-making process has started for real. Instead, the planning programme states that the further work will be based on transport model analyses and cost-benefit analyses, and it include only two alternatives which are different only with respect to road capacity.

In this case, we saw that properties of the planners involved (discipline, paradigm, skilfulness, role) cause that nobody are knowledgeable enough to present an acceptable traffic-reducing alternative and that the expert knowledge in question clashes with an expert knowledge involving transport models as well as a more limited and different set of traffic-reducing measures. It also causes that the problem is framed as a road building project instead of a traffic problem solving project. Further, the roles and the disciplinary backgrounds of the planners make them prioritise other objectives stronger than reduction of traffic volumes, among others because they don't believe that actual reduction of the traffic volumes is possible. Nobody stands up for the expert knowledge in question. Rather, they accept that the transport models (despite well known, deep and important faults) will be applied instead.

The result is that the planners don't apply the expert knowledge, but rather knowledge embedded in the transport models, that they include only traffic-increasing alternatives, and that they arrive at traffic-increasing planning proposals.

5.8 Conclusions related to the planners

Four explanations have been developed for how and why properties of the planners and the ways they relate to the expert knowledge affect whether planners make traffic-increasing

plans. The cases have been assessed with respect to whether each of the explanations is relevant in the respective cases. The findings are summarised in the table. All the explanations have been substantiated in at least one of the cases.

Table 3: Most explanations related to planners and how they relate to the expert knowledge in question developed in the abstract analyses were also found to be relevant in the case study.

Case	Case Tunga	Case Økern	Case Skedsmo	Case E 18
Properties of the planners cause that main actors don't apply the expert knowledge	X	-	X	-
Properties of the planners cause that (some) main actors apply the expert knowledge wrongly	-	X	-	-
Properties of the planners cause that (some) main actors apply less helpful kinds of knowledge with respect to reducing traffic volumes	-	X	-	X
Properties of the planners cause frame conflicts and clashes of expert knowledge, which result in less helpful kinds of knowledge being applied	-	X	-	X

When asking how and why properties of the planners and how they relate to the expert knowledge in question can contribute to explaining that planners make traffic-increasing plans, a broad and summarising answer can now be presented.

Even if most planners think that traffic volumes and GHG emissions ought to be reduced, few see this as the main objective. This is especially the case when it comes to the concrete projects they are working with. Even though many planners do possess at least basic knowledge regarding how land use and transport-systems ought to be developed in order to contribute to reduced road traffic volumes, few planners know the expert knowledge in question well enough to be able to apply it skilfully in development of traffic-reducing alternatives. Some planners rely on other kinds of knowledge. This is causally related to their discipline, paradigm, skilfulness and role in the plan-making process.

These properties of the planners may be understood as causal powers that may contribute to traffic-increasing plans are made or not stopped, and that traffic-reducing alternatives are not made. They may work through several mechanisms: The planners don't apply the expert knowledge in their plan-making, they apply the expert knowledge wrongly (with or without purpose) or they rather apply other and less helpful knowledge when it regards to reduce traffic volumes. We have also seen that planners may disagree with respect to which expert knowledge to apply, and they may frame the problem at hand differently from each other.

Whether these causal powers actually work through such mechanisms and contribute to that traffic-increasing plans are made depend on the conditions, especially related to the composition of the group of planners involved (working for different actors), the expert knowledge in question and how the plan-making process proceed.

The situation could be changed if the understanding of the expert knowledge in question were improved among planners in general. Not least would it be helpful if more planners had thorough and deep knowledge regarding how developments of land use and transport-systems affect travel behaviour and traffic volumes, and how this system ought to be developed and stimulated in order to actually reduce traffic volumes in a long time perspective.

Such improvements could be achieved if more planning students were taught coordinated land use and transport planning. At present, planning students at the University of Science and Technology can choose this as a topic in their master degree. Planning students at the other large teaching institution for planners in Norway, University of Life Sciences, are not offered this as part of their study programmes. If they were, that could contribute to improving the situation.

As we have seen, many of those working as planners have not been educated as planners, and many of those educated as planners have not been taught coordinated land use and transport planning. This means that it could contribute to improve the situation if post-university courses in coordinated land use and transport planning were offered.

To improving the shortcomings of the expert knowledge in question revealed when discussing the expert knowledge, would make it easier for planners to achieve this knowledge and to apply it in more useful ways.

How and why planners make plans which, if implemented, cause growth in traffic volumes

6. The plan-making processes

6.1 Introduction

The third issue regards whether and how properties of the *plan-making processes* can contribute to explaining how and why planners make plans which, if implemented, cause growth in traffic volumes. The main focus is on how knowledge is used in plan-making processes.

The plan-making processes are the arenas where the planners, working for various actors, apply the expert knowledge and make plans. They arrive at plans for developments of land use and transport-systems which contribute either to reduce or to increase road traffic volumes. These plan-making processes are systems of organised complexity, 'in which a half-dozen or even several dozen quantities are all interrelated and varying simultaneously and in subtly interconnected ways'. The plan-making processes are parts of larger planning processes.

The chapter starts out with a description of the planning system within which the planning processes and the plan-making take place. It is discussed how this system ideally is supposed to work in order to produce plans which contribute to reducing urban road traffic volumes and other societal objectives, and how and why making the planning system produce such plans is a challenging task.

This is followed by a discussion of how the plan-making processes can produce traffic-increasing plans. The analyses reveal that properties of the objectives, knowledge and powers of the planners involved in a plan-making process are relevant causal powers. They work through the actions and interactions of the planners involved, and affect which objectives are made prominent and which expert knowledge is applied in the plan-making processes. This strongly affects whether planners make traffic-increasing or traffic-reducing plans.

In the next sections, abstract analyses are carried out in order to explore, elaborate and discuss these causal powers, the mechanisms through which they may work, and how planners may go about when making traffic-increasing plans. Promising explanations are developed.

This is followed by an empirical analysis with basis in the case study. It is examined how potential causal powers, mechanisms, conditions and explanations detected and developed in the abstract analyses manifest themselves in concrete situations. The main conclusions regarding how and why the plan-making processes contribute to that planners make plans which, if implemented, cause growth in traffic volumes are discussed and presented. Suggestions for changes are indicated.

6.2 The planning system

Planning and decision-making which affect development of urban land use and transport-systems are made in a number of sectors and affected by a number of actors. Most developments that involve a spatial dimension need to go through planning processes defined by a planning and building act (PBA) or the like, at least in most western countries. An important deviation from this is development of public transport services, which is highly

relevant in this context, but which is not planned and steered through the PBA. Other exceptions are fiscal measures. The further discussions will be made mainly with reference to planning under the Norwegian PBA (Ministry of the Environment and Ministry of Local Government and Regional Development 1985).

6.2.1 The Planning and Building Act defines the rules of the game

In the planning processes relevant here, the PBA is an important institution, understood as what defines the rules of the game. The PBA defines how the hierarchical planning and decision-making processes are supposed to proceed, the procedures which need to be conducted, the main actors, and their roles, rights and responsibilities in the game of planning.

Planning under the Norwegian PBA is supposed to coordinate almost everything that is built in society. § 1 states that planning according to the act should help “coordinate national, regional and municipal functions and provide a basis for decisions about the use and protection of resources” (PBA § 1). Such planning should “promote sustainable development to the benefit of the individual, society and future generations” (*ibid*). Furthermore, “[P]lanning and decisions are to ensure transparency, predictability, and participation of all concerned parties and the authorities. Emphasis will be placed on long-term solutions, and consequences for the environment and society shall be described” (*ibid*) (all quotes are the author’s translations from Norwegian).

6.2.2 A tiered and hierarchical system

The PBA defines a hierarchical system for spatial planning and decision-making. At national level, laws, white papers, policy guidelines etc. are prepared, that are meant to steer the practice of planning and decision-making at lower administrative levels. At county level, overall and non-binding plans, including plans for development of land use and transport-systems, are prepared by the county administration and approved by the County Council. After the 2009-changes of the PBA (§ 8-5), regional planning authorities can decide binding regional planning purviews related to land use in a regional plan in order to ensure national or regional concerns and interests.

All municipalities shall have a municipal plan, which is their main steering document and which defines the frames for the development of society and of the spatial resources. A municipal planning strategy needs to be prepared and adopted by the City Council the first year of a new election period. Here, strategic decisions related to development of society are supposed to be discussed, included long term spatial developments, environmental challenges, the municipal activities and enterprises as well as the needs for planning and plans in the election period. A main question regards whether a full revision of the municipal plan is necessary, or whether only certain parts of it need such revision.

The municipal plan consists of a general plan and an overall spatial plan. Municipal, as well as regional and national objectives, interests and tasks are supposed to be attended to and ensured in the municipal plan. Development trends, challenges, objectives, and strategies for different sectors and areas are discussed in the general part. The spatial consequences of the defined objectives and strategies are presented in the spatial plan, including developments of land use and transport-systems. This municipal spatial plan, or overall land use plan, consists of a map defining existing land use as well as which kind of land use that

are allowed where, and of binding purviews giving more concrete and specific rules for development of land use.

The municipal spatial plan is normally prepared by the planning authorities and adopted as binding by the Municipal Council or City Council. Formal complaints may be filed by certain actors, and if the plan is not amended in accordance with these, the Ministry of the Environment decides whether the municipal plan can be adopted or if it needs to be changed or rejected. More and less binding plans can also be made for defined areas, for sectors and for issues (such as retail developments) at municipal and county levels.

When private and public developers initiate land use and/or transport projects involving spatial dimensions, they need to make zoning plans which are supposed to be in accordance with the overall municipal plan as well as with the requirements for zoning plans in the PBA (§ 12-3). The initiators are responsible for carrying out certain procedures, including producing the required descriptions and analyses, and the zoning plan. These zoning plans are eventually adopted by the City or Municipal Council, or they are rejected or sent back with requirements for changes. If the planning authorities find that there is a need for more detailed area-wise clarifications, they can make area-wise zoning plans (according to PBA § 12-2). If formal complaints (according to PBA § 5-4) against zoning plans are filed, and the City Council decides not to take account of these, the Ministry of the Environment decides whether the plan is approved or rejected.

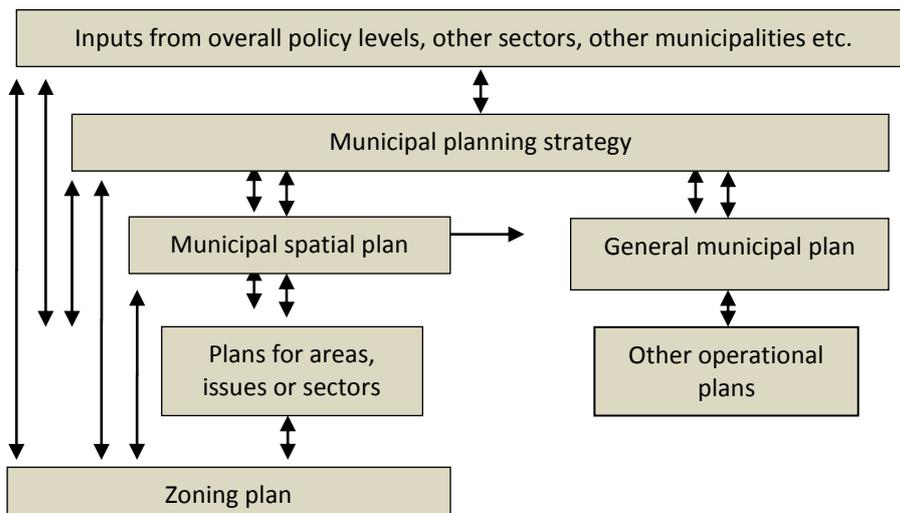


Figure 47: The tiered planning system, as defined by the Norwegian Planning and building act.

The PBA hence defines which kinds of plans are made and by whom, which political bodies make various decisions and the roles and tasks of the many and different actors involved in spatial planning (as will be elaborated below).

6.2.3 Procedures defined by the PBA

The PBA defines many and detailed procedures for the planning process, at overall as well as at detail level. These will not be described here (see e.g. Nordahl 2006 for a description). The main procedures for regional, municipal and zoning plans can, however, be briefly summarised as follows:

- A notification is made, to the public and to certain defined bodies, stating the commencement of a planning process, and asking for comments

- A planning programme is prepared, giving an overview of the situation, problem, objectives, project, which alternatives that will be assessed and which potential consequences they will be assessed with respect to
- A public consultation and review of the planning programme is carried out, where relevant actors and the public are invited to comment
- The planning programme is amended in accordance with relevant comments (or not)
- The planning proposal is prepared in accordance with the planning program, including description of the current situation, challenges, societal and other objectives, the objectives of the plan, alternative strategies, projects, or developments which may contribute to the achievement of the objectives, assessments of the various alternatives with respect to societal and environmental variables, comparisons of alternatives with respect to effects on important objectives, and preliminary recommendations to decision-makers
- A public consultation and review of the plan are carried out, where a number of private and public bodies and the general public, are asked to comment on the plan and the assessments, and where formal complaints can be made by relevant authorities
- The planning proposal is amended in accordance with relevant comments (or not)
- The planning authorities (normally), another public authority or the developers themselves write up a summary of the planning proposal to be presented for the decision-makers, of the planning process, the main disagreements and the planning authorities' recommendations
- The decision-makers adopt the plan, reject it or send it back with calls for changes

These procedures are meant to safeguard that the relevant parties are heard, and that the relevant aspects regarding national, regional, municipal, local and private interests are included.

The processes involved when conducting these procedures are not necessarily straightforward, easy or clean. Rather, these are rules for organizing potentially messy processes which often involve and regard deep and hard conflicts.

6.2.4 The main actors, their roles and responsibilities

There are several and different actors involved in the game of planning (see e.g. Strand and Moen 2000 for a more comprehensive overview in a Norwegian context). The main actors are in this work defined as four groups: The planning authorities; the public and private initiators of plans; private and public bodies that comment on plans, and; political decision-makers. Professional planners work for all these actors.

The *planning authorities*, mainly at municipal level (according to the PBA), are responsible for ensuring that the planning and decision-making processes proceed in accordance with the rules and procedures of the PBA, that plans at lower levels are in accordance with overall plans and policy documents such as governmental purviews, municipal overall plans and municipal sector plans, and that the interests of society are maintained in the planning processes. The municipal planning authorities also (normally) produce the overall spatial plan (in accordance with the will of the political leadership) which describes the main objectives for the spatial development in the municipality, the strategies for achieving it and the binding land use plan.

The public and private *initiators of plans* have needs or desires that could be fulfilled through physical developments, and initiate zoning plans under the PBA in order to get allowance to

accomplish these physical developments. They are normally (in Norwegian planning practice) responsible for preparing the plans, including doing impact assessments and other analyses. The initiators are, among others, professional developers who want to build housing or shopping centres in order to earn money, municipalities that need to build schools, kindergartens, public offices or libraries in order to serve its inhabitants, road authorities that aim at solving a traffic problem or to building a road, or a house owner that wants to build a garage.

The public and private *bodies entitled to comment* on plans are among others neighbours, neighbouring municipalities, public authorities at various administrative levels, NGOs and others that have interests in or are affected by these physical developments. Regional and governmental actors, as well as neighbour municipalities, can file formal objections if their interests are negatively affected. A formal objection from one of these actors means that the decision regarding whether to approve the plan or not needs to be made by the Ministry of the Environment (according to the PBA §§5-4 to 5-6). The public authorities responsible for various interests, areas or topics (such as agriculture, aesthetics, toxic pollution etc.) are important contributors to and quality assessors of the planning processes, and commenting on planning proposals is an important part of their duties.

Politicians at national, county, and municipal level initiate overall or strategic planning processes and analyses, they debate societal problems in public and in political forums, and they deliberate directly with a number of different groups (developers, initiators, businesses, environmental NGOs, local community groups of different areas in the city etc.). Politicians make the decisions regarding whether to approve or reject planning proposals. Most planning proposals relevant in this work are adopted (or rejected) by politicians at municipal levels.

6.2.5 The ideal workings of the tiered planning system

An important question is how the planning system is supposed to work so that it facilitates achievement of societal objectives. The main idea is that strategic and important problems are defined, discussed and decided in overall planning and plans, which also give directions for developments and actions. These are followed up by more detailed plans regarding concrete developments, where the subordinate plans comply with superior plans.

6.2.5.1 Overall plans need to be clear frames for steering in traffic-reducing directions

The overall municipal spatial plan shall function as a clear and strong steering frame for the spatial developments in the geographical area covered by the municipality. In order to steer developments of land use and transport-systems in traffic-reducing directions this objective needs to be stated strongly and clearly, and the strategies and measures recommended in the overall plan need to actually take development in those directions.

Ideally, the whole society shall take part in the discussions regarding the overall municipal plan. This means that the various and often conflicting objectives, aims, demands, needs, values, attitudes, interests, concerns of numerous different actors are involved in the debates regarding what the most important problems are. Likewise, the different kinds of knowledge of the numerous involved actors are merged in the discussions regarding what needs to be done in order to achieve the most prominent objectives without affecting other important objectives and concerns negatively. The debates and discussions leading towards decisions may be understood as a battle between actors and their objectives, knowledge and powers.

The discussions and decisions related to these processes are not easy, straightforward, or objective. Rather, they are value-laden decisions, often made under conditions of large uncertainties, and which often have major impacts on many people's lives now and in the future. It is often hard to lead an all-inclusive deliberation regarding these complex, important, delicate, and highly political questions towards clear and knowledge-based alternatives which the City Council can choose between.

Hence, the overall municipal plans may become manifestations of the negotiated compromises which one managed to agree on rather than the clear recommendations for developments built on the wide, deep and well informed societal debates regarding desired directions for development and knowledge-based strategies for getting there, which one may understand the ideal to be.

The result could be that reduction of urban road traffic volumes are not made a prominent objective in the overall plan, or that the strategies defined for achieving this are wrong in the sense that they will not take development in that direction, or that it is not a clear and strong tool for steering. If any of these is the case, one does not have an overall plan which is a strong frame for steering development of land use and transport-system in traffic-reducing directions.

6.2.5.2 Traffic-increasing zoning plans need to be detected and rejected

For something to be built, a public or private initiator needs to initiate a zoning plan or another operational plan for their project. An approved zoning plan means that the initiator is allowed to start building their project. Zoning plans are supposed to be in accordance with the overall land use plan in terms of localization, function, sizing, design, etc. However, the needs or desires of the initiator can be something else than what the municipal land use plan defines. In such cases, the initiators may propose another development through a zoning plan, which the City Council can approve or reject.

When initiators propose traffic-increasing zoning plans which are not in accordance with the binding municipal land use plan or with other defined objectives, this may or may not be detected by the planning authorities or others. If this is detected, the initiators may try to persuade, pressure or convince the planning authorities, other authorities, the public, and the decision-makers to allow them to implement their project anyhow. Such strategies can be met with different intensity, and in different ways, by for instance referring to objectives and directions in a strong and clear overall plan. Initiators can in turn respond to this in different ways, etc.

These discussions, debates or battles over objectives, knowledge and power constitute the game of planning, which in the end results in zoning plan proposals which do or do not cause growth in urban road traffic volumes. If decision-makers adopt zoning plans which do cause or allow growth in urban road traffic volumes, a decision has been made which, if the plan is implemented, will contribute to increase urban road traffic volumes. In order to prevent this, such plans need to be detected and rejected.

In order to contribute to reducing instead of increasing urban road traffic volumes, the zoning plans and other operational plans for the numerous smaller and larger projects involving changes of land use and transport-systems would need to be prepared in accordance with the overall plan, so that they separately and in sum contribute to achieving reduction of urban road traffic volumes (assuming that the overall plan steers development

in traffic-reducing directions). This means that many zoning plans which are not in accordance with overall plans, and which do cause growth in urban road traffic volumes, would need to be rejected.

6.3 How plan-making processes can produce traffic-increasing plans

In order to figure out how and why plans are made which cause growth in road traffic volumes, we need to go deeper into the processes of *plan-making*. It is necessary to study and understand what is embedded in the process of making plans that may cause that the planners make traffic-increasing plans.

6.3.1 Plan-making processes are arenas for struggles and debates

Land use and transport planning under the PBA is not as clear and tidy as the hierarchical structure and the clear role definitions may indicate. Rather, all political and administrative levels are involved, several policy areas and sectors as well as the private sector are more or less active and they overlap, and the general public is supposed to participate in the processes. The actors involved enter the planning processes aiming at achieving certain objectives or to protect certain values, interests or concerns. They possess and promote different kinds of knowledge regarding how to achieve this, and they have different tasks, responsibilities, and powers due to their roles in the game.

Hence, planning and decision-making processes often regard real and fundamental conflicts of interests, values and objectives, where some actors gain and some actors lose from the decisions made. The planning processes can be understood as arenas for such battles, and for settling conflicts and making decisions. This does indeed not necessarily include to arrive at consensus or to agree.

This involves to deciding what should be understood as the most important problems and the most prominent objectives, which knowledge regarding problems and objectives that is valid and credible, what should be understood as relevant and applicable alternative strategies and measures for achieving the objectives, which methods ought to be applied in order to assess effects and consequences of the alternatives and which methods to apply in order to compare the alternatives, which criteria should be used for deciding which alternative is the better, how different impacts should be weighed in relation to each other, and so forth.

The PBA and the planning system define the rules of the game of planning processes dealing with all this, as well as the rights, responsibilities, and tasks of the different actors. There are, however, large latitudes allowing the actors degrees of freedom to play their roles in the game in different ways in order to achieve their objectives. How this game is played by the various actors affects whether the plan produced becomes a plan which cause either increase or decrease of road traffic volumes.

6.3.2 Which objectives are made prominent and which expert knowledge is applied strongly affect the plan

Planning was previously defined as to bring knowledge into decision-making regarding the consequences of proposed actions, in order to improve the decision-makers' abilities to make decisions about future actions which contribute to the achievement of their objectives. The processes of making plans hence revolve around two main entities; objectives and knowledge.

The existence of objectives (or goals, aims, concerns, needs, interests...) may be understood as a main cause for planning processes to be initiated, plans being made and land use and transport-systems developed²⁵. The objectives held or safeguarded by various actors are the main reasons for them to be part of and contributing to planning processes.

Which objectives are made prominent in the planning process will affect the plan-making and the outcome as plans, since the efforts in the planning process would be focused on arriving at solutions which contribute to the achievement of the most prominent objective(s). As indicated, there will normally be many, often competing and conflicting, objectives present in a planning process.

The knowledge planners *produce* in plan-making processes – various analyses as well as recommendations and the plans themselves – is the knowledge which is supposed to inform actors making decisions about which measures and actions can contribute to achievement of their objectives, and about the consequences of selecting certain measures or actions.

The expert knowledge in question is *applied* by the planners in order to produce such knowledge with respect to how developments of land use and transport-systems affect traffic volumes. The expert knowledge may hence be understood as a tool enabling the making of analyses, recommendations and plans regarding how to achieve reduced traffic volumes, as well as analyses concerning the consequences if certain measures, actions or strategies are carried out. Which expert knowledge is held, accepted, and applied by the actors in land use and transport planning processes will influence which alternatives are brought into the processes and considered, how they are assessed, and hence the outcome of the plan-making processes as plans.

If relevant and valid expert knowledge regarding the interrelations between development of land use, transport-systems, travel behaviour and traffic volumes is *not* brought into the plan-making, the processes can hardly produce valid and relevant analyses and recommendations regarding which development that will contribute to reduction of urban road traffic volumes. Further, the planners would not have valid tools to assess whether a proposed development will contribute to this or not. The same is true if out-dated, over-simplified or non-valid understandings of this knowledge are applied, or if the knowledge is applied wrongly. This reasoning is also relevant for expert knowledge regarding other issues, such as housing quality and traffic safety.

The understanding in this work is that which objectives are made prominent and which knowledge is applied in a plan-making process affect the plan-making and the resulting plans strongly. Hence, when plans are made which cause growth in urban road traffic volumes, this could be because the objective of reducing urban road traffic volumes is not prioritised in the planning processes, and/or that valid and relevant expert knowledge of how to do it is not (correctly) applied.

6.3.3 Searching for causal powers

The logical next question is what causes that some objectives are made prominent and others not, and that one kind of expert knowledge is applied, and not another. The obvious

²⁵ Another main cause is the planning system itself, requiring that the municipal plan is revised every fourth year.

answer is that the objectives and the expert knowledge of the actors present in the plan-making process define this. We know, however, that *multiple and various* objectives and knowledge are present in planning processes, and that there are logical and natural reasons why the actors disagree on objectives and knowledge. Hence, we understand that there must be some other variable present which affect which of the many objectives that are actually made prominent and which kinds of knowledge that are actually applied. This variable is here broadly defined as 'power'.

6.3.3.1 What it is about the plan-making processes that may cause that they produce traffic-increasing plans

When conducting a structural analysis, we find that the plan-making process is substantially related to the planners, since the planners make the plans. Further, there are substantial relations between the planners and the objectives, knowledge and powers in the plan-making processes. Each planner has her own objectives, knowledge, and powers. The sum of these objectives, knowledge and powers constitute, through the interrelations and interactions between the planners, which objectives become prominent and which knowledge is applied in the plan-making process. This is substantially related to the plan that is produced in the process.

The relations between the planners being directly involved and the plan-making process are internal and necessary. If there were no planners making plans, there would be no plan-making process. Likewise, unless there is a plan-making process, there would not be planners partaking in the plan-making process. The relations between each planner and her objectives, knowledge and powers are internal and necessary too. The planner cannot be a planner actively involved in making a plan without having, representing or exerting objectives, knowledge and powers. The objectives, knowledge and powers so to speak *constitute* the planner as a planner involved in making a plan.

Hence, there are internal relations between the plan-making process and the plans being the outcome of the plan-making process. Unless there is an aim to produce a plan, there will be no plan-making process. Without a plan-making process, it will not be produced a plan (as defined here).

The *properties* of the objectives, knowledge and powers of the planners are *external* relations. A plan-making process is a plan-making process no matter what kinds of objectives, knowledge and powers the planners involved have, as long as they actually have objectives, knowledge and powers. Which kinds of objectives, knowledge, and powers the various planners possess, represent and promote do not affect whether it is a plan-making process. It does, however, determine how the actors act, and hence what become the prominent objectives and knowledge in the plan-making process.

6.3.3.2 The structure

A plan-making process can hence be defined as existing of planners with objectives, knowledge and powers that are related through their interaction in the practice of making a plan.

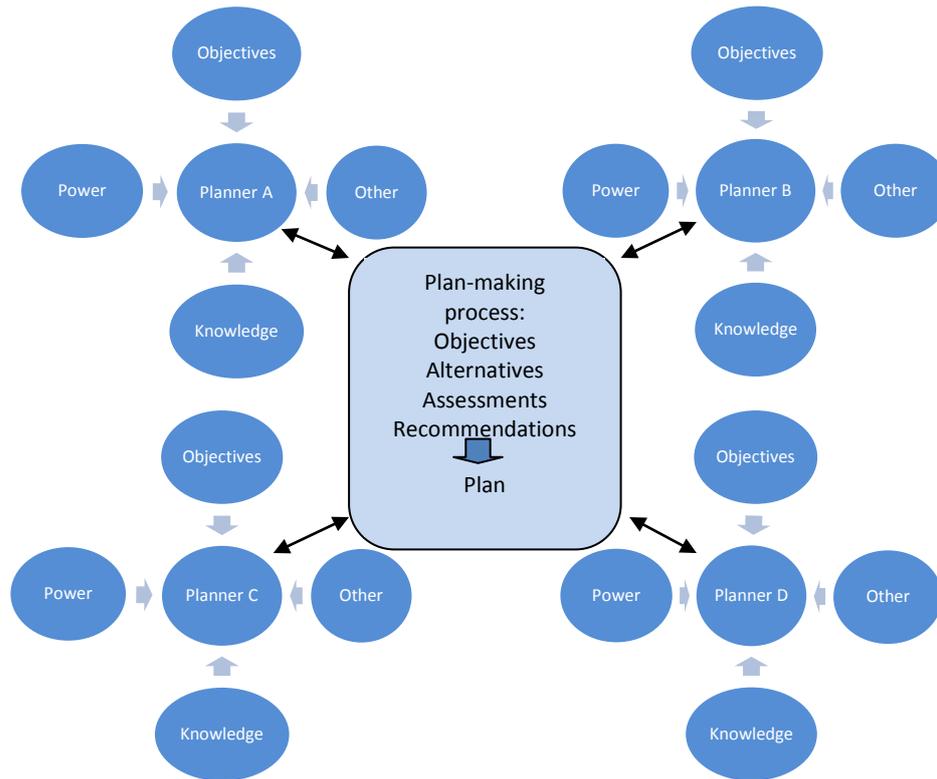


Figure 48: The structure of the plan-making process consisting of the planners with their objectives, knowledge and powers, interacting in the tasks constituting the plan-making process and producing a plan.

6.3.3.3 Causal powers

The properties of the objectives, knowledge, and powers the various planners possess and promote represent the causal powers enabling the plan-making processes to produce traffic-increasing, as well as traffic-reducing, plans. This is strongly related to the discipline, paradigm, skilfulness and role of the planners, as discussed in chapter five. Whether this actually causes that a traffic-increasing plan is made does however depend on contingent conditions.

6.3.4 The objectives, knowledge and powers of the actors define which objectives are made prominent and which expert knowledge is applied

The main conceptual model or framework can now be constructed, as illustrated in figure 49. The plan-making processes are understood as basically *being* debates and struggles between different actors. The planners working for these actors apply objectives, knowledge, and powers as tools in their struggles to make their objectives and knowledge more prominent and influential, and hence that the planning process results in a plan which is as much in accordance with the objectives and concerns of their employers as possible. This includes exploiting the latitudes there exist for them to act within the frames or structure defined by the PBA.

The objectives, knowledge and powers of the actors are the causal powers that affect how the planners act. How the planners act represent the mechanisms through which the causal powers may work. This may produce certain effects with respect to which objectives are made prominent, which knowledge is applied, and how this knowledge is applied. This may strongly affect which event that is produced: whether the plans produced are plans which do or do not cause growth in traffic volumes.

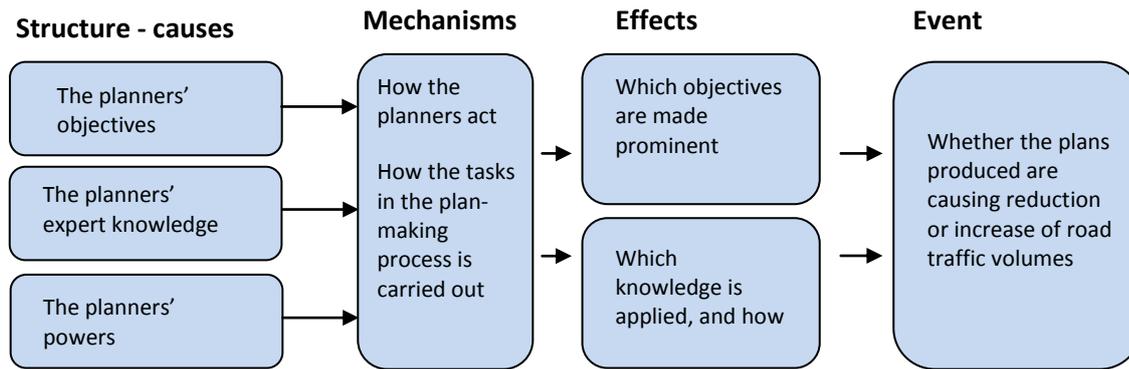


Figure 49: The objectives, knowledge and powers of the actors define how they act in plan-making processes, and hence which objectives and knowledge are made prominent, and whether the result is plans which do or do not contribute to growth in urban road traffic volumes.

This understanding imply that if certain planners with certain kinds of knowledge were involved in a plan-making process, this would cause application of other kinds of knowledge and prioritisation of other objectives, and hence that the resulting plans became something else than if other actors with other knowledge were involved. The same goes for objectives. The power distribution among the actors will also vary, and affect whom of the planners that influence prioritisation of objectives and knowledge the most.

This could also mean that if certain tendencies exist regarding which objectives and which knowledge are made prominent in planning processes, and these are caused by tendencies regarding objectives, knowledge, and powers among the actors, then planning processes and plans could be changed if objectives, knowledge, or powers of the actors changed.

6.3.5 Focus on planners and expert knowledge in plan-making processes

Planners affect the plan-making and the plans strongly, as described in chapter five. This does not mean that experts do the plan-making in isolation, far from it! As previously described, numerous actors are involved in planning processes, and they bring different kinds of knowledge into the discussions. The planning processes can be understood as struggles between many different actors regarding which objectives and knowledge which are to be made prominent.

Forester's (1989) observations and descriptions of the tasks and practices of planners working for the planning authorities clearly show the massive interconnections between 'society' and planning processes. Krizek et al. (2009:467) found that "Overall, determining what compromises useful or valid evidence depends partly on the question that is asked, and partly on whether one is focusing closely on the evidence-based practice model or the larger planning process of which it is typically a part", and that "[e]ven where EBP [evidence based planning] uses research from a narrow technical base, the total planning process almost always integrates this with a wider range of information and knowledge, including local knowledge, current data, and information generated through deliberative processes".

This author shares this understanding fully. Looking widely at it, the planners collaborate with the whole society when doing the plan-making. The procedures for planning required by the PBA are meant to ensure that this collaboration actually takes place. It is, however, still the planners who *do* most of the actual work carried out as part of making the actual plan.

Whether the collaboration with other parts of the society and the public is satisfactory, how it ought to be, and to which degree it is realistic to assume that people will and can partake in planning processes, has been thoroughly discussed in planning literature the past decades (see e.g. Friedmann 1987, Forester 1989, Flyvbjerg 1991 a, b, Healey 1992, 1997, Innes 1996, Connelly and Richardson 2004). This discussion will not be described here (see e.g. Innes and Gruber 2005: 183-184 for a short summary).

6.3.6 Developing a framework for studying plan-making processes

The main focus in this chapter is rather on how planners taking part in the plan-making processes end up making plans which cause growth in urban road traffic volumes. It seems as the role of planners applying their expert knowledge regarding 'how the city works' in the making of plans are not well covered in planning research and theory, as discussed in chapter four. The literature regarding how planners interact in plan-making processes and how they apply the expert knowledge in question (or any expert knowledge 'in planning') is scarce. Few of the more recent contributions discuss how expert knowledge is actually applied (or not) in the processes of making analyses and plans, or whether and how it affects the planning and the plans. Where knowledge is a topic, the focus is on 'the role of knowledge' in general in the planning processes rather than on the processes of actually applying knowledge and making plans.

It was therefore necessary to develop a theoretical or abstract framework which can be applied when carrying out the case study and the analyses regarding how properties of the plan-making processes can contribute to explaining how and why plans are made which cause growth in road traffic volumes. This has been done in the following chapters, which describe theoretical frameworks regarding: *first* the causal powers embedded in objectives, knowledge and powers of the planners in the plan-making processes; *second*, the mechanism that may cause that the objective and knowledge in question can be excluded or ousted in each of the tasks in plan-making processes, and; *third*, more detailed about how the different actors can act when applying and playing on objectives, knowledge and powers in order to affect which objectives are prioritised and which knowledge is applied.

6.4 Objectives, knowledge and powers in planning processes

The aim is first to determine what it is about the objectives, knowledge and powers of the planners which may affect how they act in and affect the plan-making processes.

6.4.1 Objectives

Agreement on objectives is understood as an important factor explaining successful implementation of a project or strategy in traditional implementation theory (see e.g. Offerdahl 2005). However, competing and conflicting objectives are the natural state in planning processes of the kinds discussed here.

Forester (1989:19) describes goals as not given, but rather as "practical and political problems to be formulated, reinterpreted, continually reevaluated and reconstructed". Schön (1983) discusses the problem of problem *setting*. In these processes, planners more or less consciously stress some issues and downplay others, clarify some alternatives and obscure others. Hence, the professionals involved in planning and plan-making do affect which objectives are made prominent in a plan-making process.

6.4.1.1 The actors have different kinds of objectives

The different actors involved in planning processes are normally motivated by different kinds of objectives and concerns, and bring these into the processes. This could regard achieving enough school capacity in a municipality, earning money on building housing or offices for sale, protect cultural heritage and valuable architecture, cleaner air, that the procedures of the PBA are obeyed, being re-elected as politicians, doing a good job, or reducing urban road traffic volumes.

Various laws, regulations, directives and plans bring requirements which may be understood as objectives into the processes. National purviews, planning guidelines and the like often represent highly prioritised national objectives which cannot be ignored at any planning level. The numerous objectives and concerns present in a planning process may hence regard a range of different topics and issues.

6.4.1.2 The actors may prioritise competing or conflicting objectives

The actors judge the importance of various objectives, such as 'reducing urban road traffic volumes' differently with respect to other objectives, as discussed in chapter five. Other objectives may be *competing* with reducing traffic volumes, as when transport reducing measures cannot be funded because the money are used for achieving other objectives. Objectives could also be *conflicting*, as when measures implemented in order to achieve a certain objective also contribute to increasing traffic volumes (unintended consequences).

If an objective, such as region-enlargement, fewer and bigger hospitals, safer roads, or building a mega retail centre, can be achieved by a development of land use or transport-systems which causes growth in traffic volumes, and if this objective is made more prominent in the planning process, a plan will probably be made which causes growth in traffic volumes. Objectives in planning processes may as well not be related to the objective in question.

Among the many actors initiating projects that are handled in the planning system, few do it *in order to* reduce urban road traffic volumes. Private as well as public initiators usually have other main objectives in mind when entering these processes, such as earning money or reducing congestion. This means that it normally needs to be the duty of the planning authorities, or of environmental NGOs, public authorities responsible for certain national purviews, or politicians to introduce and promote the objective of reducing urban road traffic volumes in concrete planning processes. It will probably vary between municipal planning authorities whether they understand that safeguarding the objective 'reducing urban road traffic volumes' is among their tasks and how this objective should be prioritised.

In order to understand how and why traffic-increasing plans are made, it therefore seems interesting to map what the main actors perceive as their main and secondary objectives in particular plan-making processes, and whether and how these objectives conflict or compete with 'reducing traffic volumes'.

6.4.1.3 The actors rate the importance of this objective *per se* differently

The various actors may rate the importance of the objective of reducing urban road traffic volumes *per se* differently, as we saw in chapter five. This will probably also vary between cities due to differences in context with respect to traffic congestions and delays, pollution problems, and the like. Even if actors enter the plan-making processes with other main objectives, they may still think that reducing urban road traffic volumes (or reducing GHG

emissions, reducing congestion, reducing local health- and environment problems caused by traffic) is an important objective too.

The understanding of the importance of 'reducing road traffic volumes' varies among the main actors in planning process and among municipalities. Tennøy (2005) found in a survey that the percentages of decision-makers agreeing that 'reduction of road traffic volumes' is important or very important were 63 % in Oslo, 50 % in Bergen and 40 % in Bærum. She also found that there is a clear tendency that planning professionals and left wing politicians find 'reducing urban road traffic volumes' to be a more important objective than right wing politicians.

Whether the main actors find that reducing urban road traffic volumes is an important objective, even if it is not their main objective, may influence how actors act in a particular planning process. It will hence be relevant to know whether the main actors find that 'reducing urban road traffic volumes' is an important objective.

6.4.1.4 Different understanding of what 'reducing urban road traffic volumes' means and whether it is achievable

Among the actors involved in plan-making, there may be different understandings of what the objective 'reducing traffic volumes' means. This goes for professionals involved in plan-making, as well as for politicians adopting the plans and others involved. The expression is applied for describing different developments in planning documents and in the literature. Reducing road traffic volumes could for instance be understood as to reduce: the *growth rates* of traffic volumes; the car shares; vkm per person, or; the total traffic volumes in vkm in a defined area. The latter is the understanding in this work, since it is the actual transport volumes and belonging GHG emissions which matter for global warming.

Different actors can have different understandings of how achievable this objective is, as described in chapter five. Such differences have practical consequences with respect to land use and transport planning. If one for instance understands that traffic will continue to grow, more road capacity is needed. If one instead think that the traffic volumes could and should be reduced, building more road capacity would be contra-productive as well as unnecessary.

Hence, it will be relevant to map how the professional planners and others working for different actors in the processes one study understand the objective 'reducing traffic volumes' with respect to what it actually means and whether it is achievable.

6.4.1.5 How the actors understand the importance of this objective for politicians

If the planning authorities actually do aim at achieving the objective of reducing urban road traffic volumes, their chances to succeed in making this objective prominent will depend heavily on whether the objective is well rooted in the overall plans, in the planning administration and in political bodies. This is not necessarily the case. Sager (1991) found that political objectives stated in plans may have primarily legitimating functions, by leaving an impression that one is working on solving a problem, even though there may be no real intentions to carry out the necessary means in order to achieve the objective.

One example of this may be that many municipalities and cities have defined ambitious target for reduction of GHG emissions, while they at the same time plan and carry out projects which will contribute to increase of GHG emissions, such housing developments in car-dependent areas. Another example could be national authorities claiming objectives of

reducing GHG emissions from transport, when simultaneously grant large sums for road building and far less for development of public transport-systems (Hull 2005).

In order to understand why actors act as they do, it will hence be interesting to know whether the planners involved in making plans understand that stated objectives regarding or implying 'reducing traffic volumes' are honestly meant, and if they think that the politicians stating such objectives are willing to make any efforts or sacrifices in order to achieve them.

6.4.1.6 Mapping properties of the main actors' objectives

In order to understand how and why plans are made which cause growth in traffic volumes, it would be useful to map, for each of the main actors (initiators, planning authorities, bodies entitled to comment and politicians):

- What their main objectives in the particular case are, and whether and how any of these are competing or conflicting with the objective of reducing traffic volumes
- Whether they find that the objective 'reducing urban road traffic volumes' is important
- How they understand this objective (what it means, whether it is realistic)
- Whether the main actors understand that this objective is actually prioritised by society and the politicians

6.4.2 Knowledge

The knowledge of the planners present in a plan-making process defines which knowledge is available in that particular process (including that it can be applied for collecting new or other knowledge). This may strongly affect how the plan-making processes proceed, which inputs are made in each of the steps of the process, and thus which answers that can be produced regarding 'what should we do in order to...?' and 'what are the consequences of...?'.

This was discussed in chapter four with a main focus on how the planners relate to the expert knowledge *in question*. The knowledge of the planners is discussed in a more open perspective here, asking which kinds of expert knowledge the planners possess and bring into the plan-making process. There are nevertheless large overlaps with chapter five, and the discussions are therefore presented only briefly and summarising.

6.4.2.1 Whether the planners possess or know of competing knowledge

Planners involved in plan-making processes can hold and apply various kinds of expert knowledge. This is among others due to which paradigm they relate to, their discipline, their skilfulness and their role, as described and discussed in chapter five.

This knowledge could be competing knowledge to the expert knowledge in question, and it may be more or less helpful when it comes to developing traffic-reducing plans. Hence, when searching for explanations how and why traffic-increasing plans are made, it would be interesting to map which kinds of expert knowledge the professionals involved in the plan-making processes possess and apply.

6.4.2.2 Whether the planners possess the expert knowledge in question

It varies whether and to which degree the planners involved in a plan-making process know the expert knowledge regarding causal interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes.

They may be experts which possess deep knowledge and can conduct insightful analysis regarding what could be done in order to reduce urban road traffic volumes, how a certain objective can be achieved without increasing urban road traffic volumes, and which consequences implementing a certain project may have for development of traffic volumes.

Mapping whether the different actors possess the expert knowledge in question would shed light on whom, if anybody, may bring such knowledge into the processes.

6.4.2.3 How the expert knowledge in question is perceived

If the planners know of or possess the expert knowledge in question to any degree, they may find it to be valid, relevant, useful and useable to various degrees. This would affect whether they would support the use of this expert knowledge or not. This is interesting and should be mapped.

6.4.2.4 Alternatives, methods and assumed interrelations

When studying how and why concrete plans are made which cause growth in urban road traffic volumes, it will be of particular interest to map which (kinds of) *alternatives* that are proposed or supported by the planners working for each of the main actors, which *methods for analyses* they apply or support and which *knowledge regarding causal interrelations* between development of land use, transport-systems and traffic volumes they know, apply and support. It will also be interesting to know which *kinds of outputs* they expect from planning analyses (quantitative, qualitative, aggregation level, etc.), and how they relate to uncertainties in planning predictions and analyses. This may be understood as concrete and measurable manifestation of the expert knowledge the various planners relate to.

6.4.2.5 Mapping the knowledge of the planners working for the main actors

Whether actors involved possess or know of the expert knowledge in question, how they perceive it and whether they possess competing knowledge will affect the plan-making. In order to understand how and why plans are made which cause growth in traffic volumes, it would hence be useful to map, for each of the main actors (planners working for initiators, planning authorities, bodies entitled to comment and politicians):

- Whether they possess or know of the expert knowledge in question (expert, can use it, know of it)
- How they perceive this knowledge (relevant, valid, usable, others)
- Which competing knowledge they possess or know of
- Which (kinds of) alternatives they propose or support
- Which methods for analyses they apply or support
- Which knowledge regarding causal interrelations between development of land use, transport-systems and traffic volumes they know, apply and support
- Which kinds of outputs they produce and/or expect from planning analyses (quantitative, qualitative, aggregation level, etc.)
- How they relate to and express uncertainties in plan-making and planning analysis (express uncertainties or not, how they describe it)

Some of these are overlapping with the empirical needs defined in chapter five. This is necessary because the factors need to be included both when discussing properties of the planners as explanations how and why traffic-increasing plans are made, and when discussing properties of the expert knowledge as explanations for the same.

6.4.3 Power

Planning processes are (here) understood as *struggles* over which objectives are made prominent and which expert knowledge is applied when plans are made. Hence, which powers actors *have* and *exert* in planning processes are interesting factors when explaining how and why certain plans are made, and not others. If those introducing and promoting the objective reducing urban road traffic volumes, or the expert knowledge in question, do not have or exert power in the planning process, then this objective and this knowledge will probably not become prominent.

Power can be created and exerted in numerous ways, and there is a vast literature regarding power. It has not been made any attempt to give an overview of this literature here (see Flyvbjerg 2001 for a discussion of power in relation to social science research and practice). Instead, some parts of the literature regarding how power can be created and exerted have been applied in order to develop a simple framework within which power in plan-making processes, and how it affects the processes and their outcomes as plans, can be analysed and discussed.

Foucault claimed in an interview that when studying power “it is necessary at the same time to question the practices, their professed purpose, the means they employ, and the intended or unintended results these means may have” (Baker 1994 [1984]: 395). This wide approach to power has been attempted applied here. My approach is also inspired by Flyvbjerg (2004:293), who (inspired by among others Foucault) describes power as positive, productive and ultra-dynamic, and finds that “power produces knowledge and knowledge produces power”.

6.4.3.1 Lukes’ three dimensions of power

Lukes’ ([1974] 2005) ordering of power into three dimensions is chosen as the main structure of the discussion of power in plan-making processes. Lukes presented this in a small book called ‘Power: A radical view’, as a contribution to the on-going debates at the time regarding how to think about power theoretically and how to study it empirically.

Direct power – to win or lose in direct confrontations

The first dimension of power is straightforward about who ‘wins and loses’ in more or less open conflicts. This “involves a focus on *behaviour* in the making of *decisions* on *issues* over which there is an observable *conflict* of (subjective) *interests*, seen as express policy preferences, revealed by political participation” (Lukes’ ([1974] 2005:19, italics in original). Lukes draws especially on Dahl (1957) when describing the first dimension of power: that A has power over B to the extent that he can get B to do something that B would otherwise not do. The exercise of power is central, and there is a strong focus on decision-making situations.

In plan-making processes as discussed here, this would involve the power the different actors have and more or less openly can exert in order to affect which become the most prominent objectives and which kinds of knowledge one takes ones’ basis in (including how one understand that the world or the city ‘works’). This could be exemplified by the initiators’ powers to define the project that is discussed in a zoning plan process, the planning authorities’ power to propose alternative planning proposals, commenting authorities’ power to file (formal) complaints and decision-makers’ power to adopt or reject a plan.

Agenda-setting power

The two-dimensional view of power was developed as a critique of the one-dimensional view. Lukes ([1974] 2005:25, italics in original) summarises that it “allows for considerations of the ways in which *decisions* are prevented from being taken on *potential issues* over which there is an observable *conflict* of (subjective) interests, seen as embodied in express policy preferences and sub-political grievances”. Lukes describes the second view of power mainly on the basis of the works of Bachrach and Baratz (1962). They pointed out that an important way of exercising power is by influencing what is and what is not discussed; the agenda-setting. This agenda-setting power is also embedded in institutions and organisations, in the rules and the game, which are biased in the sense that they systematically benefit some groups or interests at the expense of others. They also brought ‘non-decision-making’ into the discussion, meaning that a decision is hindered from being made which challenges the interests of the decision-makers.

This dimension of power regards for instance that initiators produce the zoning plans and the impact assessments, and hence that they control the knowledge production. It regards whether ‘reducing urban road traffic volumes’ is made a prominent objective, and how. It regards how certain alternatives come to be regarded as realistic, and whether certain methods are understood as better. This ‘becomes decided’ (by someone), and what is decided defines the agenda for the planning and plan-making processes, and hence it will affect the plan being the outcome of these processes.

Structural power

The three-dimensional view of power, which was Lukes’ contribution to the debate, also involves that which is related to conflicts which are latent and not consciously expressed. It includes the shaping of people’s wills in ways which contribute to avoid conflicts. Lukes finds it “highly unsatisfactory” to suppose that power is only exercised in open conflict (Lukes ([1974] 2005: 27). On the contrary, one way of exercising power is to make someone doing what you want them to do by “influencing, shaping or determining his very wants” (*ibid*), and thereby prevent conflicts from arising. He does not accept that lack of uttered grievance implies that nobody’s interests are harmed by the use of power, since preventing people from having grievances “by shaping their perceptions, cognitions and preferences in such a way that they accept their role in the existing order of things...” is just a more supreme and insidious exercise of power (Lukes ([1974] 2005:28).

When searching for third dimension power when analysing plan-making processes, different kinds of factors are interesting. One is the existence and design of the planning system itself, ruled by the PBA, and which defines powers structures and how society makes decisions regarding spatial developments. Another kind regards how we understand the world and how it can be affected – such as the taken-for-granted assumption of the necessity of continuous economic growth (Owens and Cowell 2002) or the unstoppable growth in urban road traffic volumes. A third kind could regard the ways in which the methods applied or required (such as cost-benefit analysis in public investment projects) shape plan-making processes, as well as which alternatives and effects are considered (see Howe 1990 for an interesting discussion). A fourth example could be how an objective is interpreted and reconceptualised so that it fits existing ideas and objectives (Owens and Cowell 2002).

6.4.3.2 Forms of power creation and exertion

Within these dimensions of power, there are numerous ways of creating and exerting power. Boulding (1989:15) presents the widest meaning of power as “a potential for

change”, or more narrow as “the ability to get what one wants”. He discusses ‘power over’, ‘power to’ and ‘power with’. ‘*Power over*’ regards power exerted through among others threats in order to make others do something they don’t want to do or to prevent them from doing something they want to do. He also terms this destructive power. ‘*Power to*’ regards exertion of power in ways which makes things happen. He exemplifies this productive power among others with the fertilized egg, with an idea, and with the activity of human brains and muscles that sow, build and paint. ‘*Power with*’ refers to abilities to work together in order to make things happen and make desired changes.

Bachrach and Baratz (1962) used a typology of five different ways of exerting power. *Coercion* involves that one actor secures compliance from another actor by the threat of deprivation where there is a conflict between these actors. *Influence* occurs when an actor changes another actors’ course of action without threats of severe deprivation. *Authority* includes that an actor complies because he recognises that another actors’ command is reasonable in terms of his own values – either because its content is legitimate and reasonable or because it has been arrived at through a legitimate and reasonable procedure. *Force* is applied when one actor achieves his objectives by stripping the other actor of the choice between compliance and non-compliance. Finally, *manipulation* is applied when compliance occurs because the complier does not recognize the exact nature of the demand of other actors upon him/her. See also Haugaard’s (2003) reflections on seven ways of creating power.

6.4.3.3 The powers of the planners by virtue of their roles in the planning process

The different actors involved in planning processes are given different kinds of power through the PBA by the virtue of their roles. Hence, the actors *have* a potential to exert certain powers. Whether and how they *do* exert it is not controlled by the PBA. It is affected by various kinds of conditions. It depends on among others the knowledge of the individuals representing these actors and whether the process affects objectives (or aims, concerns, values...) which they understand as important.

Private and public developers have the power to initiate, and if given permission by political bodies, implement projects. This also includes that they have the power to *not* implement a suggested project, and this can be used to force their will through. The developers are responsible for making zoning plans. This gives them agenda-setting powers, as well as powers to influence and manipulate the selection of alternatives, production of analyses and the plan. The developers’ powers also include the possibilities of influencing other actors in several ways (lobbying), and for rewarding other actors (only legal measures are implied here), maybe in order to make them work with them in order to achieve common aims.

The public planning authorities (at municipal level in Norway) have a lot of power, as authority, in planning processes. They have the power to stop a planning process if the developers do not act in accordance with the procedures, intentions and qualities defined by the PBA. The planning authorities normally also have agenda-setting power by being responsible for making, or important deliverers of input to, the overall municipal plan (at least the spatial part) and to binding sector plans and area plans, and to ensure that these are regarded and respected. The overall plans are supposed to have strong agenda setting powers in zoning plan processes. They are also supposed to be channels for ‘top-down’ exertion of power, by bringing signals, regulations and rules from higher political and administrative levels to lower levels, where these signals can be implemented and ‘enforced’ in zoning plan processes and developments.

A number of different actors have the power to influence planning and plans through *commenting* in planning processes and on planning proposals, through their roles as neighbours or neighbouring municipalities, as responsible authorities for certain interest, values or fields etc. Some of these actors have the power to stop projects which are violating interests which these bodies are responsible for ensuring, by filing formal objections. Whether these powers are exercised may have strong influence on the planning processes and not least the plans. For instance are the national planning guidelines for coordinated land use and transport planning powerful only if the actors who can file formal objections do so.

Politicians and political bodies have power to decide future realities by approving a proposal or not through their voting in the formal decision-making assembly. They have the power to affect agenda-setting, through their contributions in public and press, through their authority as leaders, through their command over a bureaucracy. They also have the power to focus on and/or call for analyses regarding certain problems and needs. These powers are, however, dispersed at several levels and policy areas. This means that the politicians need to be good at creating power with other groups, to form alliances, in order to increase their abilities to achieve that which they think is good and useful.

6.4.3.4 How planners perceive the powers distribution in planning processes

In the survey by Tennøy (2005), the planners were asked how much power various actors have in the land use and transport planning and policy-making. The planners answered that the developers/initiators, the local politicians and the national and regional politicians have most power.

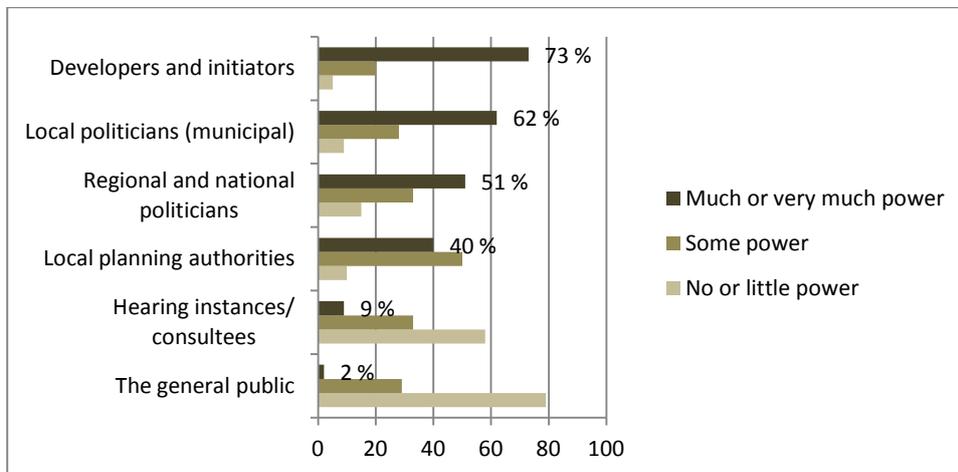


Figure 50: Planners' responses when asked 'How much power do these groups have in land use and transport planning and politics?' (Tennøy 2005).

An equally interesting question is who should have more and less power. To this question, most planners answered that local planning authorities should have more power and that developers and initiators should have less power. Except from these two groups, it seems like the planners find that the power is distributed in a sensible way, since more than 50 % answered that their power should be 'unchanged'.

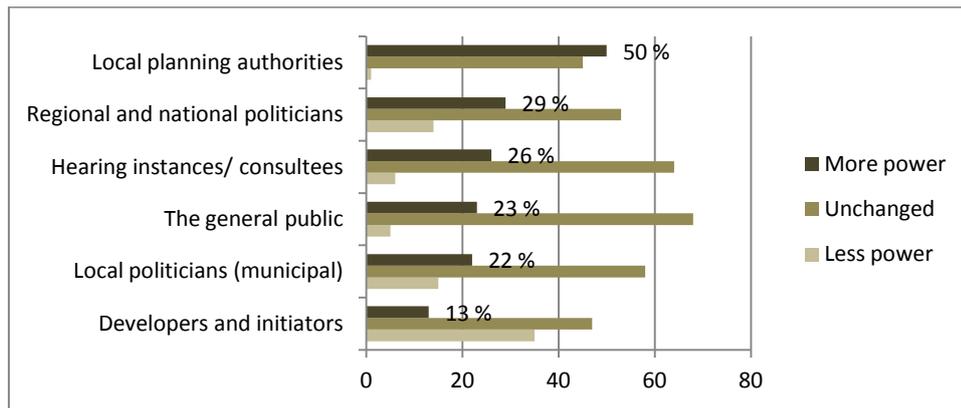


Figure 51: The planners' response when asked 'Who should get more and less power in land use and transport planning and politics?' (Tennøy 2005).

Almost half of the planners responding in the survey work for public authorities, including planning authorities, NPRA, governmental departments and the like.

6.4.3.5 Mapping the distribution and exertion of power

The distribution and exertion of power in planning processes affect which objectives become prominent and which knowledge is applied, and hence the plans being the outcomes of the plan-making processes. In order to understand how and why plans are made which cause growth in road traffic volumes, it would be useful to map, for each of the main actors (initiators, planning authorities, bodies entitled to comment and politicians) whether and how they have and exert Lukes' three dimensions of power:

- Direct power – applied in order to win in more or less open conflicts
- Agenda-setting power – applied in order to decide which issues are made prominent
- Structural power, exercised in relation to latent or not consciously expressed conflicts (and which are not necessarily to be found in the observable behaviour of the actual participants)

Bouldings' (1998) typology of three ways of exerting power: Power over; Power to, and; Power with, will be applied in descriptions of how the power is exerted. So will also an extended version of the typology of Bachrach and Baratz (1962), including power exerted as: coercion; influence; reward; authority; expert; referent; force, and; manipulation.

6.4.4 Objectives, knowledge and power reciprocally affect each other

Objectives, knowledge and powers of the planners interacting in the plan-making affect and shape plan-making and plans directly. They can also reciprocally affect each other and hence - indirectly - the plan-making and the plans.

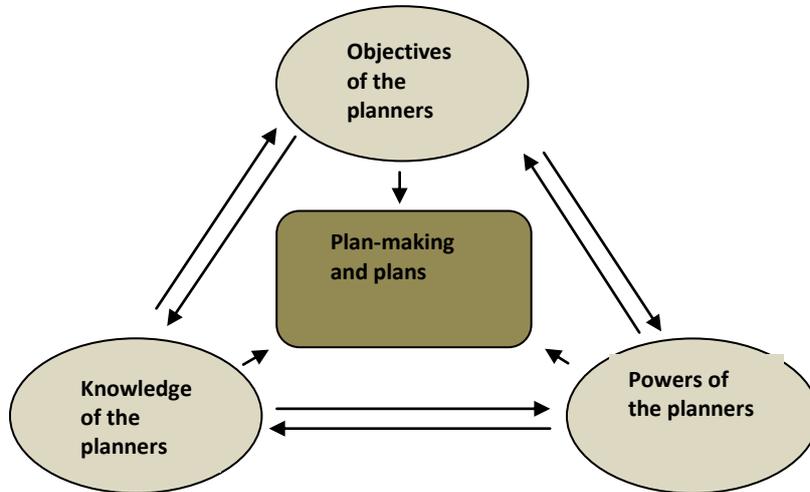


Figure 52: Objectives, knowledge and power of the actors in the planning processes affect the plan-making and the plans directly and indirectly.

6.4.4.1 Which knowledge exists affects which objectives are made prominent

What are defined as key objectives will be affected by which knowledge that exists. If knowledge regarding the problems of increasing urban road traffic volumes, the objective would not be stated. If knowledge regarding how to reduce urban road traffic is weak, contested or not applicable, the objective 'reducing urban road traffic volumes' may be prioritised and promoted to a lesser degree.

6.4.4.2 The power distribution affects which objectives are made prominent

What become the most prominent objectives is also affected by who has (the most) power in the given situation and can promote and/or enforce their priorities. Actors with more financial powers can hire consultants which produce inquiries and analyses supporting their objectives, while the less financially powerful cannot. Actors may have formal powers to ensure that certain objectives are made prominent, as when planning authorities can refer to overall and binding plans. National authorities have defined national guidelines for what they define as the most important objectives, in order to ensure that there is more formal power behind such objectives.

6.4.4.3 Which objectives are made prominent affects which knowledge that is applied

Which knowledge comes to be understood as most relevant, valid, and usable will obviously (or hopefully) be strongly affected by what is understood as the main objectives in a planning process. In order to achieve ones' objective(s), one needs to know what to do in order to achieve it, and how. Knowledge regarding how to achieve other objectives is less relevant. If reducing urban road traffic volumes is a main objective, one would expect that knowledge regarding how to achieve this would be applied instead of for instance knowledge regarding aesthetics.

6.4.4.4 The power distribution affects which knowledge that is applied

What comes to be understood as valid and relevant knowledge also depends on the power distribution in the planning and decision-making processes. Those who produce analyses,

recommendations and plans normally have the power to choose how to do it. Powerful actors in terms of money and/or time may affect which kind of knowledge which is understood as valid and relevant by setting a certain standard (such as traffic model analysis), and thereby oust other kinds of knowledge. Further, there are defined formal requirements for which knowledge is to be applied and produced in and in connection to the PBA (requirements for impact assessments, national planning guidelines) and which the planning authorities have the power to ensure are complied. Likewise, the National Public Roads Authorities require that CBA are carried out for projects which they finance.

6.4.4.5 Which objectives are made prominent affects the power distribution

Which objectives are prioritised may influence the distribution of power in planning processes. Those being (understood as) important actors in order to achieve a certain important objective may be attributed more powers than others. For example, housing developers may gain more power in planning processes involving housing development if 'building enough housing' is an agreed and important objective. This could involve that they more easily get their will through regarding for instance heights, densities, outdoor space etc. or that they are allowed to develop housing as sprawl.

6.4.4.6 Which knowledge is applied affects the power distribution

What is defined as 'good' or 'true' knowledge can affect the power distribution, as when acceptance of certain methodologies and tools in planning processes (transport models, cost-benefit analysis, others) gives those which master these tools more power than those who possess other kinds of knowledge regarding the same problem field.

6.4.5 A system of organised complexity

This is hence a system of organised complexity. If any of the variables are changed, meaning for instance that one planner is replaced by another or that a planner has gained new knowledge, this may change what is understood as main objectives and relevant knowledge, and hence the plan-making and the plans. The same could be the case if new knowledge was developed, if certain objectives were prioritised higher or if the power distribution was changed.

6.4.6 Exploring relevant variables

The matrix below has been developed as a framework for mapping relevant properties of the objectives, knowledge and powers of the planners when studying concrete cases.

Table 4: Relevant properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes, which have been collected in the case studies.

	Planners working for:	Developer/ initiator	Planning authorities	Consultative bodies	Decision- makers
Objectives	Main objective				
	Is reducing traffic volumes important?				
	How they understand this objective				
	Other relevant objectives				
Knowledge	Possess or know of expert knowledge in question				
	How they perceive this expert knowledge				
	What are their main expert knowledge				
	Alternatives they propose and/or support				
	Methods they apply and/or support				
	Causal interrelations they include and/or support				
	Types of outputs				
	How they relate to uncertainties				
Powers	1. dimension - direct; win or lose in direct battle				
	2. dimension – agenda setting; what it is about				
	3. dimension – structural; what one thinks is 'right' or obvious				

6.4.7 Emergence into different kinds of plan-making processes

After having described the entities of this system as objectives, knowledge and powers of the actors, as well as the relations between them, it seems clear that these entities may affect a plan-making process. How these entities emerge into plan-making processes that either are processes that produce traffic-reducing or traffic-increasing plans, and what triggers this, is not explained by this description. This process is explored in the following discussions.

6.5 The objective and knowledge may be excluded or ousted in plan-making processes

In order for the causal powers embedded in the objectives, knowledge and powers of the planners interacting in a plan-making process to actually produce traffic-increasing plans, these powers need to work through certain mechanisms. These mechanisms were previously described as 'how the planners act'. The following analysis is made in order to developing the main mechanisms involved and to arrive at a framework for studying how traffic-increasing plans are made in the cases.

6.5.1 Main mechanisms allowing traffic-increasing plans to be made

As previously described, plan-making processes include numerous planners, with different objectives, knowledge and powers, working for various employers. The plan-making processes were described as co-operation, struggles or battles, where the planners bring in and apply their objectives, knowledge and powers as tools to achieve their main objectives. In these struggles, some objectives become prominent and others do not. Likewise, some kinds of knowledge are applied, and others are not.

This means that the objective 'reducing urban road traffic volumes' may or may not be brought into the plan-making process, and it may or may not become a prominent objective which is given the attention it needs in order to be achieved. Likewise, the expert knowledge in question may or may not be introduced or applied in ways which contribute to arriving at planning proposals which actually will contribute to reduce road traffic volumes. If this objective is not made prominent, or if the expert knowledge in question is not applied in correct ways, these are mechanisms through which traffic-increasing plans may be made.

The mechanisms through which traffic-increasing plans may be made, can hence be listed as:

- The objective 'reducing road traffic volumes' was not introduced
- The objective 'reducing road traffic volumes' was ousted by other objectives
- The expert knowledge in question was not introduced
- The expert knowledge in question was ousted by other knowledge that is less helpful when it comes to reducing road traffic volumes
- The expert knowledge in question was applied wrongly

If any of these mechanisms are activated, then a number of effects may occur that can contribute to that traffic-increasing plans are made. For instance, if the objective in question is not introduced to a plan-making process, conflicting objectives embedded in a planning proposal may not be detected. If it is ousted, then proposed alternatives may not be assessed with respect to this objective. If the expert knowledge in question is not introduced in the process, then traffic-reducing alternatives may not be suggested. Effects and consequences of the alternatives with respect to traffic volumes may not be assessed or be assessed wrongly. Further, alternatives may be compared in less insightful ways with respect to changes of traffic volumes. The same may be the effects if the expert knowledge is ousted or applied wrongly.

6.5.2 Planning and decision-making as continuous discussions within defined tasks

The understandings of planning have changed during the decades. Through the shifting discussions, however, some tasks seem to define planning and to be unavoidable in a practice defined as planning (Friedmann 1987). Based on among others Friedmann (*ibid*) and

Banfield ([1959] 1973), the tasks involved in planning and decision-making may be listed as in figure 53. These tasks are carried out in overall land use and transport planning as well as in zoning plan processes (at least they are supposed to be).

Planning and decision-making processes will normally not follow a direct course of action from task number one to task number nine. Rather, they are iterative processes, more to be understood as continuous discussions regarding where we are going, what needs to be changed, where we want to go, how to get there and whether a proposed project contributes to take us there or not.

- 1. Situation analysis and problem definition**
- 2. Formulation of goals and objectives**
- 3. Identification and design of alternatives**
- 4. Identification, prediction and assessments of impacts and consequences for each alternative (impact assessment)**
- 5. Comparison of alternatives with respect to consequences in relation to desired objectives and other values**
- 6. Recommendations (planning proposals)**
- 7. Decision about action, based on knowledge produced through the preceding steps and other knowledge**
- 8. Implementation of the decision through appropriate institutions**
- 9. Feedback and post-auditing**

Figure 53: The classic description of tasks involved in planning and decision-making (based on among others Banfield [1959] 1973 and Friedmann 1987).

Innes and Booher (2010) describe the idea that public decision-making follows this prescription in certain ways and in this order as a myth, and I agree with them. I still find that these tasks somehow and in some order normally are part of the kind of plan-making processes discussed here. Further, the formal organisation of the plan-making processes are organised around these tasks.

In the processes of fulfilling the various tasks of plan-making, planners working for different employers pursue certain objectives and concerns, they apply their expert knowledge and other kinds of knowledge, and they do this in a constant power-struggle. The objective and expert knowledge in question can be ignored, ousted or applied wrongly in each of these tasks.

Some tasks in plan-making need and open for collaboration and debate with 'society', especially the situation analysis and the definition of objectives. In other tasks, only 'experts' normally can be expected to be able to discuss, criticize and point at faulty, biased, weak, or in other ways unsatisfactory practices, and to distinguish between knowledge production of good and bad quality. This regards often the impact assessments.

Disagreements and struggles in plan-making processes may concern a range of different issues. This could concern what the project in reality *is* (only the building on the site, or the necessary roads, the traffic generated etc.), what the relevant alternatives are (different road alternatives, or a broad range of measures for reducing traffic volumes), which objectives and concerns assessments should focus on, what to include in the description of the physical context or how to interpret existing plans.

Likewise, there may be disagreements regarding which kinds of methods to apply when doing analyses, as well as whether the analyses have been conducted in scientifically and professionally acceptable ways. These may all be important in defining which analyses and predictions that are produced in the plan-making and hence the plans. Disagreements over knowledge can regard whole systems of thoughts, as well as concrete input data to models, and that in between. It can also regard which types and forms of outputs and analyses the plan-making processes ought to produce.

In the fine-grained processes of plan-making, various objectives, aims and concerns are brought in, weighted, contested and adjusted, and alternatives are sought which contribute to meet several objectives and concerns and arrive at agreeable recommendations for actions. Through interacting in a plan-making process and accomplishing these tasks, the planners shape and define which objectives are prioritised and which knowledge is applied, and hence which planning proposals that are the outcome of the plan-making process.

The tasks in plan-making are different, and often involve different people. If the objective and expert knowledge in question have been made prominent in one task, they can still be ousted in another task. Objectives and knowledge laid down in one task may hinder that the objective and knowledge in question are prioritised or applied in others. Since the plan-making processes often are iterative, there are many chances for ousting the objective and the knowledge before the final plan and recommendations are presented. When studying concrete plan-making processes, it may hence be relevant to see in which of the tasks in a plan-making process the objective and knowledge is excluded and ousted, in which tasks it is reintroduced, and so on.

How objectives and knowledge can be excluded, ousted or applied wrongly in each of the nine tasks in plan-making are described in Appendix D. An example is included here in order to illustrate the point.

6.5.3 An example: Identification and design of alternatives

In the third task, the question regards which alternative actions that can (efficiently) contribute to achieve stated objectives. This is where the question 'what could we do in order to achieve...?' is supposed to be answered. Which alternatives are considered relevant and should be assessed will be affected by the kinds of strategies and measures the participants know and consider efficient and acceptable, and which they bring into the planning discussions. This is strongly related to the individuals' knowledge, and to which objectives and concerns they understand as prominent.

Professionals with different expertise often disagree in discussions regarding which measures that can contribute to achieve stated objectives. They may be informed by different theories and research, experiences from former planning processes and implemented projects, but also by what is considered achievable and acceptable among politicians and the general public. Which alternatives are promoted by the different actors in the process will, however, also be affected by whether the alternatives contribute to achievement of their main objectives, whether it brings other benefits, and how it affects important concerns. The actors having and exerting most power may have stronger influence on what is understood to be relevant, acceptable, and efficient measures. A zero-alternative or do-nothing-alternative are normally included among the assessed alternatives.

Differences with respect to what is suggested and supported as relevant alternatives also depend on how the actors perceive the objective. If the objective is understood as to reduce urban road traffic volumes, other alternative strategies and measures would be suggested than if it is understood as to increase the number of people travelling by public transport, to reduce congestion or to build a road.

Decision-makers, developers, the public and others may bring alternative strategies and measures into the plan-making processes, and they may have strong opinions about and influence on what are understood as relevant alternatives. If an alternative has negative effects on something which the neighbours, inhabitants, politicians or others find important, and mitigation measures are not available, this alternative may be considered not relevant for those reasons.

It is normally the planners who suggest and design alternatives. Planners with expertise in traffic-reducing development of land use and transport-systems may contribute to the discussions by suggesting strategies, changes, and measures which do contribute to reduce traffic volumes (whether this is a stated objective in the process or not). Professionals with other expertise may suggest other alternatives. If the objective is defined as to reduce congestion and delays on main roads, experts on traffic-reducing planning may suggest measures like improved public transport services, reduced parking capacity and change of land use development strategies towards densifications and car-independent locations of new activities. Other professionals with other backgrounds and types of knowledge may instead suggest to increase road capacity or to change land use development strategies towards sprawl in order to utilise the capacity on the roads, or to rely on economic measures.

In order for strategies, measures, and actions to be considered, which according to the expert knowledge in question will contribute to reduce urban road traffic volumes, someone needs to bring such alternatives into the process, to promote them and to win through. If not all of these conditions are present, alternatives contributing to reduce urban road traffic volumes will not be considered in the plan-making process, and can hence not be adopted.

6.5.4 Exploring where in the plan-making processes the objective and the knowledge have been ousted

When asking how and why properties of the plan-making processes can contribute to explaining how and why planners make traffic-increasing plans, it may be fruitful to ask which of the mechanisms listed above that have been activated. It may also be useful to locate where in the plan-making process this have occurred, who made it happen and how. Not least is it interesting to studying *why* it occurred. This regards which causal powers that 'won' and the conditions allowing it to occur.

This has been done in the case study. The table below was developed as a framework for these descriptions and analyses. The why-question is supposed to be answered in a broader perspective, summing up the actors' influence on the outcome, their reasons for wanting it and why they succeed.

Table 5: The objective and expert knowledge in question may be prioritised or not and applied or not in each of the tasks involved in planning and decision-making processes, in different ways and for different reasons.

Questions/issues Tasks	Objective prioritised? Y/N	How? (O, K, P) Who?	Why?	Knowledge applied? Y/N	How? (O, K, P) Who?	Why?
Problem definition						
Formulation of objectives						
Identification of alternatives						
Impact assessments						
Comparison of alternatives						
Recommendation - plan						
Decision made						

6.6 How the planners may act in plan-making processes in order to achieve their objectives

While the previous analysis was made with basis in how plan-making processes proceed, the following discussion focuses on *the planners who are the acting agents* in the plan-making process. Even though the PBA defines the frames for planning processes, there are large latitudes for planners to act in different ways within these frames. How the planners working for various employers act in the game of planning may strongly affect the outcome of plan-making processes. Objectives, knowledge and powers are main tools in this game.

In order to help structuring the discussions in the case study, the following analysis is an attempt to describe *how*, exactly, the actors can go about when applying these tools in their struggles to achieving their objectives. The discussion is based on retroductive reasoning, relevant literature and the authors' experiences as planner and planning researcher.

6.6.1 Clashes between overall and operational plans

When a private or public developer initiates a zoning plan, it is because this developer has conducted a situation analysis (within their field of business) and found that they need to build or develop something which requires a zoning plan. The *main* objective for the initiator will normally be to achieve a permission to carry out their project, in order to achieve the objective or meet the need which originally triggered the process. Many developers will probably also aim at contributing to societal goods.

In the zoning plan process, the spatial manifestations of this objective are discussed in relation to its effects and consequences with respect to prioritised objectives of the society and of other actors. The societal objectives are supposed to have been clarified and stated in overall plans, but this is not necessarily the case. Hence, discussions which have not been brought up or properly settled in overall planning processes often appear in zoning plan processes.

The initiators of zoning plans and other operational plans are supposed to orient themselves with respect to overall plans as well as other relevant plans, and either ensuring that their proposal is in accordance with these plans or describing discrepancies between their plan and other plans. If reduction of traffic volumes and GHG emissions are stated objectives, the developers and initiators are supposed to analyse and discuss whether and how their project contributes to achieving these objectives. If the discrepancies between the zoning plan and the overall plan are substantial, an impact assessment needs to be carried out.

In the following discussion, it is assumed that reducing traffic volumes and/or GHG emissions are more or less clearly stated objectives in overall plans. The intention with the discussions is to describe how planners may act when making traffic-increasing plans and hence *not* complying with objectives regarding reduction of traffic volumes and GHG emissions.

6.6.2 The initiators have several options

6.6.2.1 The initiators may comply with the overall plan

When a developer plans to initiate a project, she could aim at obeying to the overall municipal plan (or the like), and e.g. propose the new office building or housing project in locations allocated for these purposes, with the density and height which the overall plan suggests etc. If the overall plan is agreed and clear, and if the developer honestly try to comply with the overall plan, the zoning plan should (at least this is the intention) move fast and smooth through the planning system and be approved.

6.6.2.2 The initiators may *pretend* to comply with the overall plan

For such reasons, and in cases where the City Council is not allowed to decide against their own sector plans (as is for instance the case with larger shopping centre developments according to national planning guidelines in Norway), the developers may present their plan as if it is more in accordance with the overall plan than it in reality is.

They could *pretend* to comply with the overall plan, by:

- presenting the project itself as something else than it in reality is intended to become, for instance that it is smaller than it is intended to be, that there are fewer parking spaces etc.
- presenting mitigation measures as being more efficient than they are or presenting or which one knows will not be realised (for both – e.g. to ‘improve public transport services’ in order to avoid high traffic generation caused by sprawling office locations)
- presenting analyses and assessments which have been manipulated in ways which make the project appear as having fewer and less severe impacts with respect to important objectives than it in reality will have (for instance that it generates less car traffic)
- presenting the results of analyses to decision-makers in ways which make them believe that the proposal is in accordance with the overall plan or with the intentions in the overall plan, even though it is actually not so (for instance that the state-of-the-art-knowledge in this field, empirical knowledge, and/or the analyses carried out for this project say something else)

If the objective ‘to reduce urban road traffic volumes’ is not understood as important in the planning process, involved actors may accept that the project description is ‘glossed’ in order to make it suit the overall plans, and allow the project to pass un-hindered through the plan-making process. Likewise, if the expert knowledge in question is not present or applied

in the planning process the 'glossing' may not be detected and pointed out, with the same result.

If, on the other hand, the objective and/or the expert knowledge are present and prominent in the plan-making process, someone (this can be planning authorities, politicians, other private or public authorities, NGOs, neighbours, the public) will probably detect the manipulation, and communicate this into the plan-making.

In such cases the initiators may admit that their proposal oppose the overall plan (see below), or they may go on insisting that their proposal is in accordance with the overall plan. In the latter case they need to prove or warrant this through discussions of objectives showing that the objective may embed their proposal, through application and production of knowledge in the form of analyses showing that this is the case, or to apply their power as initiators by threaten to stop the process if their proposal is not accepted as in accordance with the overall plan. These strategies are elaborated below.

6.6.2.3 The initiators may oppose the overall plan

There are many possible reasons (or causes) why developers will not or cannot comply with the overall plan and at the same time carry out their project in the form that they want. They may propose to build or develop: Something else on a site than defined in the overall plan (e.g. housing instead of business); Something which is not discussed in the overall plan; Something which one has decided not to develop in this city (e.g. large shopping centres, sprawled development), or; Something which does not fit overall strategies (e.g. increasing road capacity or parking capacity if the overall strategy is to prepare for reduced road traffic volumes). In such cases they may choose to oppose the overall plan.

Initiators may also propose projects that are aimed at contributing to achieving objectives stated in overall plans, and where increasing road traffic volumes and GHG emissions are unintended negative consequences. This could regard to provide more housing or to reduce congestions or local environmental problems caused by traffic.

In such cases, the initiators need to convince the planning authorities and/or the decision-makers (the City Council politicians) that their project should be allowed. Objectives, knowledge, and power are important tools in this game.

6.6.2.4 The initiators may play on objectives

The overall municipal plans usually have several objectives, which may be conflicting or competing, as well as more or less clearly stated. Initiators challenging the overall plan can use this as a tool in order to get their zoning plan approved.

They can argue that their project contributes to economic growth, improved local environment, making the city more competitive, development in all parts of the municipality, facilitating more housing fast or other objectives stated at in the overall municipal plan, in area plans or sector plans. Hence, their project should be allowed even if it *also* contributes to urban sprawl, making the city harder to serve with public transport, growth in urban road traffic volumes or other un-desired consequences.

They can also argue that they contribute to achieving something which is not stated as an objective, but which is desirable. For instance, they may offer to build or contribute to the building of a new school if they are allowed to build housing in a certain area, to include public facilities if they are allowed to develop retail facilities of a certain size in a certain

location, to move their main quarters here if they are allowed to build their office facilities where and how they desire etc.

Initiators can interpret objectives which are not well defined or described in ways which suits their planning proposal (see e.g. Owens and Cowell 2002: chapter 3). If the overall plan for instance states that high density developments should be located in nodal points, without defining this clearly, developers may claim that the site they plan to develop is located in a nodal point (because two bus routes cross) even if it is not (since nodal points usually refers to points with extraordinary good public transport services to large parts of the city). Likewise, developers may argue that their development is 'densification' and hence contribute to reduce road traffic volumes if they build within the building zone, even if they build at the car dependent fringes of this zone.

Another angle could be to claim that the objective is unachievable, for instance because public authorities don't have the necessary powers, because human behaviour cannot be altered ('it is impossible to get people out of their cars'), because other agents, cities or countries will not take their shares, or because we don't 'know how'. Hence, even if their project contributes a little to the increase of urban road traffic volumes and GHG emissions from transport, it is meaningless to deny them to carry out the project.

Initiators/developers may hence apply conflicting and competing objectives as tools in order to get their zoning plan approved by:

- claiming that their project contributes to achieving certain objectives stated in the overall plan, and hence should be allowed even if it counteracts the achievement of other objectives
- showing that they contribute to achieving something which is not stated as an objective, but which is desirable
- interpreting objectives which are not clearly defined in ways which suit their planning proposal
- claiming that the objective is unachievable anyway, and hence their project should be allowed
- bringing new elements into the discussions

6.6.2.5 The initiators may play on knowledge - in various ways

Challenging the knowledge in overall plans

Developers may challenge the knowledge the overall plan is based on. They can question the fundamental theoretical or ontological understandings of the interrelations between causes and effects upon which the plan and the analyses are built. They can question the situation description and what are understood as main objectives. They may oppose what are seen as the main alternatives, the analyses of effects, consequences, and impacts of the different alternatives, the comparison of alternatives, and the recommendations made on the basis of all this.

The initiators (or others!) can do so by just claiming that they disagree or don't believe in the knowledge underpinning the plan, by pointing out weaknesses and demonstrating why they disagree with certain knowledge claims, and by generating and/or bringing in new and opposing knowledge in the form of analysis that challenges the overall plan.

By challenging the knowledge in the overall plan, the initiators can weaken the authority of the overall plan and its objectives and recommended strategies. This increases the relative

strength of their objectives and plan. This strategy can be strengthened if they also can play on conflicting objectives. By undermining a prominent objective and its strategies and measures, the developers strengthen the case of those disagreeing with the prominent position of this objective and/or the strategies and measures for achieving it. Hence, the developers can hope for support from them.

Making zoning plans and analyses

The initiators are responsible for producing the analyses and assessments on which the decisions are supposed to be made. This means that the initiators are given strong powers to select and produce knowledge in the planning process. This regards the situation description, what are understood as main objectives and the main alternatives, which analyses of effects, consequences, and impacts to be carried out (theoretical understandings, methods, assumptions, baseline data, input data), the comparison of alternatives, and the recommendations. These need to be chosen, and these choices will affect the results of the analyses and hence the descriptions of the consequences of the projects (see e.g. De Jongh 1988, Tennøy et al. 2006).

Knowing the large uncertainties and the many unavoidable subjective considerations embedded in these analyses and assessments, it becomes obvious that this gives the initiators the power to present their project as positively as possible, even though one assumes (or at least the PBA must assume) that the developers will strive to assess and present the negative consequences of their project just as strong and clear as the positive consequences, that they will select the most relevant alternatives to be assessed etc.

If the developers and/or their consultants more or less consciously choose the more positive presentation of the project, the negative effects of a project – such as increased road traffic volumes – may be presented to decision-makers and others as less negative or severe than they in reality are. They can argue that even if their project counteracts a main objective in the overall plan, the effects are very small, and hence they can be disregarded and the project allowed.

Change focus from overall considerations to the project at hand

Another way of playing on knowledge in order to get zoning plans approved which is not in accordance with overall plans(s) is to change the focus and knowledge discussions towards the zoning plan and away from the main objectives in the overall plan. One can claim that this particular project is different from what is discussed in the overall plan, that this particular context is special, or that time has changed (or will change) in ways which are not assumed in the overall plan. Hence, this project needs to be analysed on other terms than defined in the overall plan.

One can also compare the particular project with other potential developments (the same function in another location, another function, density, size... in this location), and show that the proposed project is less harmful than other potential developments. Hence, the discussions may come to revolve around how the project can be implemented with least harm and maximum benefits, rather than whether the project should be rejected – which would be the recommendation according to the overall plan.

Strategic misrepresentation – or lying with numbers

Initiators may also apply knowledge in manipulative ways, in order to make other actors believe that the plan will cause less negative effects than the initiators assume or know that

it will. Wachs (1989) describes how data, models and statistics can be, and are, applied in order to arrive at results which suit the planners' or analysts' client when doing analyses and assessments, and hence arriving at biased results. Flyvbjerg et al. (2002:290) concluded that cost estimates for public investments used in public debates are "highly, systematically, and significantly deceptive". They found that this could best be explained by "strategic misrepresentation, i.e., lying" (*ibid*).

If the initiators or their consultants don't get the results they need, they may produce several analyses and cherry-pick the results which make the project appear its best with respect to important objectives. Alternatively, they can present the results of the analyses as different from what they really found. This is another form of strategic misrepresentation (or lying).

Other ways of applying knowledge in manipulative ways are to produce large quantities of knowledge, in the form of analyses, data, or extrapolations. This may give the initiator the upper hand in the knowledge discussions, since few other actors will be able to apply the amount of resources necessary to keep themselves fully oriented. This also makes the initiator appear (and maybe become) the most knowledgeable actor in the planning process.

Causing confusion

Another manipulative way of applying knowledge is to present knowledge in in-transparent or hard-to-understand ways. This may cause that the other actors spend much time on understanding what it means – or that they are not able to understand it due to lack of information regarding data, assumptions or cause-effect interrelations implied.

Knowledge-production can also be applied in order to confuse actors regarding what state-of-the-art-knowledge regarding effects of actions are, or to plainly cause confusion instead of clarity. Oreskes and Conway (2010) claim that creation of doubt regarding important causal interrelations has been used as a strategy for misleading the public and to defer necessary decisions and actions in several important policy fields, worldwide and for decades. They describe among others how the tobacco industry has contributed to produce counter-knowledge in order to spread doubt regarding the health effects of smoking and passive smoking, and how the oil-industry and others have done the same regarding whether man made climate changes are real.

In a situation of confusion, decision-makers may choose to disregard expert knowledge, which may suit initiators if such knowledge actually does show that the project causes unwanted negative impacts. They may also postpone decisions which have negative effects for the industries in question. Such strategies may be applied in planning and decision-making processes regarding developments of land use and transport-systems as well.

Summing up

Initiators/developers may hence apply knowledge as tools in order to get their zoning plan approved by:

- Weakening the authority of the overall plan by challenging the knowledge upon which it is based
- Making it appear as if the project has less negative impacts with respect to important objectives than foreseen in the overall plan
- Changing focus from the overall plan and its objectives towards the zoning plan and its project

- Applying knowledge to (more or less consciously) manipulate other actors so that they don't understand that they adopt plans which will cause negative effects (lying with numbers, causing confusion)

6.6.2.6 The initiators can exert their powers in order to get their plan through

The main actors in plan-making processes have certain powers due to their role in the game, but there are large latitudes regarding whether and how the actors exert their powers. The potential strength of the initiators' power differs between planning processes, depending on a number of factors concerning among others the initiators themselves, their project, the local political context, and the nature of the consequences of their project.

Power to not implement plans

Public and private initiators have the power to initiate plans, and if given permission by political bodies, to implement projects. This power consists of among others financial capital and organisations to carry such projects through. This also implies that developers have the power to *not* implement a project. This gives the initiators potential power to force the authorities to accept their planning proposal by threatening to not build or develop their project at all, to locate it in the neighbour municipality, or to move their entire business elsewhere if they are denied the permission to carry out their project in the way they have described it in the zoning plan. Hence, the initiators have 'power over' the public authorities, exerted as coercion or force (Bachrach and Baratz 1962). This power is stronger in situations where the authorities strongly welcome the project, and where there are differing opinions regarding the objective(s) that the project thwarts.

Power to add tempting extras

The initiators also have the power to alter the project in ways which make it more tempting and acceptable, by for instance including things which are useful and good. This could be to financing necessary physical or social infrastructure, to include an open park in the project, or to contribute to upgrading in the area. This could be understood as rewarding power.

They can also offer to comply with the most important complaints. Some even propose projects which have large discrepancies with respect to the overall plan in order to be able to comply with complaints, but still be allowed to build something else than defined in the overall plan. This could regard for instance the height of the buildings, the number of parking spaces or the share of large flats. This could be understood as manipulating power.

Power to define important frames

The developers are responsible for making the plans in planning processes. This gives the developers power, both regarding who wins and loses and in terms of agenda setting. In terms of agenda-setting, this power is exerted when defining the problem, the objectives, the alternatives, the variables which needs to be assessed, and how to compare alternatives. In terms of who wins and loses, putting the planning analyses, including the many necessary subjective considerations and the large uncertainties, in the hands of the developers opens for power exerted as more or less conscious manipulation.

The initiators may or may not exert this power in ways which deceive planning authorities and others (and to a stronger or lesser degree, and more or less consciously), and hence obtain permission to build something which is not in accordance with the societal objectives defined in the overall plan. Whether the initiators do exert this power in such ways depend among others on the moral of the developers, the ability and will of the planning system to

arrest and correct such manipulations, nature of the project and its possible consequences. Hence, this gives the initiators first and second dimension power (according to Lukes [1974] 2005) to get their project approved through influence and manipulation.

Power to lobby

The initiators have (in contrast to the planning authorities and other public authorities) the power to promote their project to decision-makers, neighbours, industry and commerce, other authorities etc., often termed lobbying. The initiators may promote their arguments in discussions regarding objectives and knowledge, as described above, or the benefits of the project. They may do this through direct contact, through media and through other channels (this is completely legal and acceptable, and it is not the intention here to make it seem suspicious).

The initiators can strengthen their power by forming alliances with other actors which benefits from their project and/ or which agree with the objective(s) the project is supposed to contribute to achieve.

Power to decide how to react to comments

The initiators, having the lead in the planning process, can also to a certain degree choose how to react to corrections, complaints, and comments from planning authorities and other during the planning process. They can choose to carry out new analyses if the planning authorities or others claim that the ones presented are faulty, biased etc., or not. They may choose to alter their proposed alternative due to comments and complaints or to present it for the decision-makers in order to make them decide whether the proposal is acceptable or not. This means that as long as the initiators follow the rules of the PBA, they can make and present whatever planning proposal they choose. Whether comments and disagreements, as well as mistakes and biases in the decisions support material, are presented for and understood by decision-makers depend heavily on the other actors in the game, as I will soon return to.

Power to challenge overall plans

The initiators (and others) also have the power to challenge the authority of the overall plan in order to strengthen the relative power of their zoning plan proposal, for instance when lobbying for their project. They can, as described above, challenge the objectives of the overall plan(s) and the knowledge they build upon, but also the authority of the overall plan *per se*. They could question whether strategic and principal decisions concerning overall objectives should be given prominent influence when discussing concrete projects, and implicitly whether the overall plan should be steering in this concrete zoning plan. This obviously also challenges the whole planning system and the PBA, but if this is intelligently effected, this point may pass undetected²⁶.

Playing on dispersed powers

The dispersed power structure in planning processes can be exploited by developers who want to challenge the overall plans. In this landscape, developers can play on the power struggles and grey areas, especially seen in relation to competing objectives and knowledge.

²⁶ One could also claim that it gives initiators tools to exert power within the third dimension, by influencing what is understood as important (economic growth, reducing urban road traffic volumes) and what is necessary to do in order to achieve this.

They can argue that they contribute strongly to achieving a certain objective defined as prominent by certain influential actors, or use knowledge accepted in certain influential milieus in order to demonstrate that their project for instance is societal profitable, even if it jeopardises objectives understood as highly important by others. They can gain broad local support to carry out projects which clearly conflicts with for instance national planning guidelines. This may make it hard for county or national authorities to require that the guidelines are complied.

Summing up

The ways initiators can exert their powers in order to get their project through can be summarised as follows:

- They have the power to *not* implement projects, and hence to force the authorities to allow them to do what they want
- They have the power to alter the project in ways which makes it easier to accept even though it is not in accordance with overall plans
- They make the plans and the analyses, which gives them the power to setting the agenda for the planning process and to producing analyses in more and less biased ways
- The initiators have the power to lobby their project through different channels
- They can strengthen their power by forming alliances
- They have the power to decide whether and how to react to comments and directions from planning authorities and others
- They have the power to challenge the authority given to the overall plan ('Should this kind of decisions be made on such and general and overall level?')
- They may undermining the authority of the overall plan and/or the planning authorities by applying their power to do lobbying
- They can play on the dispersed power structure in planning and decision-making for development of land use and transport-systems in order to get their will trough

6.6.3 The outcome of the processes are conditioned by how the other actors respond

It is in the nature of the planning system that developers and initiators apply the tools they have within the PBA and the system in order to be allowed to carry out their projects. Whether the PBA and the planning and decision-making system manage to steer development in directions securing the societal objectives they are designed to safeguard, depend on how the planning authorities and other main actors in the system act in each zoning plan case.

When initiators apply their tools in order to be allowed to carry out their project, and these projects are not in accordance with the overall plan and the overall objectives (such as reducing road traffic volumes or GHG emissions), the other actors can react in different ways. This constitutes in many ways the conditions for how the initiators may act and what they may achieve.

As one can understand from the description above, especially the planning authorities need to master a large repertoire of responses in order to steer the many zoning plan processes in traffic-reducing directions. They too have tools which they can apply, but here as well there are large latitudes regarding whether and how these are applied. There are many and different reasons and explanations why the tools come to be applied in various cases, or not.

6.6.4 Planning authorities have large responsibilities

The planning authorities shall ensure that procedures defined in the PBA are fulfilled. This involves, according to PBA § 4-2, among others to ensure that the project proposed in the plan, its purpose, its main effects, and how it relates to relevant plans and guidelines, are described. This also includes to ensuring that substantial effects and consequences of the project on environment and society – so called impact assessments – are carried out in satisfactory ways.

This means that the planning authorities can and shall (according to the law) overlook the plans and analyses that the initiators prepare, assess the quality of the plans and analyses and call attention to that which is not described or analysed in satisfactorily ways. This opens for different practices from planning authorities, where they to various degrees and in different ways follow up their duties.

6.6.4.1 Planning authorities may point out conflicting objectives

A main responsibility for planning authorities in zoning plan processes is to assess whether the proposed project is conflicting with objectives defined at all administrative levels, which are stated in various laws, and in regulations which the municipality is responsible for. Regarding development of land use and transport-systems, objectives and strategies will normally be defined in the overall municipal plan. There are also the national guidelines which can be (and shall be) applied in plan-making regarding development of land use and transport-systems, and which the planning authorities can lean on if they so wish and need. Hence, an important task or tool for planning authorities is to point out that proposed projects conflict with overall objectives and regulations stated in overall plans and elsewhere.

Initiators may apply different strategies when playing on objectives. Hence, planning authorities may need to getting involved in discussions regarding whether it is more important to achieve certain objectives than others, how the objectives are meant to be understood and interpreted, and to defend the achievability of objectives defined in overall plans. Whether, to which degree and with what success they do point out such conflicts of objectives depends on a number of factors.

One regards the quality of the overall plans. If the formulations of the relevant objectives are weak or unclear, the planning authorities cannot refer to these objectives as strong correctives for the zoning plan. On the other hand, planning authorities can emphasise clear and strong objective formulations in overall plans and national guidelines.

Another factor regards the expert knowledge at the planning authorities' office. If they do not have the expert knowledge to understand that a planned project e.g. conflicts with the objective of reducing urban road traffic volumes, they can hardly point out and substantiate that this is the case. Further, if this expert knowledge is lacking, one could expect that this aspect is lacking in the overall plans as well, and hence that one would not find clearly stated objectives regarding traffic reduction in the overall plans. On the other hand, if the planning authorities have obtained this expert knowledge, they can detect and point out conflicts of interests.

A third factor regards how the decision-makers relate to the overall plans and how they respond to conflicting objectives, and hence with which power planning authorities may claim that a zoning plan needs to be altered in order to be approved. If an objective is not

broadly supported politically, the initiators can choose to disregard the corrections from the planning authorities and rely on decision-makers to disregard them too. If an objective has strong political backing, the planning authorities often have no other option than to focus strongly on this.

Hence, an important tool for planning authorities in order to steer zoning plan processes in directions which are in accordance with overall plans and objectives is to point out and to problematize conflicts with stated objectives, by:

- assessing whether the planning proposal is in conflict with societal and other plans and objectives, and pointing it out and substantiating it if this is the case
- involving themselves in discussions regarding clarification and prioritisation of objectives

Relevant conditions affecting whether planning authorities can and will do this regard among others on:

- the quality of the overall plans
- the expert knowledge at the planning authorities' office
- how the decision-makers relate to the overall plans

6.6.4.2 Planning authorities may challenge the knowledge applied and produced

As described above, initiators may – more or less consciously – produce and present biased and faulty analyses and assessments of the consequences of implementing a proposed project. A highly important factor in the discussions of how and why plans are made which cause growth in urban road traffic volumes is whether and how the planning authorities do quality control and follow-up of the analyses and assessments carried out as part of the planning process.

This would be necessary in order to detect and point out if the plan or project in question causes and/or allows growth in urban road traffic volumes (or other negative and unwanted consequences), to detect and point out faulty or biased analyses under-estimating or hiding such effects, as well as to detect and point out lack of clarity with respect to this in presentation of plans and analyses. If planning authorities (and others) fail to detect and/or to point out manipulated or faulty assessments and analyses, decision-makers will make their decisions based on manipulated and/or faulty knowledge regarding future consequences of the project.

Planning authorities can also challenge the knowledge produced by initiators by doing their own analyses regarding important issues where they doubt the quality of the assessment carried out by the initiators. They can also propose their own alternatives if they find that relevant alternatives are missing, or they may refer to existing knowledge regarding the issue they discuss and substantiate their claims that way.

Planning authorities do to various degrees control, audit, and challenge the knowledge presented in plans, assessments, and analyses by the developers, for different reasons. One obviously regards whether the planning authorities have the necessary expert knowledge. If the planning authorities don't possess the necessary expert knowledge to evaluate the plans and their consequences with respect to e.g. influence on road traffic volumes, as well as the analyses and assessments regarding this, they obviously cannot correct and arrest low quality, biased, and/or manipulative knowledge and presentations of knowledge. This

problem could be (partly) mitigated if the planning authorities hired experts to assess the plans and analyses, and/or if they cooperated with other authorities that have such expert knowledge.

To which degree the planning authorities do such follow up also depend on their capacity and efficiency; whether there is time available to do the job. This will often also be a question of prioritisation, where the planning authorities decide or are instructed by decision-makers to focus more on certain issues (for instance aesthetics, universal design, reducing GHG emissions, reducing road traffic volumes) than on others.

Whether the planning authorities can claim that a project will have a certain consequence, or that an analysis is insufficiently carried out, also depends on the knowledge base within the field. If there are large uncertainties and unsettled scientific disagreements within a field, this will reduce the planning authorities' abilities to claim that a plan has certain effects or that an analysis is insufficiently carried out. Properties of the expert knowledge itself were discussed in chapter four, and will not be discussed any further here.

Whether the case-handler 'goes the extra mile' in order to point out clashes between zoning plans and overall plans, and/or weaknesses or biases in analyses and assessments, also depends on the characters of the professionals involved. This will not be further elaborated here.

These factors are also relevant when discussing whether, why and how the planning authorities go into debates and defend overall plans and the knowledge upon which these are based. If the planning authorities lack the expert knowledge, the capacity and the enthusiasm, and/or if the general knowledge base in this field is weak, and/or if the analyses upon which the overall plan is built is insufficient, the planning authorities can hardly defend the objectives and strategies defined in the overall plan on a professional or scientific basis.

As previously described, a strategy developers can apply is to change the focus in the planning processes from overall plans and objectives towards their project. Again, a clear and strong overall plan, possession of strong expert knowledge, capacity, and not least planners which are ready to go the extra mile and which have the abilities to steer through muddy waters, are necessary in order to detect, point out, substantiate and challenge such strategies.

Hence, planning authorities may challenge the knowledge applied and produced, by:

- assessing the proposal with respect to the quality and potential bias of the knowledge, and point out faulty and biased analyses
- assessing the proposal with respect to clarity in the presentation of consequences
- doing their own analyses regarding important issues where they doubt the quality of the assessment carried out by the initiators
- proposing their own alternatives if they find that relevant alternatives are missing
- referring to existing knowledge regarding the issue they discuss
- pointing out faults and disagreements when presenting their recommendations

Whether the planning authorities can and will to this, depends on the conditions, among others:

- whether planners at the planning authorities' office possess the expert knowledge in question
- their capacity, efficiency and prioritisations
- the knowledge base within the field
- the characters of the professionals involved

6.6.4.3 Conditional powers of planning authorities

The planning authorities do have - they are given - the power and the responsibility to ensure that planning processes are carried out in accordance with the procedural requirements of the PBA, to control that plans and assessments are made and described satisfactorily, and ask for improvements of descriptions, analyses and/or assessments which are not carried out within what is understood as good professional conduct. Further, they have the power to assess whether a proposed project is in accordance with overall plans and objectives, and to call attention to this fact if it is not. This can also be a strong agenda-setting power.

As discussed above, these powers can only be exerted efficiently if main objectives are clearly stated and defined, and if the planning authorities have the necessary capacity and expert knowledge to do follow-up. Another requirement regards how decision-makers relate to the knowledge, judgements and recommendations they receive from their planning authorities.

Developers/initiators, as well as planning authorities, will be aware of how decision-makers in the particular municipality normally react, and act in accordance with this. If decision-makers normally support the developers, the developers would more easily oppose and/or disregard the overall plans and the planning authorities. They could also be tempted to twist and manipulate data and analyses, since they would know that this probably will pass. The professionals working for the planning authorities would know that they have no power, and would eventually find it to be a waste of time and energy to point out biases, manipulations, weaknesses, and faults in plans and assessments. If decision-makers listen to recommendations from their planning authorities, on the other hand, this would increase the power of the planning authorities to steer plan-making processes towards achievement of stated societal objectives.

One could also expect that some areas and some types of developments are more in focus than others, meaning that the planning authorities know that decision-makers, consultative bodies, and/or others would raise questions if they let the developers get away with conflicting planning proposals or insufficient analyses in these cases. This means that somebody has exerted agenda-setting power, making certain objectives more prominent.

Whether planning authorities decide to do strong follow-up on planning processes, and how they do this, may also be affected by features of the initiators. Well respected developers and initiators, known as honest and respectable, may be treated with more sympathy than notorious rule-breakers, for instance. Some developers are extra welcome everywhere, such as IKEA, main quarters and buildings drawn by famous architects. Some developers and consultants may also be understood as stronger and tougher than others, meaning that they would put up a hard fight if the planning authorities decide to challenge their plans and analyses. These may be understood as powers possessed by the initiators, and which the planning authorities may respond to.

Hence, planning authorities have the power to:

- ensure that planning processes are carried out in accordance with the procedural requirements of the PBA
- assess whether a planning proposal is in accordance with overall plans, and call attention to the fact if it is not
- to control that plans and assessments are made and described satisfactorily
- ask for improvements of descriptions, analyses and/or assessments which are not carried out within what is understood as good professional practice
- recommend the politicians to not adopt the planning proposal if it is not in accordance with overall plans and objectives, or with procedural requirements

Whether this power can and will be exerted depend on a number of conditions, among others:

- if main objectives are clearly stated and defined in overall plans
- if the planning authorities have the necessary capacity and expert knowledge to do follow-up
- if decision-makers are loyal to the overall plans and to recommendations from the planning authorities
- properties of the initiators

6.6.5 Others entitled to comment on plans

The planning authorities do not carry the burden of steering zoning plan processes in directions defined by overall plans and/or objectives alone. Planning processes are organised in ways which are meant to ensure that plans and assessments are presented for affected and responsible bodies. They shall ensure that the areas, topics or interests they are supposed to safeguard (this could be water supply and sewage, drainage, traffic management, noise, local pollution, cultural historical interests, green areas, aesthetic considerations, universal design, public transport, other relevant plans in the area etc.) are treated in professional and responsible ways in the plans and assessments, and in accordance with laws, regulations, overall plans etc.

Throughout the planning processes, the hearings among authorities, the public, and others are meant to ensure: that the relevant contextual conditions are taken account of, that the most relevant alternatives are included in the planning process, that the relevant and important effects and consequences are assessed, and that the comparisons are done in reasonable ways.

6.6.5.1 Conflicts of objectives which they have special responsibilities or interests for

Whether various authorities and groups get involved in a zoning plan proposal at all, and how they respond, depend on whether the proposal is supporting or conflicting with the objectives of these bodies. If the planning proposal is in conflict with their objectives, and if they do understand that this is the case, they are supposed to call attention to this, and to call for changes.

This also means that various authorities ensure that analyses and assessments carried out within and with regard to their expert field is handled in acceptable ways. Regarding total traffic volumes, GHG emissions and land use and transport planning, the main authorities are normally the planning authorities as responsible for the overall municipal plan, the NPRA

as responsible for the main roads, the County Governor's office as responsible for ensuring that plans are in accordance with national planning guidelines etc., the County Council as responsible for spatial coordination between municipalities, and municipal transport and environment authorities. Environmental NGOs often play important roles as pressure groups and knowledge-suppliers.

6.6.5.2 Different kinds of powers

Whether the bodies entitled to comment on plans actually do so will vary with whether the objectives are clearly defined and politically supported, as well as their knowledge, capacity and priorities, much in the same way as described for the planning authorities. The kinds of powers these bodies have can, however, be of different kinds. Whether these bodies choose to apply those powers may be of great importance for the results of the planning processes.

Certain actors have, as previously described, the power to file formal complaints if a planning proposal conflicts with national or regional interests, is not in accordance with overall municipal plans, or if the consequences for their interests are not assessed or analysed satisfactorily. If the plans and/or assessments are not changed or improved in accordance with the complaints so that the formal complaint is dropped, and the City Council chooses to adopt the plan, the plan will not be valid. It needs to be presented to the Ministry of the Environment, which will approve or reject the plan.

This means that the authorities with powers to file formal complaints have important roles as guardians for national guidelines, purviews etc. Such tools can only have effect if the responsible authorities file formal complaints in planning processes where the guidelines and purviews are violated.

Other actors, such as neighbours, can have relatively strong powers. Negative response from neighbours can stop a plan, while positive support from local interests can be a strength. This means that initiators of plans normally will try to get local support. NGOs may have strong agenda-setting powers, by pointing at plans and/or assessments being biased, manipulated, faulty, or weak, that important alternatives are not included in the plans, that a proposed project counteracts prioritised objectives, and more. They can work through the procedures of the planning system, they can communicate directly to decision-makers, planning authorities, developers and others, as well as through media. Hence, they can have strong influence on the agenda and the ways a plan or a project is understood.

Hence, other authorities entitled to comment on plans can:

- Deliver statements in the hearings in the planning processes regarding issues which are not included, analysed in faulty ways, downplayed etc.
- Deliver formal complaints regarding issues which they have special responsibilities for protecting
- Bring focus on certain aspects which they find to have been downplayed by calling the attention of neighbours, the public and the media to it

If:

- The planning proposal conflicts with their objectives
- The issues they are supposed to safeguard are not satisfactorily treated in the planning process
- They have the knowledge and capacity to follow up and to respond on these issues

6.6.6 Decision-makers influence how the planners act

The last main group of actors (as defined here) are the decision-makers, the politicians at municipal level being the most relevant in zoning plan processes. If they do adopt zoning plans for development of land use and transport-systems which, if implemented, will cause growth in urban road traffic volumes, they directly contribute to developments of land use and transport-systems which cause growth in urban road traffic volumes. It is through the many zoning plan decisions municipal politicians actually steer the spatial development in their municipality.

Decision-makers affect the abilities of their planning authorities and planning system to deal with certain problems and questions, by calling for (or not calling for) overall or more detailed analyses and inquiries regarding for instance retail development or how transport-systems can be developed in order to minimize urban road traffic volumes. These can be produced as independent analyses or as part of the planning process for the municipal plan.

Decision-makers affect the understandings of problems, the political system's ability to understand problems and the focus on problems by contributing (or not) to the general public and political discussions, as well as in the discussions related to the planning processes. As described above, the attitudes and actions of decision-makers in situations where zoning plans conflict with objectives stated in overall plans will also affect the planning processes indirectly, by affecting how the planning authorities and others act in planning processes.

6.6.6.1 Defining objectives and deciding priorities

The objectives stated in overall plans and adopted by decision-makers are main tools for planning authorities. Challenging these objectives in several ways are, as previously described, a potential strategy for initiators which strive to be allowed to build something which is in conflict with such plans and objectives. We have also seen that 'a municipality' has numerous objectives, regarding numerous topics, which may be conflicting or competing.

Among the main tools for decision-makers could be to contribute to defining certain objectives as important, or to preventing this (differences between political parties could be understood as differences concerning what should be understood as the most important objective, as well as how to best achieve certain objectives). In zoning plan processes they have the power to reject planning proposals which are conflicting with the objectives they have stated and adopted. This would sometimes involve negotiations, and other times to defend their objectives in situations where developers threaten to not build anything if they don't get their will, or where they offer extra benefits if they do. Rejection or adoption of zoning plans can also involve prioritising between conflicting and competing desirable societal objectives.

6.6.6.2 Taking stand in knowledge disputes

Decision-makers decide whether they will listen to recommendations from the planners involved in planning processes. If they decide not to, they choose to make decisions without being informed about the effects and consequences of the decisions they are about to make. They could also have their own understanding regarding effects and consequences, or focus on certain aspects where they do know the effects and consequences, or they may rate the political importance of the project high enough to disregard its consequences.

Decision-makers also decide how they react to competing knowledge claims presented by initiators (and their consultants) and planning authorities and other public authorities. They may decide to listen to and follow the recommendations of any one of these, to disregard knowledge claims all together or to rely on other kinds of knowledge. As described above, how decision-makers respond to such knowledge debates and conflicts may have strong influence on the power distribution between initiators and planning authorities, and hence how they act.

6.6.6.3 'Decision-makers' are individuals

In the game of planning, decision-makers can apply a number of tools related to objectives, knowledge, and power. Many of these may be understood as different ways of reacting to zoning plan proposals from initiators of projects. We must bear in mind that when talking about 'decision-makers' here, we talk about many individuals, being more or less strongly tied to certain political parties, and which act more and less autonomous in societal and political debates and when voting in the City or Municipal Council. Decision-makers are clearly not a block or a co-ordinated group, they are also individuals.

Summing up, decision-makers can:

- call for analyses concerning issues they find important
- contribute to defining certain objectives as important, or to preventing issues to become important
- negotiate with developers/initiators
- affect the power distribution among other actors by supporting and act on recommendations
- reject or adopt zoning plans

If:

- They for any reason find that this suits the objectives of their party or themselves

6.6.7 Action and reactions of the actors constitutes the game of planning

This analysis has shown that the actors may use and play on objectives, knowledge, and power in many ways in order to affect the plan-making and the resulting plans. The actions and reactions of the actors constitute the game of planning, and it is through this game that the plans are shaped and produced. These kinds of games are going on within all the tasks in plan-making.

Hence, when plan-making results in plans which steer development of land use and transport-systems in directions which cause growth in traffic volumes, it is understood here that this among others is a result of how the planners working for the main actors have acted and reacted in the particular plan-making process.

In the studies of concrete cases, it has been explored how, exactly, the different actors have acted and reacted in the plan-making processes, and how and why their acting resulted in plans which cause growth in urban road traffic volumes.

6.7 Relevant explanations related to the plan-making processes

The research question in this chapter was whether properties of the plan-making processes can contribute to explaining how and why planners make plans which, if implemented, cause growth in urban road traffic volumes.

In order to answer this question, the plan-making processes have been understood as systems of organised complexity, where objects are causally interrelated, and vary simultaneously and in subtly interconnected ways. Critical realism approaches have been applied in order to describe and analyse the processes. By doing so, the black box that plan-making processes often seem to be, have been opened.

The causal powers embedded in the properties of the objectives, knowledge and powers of the planners interacting in plan-making have been identified and described. The main mechanisms through which the causal powers may produce traffic-increasing plans have been defined, and it was emphasised that these mechanisms can be activated in each of the tasks that constitutes a plan-making process. Finally, it has been described how planners working for various actors may act when struggling to achieve their (or their employers) main objectives through triggering the mentioned mechanisms.

This allowed for developing promising explanations for how and why properties of the plan-making processes may contribute to planners make traffic-increasing plans, and to illustrate this as in figure 54.

The figure may be summarised as follows: The structure (consisting of planners with their objectives, knowledge and powers interacting in plan-making processes in order to produce plans) has causal powers (embedded in properties of the objectives, knowledge and powers of the planners) to trigger generative mechanisms (the objective is not introduced or is ousted, the expert knowledge is not introduced or is ousted) under certain conditions (mainly related to properties of the other planners involved).

Triggering these mechanisms may, under certain conditions (mainly related to properties of the objectives, knowledge and powers of the actors in the plan-making process, the expert knowledge and the planners) produce certain effects (conflicting objectives are not detected, traffic-reducing alternatives not assessed etc.) which, under certain conditions (mainly related to how other actors respond in the plan-making process, to properties of the expert knowledge in question, and to properties of how the planners relate to this expert knowledge) cause the event 'traffic-increasing plans are made'.

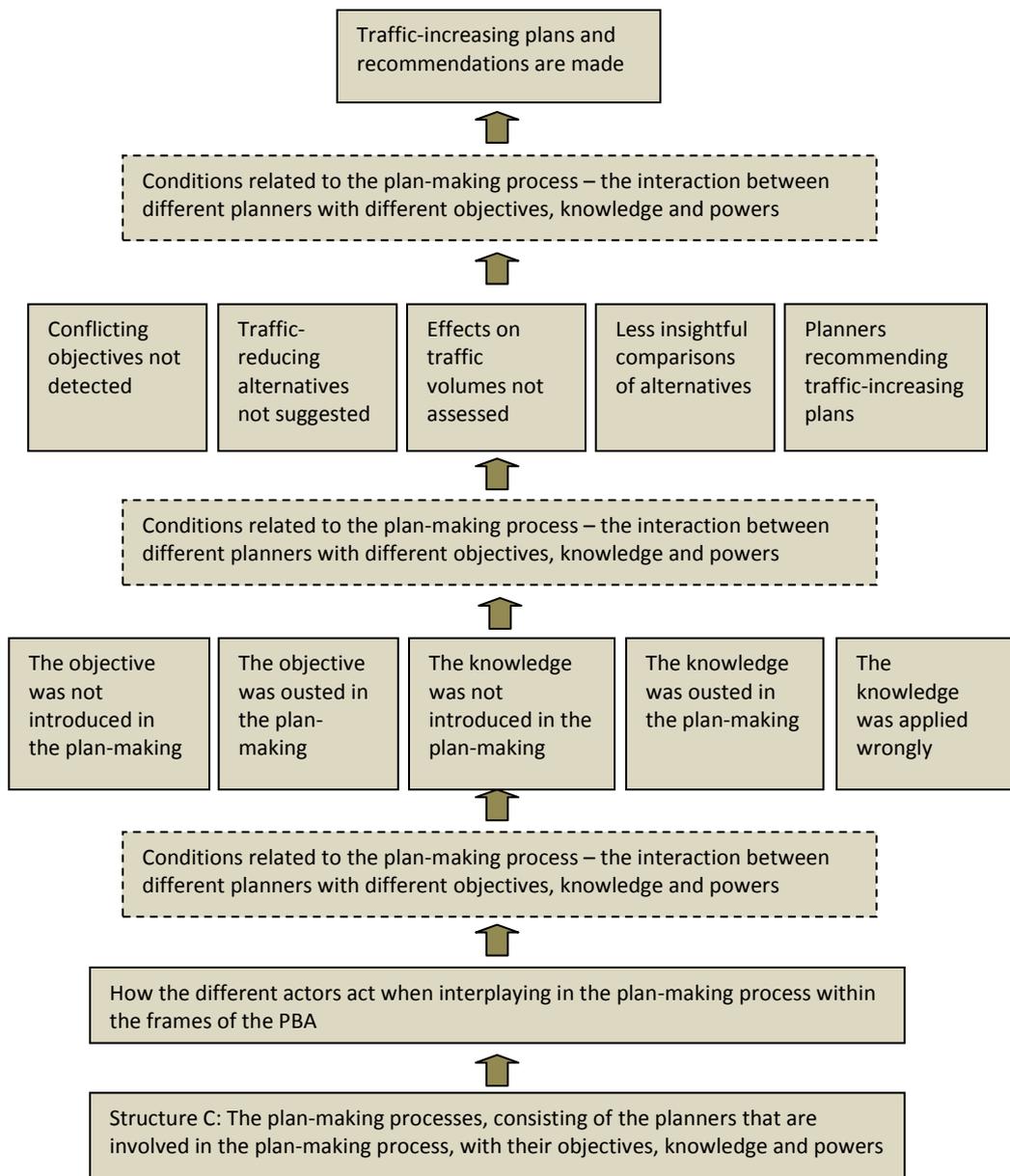


Figure 54: Explanations related to the plan-making process.

The main explanations for how and why plans are made which cause growth in traffic volumes, related to the plan-making processes, can be summarised:

Properties of the objectives, knowledge and powers of the planners may cause that:

- the objective is not introduced, causing that conflicts with the objective are not detected
- the objective is ousted, causing that the plan-making process is not steered in this direction
- the expert knowledge is not introduced, causing that a traffic-reducing alternative is not developed, and that the alternatives are not assessed with respect to traffic volumes
- the expert knowledge is ousted and other and less helpful knowledge with respect to reducing traffic volumes is applied
- the expert knowledge is applied wrongly, causing that the planners arrive at traffic-increasing answers

Whether the causal powers work through these mechanisms and produce traffic-increasing plans depend on the conditions, among others related to properties of the expert knowledge in question, the planners and the plan-making process.

6.8 Empirical findings regarding the plan-making processes

We now move on to examining whether and how the causal powers, mechanisms and conditions manifest themselves in concrete situations, through empirical studies.

The main objectives, knowledge and powers of the main actors in each of the four planning processes in the case study have been mapped. Analyses have been conducted in order to disclose how and why the objective of reducing traffic volumes and the expert knowledge in question have been excluded or ousted from the plan-making processes, and in which of the tasks in plan-making. It has also been mapped how, exactly, the planners working for various actors acted when excluding or ousting the relevant objective and expert knowledge.

Findings regarding these aspects are reported for each of the four cases. Each case-description is concluded with an explanation of how and why properties of that specific plan-making process contributed to planners making plans which, if implemented, cause growth in traffic volumes.

Describing objectives, knowledge and powers of the many actors involved, how these are applied when the planners involved shape and define objectives and knowledge in fine-grained, integrated and complex processes, and how the game of planning is played, takes much space. The descriptions and analyses below are only summaries of the more thorough and comprehensive descriptions and analyses reported in Appendix B.

6.8.1 Car based office development at Tunga

When explaining how and why the plan for a car-based and traffic-increasing office development at Tunga was made and recommended, a main explanatory factor was that nobody proposed to reject the plan (but rather to reduce it). How and why this occurred may partly be explained by properties of the plan-making process.

6.8.1.1 Objectives, knowledge and powers of the main actors

The objectives of the main actors

The main objective of the *initiators* in this case was to be allowed to develop their property, for reasons not relevant here. This was the initial cause why the planning process was initiated and the plan made.

The *planning authorities* shall among others ensure that spatial developments proceed according to overall plans. This involves in Trondheim to ensuring that land use is developed in ways that contribute to achieving the objective of reducing traffic volumes and GHG emissions from transport (Municipality of Trondheim 2007, 2008). Most new area-intensive work-places are to be located in the public transport corridor defined in overall plans.

Other and potentially competing objectives mentioned are to ensure densification on already developed areas in order to reduce the need for developments on new land, to ensure that a variety of business properties are offered in the city, and to ensure predictability and equality for initiators of planning processes. These objectives can be in conflict with denying office developments at Tunga, in various ways.

The regional authorities are supposed to ensure that the national planning guidelines and regional plans are followed, and that national interests are considered. In their comments to the case, the *County Council's office* and the *County Governor's office* signal that office developments at Tunga are problematic (Sør-Trøndelag County 2003, County Governor's office in Sør-Trøndelag 2009).

The knowledge of the main actors

The readings of the case-documents, as well as the interviews, leave the clear impressions that those involved know that office developments at Tunga and similar locations will generate more traffic than developments in the defined public transport corridor (Municipality of Trondheim 2009). The main mechanism in focus is that there will not be high bus-shares on journeys to work at work-places located at Tunga because the public transport services are not good enough to compete with the private car. Walking distances to bus-stops are too long, frequencies too low, and the bus-connections are in general unsatisfactory to large parts of the city. The case-handler claims that this is common knowledge at the planning authorities' office, and that 'most professionals' agree to this as far as she knows. This is confirmed by the other interviewees.

The relevant analyses in this case were simple analyses regarding the quality and competitiveness of the various modes of transport, as well as simple calculations regarding car traffic generation. These were conducted by the initiator's consultants. The planning authorities did not disagree with the descriptions and calculations, but they did disagree with the impact assessments. They found that the public transport services cannot be characterised as 'good' here, and that a predicted 2 % increase of road traffic on the already overloaded main road *will* indeed be noticeable.

It is clear from the documents that the analyses are rough and approximate, and hence that they are uncertain. The analysis is transparent, easily understandable, simple, and it uses realistic assumptions. There are no obvious attempts to make the predictions appear more positive or more certain than they are. The method and description of how the analyses have been carried out is understandable. The assumptions, data, analyses and results can be understood and opposed by others.

In the planning authorities' assessments and recommendations, they clarify that "Present public transport services imply that high office shares at Tunga will cause extensive car-use and undesirable GHG emissions" (Municipality of Trondheim 2009:9).

Exerted powers

There were no *strong* exertions of powers in this case, but all the main actors exerted powers. The *initiators* exerted their power to propose a project which they knew was not in accordance with the intentions in overall plans and policies. If they knew how previous office proposals in this area have been met, they also had the power to propose an office development that is about double the size that they actually intended to realise, in order to be allowed to build what they actually intended to build²⁷ (preparing for bargain). They also had and exerted the power to describe the impacts of the project with respect to traffic generation in positive and hopeful ways with respect to existing and future public transport services. Further, the initiators exerted their powers to collaborate with the public transport company.

The initiators and their consultants did not challenge the objectives or the expert knowledge embedded in the overall plans, but they did point at the fact that the plans state that 'most of' and 'at least 60 % of' the office developments are to be located in the public transport corridor. Offices can be developed in other locations if the public transport services are good. This contributed to change the agenda towards *how much* offices they should be allowed to develop rather than *whether* they should be allowed to develop offices here.

The *planning authorities* exerted their direct powers to propose an alternative project (a reduced development), which was accepted, to review and comment on the descriptions and analyses of the initiators, and to disagree with their assessments of consequences. They also exerted their agenda-setting powers by focusing on overall plans claiming that office developments in areas like Tunga should be restricted due to the transport consequences, forcing the initiators to assess the impacts of their project with respect to these issues. This was reinforced by the *County Council's and the County governor's offices'* exertion of their powers to commenting on the plans, and requiring that the size of the project was reduced. They did not exert their powers to stop the project.

The planning authorities signalled in their assessments and recommendations that a main reason why they don't call for a rejection of the plan is that they are uncertain of what the Tunga-area should be used for. Since they have no clear answers, they have to allow the initiator to develop something. This could be interpreted as an understanding that the initiators should be allowed to build *something* on their properties, they cannot be denied to develop their property. This could be an underlying structural power that contributes to the plan being made and recommended.

6.8.1.2 How and by whom the objective or knowledge were ousted

A traffic-increasing plan has been made. This requires that either the objective or the expert knowledge in question have been excluded or ousted in one or more of the tasks involved in the plan-making process. The following analysis aims at disclosing which of these

²⁷ I was not able to get an interview with the initiators, which is the reason why they have not been asked whether this was the case.

mechanisms that were activated in this case, and which conditions that allowed this to happen.

The objective was introduced and understood as important

The objectives concerning to reduce road traffic and GHG emissions were brought into the plan-making discussion by the planning authorities' references to overall plans, and by comments in the hearing. This objective was a main issue throughout the process. The planning authorities' *recommendations* also revolve around this topic. This means that the objective in question was introduced early in the process, and understood as important throughout the project.

The expert knowledge was introduced and applied

The expert knowledge in question was brought into the plan-making process through references to overall plans. These state that area-intensive work-places rather should be located in the public transport corridor. There is no real opposition to the expert knowledge in question. The expert knowledge was concretely manifested by the municipal and county authorities presenting *alternatives* involving smaller office projects than the original proposal. The argument for reducing the project was to reduce the growth in traffic volumes and GHG emissions. Consequences with respect to this objective, as well as potential mitigating measures, were the main issues in the *impact assessments*. Nobody proposed an alternative with no office development.

Arguments based on the expert knowledge in question have been applied throughout the plan-making process. This means that the expert knowledge in question *was* introduced in the plan-making process and *not* ousted.

The objective was ousted by other objectives

When asked why this plan was made and adopted, instead of rejected, the planners at the planning authorities' office had multiple and reflective explanations, which mainly were related to competing objectives and ambiguous overall plans.

The interviewees at the planning authorities' office explained that the municipal plan, which is the steering instrument the planning authorities uses when intervening in this case, is somewhat ambiguous when it regards whether one should allow office developments at Tunga. The Tunga area is designated for un-specified business development, which may be office developments. Further, the overall plans say that 'most of' and '60 % of' the area-intensive workplaces should be located within the public transport corridor, not 100 %. This means that the municipal plan is not a very strong steering tool with respect to preventing office developments at Tunga. The politicians had overruled the planning authorities' recommendations of rejecting proposals for area intensive business here several times. Hence, this objective is not a very strong steering instrument for those finding that no office developments should be allowed at Tunga.

According to the interviewees, there are competing objectives. The call for high density development on already developed land indicates that high density developments should be allowed here. Established practice indicates that objectives regarding predictable and equal conduct call for allowing the developers to build about half of what they propose. There is also the fact that the planning authorities have not yet clarified what should be developed at Tunga.

These factors constitute the conditions that allowed the mechanism 'the objective reducing urban road traffic volumes is ousted' to be activated. Hence, a traffic-reducing alternative was not proposed' and a traffic-increasing plan was made and recommended.

The following office development plans were met by formal complaints from the County Governor's office. The fact that several office developments were proposed within a short time at Tunga made them understand that the situation needed to be evaluated. They had not been 'aware enough' of the situation until then. If they had, they could have stopped this and other plans.

6.8.1.3 How the actors acted when making the traffic-increasing plan

It is interesting to mapping how, exactly, the planners acted and interacted when making the traffic-increasing plan. This is summarised below, according to the framework defined in chapter 6.6.

- The initiators proposed a zoning plan that was not in accordance with the intentions and objectives in overall plans, and did hence oppose the overall plans
- The planning authorities pointed out conflicts with objectives in overall plans, assessed and challenged the analyses and assessments conducted by the initiators and their consultants, and suggested a reduced alternative
- The County Governor's office and the County Council's office delivered comments, but not formal complaints, drawing attention to negative consequences with respect to traffic volumes and GHG emissions and suggesting a reduced alternative
- The initiators agreed to reduce their project in accordance with the alternative proposed by the planning authorities
- The planning authorities recommended the politicians to adopt the reduced planning proposal
- The political decision-makers adopted the planning proposal recommended by the planning authorities, against the votes of a large minority voting for rejecting the plan and calling for more comprehensive analyses

6.8.1.4 Explanations related to the plan-making process

The explanations why this zoning plan was made and adopted are mainly found in the plan-making processes. The objective was introduced and understood as important, and the expert knowledge was applied. The objective 'reducing road traffic volumes' was nevertheless ousted by competing objectives, which called for allowing office developments at Tunga. This caused that the planning authorities recommended a reduced office development at Tunga instead of to reject the proposal. The main conditions allowing this to occur, regard mainly that the overall plans are ambiguous with respect to office developments at Tunga and that competing objectives exist, as described.

6.8.2 The largest shopping centre in Oslo at Økern

The planning authorities and the initiators proposed different planning-alternatives in the zoning plan for Økern. The proposal from the initiators is understood as the traffic-increasing alternative. A main explanation how and why this traffic-increasing planning-alternative was presented by the initiators and adopted by the municipal politicians, was that the initiators were able to cause doubts and confusion regarding whether they proposed a regional and car-based shopping centre.

This was done by twisting the objective as well as the knowledge in ways that in reality ousted the objective and knowledge in question. This allowed politicians and others to believe that the project is in accordance with the overall plans, and they adopted it. The planning authorities upheld their alternative and argumentation throughout the process, meaning that the City Council *chose* to rely on the initiators rather than the planning authorities. The case will be finally decided by the Ministry of Environment.

6.8.2.1 Objectives, knowledge and powers of the main actors

The main objectives of the main actors

The initiators' main objective is to be allowed to realise their plans for 160.000 m² new developments at Økern, including a 60.000 m² shopping centre. To generating only as low as possible GHG emissions from transport and stationary energy consumption are among the objectives stated in their planning proposal (Space group et al. 2010).

The clear and outspoken objective of the planning authorities is to make sure that the plans and projects are in accordance with relevant overall plans and policy documents, such as the municipal sector plan for retail and services. These overall plans and purviews aim at reducing transport demand and car dependency, by offering necessary retail and services to the inhabitants that is easily accessible without car (Municipality of Oslo 2003, 2004, 2009, 2010). A main idea is that regional and car-based shopping centres shall not be allowed in Oslo. The planning authorities have arrived at about 25.000 m² retail is the optimal amount of shopping here.

The other main objective for the city is to make a zoning plan which prepares for the area to be developed as soon as possible after the construction works in the area are completed. The District Council politicians emphasised that the objective to ensure that *something* good for the area is going to happen here, and soon, is their main concern (Municipality of Oslo 2009a). The main objective for the planning authorities could hence be understood as to make sure that a planning proposal for a 160.000 m² development at Økern is made and adopted, but that only about 25.000 m² of this should be shopping.

Among NPRA's responsibilities is to draw attention to, and (sometimes) to filing complaints against, consequences of spatial development plans on the traffic on the main road system. In this case, the NPRA focused just as much on objectives related to GHG emissions (NPRA 2009).

The County governor's office is supposed to ensure that the national purviews and guidelines are obeyed, including that zoning plans for the shopping centre developments are in accordance with the municipal sector plan. The main objectives are to strengthen existing city centres and local centres, and to avoid car dependency and worsened access to shopping and services for those that cannot or will not drive a car.

The knowledge of the main actors

The planning authorities lean on overall plans and their requirements related to retail development. They explain how and why a project including 60.000 m² shopping centre will cause more traffic and have more negative effects on the existing retail structure than a project including a 25.000 m² shopping centre. This is done as professional reasoning with basis in the expert knowledge in question, explaining how certain changes in the system cause multiple and iterative effects. They include simple and understandable calculations.

Hence, the planning authorities seem to possess and apply the expert knowledge in question.

The case handler demonstrates her insights in interview, but explain that her own, as well as the planning authorities' competence when it regards transport analyses could have been better. In these questions, they often lean on NPRA. The case-handler at NPRA agreed that they had assessed the transport analyses. He explained the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes in accordance with the description of the expert knowledge in chapter four, and he did his reasoning on basis of such understandings.

The analyses presented by the initiators build in several ways on understandings similar to those embedded in the expert knowledge in question. In their planning proposal (Space group et al. 2010), the initiators seemingly follow the same lines of professional reasoning as the planning authorities. At the same time, they make assumptions that are not in accordance with the expert knowledge in question at all. This points in direction that they don't possess the basic understandings of the expert knowledge in question. They also bring in competing expert knowledge (retail analyses), and take these as starting point for discussing traffic generation and effects on existing retail structure, assisted by traffic analyses.

The interviewee at the District Council's office doubted if there could be any general knowledge regarding how locating a shopping centre of this size at this site would affect traffic volumes and existing retail structure.

Powers exerted at full force

Powers are exerted at almost full force by all actors in this process. *The initiators* propose a project that they know is not in accordance with the overall plans. They 'threaten' that there will be no project at all if they are not allowed to build the proposed shopping centre. This may be understood as an attempt to force the decision-makers to accept their proposal. They also make the proposal more desirable for the politicians by adding tempting activities such as a public bath, library etc.

The initiators use their power as the employers of the consultants to manipulate the analyses with biased data and assumptions that make the project appear less in conflict with the municipal sector plan than it is, to present the findings in best possible ways with respect to their project, and to create confusion regarding the consequences of the two alternatives. They use their power to (in their full right, legally and ethically) present their proposal to the district politicians and others in order to convince them that their proposal will bring assets to the district ('lobbying').

The *planning authorities* line up the national guidelines for land use and transport planning, the national purviews for shopping centres, the overall municipal plan, the municipal sector plan for location of retail and services and the binding area plan for the Økern-site as strong and heavy agenda-setting power tools. They control that the planning process is done in accordance with the PBA, and make sure that important issues are defined in the planning program.

The planning authorities also propose an alternative to the initiators' proposal, which according to the case-handler is rare. They write up the planning proposal which is presented for public hearing, and they ensure that the main discussions between the

planning authorities and the initiators are made visible, clear, and understandable. They also discuss the analyses and findings presented by the initiators, and explain where they disagree with assumptions, data, interpretations and presentations, and why. Later, they write the presentation of the planning proposal to the City Council, and recommend strongly that the City Council does not adopt the proposed plan.

The District Council exerted their powers to emphasise what they find to be more important locally, even though they knew this could cause negative effects for the city and the environment.

A number of authorities exert their powers to *comment on the plan* and point out that the initiators' proposal is not in accordance with the overall plan, that it will be a regional and car-based shopping centre, and that it will have negative effects with respect to traffic volumes and retail structure. They also point out false or questionable data and assumptions. *NPRA* and *the County Governor's office* use their strongest tools, the formal complaint. They state from the start of the process that they will apply this tool if the initiators propose a 60.000 m² shopping centre, and they eventually file the formal complaints.

6.8.2.2 How, why and by whom the objective or knowledge were ousted

The initiators needed to demonstrate that the proposal was in accordance with overall plans According to governmental purviews presented by the Ministry of Environment (2008), zoning plans for shopping centres larger than 3.000 m² can only be adopted by the City Council if an adopted regional overall plan for retail development exists, and if the zoning plan is in accordance with this overall plan. In Oslo, there is a binding municipal sector plan for retail and services (Municipality of Oslo 2003).

A defined assumption in the sector plan is that regional and car-based shopping centres that cause car-dependency, more traffic and negative effects on the existing retail structure shall not be allowed in Oslo. One aims rather at upholding and developing a pattern of many relatively small centres in short distance to where people live. According to the planning authorities, the *NPRA* and *Akershus County*, the initiators' proposal will break up this pattern, cause negative effects on the existing retail structure and generate high traffic volumes. Hence, it is in conflict with the binding sector plan, and cannot be adopted.

This means that in order for the initiators to get a binding zoning plan, they needed to convince the municipal politicians, the authorities with right to file formal complaints and preferably the planning authorities that their plan *is* in accordance with the overall plans. They needed to convince them that this is not 'a regional and car-based shopping centre' that will cause high car shares and negative effects on the existing retail structure. The following analytical description presents the short story of how they went about with this in the various tasks in the plan-making process.

The objective was introduced and perceived as important in all tasks

The objective 'to reduce urban road traffic volumes' was introduced in this zoning plan process by the planning authorities and other authorities. It was made a prominent objective by references to the national purviews and the municipal sector plan, and it was explained that the large shopping centre was not in accordance with these. Two authorities warned that they would file formal complaints if that part of the plan was upheld.

The initiators did, however, uphold their original plan. The planning authorities decided to present their own *alternative*, including 25.000 m² shopping as part of a 160.0000 m² plan. This would allow the decision-makers to make a decision that is in accordance with the overall objective, and still allowing for development of the area.

Because of the clear requirements in the planning programme with respect to objectives regarding traffic volumes and retail structure, the initiators had to include these issues when conducting *impact assessments* for both alternatives and when doing *comparisons* of the alternatives on the basis of these.

These impact assessments demonstrated that the initiators' alternative was not in accordance with objectives in the overall plans. The initiators met this by changing the focus away from the concrete objectives 'reducing urban road traffic volumes' and 'effects on retail structure' and towards the more vague objective formulations regarding whether their proposal regards 'a large local centre' in contrast to the 'regional and car based' centres that the municipal sector plan establishes that are not allowed.

The initiators also focused more strongly on the other objective; to ensure that something happens here soon. Among their strong arguments is that the developers 'offer' to develop the whole site. It is, however, necessary to develop 60.000 m² shopping centre as part of the project, since "[e]conomic feasibility studies²⁸ show that the development of Økern must include 60.000 m² retail" (Space group et al. 2010:40). If they are not allowed to develop the large shopping centre, there cannot be any project at all. The interviewees working for the planning authorities and the NPRA are sure the area will be developed anyhow, but maybe not as fast.

The developers *recommend* that their project is adopted, and emphasise that they can and will develop this area as a good contribution to the city, and that the proposal "will not have negative consequences with respect to environment and society" (Space group et al. 2010:129). The planning authorities emphasise that the initiators' proposal will have strong negative effects with respect to objectives related to traffic and retail structure, and they strongly recommend the decision-makers to not adopt the plan. They also emphasise that their alternative proposal facilitate development of the area without causing those negative effects. Two regional authorities did the same, through formal complaints.

This demonstrates that the objective 'reducing urban road traffic volumes' was introduced in the plan-making process, and that it was upheld as prominent by the planning authorities and others throughout all the tasks of the plan-making process. It also shows that the initiators tried to change focus and 'twist' the objectives in ways that made it less obvious that their alternative is in conflict with overall plans and purviews.

The expert knowledge in question was introduced and applied

The expert knowledge in question was applied when the overall national purviews and municipal plans were developed. This in turn enabled *objectives* stating that traffic volumes need to be reduced and how land use and transport-systems need to be developed in order to contribute to this. On basis of this, Oslo had arrived at a strategy for developing 'many and small' centres rather than 'few and large'. This ensures good access to shopping and

²⁸ These feasibility studies were not presented in the planning process.

services for all as well as low car dependency and traffic volumes related to shopping travels. This has been described and formalised in the municipal sector plan for retail and services (Municipality of Oslo 2003).

The planning authorities arrived at their *alternative* by applying the expert knowledge in question and dimensioning the shopping centre with respect to the number of people living in real walking distance from the centre. Hence, the planning authorities ensured that an alternative based on the expert knowledge in question was introduced in the process. The developer based their dimensioning of the centre on an economic feasibility study. They hence applied other kinds of expert knowledge in order to arrive at their alternative.

In the discussions regarding which *impacts* that should be *assessed*, there were no doubt that effects on traffic volumes and retail structure should be assessed. The initiators conducted a kind of professional reasoning, and applied retail analyses and traffic analyses as part of this, in their impact assessments (Space group *et al.* 2010). This do to some degree include that the simplest understanding of the expert knowledge in question is applied by the initiators (or at least this is how it is presented in the analyses).

The initiators conclude that their proposal is in accordance with the governmental purviews because "[t]he retail analysis shows that the project will not have negative consequences for Oslo city centre and for other centres in the district, and because the traffic analyses show that this project will not cause higher traffic volumes than if the shopping was done other places in the city. The initiators hence conclude that "the project is in accordance with the municipal sector plan for development of retail and services" (Space group *et al.* 2010:59).

My assessment is that the initiators can only conclude this way because they have applied questionable analyses, applied biased data, done speculative comparisons and presented their findings in misleading ways. Some examples are described below.

The initiators present questionable analyses and present the findings in misleading ways

The initiators use car shares that are quite optimistic with respect to the large market area that is required, as pointed out by several commentators. Further, they use the same car shares for both alternatives, which is unrealistic since a larger centre needs to recruit customers from a larger area, and hence that fewer customers can and will walk or bicycle on their shopping journeys. Choosing these *input data and assumptions* is not in accordance with the expert knowledge in question. It causes that the traffic analyses produce too low traffic generation volumes for the large centre, according to the NPRA and to my own evaluation of the analyses. This has effects for the other analyses conducted on basis of traffic analyses.

Further, the initiators measure the number of people living within a 2 km radius as the crow flies when doing their calculations. In planning analyses, when applying the expert knowledge in question, real walking distances are usually applied. This is because choice of traffic mode varies with actual travel distance and not with distances 'as the crow flies'. The figures for 'the number of people living within 2 km from the centre' are higher than the figures for 'people living within 2 km in real walking distances'. When the initiators apply the same variable ('2 km') as the planning authorities, but for something else ('local' not 'walking- and bicycling distance'), the difference is hard to understand for others. It is quite confusing that the initiators use this variable differently from what is normally done.

The initiators present their analysis and findings as far more scientific and certain than they are, and it takes quite some work to understand what are based on chosen assumptions and what are based on 'facts' and analyses. For instance are the market area, the market shares in each areas and the car share on travel journeys assumptions *defined* by the ones doing the analyses. This is not clarified. Rather it *appears as these variables are deduced* through objective and fact-based analyses. The analyses and findings are presented as certain, objective and scientific. Necessary information regarding method and data are not included, making especially the retail analysis a black box.

The presentations of the findings and the consequences of these, are not clarifying either. The initiators state that they base their analyses on the expert knowledge in question, and that the analyses show that the initiators' proposal will not cause negative effects for existing retail structure and traffic volumes, when the findings of the initiators' analyses, demonstrably and in fact, show that it will.

They also make rather speculative assumptions. This can be exemplified by their discussions concerning GHG emissions. The initiators assume a certain 'stationary GHG emissions level' for the 25.000 m² shopping centre, while those emissions are set to zero for the 60.000 m² shopping centre. Hence, when summarizing the stationary and mobile GHG emissions, the large centre cause less GHG emissions than the smaller one, even though the 'transport GHG emissions' were larger.

In their final proposal to the Standing committee on urban development, the initiators present a calculation as 'evidence' that the planning authorities have arrived at wrong answers because they have applied faulty or biased data and assumptions (Civitas 2010). The initiators, applying their own data and assumptions, find that the necessary size of the shopping centre is about 56.000 m². They have however, made major mistakes with regards to calculating the figures and with regard to assumptions (discounting buying power but not turnover), see appendix B for further details. If the obvious mistakes are corrected, the calculations show that the necessary size is about 34.000 m². If they used less optimistic prognoses and included only people living in real walking distance according to the planning authorities' assumptions, they would have arrived at about the same figures as the planning authorities.

In their *recommendations*, the planning authorities explain how and why the initiators' proposal is not in accordance with overall plans, with basis in the expert knowledge in question.

This shows that, the expert knowledge in question was introduced and applied throughout the process by the planning authorities, and seemingly also by the initiators. It was, however, challenged by the initiators' analyses which had been twisted and interpreted in order to present the project as in accordance with overall plans, as well as by other kinds of knowledge.

Objectives and knowledge have been 'twisted' in order to make the project acceptable

The discussions above have demonstrated that the planning authorities, NPRA and Akershus County have ensured that the objectives 'minimising traffic volumes' and 'not affecting existing retail structure negatively' have been in focus throughout the plan-making process. They have also demonstrated that the initiators have tried to change focus and 'twist' the

objectives in directions making it less obvious that their proposal is not in accordance with the overall plans.

Likewise, the planning authorities have applied the expert knowledge in question in overall plans as well as in their calculations, argumentation and reasoning in this zoning plan. They have also applied this knowledge when analysing and explaining how and why the initiators' proposal is not in accordance with overall plans.

The initiators have applied the expert knowledge in question, together with retail analyses and traffic analyses in their argumentation and reasoning. They have however applied the knowledge in ways that make their project seem less in conflict with overall plans than it is, and in ways that cause confusion among those that are not very knowledgeable within this issue. Several of the interviewees find that the initiators 'twist' the expert knowledge in question as well as other kinds of knowledge in order to make their project appear less in conflict with overall plans than it in reality is. This is also quite evident when studying the case documents.

As discussed in chapter four, one could ask whether weaknesses of the expert knowledge cause that the initiators apply the expert knowledge and present their findings this way. We did however find that the initiators' analyses actually demonstrate the same as the public authorities claim. Further, the planning authorities and other authorities have pointed this out throughout the plan-making process and in all the central planning documents. The initiators have not substantiated claims there have been clear disagreements about any further, such as their argument that a large amount of the customer will be people from Oslo that go shorter and by public transport to shop at Økern rather than to travel longer by car to shop at the neighbouring municipalities. Rather, their own analyses demonstrate the opposite.

By twisting the objective as well as the knowledge, the initiators facilitate that politicians can conclude either that they rely more on the initiators than on the planning authorities, or that they don't rely on these 'experts' who do nothing but fighting.

The political decision-makers bought it

The City Council adopted the plan. The majority in the Standing Committee on urban Development remarked that the main reasons why they recommended the City Council to adopt the plan, were that this is an expansion of the inner city that is in accordance with overall plans, that the retail analyses show that the large centre will not affect the market shares for the City centre or other shopping centres in the vicinity, and that the new centre instead will compete with regional centres in the neighbour municipalities. They also emphasise that the District Council is positive to the plans, and they agree that it is important that the area is developed and improved as fast as possible.

Hence, the initiators had been successful in their strategy of twisting objectives and knowledge. The political decision-makers listened to them, rather than to their own planning authorities, the NPRA and the County governor.

6.8.2.3 How the actors acted when making the traffic-increasing plan

This case offers a view into an interesting battle between strong developers and initiators at one side, and strong planning and other public authorities at the other. Both sides apply knowledge production and knowledge discussions as main tools. How the actors acted,

exactly, is presented very briefly below, based on the framework defined in chapter 6.6. A few more detailed descriptions of how the actors act are included as examples. A thorough description is found in Appendix B.

The initiators proposed their project and presented 'twisted' analyses

- The initiators proposed a project which was not in accordance with overall plans
- Several authorities warned that formal complaints would be filed if the plan was upheld, and the City Council would not be allowed to adopt the planning proposal
- Hence, the initiators needed to demonstrate that the plan *was* in accordance with the overall plans
- The initiators were made and presented biased and manipulated analyses in order to make the project appear as being more in accordance with overall plans while it was not, by:
 - o applying biased data and assumptions, often without references
 - o manipulating analyses and in ways which made them arrive at fewer and less severe impacts with respect to important objectives than it in reality will have
 - o doing several analyses in order to come up with something they could use as argument how and why their project was not worse than another project
 - o present many and confusing analyses in order to be able to present the findings in ways that suits the project
- Presenting findings in ways which make the project appear more in accordance with the overall plan than it is

Illustrated by an example

The latter point can be more thoroughly described, as an example. It was found that even if the developer's consultants did apply assumptions and input data which made the project appear more in accordance with the municipal sector plan, they still did arrive at results which show that their proposal is not in accordance with the overall plan:

- The primary market area of the centre includes five urban districts in Oslo, and the secondary market area additional four, hence the total market area covers nine out of 15 urban districts in Oslo (Space group et al. 2010:73) – this is considered 'regional' by the planning authorities
- The 60.000 m² shopping centre will reduce the city centre's market share in this market area (nine out of 15 urban districts) by 20 %, 'the rest of the primary area's share by 13 % and 'the rest of the secondary area's' share by 12 % (Space group et al. 2010:77, Municipality of Oslo 2010:29)
- In total (all 160.000 m²), the developers' proposal will cause about 54 % more traffic than the planning authorities' alternative (Space group et al. 2010: 97)
- Compared to 'averagely traffic generating' localisation of the proposed functions in the city, the proposed project will cause 12,6 % more vkm and GHG-emission caused by transport, while if looking only at retail the figure is 7 % (Space group et al. 2010:100)

Based on these findings, the initiators repeatedly claim that their analyses do show that the project is in accordance with the municipal sector plan and the governmental purviews. They state that: "The initiator find that the proposal is in accordance with the intentions in the national purviews because it opens for a sustainable development in a node, because the retail analysis show that the project will not have negative effects on Oslo city centre or other nearby retail centres, and because the traffic analyses show that the project will not

generate more traffic than if the shopping would take place other places in the city” (Space group et al. 2010:59).

Other ways of exerting power

- When confronted with the facts that their project caused more traffic volumes and GHG emission than all other comparable developments, the initiators brought in other elements in order to reduce the significance of differences in traffic generation (such as assuming 0 tons stationary GHG emission from their project)
- The initiators also argued that the objectives should not be seen in relation to effects on traffic volumes and existing retail structure, but that one rather should discuss whether this is a ‘regional and car based shopping centre’ or ‘a large local centre’
- They brought ‘sweets’ into the project, such as a public bath, a potential library etc., which was much appreciated by the District Council politicians
- The initiators used ‘threats’, claiming that if they were not allowed to build what they wanted here, the site would not be developed for a long time
- The initiators aimed at weakening the authority of the overall plan by challenging its knowledge base, by:
 - o claiming that the large shopping centre is a missing link in the centre hierarchy, causing people from Oslo travel long distances to the large shopping centres in other municipalities (this was never substantiated)
 - o claiming that it was based on insufficient understanding of how the retail-market functions, and hence which centre-structure is adequate in Oslo
- The initiators aimed at changing focus from the overall perspective and objectives regarding how the retail structure ought to be, towards what they should be allowed to do in project; from structural approach to project approach

The planning authorities pointed out conflicting objectives

How a plan-making process proceeds is a result of actions and reactions by all the main actors involved. The initiators may act in various ways, but the outcome of a plan-making process is also strongly affected by how the planning g authorities act and react. In this case, the planning authorities have applied most of their tools:

- they pointed out that the project is in conflict with the overall plan and how, in a clear and unambiguous way
- they proposed an alternative
- they did their own assessment of this as an alternative to the analyses conducted by the initiators’ consultants
- they were making clear recommendations to the decision-makers

The planning authorities could play a strong and active role in this case because the quality of the overall plan was good, the objectives were relatively clearly stated, because they had the necessary competence and could use the necessary capacity, and because the politicians previously had been loyal to the overall plan. Further, the expert knowledge in question is good enough to lean on in these discussions, even though it could be even better, especially with regard to empirical knowledge. They met strong developers and initiators, but decided to take the fight.

Other authorities applied their knowledge and powers

Other actors did contribute in this plan-making process:

- a number of authorities commented on the planning proposal several times throughout the planning process
- The County governor's office and the NPRA stated from the start that they would need to file formal complaints if the initiators decided to uphold their proposal
- the two authorities finally filed formal complaints

The politicians adopted the plan

When the politicians adopted the plan, this could not be blamed on the planning authorities or the other relevant authorities. They had done their part, and explained as crisp and clear as possible, the negative impacts of the project with respect to prioritised objectives in the City's own overall plans.

6.8.2.4 Explanations related to the plan-making process

As thoroughly described, discussed and analysed above and not least in Appendix B, the objectives and the expert knowledge in question were introduced into the process, and never excluded. The initiators did however twist the objective and knowledge. All together they were able to create an understanding that in order for something to happen at all at Økern, the developers needed to be allowed to build a 60.000 m² shopping centre. They were also able to present their analyses and findings in ways that made it appear as this would not cause significant negative effects on existing retail structure or more growth in traffic volumes than 'the alternative' (although it in fact will). It was clever and good done, and convinced the majority of the politicians. It did, however, never convince the planners at the planning authorities, the NPRA and Akershus County.

6.8.3 Car based housing development in Skedsmo

The main explanations how and why three zoning plans for housing developments in car based locations were made and recommended in Skedsmo were that the objective 'reducing urban road traffic volumes' and the knowledge of how to do it were never introduced in the plan-making processes. This has a lot to do with properties of the plan-making processes.

6.8.3.1 Objectives, knowledge and powers of the main actors

The objectives of the main actors

Objectives were in general not clearly discussed in the planning proposals. In all three proposals it is stated that the intention with proposing the plan is to be allowed to develop housing on the respective sites (Municipality of Skedsmo 2007, 2008, 2008a, 2009).

The planning authorities did not present or promote any other objectives in the zoning plans, even though such objectives were stated somewhat vaguely in the current overall plans (Akershus County 2004, Municipality of Skedsmo 2006). According to the case-handler for two of the cases, one is aware that housing developments located like these are car-based, but this was not in focus in these plans. Reducing road traffic volumes was not mentioned by any of the actors in any of the cases.

The knowledge of the main actors

When reading the planning proposals, one finds no traces that the expert knowledge in question has been applied in order to assess whether the location of the projects, or to develop housing in these areas, will cause undesired growth in traffic volumes. This was

confirmed in the interviews. There are conducted traffic-analyses in the cases, arriving at how much traffic the new developments will cause and whether this has local consequences, but this is not analysed with respect to whether one should allow housing developments in these car-based locations. This is as expected, since there is no focus on this objective in the cases.

Exerted powers

In these cases, nobody needed to exert their powers strongly. The initiators exerted their power to propose plans, the planning authorities exerted their powers to process them according to the PBA, and the majority of the Municipal Council exerted their powers to adopt them.

This also means that the planning authorities, as well as important hearing instances, *did not* exert their powers to assess whether the projects were in conflict with objectives regarding spatial development and reduction of traffic volumes. They could have exerted agenda-setting power by pointing at overall plans and calling for such assessments, but they did not. According to interview with the case-handler, this was mainly because this was not in focus in these plans.

6.8.3.2 How, why and by whom the objective or knowledge were ousted

The main mechanisms through which traffic-increasing plans were made in these cases, were that the objective 'reducing urban road traffic volumes' was never introduced in these plan-making processes and that the expert knowledge regarding how to achieve it was not applied.

The main conditions allowing this to occur was among others that there was no strong focus on reduction of traffic volumes or on traffic-reducing spatial development in the overall municipal plan or from the leaders in the system, and hence there was not a strong consciousness with respect to this among the case-handlers for zoning plans. Further, the case-handlers working with the zoning plans were not specialised in overall land use and transport planning, and did not have the necessary expert knowledge in this field to take independent initiatives with respect to this. Finally, nobody else in the system pointed out that the plans were in conflict with for instance national purviews for coordinated land use and transport planning, meaning that a number of authorities did not apply their powers in order to maintain their responsibilities.

6.8.3.3 How the actors acted when making the traffic-increasing plans

In these cases, none of the actors had focus on reducing traffic volumes or on the overall spatial development, and hence they never considered this as a problem.

- The initiators of the plans proposed zoning plans that were not in accordance with the intentions and objectives in overall plans, and did hence oppose the overall plans
- The planning authorities did not point out conflicts with objectives in overall plans
- The County governor's office and the County Council's office did not deliver comments regarding the car-based locations of the proposed housing developments
- The planning authorities recommended the politicians to adopt the plans, which they did

6.8.3.4 Explanations related to the plan-making process

The main explanations how and why the three plans for car-based housing developments were made and recommended in Skedsmo were that the objectives, knowledge and powers

of the planners involved caused that the objective and the expert knowledge in question was never introduced in the plan-making process. The main conditions how and why this could occur was that the overall plans were not very clear with respect to this, that the case-handler were not specialised in this issue and that nobody else in the system focused on this.

This was explained in many kinds of ways by the planners that were interviewed, as reported in appendix B. In summary, the answer is that Skedsmo traditionally has welcomed most planning initiatives and that it is common practice to not assess the impact on traffic volumes in such projects.

6.8.4 Increased road capacity on E 18

In the E 18 case, a traffic-reducing alternative was never developed or introduced in the plan-making processes. This was mainly due to the objective 'reducing traffic volumes and GHG emissions' was ousted in the plan-making process, as was the expert knowledge in question.

6.8.4.1 Objectives, knowledge and powers of the main actors

The objectives, knowledge and powers of the main actors, which are assumed to embed the main causal powers for the plan-making process to producing traffic-increasing plans, are explored first.

The main objectives of the main actors

The main objectives of the initiators of this plan, the NPRA, are developed with basis in relevant overall plans and policy-documents, as well as laws and regulations. The objectives are listed as (NPRA 2009a:46):

- A transport-system with improved accessibility and reduced travel times
 - o Reduced rush hour delays, prioritisation of business traffic and public transport
 - o Facilitate increased shares of travels by public transport, walking and bicycling
 - o Facilitate concentrated development of housing, work places and service in important nodal points
- Reduce environmental problems caused by road traffic
 - o Restrict the traffic load in the inner city streets in Oslo
 - o Reduced local air pollution and noise problems
 - o Reduced GHG emissions from transport
 - o Reduced barriers
 - o Delimiting through-traffic in housing areas

When discussing the prioritisation between objectives with the interviewees in the NPRA, it seems clear that objectives related to 'good enough transport quality', especially for the business traffic and for the through-traffic, is an absolute prerequisite. This regards especially the predictability and the stability of the transport quality.

According to all interviewees, the local focus in Bærum is mainly on the local environment. The local politicians have clarified that long tunnels is an absolute prerequisite if they are to accept a proposal. The interviewees explained that traffic-increasing effects or increased road capacity is not a topic for discussions at their office.

From the documents and the interviews it does not seem as anybody focus on or emphasise the objectives related to reduction of GHG emissions or traffic volumes. The interviewees claim that these are important objectives in their organisations, even though they don't find

that it is a strongly prioritised objective. Most agree that reducing traffic volumes and GHG emissions is not a main objective in *this* case.

The main understanding in the interviews is that to actually reduce traffic volumes in the region hardly can be understood as *realistic*, mainly because of an expected strong population growth in Oslo and the region. The agreed understanding is that one aim at freezing the total traffic volumes at present level. Most interviewees express that this is an ambitious objective that will be hard to achieve. Several do, however, find that the objective is realistic in the sense that the traffic volumes can be affected by how land use and transport-systems are developed.

In this case there are *conflicting objectives*. The local authorities focus on local environment, and want tunnels. NPRA find that this requires large capacity increases, for safety reasons. The increase of road capacity will cause and allow growth in traffic volumes. Hence, there is a conflict between the objectives regarding to 'make the transport-system work', 'to reduce local environment problems' and 'reducing traffic volumes and GHG emissions'. NPRA find that this is not necessarily the case, since they hope that traffic-reducing measures like road pricing and access control will be implemented and keep the traffic volumes down when the road is built.

The knowledge of the main actors

A simplified version of the main contents of the expert knowledge in question is described in the system analysis report (NPRA 2009a). It is expressed, in all the main documents and in most of the interviews, that in order to improve the conditions in the E 18 corridor with respect to the listed objectives, a number of measures need to be implemented in addition to road construction. The measures listed in the system report are in accordance with measures discussed in the description of the expert knowledge in question. The NPRA planners seem, however, to rely more on measures like road pricing and access-control. The expertise with respect to the expert knowledge in question varies among the planners that are interviewed.

When asked how they perceive this expert knowledge, especially the understanding that increased road capacity causes and allows growth in urban road traffic volumes, their understandings can be summarised as follows: there are many and different factors and mechanisms involved, and the knowledge regarding these could probably be improved. Nobody pointed at concrete shortcomings of the expert knowledge.

The main method is transport model analyses. Based on the results from these calculations, different analyses at various geographical levels are conducted. All the interviewees expressed unasked that they know that the transport models are inaccurate and uncertain. Some also mention that important variables, such as land use development, are kept exogenous in the models, and that the models are relatively in-sensitive to a number of the measures that are assumed to affect traffic volumes. The general understanding is, anyhow, that the model analyses are important and necessary in these kinds of plan-making processes and that one are better off with than without them.

Regarding *how the knowledge and the findings are presented*, the main document is the system analysis (NPRA 2009a). The expert knowledge in question (or something quite similar) is presented in a good and informative way. The alternatives or concepts are described in a short and transparent way. So are the objectives, and hence the arguments

why the effects on certain variables are analysed. It is said, but not problematized, that certain important variables such as land use development are kept exogenous in or excluded from the analyses.

It is, however, not clear from the report which mechanisms that have been included in the model, with which strengths, or how they have arrived at certain strengths. This regards for instance public transport shares. It is hence impossible to actually evaluate or judge whether one finds the analyses likely, realistic or trustworthy. This makes the transport model analysis a black box in this plan-making process. Since there are quite large uncertainties and disagreements regarding how certain changes of land use or transport-systems affect traffic volumes in certain contexts, this strongly undermines the validity of the analysis.

The findings are mainly presented in good and informative ways. It is, however, confusing that the text to a large degree refers to differences between alternatives at regional level. This leaves the impression that the differences between the alternatives do not affect travel behaviour and traffic volumes. When looking at the corridor-discussions, however, it is obvious that there are large variations in the potential future traffic volumes. This matters for which measures that are understood as realistic and efficient, and which may be applied in the west-corridor.

When reading the selection report (NPRA 2011), it is easy to come to the understanding that it does not matter with respect to traffic volumes in the corridor whether the road has more or less capacity. Hence, this report is in-transparent with respect to understanding the consequences of choosing an alternative with higher or lower capacity with respect to traffic volumes and GHG emissions.

Powers exerted

The initiators (NPRA) exerted their powers to initiate the project by starting the work with the system analysis. In the system analysis, the NPRA exerted their powers as initiators to include other approaches and measures than road building, and to warn that road building alone cannot solve the problems in the corridor and the region. According to the project leader, the area-plan process now regards only tunnel-lengths and final designs of the largest road project.

It seems as the municipal politicians have exerted their power stronger and more direct than what normally is the case. The message from the interviewees are quite unambiguous: Since the local politicians have stated so clearly what they would and would not accept, it is in reality impossible for the planners at NPRA or in Bærum to call for other alternatives in order to reduce GHG emissions.

The County Governor's office and the County Council, as well as other authorities with right to comment on the plans, did exert their powers to point at the traffic-increasing and GHG emissions increasing effects of the suggested alternatives. Further, they applied their powers to call for analyses of alternative measures. They did, however, not call for this with strength, or in ways which actually could force NPRA and Bærum to obey. Neither did they apply their powers to call for an alternative that may contribute to achieving objectives with respect to traffic volumes and GHG emissions. Nobody sketched or developed an alternative proposal themselves which could have been an input to the plan-making process.

The powers discussed above may be termed either agenda-setting or direct powers, but I see them mainly as agenda-setting. It has caused that the two alternatives that will be

presented include to increasing the road capacity to eight or ten lanes. No alternatives that restrict the traffic, or do not allow growth, will be presented. There will, however, need to be conducted an impact assessment, which will show increased traffic volumes and GHG emissions, and very high costs. At that point, the different actors may exert their direct powers.

Relevant *structural powers* in this case may be the understanding at NPRA that ensuring the transport quality of the main road is their main responsibility. This may contribute to shape what the planners at NPRA and other places think is 'good' and 'possible'. All planners interviewed express that they cannot bring in something that may be understood as opposing the local politicians when the politicians so clearly have expressed what they require. This may contribute to planners not coming up with critical comments or traffic-reducing alternatives. The local politicians demonstrate in their actions that they find local environment for their inhabitants to be more important than most other concerns, such as increased road traffic volumes in the region or increased GHG emissions.

6.8.4.2 How, why and by whom the objective or knowledge were ousted

In order for the causal powers embedded in the objectives, knowledge and powers of the actors to produce plans which, if implemented, cause growth in traffic volumes, these powers need to work through mechanisms relating to whether the objective is prioritised and the expert knowledge applied.

The objective was ousted as unrealistic and less important

The objective 'reducing GHG emissions' was introduced and stated as one of eight effect-objectives in the system analysis (NPRA 2009a). The objectives were not ranked or weighted, and one may assume that they were seen as equally important. This means that the objective was introduced. According to the NPRA it is still an important objective.

It is nevertheless clear from the documents and the interviews that the objectives 'reducing traffic volumes' and 'reducing GHG emissions' have been ousted, in two different but reinforcing ways. They are ousted by the understanding that it is unrealistic to think that they can be achieved by decisions made in this case, and they are ousted by other objectives that they are considered mutually exclusive to.

Starting with the latter, the interviewees express that other objectives are more important than reducing traffic volumes and GHG emissions. The main objective for the municipal authorities is to improve the local environment, since this is the main focus of the local politicians. The most important objectives for NPRA are to 'ensure sufficient transport quality for all users' and to arrive at a solution they and Bærum can agree on. Since local environment improvements require tunnels (according to Bærum), and tunnels require capacity (according to NPRA), a capacity-strong road is required. Increased road capacity cause and allow growth in traffic volumes, according to the expert knowledge in question, the interviewees and the analyses in this case. When only capacity increasing alternatives are developed and recommended, this means that the objective in question has been ousted.

This is among others done by presenting the situation as if the objective 'reducing traffic volumes' is unrealistic in the analyses and assessments. Only traffic-increasing alternatives are developed and assessed, the methods applied are by and large insensitive to traffic-reducing measures. Hence, one finds that all alternatives cause more traffic than at present.

My interpretation is that this is not a result of conscious bias, but rather a consequence of the properties of the planners and hence of the knowledge and method applied. It is concluded that “none of the concepts can meet the target set for reduction of GHG emissions in the region” (NPRA 2009a:91). One could argue that the politicians define the situation and leave no room for manoeuvre. On the other side, if the planner had made an effort to develop a traffic-reducing alternative, then the politicians may have chosen differently. At present, they are only presented for a large road with heavy traffic loads – with or without tunnels.

Several commentators call for analyses of the effects of other measures than building new road capacity. These discussions are postponed by NPRA and the planning authorities in Bærum. They claim that they will attend to this after they have developed new plans for the road system; its design and dimensions.

Why this happens may be discussed with starting point in the structural powers discussed above: that NPRA see ensuring the transport quality as their main responsibility; that planners cannot bring in something that may be understood as opposing the local politicians; that local politicians rate local environment problems to be more important than increased GHG emissions, and; that the planners doubt if making a traffic-reducing planning alternative that can be acceptable and adopted is possible.

The expert knowledge was introduced, but ousted by transport model analyses

The system analysis, which represents the starting up of the plan-making process studied here, included a broad description of the problem, definition of objectives, and a simplified description of many of the different measures that are possible and necessary to apply in order to reduce traffic volumes (NPRA 2009a).

Eight alternatives were developed and analysed, where the variables road capacity, road pricing, bicycle infrastructure and parking prices varied. The land use development had been defined and made exogenous before developing the alternatives, meaning that the land use was the same in all alternatives. No alternative was developed which aimed at reducing transport demand and traffic volumes as far as possible with the help of the listed measures and/or other measures, and in accordance with the expert knowledge in question. An alternative without any increase of road capacity was included.

A brief professional reasoning was conducted where one asked to which degree the alternatives contributed to achieving the defined objectives. Among others the alternative without increased road capacity was excluded. Six remaining alternatives were assessed. The NPRA decided that transport model analyses were to be applied, despite that it was found that the transport model is “not suitable for measuring effects of measures like access control, improvements for walking or bicycling, or for public transport (except for measures that reduce travel time or costs)” (NPRA 2009a:78).

A traffic-reducing alternative was hence never introduced, and the alternative with least capacity was ousted in the first assessment. By deciding to apply the transport model analysis, the NPRA contributed strongly to oust the expert knowledge in question, since almost all interrelations and measures of that knowledge are excluded from the analysis, and since ‘professional reasoning’ was replaced by transport model analyses.

It was found that none of the six remaining alternatives result in achievements of the defined objectives. None of the alternatives cause substantial reduction of congestions, and

the concepts that include increased road capacity without restrictions on the road traffic seems to counter the objectives (unless mitigating measures are applied that reduce these effects).

It was concluded that “the system analysis underpins the necessity of assessing different alternative road systems within comprehensive concepts also in the further work with the municipal area plan. This is because the effects of a given road system will vary substantially with the quality of the rest of the transport-system, land use and restrictions on car use. It is important to consider the effects of road alternatives and concepts in a longer perspective than 2025” (NPRA 2009a:99). This is a strong call for applying the expert knowledge in question in the further work, which was not lived by.

Planning programme with two capacity-increasing alternatives

In the planning programme, the project was delimited to regard two road systems alternatives in the E 18 corridor, as well as public transport lanes and bicycle-tracks directly related to this project (NPRA 2009b). Other measures were not to be considered in this phase, but are supposed to be dealt with later on. Two principles are discussed: Expansion of existing E 18 to six car-lanes and two public transport lanes, and; construction of new E 18 with totally eight car-lanes (motorway, local road, and/off-ramps) and two public transport lanes. Further, it is clarified that transport model analyses and cost-benefit analyses will be the main methods in the plan-making process.

When reading the planning programme, there is no doubt that we now have switched focus from ‘what should we do in order to solve the traffic and environment problems in the west corridor’ to ‘which of these capacity increasing road building projects are the better?’ The objective ‘reducing traffic volumes’, knowledge of how to do this and alternatives that could contribute to achieving this have all been ousted.

In the public hearing of the planning programme, only the Friends of the Earth states clearly that the road capacity should not be increased, but several comment that road building will not contribute to solving the main problems (Municipality of Bærum 2010b). None of the commentators with power ask explicitly for inclusion of an alternative that does not include increase of road capacity. Hence, the commentators either could not or would not bring the expert knowledge and objective in question back into the plan-making process.

In order to increase the efficiency of the planning process, the NPRA initiated analyses in order to select those alternatives that perform better with respect to the defined objectives (NPRA 2011). The analyses regard mainly how much of the road that could and should be built as tunnel, which tunnels that should be prioritised, and the costs and benefits of building the different parcels as tunnel. It is claimed that a comprehensive strategy that also includes traffic-reducing means is necessary, but that the analyses reported only includes infrastructure measures for cars, bus and bicycle.

Plan-making process not focusing on reducing traffic volumes and GHG emissions

As this is written, the plan-making process is on-going. The NPRA and the planning authorities in Bærum work intensively on developing road alternatives that can be accepted by both of them. The six-lane alternative (with less capacity) has been excluded from the discussions. In interviews, the representatives from NPRA and Bærum both explain that there are no discussions at this point regarding the consequences of the increased road capacity on traffic volumes. Further, they do not discuss other measures that can contribute

to restrict or reduce growth in traffic volumes. They have to use all their time and capacity on developing the road alternatives. Later on, new analyses will be conducted, where they will discuss traffic-reducing measures. This means that at this stage in the plan-making process, the expert knowledge is not important or applied. It has been ousted, and weak attempts to bring it back into the process have failed so far.

Why the expert knowledge was ousted

When discussing *why* the expert knowledge in question as well as alternatives that could contribute to reduce traffic volumes were ousted in this plan-making process, most of the conditions listed when discussing the objective apply.

Another reason seems to be that the NPRA in practice framed this problem as a road building project. The focus on road building as the main measure to solve the problem is demonstrated in the choice of variables in the concepts in the system analysis, the planning programme and the selection report. This may be expected, since the main duty of the NPRA is to plan, build and maintain the national road system. In this case, there is also a strong push to come up with alternatives that work – fast. This could explain why they turn to the measure they are in control of, which is road building. This may hence be an example of the ‘logic of appropriateness’, as discussed by March and Olsen (2009).

When nobody calls for a traffic-reducing alternative that also is acceptable by other standards, my interpretation is also that this is partly because the planners don’t really believe that there can be an alternative like that, not least because few (if any) of those involved have the necessary competence within this issue to actually produce such an alternative.

6.8.4.3 How the actors acted when making the traffic-increasing plan

The descriptions of what the main actors did, exactly, when ousting the objective and the expert knowledge and producing a traffic-increasing plan, can be summarised by applying the framework defined in chapter 6.6:

- The initiators initiated the process by conducting an analysis of a range of concepts which were supposed to help solve the traffic and environment problems in the west corridor
- The initiators chose to *not* present an actual and relevant traffic-reducing or -stabilising alternative
- Some commentators responded by pointing out conflicts with objectives in overall plans, but no-one called for a traffic-reducing alternative or for other methods to be applied
- The initiators chose to apply a method which is known to be in-sensitive to almost all traffic-reducing measure (transport model analysis)
- Their analysis demonstrated that none of the concepts met the defined objectives
- The planning authorities did not point out conflicts with respect to traffic volumes and GHG emissions, or call for plans that meet this objectives, but rather for plans that meet requirements for improving the *local* environment
- In the planning programme, the initiators and the planning authorities chose to include two traffic-increasing road alternatives whereof only the most capacity strong was seen as realistic
- They also decided to exclude all traffic-reducing measures from the planning programme
- The municipal politicians signalled clearly that only an alternative with long tunnels, and hence high capacity, is acceptable

- The initiators produced a selection report, discussing mainly road development designs (tunnels)
- Some commentators responded by pointing out conflicts with objectives in overall plans, while others did not, but no-one called for alternatives that contribute to reduce traffic volumes
- In the on-going plan-making process, the initiators and the planning authorities discuss only the largest road alternative, and may consider effects on traffic volumes and traffic-reducing measures later on

6.8.4.4 Explanations related to the plan-making process

As this plan-making process was carried out, there were slim chances that a traffic-reducing plan could be the outcome. A traffic-reducing alternative was never introduced, and the least traffic-increasing alternative was excluded in the first assessment. The traffic-increasing alternatives were assessed in transport model analyses where all traffic-reducing measures were excluded, and the answer was that no alternatives can contribute to reducing traffic volumes and GHG-emissions.

A main condition allowing Bærum and NPRA to prioritise other objectives was that *nobody else* took the responsibility to promote the objective of reducing traffic volumes and GHG emissions and require that this is regarded when formulating alternatives, assessing them and selecting which are relevant.

This was reinforced by the transport model analyses of the selected (all traffic-increasing) alternatives, concluding that the traffic volumes will continue to increase and that the objectives will not be reached no matter which of these alternatives that are chosen. Hence, the objective is presented as unrealistic and un-achievable. It is not explained that one has not analysed how applying the measures recommended in the expert knowledge in question in order to reduce traffic volumes would affect the defined objectives.

A third conditions is that the planners at NPRA assume that the measures road pricing and access-control will be applied when the road is completed, and with enough force to keep the traffic at today's level. They assume this despite the fact that this is politically unacceptable today, and they do not find that it is a relevant alternative to apply such measures in the present situation as an *alternative to* building a new road with more capacity. Based on this, they can argue that increasing the road capacity does not *necessarily* mean that road traffic volumes increase too.

6.9 Conclusions related to the plan-making processes

Five explanations were developed regarding how and why properties of the plan-making processes affect whether planners make traffic-increasing plans. The cases were assessed with respect to whether each of the explanations was relevant in the respective cases. The findings are summarised in the table.

Table 6: All explanations related to the plan-making processes developed in the abstract analyses were also found in the case study.

Case	Case Tunga	Case Økern	Case Skedsmo	Case E 18
Properties of the plan-making process caused that the objective was not introduced, and that conflicting objectives were not notified	-	-	X	-
Properties of the plan-making process caused that the objective was ousted, and the plan-making process was not steered in this direction	X	X 'Twisted'	-	X
Properties of the plan-making process caused that the expert knowledge in question was not introduced, and that traffic-reducing alternatives was not introduced, the alternatives were not assessed with respect to this etc.	-	-	X	-
Properties of the plan-making process caused that the expert knowledge in question was ousted, and that other and less helpful knowledge with respect to reducing traffic volumes was applied	-	X	-	X
Properties of the plan-making process caused that the expert knowledge in question was applied wrongly, arriving at traffic-increasing answers	-	X 'Twisted'	-	-

All explanations were relevant in at least one case. More than one explanation was relevant in three of the four cases.

Presenting a broad and summarising answer to how and why properties of the plan-making processes can contribute to explaining how and why planners make traffic-increasing plans is a challenging task, but I have made an attempt below.

6.9.1 Objectives, knowledge and powers causing and allowing traffic-increasing plans

The main objectives of the initiators in the planning processes were to be allowed to implement their project. If the projects are implemented, they will cause growth in urban road traffic volumes (this was a main selection criteria for cases included in the case study). This is the *main cause* why traffic-increasing plans are proposed in all the cases.

Planning authorities need to relate to several and often conflicting objectives. Even though reducing traffic volumes and/or GHG emissions are stated objectives in overall plans in all the cases discussed here, it varies how clear and strong these objectives are expressed. Even when reducing traffic volumes is a clear and strong objective, it is not necessarily understood as highly prioritised by the planners. Neither is it necessarily understood as realistic. Further, it varies to which degree the regional authorities prioritise this objective high enough to actually react to traffic-increasing developments of land use and transport-systems.

The planning authorities and the regional authorities made minimising growth in traffic volumes and GHG emissions a main and prominent objective in their argumentation in only one case (Økern) in the case study. This lack of focus on and prioritisation of this objective seems to be an important *condition* allowing traffic-increasing plans to be made. It has been demonstrated that this also is related to the politicians' lack of will to act on the basis of these objectives.

The expert knowledge in question is applied to various degrees, from not at all (Skedsmo) to a main tool in the argumentation (Økern and Tunga). In two of the cases, the initiators brought in other kinds of expert knowledge that are less helpful when assessing consequences with respect to traffic volumes or to arriving at traffic-reducing alternatives (E 18 and Økern). In two cases, it was concluded that lack of expertise with respect to the expert knowledge in question was a main reason why a traffic-reducing alternative was not introduced (Skedsmo and E 18). It was demonstrated that which kinds of expert knowledge which are and are not represented in the plan-making process can both cause that traffic-increasing plans are made, and be a condition *allowing* this to happen. Whether the expert knowledge in question is applied seems to be closely related to whether the objective in question is made prominent.

The case study demonstrated that there are large differences in how the actors choose to exert their powers. It was found that how and to which degree the different actors exert their powers influence how objectives are prioritised and which expert knowledge that is applied. These are important conditions shaping the plan-making and the plans. It was also demonstrated that how the actors exert their powers is conditioned by how strong and clear the objective 'reducing traffic volumes' is stated and emphasised, and how well the relevant authorities know the expert knowledge in question.

6.9.2 How and why the objective and the knowledge were excluded and ousted

All the main mechanisms identified in the abstract analyses were also demonstrated in the cases. Neither the objective nor the expert knowledge was introduced in the Skedsmo-case. The objective and the expert knowledge were introduced and ousted in the Økern-case (partly) and in the E 18-case. In the Tunga-case, the objective and the expert knowledge were introduced, but the objective was (partly) ousted. The faulty application of the expert knowledge was a relevant mechanism in the Økern-case.

The cases were also different with respect to where in the plan-making process the objective and the expert knowledge were ousted. It was never introduced in Skedsmo, meaning that it was excluded in the problem definition phase. In the Økern-case, the initiators tried to oust the objective and the expert knowledge in all the tasks in the plan-making process, since the planning authorities and the regional authorities brought them back in every time. One may say that the objective and the expert knowledge were never really ousted in this case, but that they were ousted in the initiators' proposal.

In the Tunga-case, the objective was ousted when the planning authorities and the regional authorities presented their *alternatives*, which were reductions of the proposal rather than a rejection. In the E 18 case, the objective was ousted in the task of *defining alternatives*, where the initiators chose to include only traffic-increasing alternatives. The knowledge was ousted when defining *alternatives*, and this was strongly reinforced in the *impact assessments*. There were weak attempts from regional authorities and others to bring the objective as well as the expert knowledge back into the process, but this was ignored by the initiators and the planning authorities.

This confirms what was found in the abstract analysis: In order to hinder that traffic-increasing plans are made, and to ensure that traffic-reducing alternatives and plans are proposed, the objective 'reducing traffic volumes' need to be seen as prominent and the expert knowledge of how to do it need to be applied in *all the tasks* of plan-making.

6.9.3 How the planners acted when traffic-increasing plans were made

'The game of planning' was played differently in the four cases. It was found that the initiators proposed plans that were in conflict with stated objectives regarding reduction of traffic volumes and GHG emissions in all four cases. The planning authorities responded differently to this. They pointed out the conflicts with overall plans and proposed their own alternatives in the Tunga-case and in the Økern-case. In the Skedsmo-case and the E 18-case, the planning authorities did not notify or bring attention to the conflict with objectives regarding traffic volumes and GHG emissions. In the E 18-case, this was strongly related to the strong and clear signals from the politicians.

The regional authorities acted differently as well. In Skedsmo, they did not react. In the E 18-case they called for more focus on reducing traffic volumes and to include traffic-reducing alternatives (according to the expert knowledge in question), but not strong and clear enough to make the initiator and the planning authorities to do so (again partly caused by the strong political signals). In the Tunga-case the regional authorities commented that the plan was not in accordance with overall plans and called for reduction of the project (and in the following cases they filed formal complaints). In the Økern-case, two regional authorities warned from the start that they would have to file formal complaints, and they did so in the final hearings.

The reactions to this from the initiators were different too. In the Tunga-case, they accepted the alternative proposed by the planning authorities. In the E 18-case, they ignored the comments and explained that this will be attended to after the plans for the road-system have been completed. In the Økern-case, they chose to try to demonstrate that their project actually was in accordance with overall plans, among others by twisting objectives and knowledge (as described).

The authorities reacted differently to this. In the E 18-case it seems that everybody have given up on finding a traffic-reducing alternative. In the Økern-case, the planning authorities included their own alternative in the planning proposal presented for the City Council, recommended their own alternative and explained how and why the initiators' proposal is not in accordance with overall plans. The regional authorities upheld their formal complaints.

It is striking how much power the initiators have as developers of alternatives and as the ones making and presenting the impact assessment. Several of the planners working for various public authorities complaint about that initiators and their consultants present their project proposals as having more and larger positive benefits and fewer and smaller negative consequences that they (the initiators and their consultants) know that they have. Further, they present good things that 'may be' as certain, and that which is not acceptable as possible to handle through mitigation. The public authorities cannot trust that the impact assessments presented by initiators are honest and true. Whether they react to this depends on their own skilfulness, capacity and will to take the discussion.

This demonstrates that the game of planning can be and is played in different ways, and that how it is played strongly affect the plan-making and the plans. Initiators may be expected to propose traffic-increasing plans. The main conditions deciding whether these proposals are changed, stopped or recommended for the politicians, are whether and how the other actors involved respond to traffic-increasing planning proposals.

6.9.4 What it would have required to stop or change the proposed plans

We may ask what it would have required if to stop the traffic-increasing plans, or if to develop traffic-reducing alternatives and proposals. In case Tunga, the planning authorities or the regional authorities would have had to propose a rejection of the planning proposal. This would have required that the planning authorities prioritised this higher than the competing objectives, and that they chose to propose a rejection despite that the majority of the City Council had voted against such proposals in previous cases. The County Governor's office did file a formal complaint in the following zoning plan processes, and required an overall assessment of the situations. They explained that the reason why they reacted was that several zoning plans for area-intensive business developments were proposed within a short time-span, and this was an eye-opener, demonstrating that a potential un-desired development was going on, that was not in accordance with municipal plan or with national purviews.

In case Økern, the planning authorities and the regional authorities exerted all their powers and applied all their tools in order to bring attention to conflicts between the zoning plan proposal and overall plans. They explained how and why the initiators' proposal will cause growth in traffic volumes and negative effects on the retail structure, and how and why their proposal was the better alternative. In order to change the outcome in this case, the initiators and their consultants would have needed to make more honest analyses, and explain their findings in more transparent and clarifying ways, allowing the decision-makers to understand the negative consequences of their proposal. Alternatively, they could have accepted the objections from planning authorities and regional authorities, and reduced the proposed shopping centre. Obviously, if the politicians listened more to their advisors than to the developer, they would have not have adopted the initiators proposal, but I try to arrive at possible changes related to planners and planning research.

In case Skedsmo, the case-handler at the planning authorities and/or at the regional authorities would have needed to be conscious about this objective, and brought it into the objectives definitions, alternative generations and assessments. This would require that the objective was defined clearer and stronger in the municipal plan (as it was in the following municipal plan, adopted in 2011), and that there was more focus on this at the planning authorities and elsewhere.

In case E 18, arriving at a traffic-reducing alternative would have required to apply the expert knowledge in question in order to arrive at a traffic-reducing and otherwise acceptable alternative. Further, the objective 'reducing road traffic volumes' would have had to be made at least as prominent as the other objectives, and alternatives that don't meet this objective would have had to be rejected. This would require that the initiators and the planning authorities reframed this from a road building project to an environment improvement project, that some of the central actors possessed the expert knowledge in question well enough to be able to produce and assess a traffic-reducing alternative, and to convince the local politicians that this was an acceptable solution.

6.9.5 Relevant improvements

When discussing actions that could contribute to plan-making processes to a lesser degree produced traffic-increasing plans, a number of suggestions could be made on basis of these studies.

Strong and clear objectives and strategies in overall plans regarding reduction of traffic volumes seems to be important in order to allow public authorities to oppose traffic-increasing planning proposals and to prioritise this objective in general. National planning purviews may be strong tools, but it seems as these are considered more usable and acceptable in situations where such objectives are stated in influential municipal plans. Planners making the overall plans often play an important role if reducing traffic volumes and GHG emissions is to be made a strong and useable objective in overall plans. Not least are they important when it regards development of strategies and concretisations in maps and purviews. A suggestion for change is hence that the planners work harder to make this a strong and clear objective in overall plans, and to ensure that the plans are good steering tools and takes developments in traffic reducing directions. Only planners have the expert knowledge to ensure this.

The objectives also need to *be made* important by planners working with zoning plans in various positions, calling for assessments with respect to them, calling for and producing alternatives helping to achieve them, addressing this objective in recommendations, making comments, filing complaints etc. A suggestion for change is hence that the planners work harder to make this objective more important in operational plan-making processes. The objectives can only *be* strong and important if politicians too act in accordance with them, but planners can often affect how politicians understand a problem and the potential solutions.

In order for planners working in various positions to detect traffic-increasing zoning plan proposals, they need to be aware of and focus on the objective 'reducing traffic volumes' and they need to have at least basic understandings of the expert knowledge in question. In order to call for rejections or changes of planning proposals, or to suggest traffic-reducing or less traffic-increasing alternatives, they need to know this knowledge well and be able to apply it in explanations, analyses and alternative generation ('proficient performer'). It would not least be an improvement if the initiators or their consultants mastered this. This has a lot to do with *properties of the planners* and of *the expert knowledge*, as discussed in previous chapters. The improvements listed in those chapters apply here as well.

The *problem of initiators presenting biased and faulty analyses* could be improved if these planners chose to be more honest in their production and presentation of analyses and assessments. If this pious desire is too naive, one could call for a system allowing only approved professionals (firms) to act as initiators of zoning plans. An approving-system would have to be developed, including approval-criteria, rules ensuring that initiators that misconduct lose their approval, and a system for complaints. This system already exists for the construction-industry.

How much power the initiators actually have in planning processes depends largely on how *planning authorities and other authorities chose to exert their powers* and use the tools they have. The planning programme, which is produced by the initiators but approved by the planning authorities, is for instance an influential tool. This was clearly demonstrated in different ways in the E 18-case and the Økern-case. The planning programme defines which alternatives need to be described and assessed, which effects and impacts need to be assessed, and which methods (and hence knowledge) will be applied. In order to employ this tool to contribute to less traffic-increasing plans, the planners working at the planning authorities need to emphasise effects on traffic volumes and GHG emissions when making and assessing planning programmes. This also goes for assessments of analyses, plans and

recommendations. Again, this rests on how planners conduct their duties. This do require that the planners need to be knowledgeable enough to do assessments and present requirements.

This demonstrates that whether traffic-increasing or traffic-reducing plans are made, strongly relates to the objectives, knowledge and powers of the planners, and how each planner chooses to act within defined frames. The case study illustrated that there are large rooms for manoeuvre within most of the positions roles planners possess. This puts much of the responsibilities for changing planning and development of land use and transport-systems in the hands of the planners.

An improvement that could contribute to change the situation towards less traffic-increasing plans could be that planners in various positions became more aware of the significance of how they act in their daily work.

How and why planners make plans which, if implemented, cause growth in traffic volumes

7. Overall analyses and discussions

In the overall analyses and discussions, I will now try to arrive at a more general answer to my research question: How and why are planners making plans which, if implemented, cause growth in traffic volumes? I first conduct overall and summarising analyses of the cases, arriving at how and why traffic-increasing plans were made in each case. I then discuss and arrive at more general explanations, on basis of all analyses and findings in the dissertation. Finally, I do a frame-critical discussion of especially *why* planners make traffic-increasing plans.

7.1 Explaining how and why traffic-increasing plans were made in the cases

In the previous analyses, the expert knowledge, the planners and how they relate to the expert knowledge and the plan-making processes have been explored and analysed as three different structures. It has been found that causal powers embedded in each of these structures may contribute to planners making traffic-increasing plans. A number of mechanisms were identified through which these causal powers may work. It was also found that whether these mechanisms are activated, and whether the process in the end results in the event 'traffic-increasing plans are made', depend on a number of contingent conditions. Conditions embedded in the structures in question were explored and found to be particularly interesting.

The plan-making processes can hence be understood as systems of organised complexity, where several systems intersect and affect each other. The effects (whether a traffic-increasing or a traffic-reducing plans is made) that are produced can be understood as a "complex compound effect of influences drawn from different mechanisms, where some mechanisms reinforce each other and others frustrate the manifestation of each other", as (Danermark et al. [1997] 2002:56) put it.

When comparing the analyses and the findings, we see that the mechanisms through which the many identified causal powers may work are more or less the same for all three structures. The most general and comprehensive list of relevant mechanisms is the one developed for the plan-making processes: That the objective 'reducing traffic volumes' is excluded or ousted in the plan-making process, and that the expert knowledge in question is either excluded, ousted or applied wrongly.

The concrete studies revealed that the main causal power why a traffic-increasing plan was made in the four cases was that the initiators found that they wanted or needed to carry out a traffic-increasing project, and initiated a zoning plan process in order to get permission to implement it. The other identified causal powers can hence be understood as contingent conditions, triggering the generative mechanisms and allowing the causal powers to work through these mechanisms and produce a traffic-increasing plan.

When conducting the overall and summarising discussions of how and why planners made traffic-increasing plans in the four concrete cases, I will hence focus on which mechanisms that were activated, and especially on which *conditions* embedded in the properties of the expert knowledge, the planners and the plan-making processes, which together allowed it to happen. Where other conditions affect the outcome substantially, this is mentioned.

7.1.1 Car-based office development at Tunga

7.1.1.1 How the traffic-increasing plan was made – the main mechanisms

The initiators proposed an office development in the car-based location Tunga. The objective 'reducing traffic volumes' and the expert knowledge in question were introduced in the planning process by the planning authorities as well as regional authorities, but the objective was (partly) ousted by other objectives at the planning authorities' office. This is the generative mechanism in this case. The planning authorities and the regional authorities recommended a reduced office development rather than a rejection of the plan. This meant that a traffic-reducing alternative (no development) was never introduced in the plan-making process, and that it was never assessed or compared to other alternatives.

7.1.1.2 The main conditions allowing a traffic-increasing plan to be made

When searching for relevant conditions, and asking why the planning authorities did not suggest to rejecting the plan, it was found that this was partly due to conflicting objectives. This regards to ensure high densities on existing business properties in order to spare un-built land, and to offer a variation of business properties in the city. Further, the overall plans were not very ambitious or clear on steering locations of office developments, or on what could be developed at Tunga. The City Council had approved zoning plans for offices and retail at Tunga, also when the planning authorities have clearly stated that this is not in accordance with overall plans and objectives. During the years, a practice have evolved, where zoning plans proposing office- and retail developments in this area have been allowed in reduced versions. To continue this practice means that the planning authorities act predictable and fair, which are important ideals.

Among others because of these conditions, some interviewees at the planning authorities expressed that they are in doubt with respect to whether to deny area-intensive developments in the Tunga-area and similar areas is the right thing to do. Some developments of this kind may be allowed, but that they are unsure how much.

Following the formal complaints from the County Governor in three later and similar cases, the on-going development at Tunga was registered and analysed. The planning authorities found a higher growth in work places than they had expected. It was also disclosed that the development was not in accordance with overall strategies (60 % of area intensive work-places located in the public transport corridor). Preliminary findings suggest that the on-going development will counteract the objective regarding reduction of traffic volumes. In retrospective, one could hence add that lack of overview of the development and the situation with respect to office- and retail developments at Tunga was a condition contributing to that the zoning plan proposal in question was not objected by planning authorities and regional authorities.

The conditions are mainly embedded in properties of the plan-making processes. The objective 'reducing traffic volumes' is not very strong, since the overall plan is ambiguous and un-ambitious. Political practice have weakened the overall plans as steering tool, established a practice allowing office-developments and made the case-handler and others unsure about what is the desired development. When facing competing objectives and a concrete planning proposal, the objective 'reducing traffic volumes' is ousted. Following form this, the planning authorities did not exert their power to propose or recommend a rejection of the plan. The regional authorities could have exerted their power to file formal complaints, but chose not to.

One could claim that conditions embedded in the properties of relevant planners matter for the outcome of the process too. This regards lack of prioritisation of the objective in question, not least that those in power at the planning authorities did not call for registrations and analyses of the actual situation and development at Tunga.

7.1.2 The largest shopping centre in Oslo at Økern

The Økern-case is the only of the cases where there is an open disagreement between the initiators and the planning authorities, and where none of the parties give in. This makes it a very interesting case. It also makes it hard to present in as short and precise way.

7.1.2.1 How the traffic-increasing plan was made – the main mechanisms

The initiators proposed a plan including a 60.000 m² shopping centre at Økern in Oslo, as part of a larger development. A shopping centre of this size is not in accordance with binding overall plans, because it would cause negative effects for the existing retail structure and cause high car shares and much traffic. This was clarified by the planning authorities and the regional authorities from the start. The planning authorities eventually proposed a second alternative with a 25.000 m² shopping centre, and they explained clearly and thoroughly why a larger shopping centre is not in accordance with the binding plans. The regional authorities warned from the start that they would file formal complaints if the large shopping centre was included in the final proposal.

Because of the conditions with respect to a strong overall plan, knowledgeable planning authorities, and public authorities who made it clear that they would exert their powers, the initiators needed to oust either the objective or the expert knowledge which the overall plan was founded on in order to be able to get their plan approved.

They ousted the objective and the expert knowledge in question by twisting the objectives as well as the knowledge in various ways. They made biased, faulty, confusing and in-transparent analyses and presented their findings far more in accordance with the overall plans than they in reality was. They presented objectives concerning 'to make something good happen here fast' as competing to the objectives in the overall plan, and threatened that the whole project would be shelved if they could not build the large shopping centre. They changed the focus from overall objectives and consequences to their project. This was going on in all the tasks in the plan-making process, since the planning authorities and the regional authorities brought the objective and the expert knowledge back into the plan-making process every time.

In the planning proposal sent to the City Council, the planning authorities pointed out that the initiators proposal will have severe negative consequences with respect to important objectives in overall plans. They politicians chose, nevertheless, to rely on the initiators (or to downplay the objectives and strategies in the overall plans), and they adopted their proposal.

The planning authorities had been successful in convincing the regional authorities that the initiators' proposal was not in accordance with overall plans, which caused that the regional authorities upheld their formal complaints. Hence, the plan was sent to the Ministry of Environment for final decision.

7.1.2.2 The main conditions allowing the traffic-increasing plan to be made

The conditions allowing the initiators to present their proposal in ways that made the City Council adopt the plan are embedded in the properties of all three explanatory factors.

Conditions embedded in properties of the expert knowledge were relevant here. It was found that the complexity of the case matter and hence of the expert knowledge made it hard for the decision-makers to understand what was valid and what was not valid knowledge in the case. This was probably reinforced by the lack of accessible and applicable descriptions of this knowledge, lack of described, agreed and good methods for applying this knowledge in such cases, and shortcomings of the empirical knowledge. These shortcomings of the expert knowledge allowed the initiators to twist analyses and knowledge and to cause confusion, allowing the decision makers to disregard the recommendations from the planning authorities and the regional authorities.

Conditions related to properties of the planners involved mattered as well. The role of the initiators probably was a main reason why they acted as they did. Further, none of the planners involved from the initiators' side were experts of co-ordinated land use and transport planning. Some were applying other and less helpful knowledge with respect to assessment of traffic consequences.

Regarding the plan-making process, the existence of a seemingly competing objective (make something good happen here fast) was an important condition how and why the initiators could win through, despite the strong and clear municipal sector plan. Conditions related to shortcomings of the expert knowledge in question, allowing it to be twisted and ousted by other knowledge, have been mentioned.

All actors exerted their powers strongly. The planning authorities and other authorities could exert their powers because they had a strong and clear overall plan, because they were knowledgeable, and because they had the necessary capacity. The initiators could exert their powers because they had the necessary financial powers, because the planning system leave the responsibility for making analyses to the initiators, and because there are no system for arresting initiators making and presenting dishonest or faulty planning analyses.

These intertwined conditions allowed the initiators to present their case in ways that allowed the City Council to disregard their own overall plan, recommendations from the planning authorities as well as formal complaints from two regional authorities, and adopt the initiators' planning proposal.

7.1.3 Car-based housing developments in Skedsmo

7.1.3.1 How the traffic-increasing plans were made – the main mechanisms

In the three Skedsmo-cases, various initiators initiated zoning plan processes for housing developments in car-based locations. Despite that overall plans and strategies required that 'the majority' of new developments should take place as densification in central areas, the car-based locations were never discussed in the planning processes. The generative mechanisms activated in all cases were that neither the objective 'reducing traffic volumes' nor the deduced 'to develop housing in not car-based locations', nor the expert knowledge of how to do it was introduced in the plan-making process.

7.1.3.2 The main conditions allowing the traffic-increasing plans to be made

It was found that the *conditions* allowing this were embedded in all three explanatory factors discussed here. The objective 'reducing traffic volumes', concretised to developments 'in less car-based locations' was not strongly formulated in the municipal plan, and there was no focus on this at the planning authorities. Rather, according to the interviewees, allowing housing (and other) developments in almost any location was the established practice. The case-handler was not specialised in co-ordinated land use and transport planning and she knew no accessible and applicable presentation of this expert knowledge she could have turned to. None of the regional authorities exerted their power to point out that the car-based locations were not in accordance with municipal, regional and national steering documents.

The on-going and eventually completed municipal plan process involved the planners and the planning authorities' office far more than previous overall plan processes, causing substantial changes. The stronger objectives formulations regarding reduction of traffic volumes and GHG emissions in the new municipal plan, the more concrete strategies for how to achieve this, the planning documents explaining the reasoning behind these objectives and strategies better, the examples of concrete local analyses of how this expert knowledge can be applied, and the raised awareness and knowledge at the planning authorities' office will probably contribute to that future zoning plans for housing developments in car-based sites not already zoned to housing will be rejected.

This demonstrated that traffic-increasing plan-making can be reduced by causing changes in the properties of each of the explanatory factors discussed here. The new plan may cause stronger focus on this objective, raising the knowledge with respect to this topic among many of the relevant planners, strengthen the power of municipal and regional authorities, and be a source of knowledge for planners not being experts in coordinated land use and transport-planning. This may allow them to detect conflicts between objectives concerning reduction of traffic volumes, questioning whether proposed projects contribute to achieving these objectives, develop traffic-reducing alternatives, questioning assessments and analyses, and producing argumentation for rejecting the proposal if necessary.

7.1.4 Increased road capacity on E 18 west

7.1.4.1 How the traffic-increasing plan was made – the main mechanisms

The E 18 case offers an interesting example of a multi-causal explanation how and why a traffic-increasing plan is made. The objective and the expert knowledge in question were introduced, but ousted in the alternative generation and in the impact assessment phases. These are the generative mechanisms in this case. In the on-going plan-making process, only large extensions of the road capacity are considered. The hope is that high toll roads will be introduced when the road is built and keep the growth in traffic volumes down.

The consequence is that a traffic-reducing alternative was never introduced in the plan-making process. Hence, a traffic-reducing alternative was never proposed, discussed, analysed, assessed or compared with the other alternatives, and a traffic-reducing alternative will not be presented. When choosing to apply transport model analyses as the main analytical approach, almost all measures included in the expert knowledge were excluded, and the expert knowledge in question had been ousted from the plan-making process. None of the commentators could or would bring the objective 'reducing traffic

volumes' or the expert knowledge in question back into the plan-making process, despite weak attempts.

7.1.4.2 The main conditions allowing the traffic-increasing plan to be made

The main objectives were to reducing GHG emissions from road traffic, reducing local environment problems and ensuring sufficient transport quality for all users. This could have been approached by defining 'reduction of traffic volumes' as a main objective, and develop a plan based on the expert knowledge in question. This could have been a solution that contributed to achieving all the objectives. Several conditions contributed to that this was not the case.

Almost none of the interviewees believed that traffic volumes could be reduced. This is an important condition explaining why the municipal authorities rather focused on local environment improvements through building tunnels and why NPRA focused on road capacity for safety and transport quality. The local politicians called very strongly for long tunnels, and this affected how the local authorities as well as NPRA acted.

The knowledge-discussion is intertwined with the objective-discussion. One condition causing that NPRA (and others) did not believe in a traffic-reducing alternative, was that nobody tried to or were able to come up with a traffic-reducing alternative. This also has to do with institutional conditions; a traffic-reducing alternative is harder to develop, there are few concrete examples of how to do it, it requires co-operation between several sectors and administrative levels and so forth.

A traffic-reducing alternative was never developed. This has much to do with conditions related to properties of the planners involved and of the expert knowledge in question. None of the relevant planners were well enough educated in co-ordinated land use and transport planning to be able to develop a traffic-reducing alternative based on this expert knowledge (or so it seems). Rather, they rely on other kinds of expert knowledge. This may be conditioned by – or at least it is reinforced by – the lack of accessible and applicable descriptions of the expert knowledge in question and methods for applying it in complex planning situations like this. The shortcomings with respect to empirical knowledge add to this. Instead, the project was reframed to a road construction project, and the discussions shifted towards the design and capacity of the new road system.

How and to which degree the various actors exerted their powers was strongly intertwined with the other conditions in this case. The local politicians exerted strong direct and agenda-setting power and forced NPRA and others to focus on tunnel-solutions in order to improve local environment. NPRA exerted their power as initiators to define alternatives and methods for assessing them, and to disregard comments from a number of commentators calling for analyses of other alternatives and measures. These calls could have been more powerful if the expert knowledge had been different with respect to the mentioned properties, or if the planners were even more skilful with respect to this knowledge.

It has been demonstrated that a strongly intertwined mix of conditions related to the properties of the expert knowledge, the properties of the planners and the ways they relate to the expert knowledge, and properties of the plan-making process have allowed that a traffic-increasing plan is being made.

7.1.5 Mechanisms and conditions in the four cases

When viewing all the cases together, we find that all the mechanisms identified in the abstract analyses have contributed to a traffic-increasing plan being made in at least one of the four cases.

Conditions triggering these mechanisms or allowing the causal powers to work through these mechanisms were found in all three structures explored. The previously listed shortcomings of the expert knowledge did trigger or allow traffic-increasing plans to be made in the Økern- and E 18-case. Conditions related to the planners and the ways they relate to the expert knowledge were relevant conditions in all cases. This regards either that they do not focus on this issue, that they do not master the expert knowledge well enough to produce relevant alternatives, or that they don't want this knowledge to be influential.

Table 7: Mechanisms and conditions which have contributed to traffic-increasing plans being made in the four cases. X means that the condition have been involved, the larger X the more important. - means that it has not been involved.

Cases	Mechanisms activated	Conditions related to properties of				
		Expert knowledge	Planners	Objectives in process	Knowledge in process	Powers in process
Tunga	Objective ousted	-	x	X	-	-
Økern	Objective and knowledge ousted, knowledge applied wrongly	X	X	x	X	X
Skedsmo	Objective and knowledge not introduced	-	x	X	x	-
E 18	Objective and knowledge ousted	X	X	X	X	X

Regarding the plan-making processes, the combination of un-ambitious and ambiguous objectives in overall plans and competing and conflicting objectives was important conditions allowing the objective 'reducing traffic volumes' to be ousted. This was a relevant condition in all the cases. Conditions related to the expert knowledge in the process regards lack of strong expertise with respect to the expert knowledge in question and application of other and less helpful knowledge with respect to reducing traffic volumes. Exerted powers were important conditions in the E 18-case and the Økern-case, in rather different ways.

Table 7 also illustrates what we found in the analyses, namely that several conditions are involved when a traffic-increasing plan is made. These are often interrelated and intertwined in strong and diverse ways.

7.2 More general explanations of how and why planners make traffic-increasing plans

After having conducted abstract analyses regarding how properties of the expert knowledge, the planners and the plan-making processes may contribute to explaining how and why traffic-increasing plans are made, and after having examined the relevant explanations empirically for each factor as well as how they work together, the time has come to arrive at more general explanations regarding transfactual conditions. These are explanations which one would expect to be relevant for plan-making processes *in general*.

7.2.1 How planners make traffic-increasing plans

How planners act when making traffic-increasing plans was abstractly described and empirically examined in concrete studies in previous chapters. It has been demonstrated that planners working for initiators, planning authorities and other relevant public authorities, as well as politicians, can act in many different ways. The interactions between the many actors define how a plan-making process proceeds and whether it produces traffic-reducing, or rather traffic-increasing, plans.

7.2.1.1 All the tasks in plan-making are relevant

When planners produce traffic-increasing plans, this has much to do with how they perceive and respond to the two major questions in planning: ‘what should we do in order to...?’ and ‘what are the consequences of...?’ in each of the tasks in plan-making.

This regards whether they see large and growing traffic volumes as a problem in the *situation analysis*, and hence whether they define reduction of traffic volumes as an *objective* that the particular plan-making process needs to contribute to achieve. This affects whether the questions are formulated as ‘What should we do in order to reduce traffic volumes?’ and ‘What are the consequences with respect to traffic volumes?’ When planners fail to include reduction of traffic volumes as part of the problem and/or do not define this as a major objective, these are important ways in which they make traffic-increasing plans.

Further, if planners do not identify and design relevant traffic-reducing *alternatives* in a plan-making process, such alternatives will not be included in the further assessments, comparisons and considerations. Hence, a traffic-reducing alternative cannot be the outcome of the plan-making process. In many cases this will regard to include a do-nothing alternative.

When doing *impact assessments*, the planners need to include development of traffic volumes as one of the effects that are assessed, and they need to do the assessments honestly and correctly. If planners fail to assess effects on traffic volumes, or if they more or less consciously do the assessments in ways that arrives at lower effects on traffic volumes than one would have arrived at if honest and correct assessments had been conducted, they may contribute to that traffic-increasing plans are made. The same is the case if the planners present such analyses and their outcomes in ways that are in-transparent, misleading, or make these results easy to overlook. The same goes for comparisons of alternatives, and for *plans* and *recommendations*.

7.2.1.2 All actors may contribute to making traffic-increasing plans

Planners working for initiators are normally responsible for doing much of the plan-making. If they ignore the objective ‘reducing road traffic volumes’, do not develop traffic-reducing

alternatives or do-nothing alternatives, do not include effects on traffic volumes in impact assessments, do faulty or biased assessments and analyses, or present the results of the analyses in misleading ways, they contribute to making traffic-increasing plans.

One may argue that planners working for initiators first and foremost are supposed to help their employers to get their project approved. Various authors have documented that some produce misleading assessments, analyses and presentations of their findings (see e.g. Wachs 1989, Flyvbjerg et al. 2002, Tennøy 2003, Tennøy et al. 2006). This may be more or less conscious behaviour. Several of the interviewees in the case study expressed that they find that planners working for initiators act this way. This should, as I see it, be understood as misconduct. If construction engineers or medical doctors consciously produced faulty and biased analyses or assessments, this would not be accepted. Neither should it be accepted if planners and planning analysts do it. If they do, they contribute to that traffic-increasing plans are made.

Planners working for planning authorities are supposed to ensure that traffic volumes are part of the situation description and that reduction of traffic volumes is understood as an important objective (if it is so in overall plans). They are also responsible for ensuring that this is included in the planning programme, together with traffic-reducing (or do-noting) alternatives and requirements for doing assessments and comparisons with respect to this. Finally, they are responsible for ensuring that this topic is discussed in clear and understandable ways in the recommendations to the politicians. If planners at the planning authorities do not exert their powers to carry out these tasks in good and thorough ways, they contribute to traffic-increasing plans being made.

Planners working for the most relevant regional authorities are supposed to notify if land use and transport plans are in conflict with overall plans, purviews and guidelines. If they fail to exert this power, they are contributing to traffic-increasing plans being made.

7.2.2 Why planners make traffic-increasing plans

7.2.2.1 Various entries for discussion

When answering to *why* traffic-increasing plans are made, the answer can be given at different levels and with basis in different structures.

Having concluded that the main causal powers why initiators initiate zoning plan processes is that the initiators (or their employers) want to implement a project *for some reason*, one may claim that the answer to the *why*-question should be sought in the motivation of the initiators. In the cases presented here this would regard why Steen and Strøm wanted to build a shopping centre this big at this site, why the three different initiators wanted to develop housing at these sites in Skedsmo, why the developer wanted to build offices at Tunga, or why the NPRA wanted to construct a new and bigger road in the west corridor. These are interesting and relevant questions, and they may be tightly connected to possibilities and restrictions embedded in overall plans.

The answer to the *why*-question could also be sought in conditions related to the formal institutions such as the PBA, the organisation of planning processes and the distribution of responsibilities and power. It could have been sought by focusing more closely on each planner, and how and why he or she defines their roles and responsibilities. It could be sought in conditions related to the interactions between the planners and the public or in

the communication between the planners and the politicians. A number of other approaches could be mentioned which are relevant and interesting.

I have, however, chosen to focus on the expert knowledge, the planners and the plan-making processes as explanatory factors in this dissertation. I study plan-making taking place within the existing system, and on the professionals partaking in it. I also chose to focus on the operational plan level, starting where the initiator propose a project by initiating the planning process.

7.2.2.2 Important contingent conditions

As described in previous chapters, the expert knowledge, the planners and the plan-making processes have properties that may cause that the generative mechanisms are activated through which traffic-increasing plans may be made. These are contingent conditions in plan-making processes. They may or may not occur, they may or may not become influential in a concrete plan-making process, they are often strongly interrelated, and they may counteract or reinforce each other. This was described in the abstract analyses and demonstrated in the studies of the concrete cases.

Properties of the expert knowledge

One answer to why planners make traffic-increasing plans is that this has to do with properties of the expert knowledge regarding the interrelations between development of land use, transport-systems, travel behaviour and traffic volumes, and how land use and transport-systems need to be developed in order to reduce traffic volumes. How well developed the expert knowledge is varies between issues and contexts. It will hence be a better and stronger tool in some plan-making processes than in others.

It has been found that shortcomings of the expert knowledge in question with respect to comprehensive and usable descriptions of the expert knowledge, lack of descriptions of and possibly underdevelopment of the method 'professional reasoning', as well as shortcomings with respect to empirical knowledge, make the expert knowledge less accessible, less applicable and less transparent.

This may cause that planners use it to a lesser degree than necessary if they are to make traffic-reducing plans and stop traffic-increasing plans. It may cause that planners apply the expert knowledge wrongly. It may cause that competing knowledge easier can oust this expert knowledge. It may also cause that others don't accept it as relevant and valid, and hence disregard analyses and recommendations made on basis of it. If any of this happens, the chances are higher that a traffic-increasing plan will be made instead of a traffic-reducing plan.

Properties of the planners

Another answer is that properties of the disciplines, paradigms, skilfulness and roles of the planners cause that they relate to the expert knowledge in question in ways that causes that they cannot or will not apply it. These may be important conditions why the planners don't apply the expert knowledge in question, apply it wrongly, or rather apply less helpful knowledge with respect to reducing traffic volumes.

There are several planners involved in a plan-making process. In order for the expert knowledge in question to be applied in a helpful and correct way, at least one of the planners involved needs to relate to the expert knowledge in ways that make them bring it into the plan-making process, promote that it is applied, and apply it in correct and useful

ways. This also needs to be accepted and allowed by the other planners involved. When a traffic-increasing plan is made, this can therefore be explained by properties of the planners and the ways they relate to the expert knowledge.

Properties of the plan-making processes

A third answer is related to properties of the plan-making processes. This was previously defined as properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes. These properties affect how the planners act and interact in a plan-making process. As described in chapter six, these conditions are reciprocally interdependent.

In the plan-making processes, it seems as a strong and clear overall plan stating objectives regarding to reduce traffic volumes and leading in the right direction is almost a decisive assumption if public authorities are to be able to stop or change traffic-increasing planning proposals. This is not least so because one normally finds competing and conflicting objectives to 'reducing traffic volumes' in a plan-making process.

In order for the expert knowledge to be introduced and applied, another decisive assumption seems to be that at least one of the planners involved needs to possess, promote and apply this knowledge. It is necessary that somebody is knowledgeable enough to detect conflicting objectives and to develop relevant traffic-reducing alternatives. Further, the public authorities actually need to exert their powers to question proposals and analyses, and to set requirements in the plan-making processes.

Reciprocally interdependent conditions cause and allow that traffic-increasing plans are made

In real plan-making processes, several of the causal powers, mechanisms and conditions are strongly intertwined. We have seen that strong and clear objectives and strategies regarding reduction of traffic volumes in overall plans are almost decisive for ensuring that zoning-plans take spatial development in traffic-reducing directions. Whether such objectives and strategies are developed depend on whether there exist accessible and applicable expert knowledge regarding how to achieve this objective. It also depends on knowledgeable planners that can and will develop such plans.

When initiators propose traffic-increasing plans, this may be because that they don't prioritise this objective or because they don't understand that their plan cause growth in traffic-volumes. The latter could be the case if the initiators or their consultants are not knowledgeable with respect to this, or because the expert knowledge is not very strong or clear with respect to the issue at hand. This could also explain why they don't develop traffic-reducing alternatives. If the objective regarding reduction of traffic volumes is not clearly stated, this could make it hard for the planners to explain for their employers that this should be recognised as important.

Likewise, planners working for planning authorities may not detect that planning proposals are in conflict with the objective in question. This could be because of weaknesses of the knowledge, or because the planners are not knowledgeable with respect to this. If that is the case, they may not be able to formulate this conflict in persuasive ways. Further, they may not be able to bring forward a traffic-reducing alternative or to assess the analyses and recommendations from the initiators. In plan-making processes they will often need to handle several and often conflicting objectives and it is hard to prioritise. When strong

initiators exert their powers strongly, not all planners working for planning authorities have the capacity or the skills that are needed to counter it.

The same goes for regional and other authorities that can file formal complaints if the plans are not in accordance with overall plans, purviews, and guidelines. They need to deal with several issues, and cannot be experts in all these. If they are not very knowledgeable in the expert knowledge in question, if they do not find accessible and applicable descriptions of the expert knowledge, and if objectives are not clearly stated, it may be hard to detect conflicts and be confident enough to exert their powers and file a complaint.

Other factors

I would agree to objections concerning that other reasons are relevant, especially political signals. At the other hand, if the planners working for planning authorities or regional authorities produce good argumentations and demonstrate how and why a certain project will cause unnecessary growth in traffic volumes, and not least if they present an acceptable alternative, the politicians could change their minds. It is anyhow the job of the planners to inform the political decision-makers when a planning proposal is in conflict with their stated objectives, such as reducing traffic volumes and GHG emissions.

Established practice is another condition that is not included in the discussion above. Again, it is the responsibilities of the planners working for public authorities to recognise that practices are working against stated objectives, to bring attention to it, and to present alternatives.

7.2.3 Explaining how and why planners make traffic-increasing plans

The intertwined explanation of *how and why* planners make plans which, if implemented, cause growth in traffic volumes, can now be summarised and explained in critical realism terms.

Because of needs or desires of the initiator, a zoning plan for a traffic-increasing project is proposed.

Because of the conditions related to:

- Properties of the expert knowledge
- Properties of the planners and the ways they relate to the expert knowledge
- Properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes

...one or more of the following mechanisms are activated in at least one of the tasks in plan-making:

- The objective is not introduced
- The objective is ousted by other knowledge
- The expert knowledge is not introduced
- The expert knowledge is ousted by other kinds of knowledge
- The expert knowledge is applied wrongly

If the objective and/or the expert knowledge, because of the mentioned conditions are not reintroduced to the plan-making process or corrected after having been excluded, ousted or applied wrongly, this will often result in traffic-increasing plans.

One may hence expect tendencies towards traffic-reducing plans being made in plan-making processes where the expert knowledge is especially good with respect to the particular issue, where the planners involved are experts of co-ordinated land use and transport planning for reduced traffic volume. The same is the case if there are strong and clear objectives in overall plans that are made prominent in the plan-making process, if the expert knowledge is introduced and applied correctly, and if those exerting most power aim at arriving at a traffic-reducing plan.

Likewise, one may expect tendencies towards traffic-increasing plans being made in plan-making processes where the expert knowledge is especially weak with respect to the particular issue, and where none of the planners involved are experts of co-ordinated land use and transport planning for reduced traffic volumes. The same is the case if this objective is not clearly stated in overall plans or made prominent in the plan-making process, if the expert knowledge is not applied or applied in-correctly, and if those exerting most power do not aim at arriving at a traffic-reducing plan.

7.3 A frame-reflective discussion of why planners make traffic-increasing plans

Another interesting approach when aiming at explaining especially *why* planners make traffic-increasing plans could be to discuss this in a frame-critical perspective, inspired by the works of Schön (1983) and Schön and Rein (1994)²⁹. When planners contribute to make traffic-increasing plans, this could be because they frame the problem differently than they would need to do in order to contribute to make traffic-reducing plans.

7.3.1 Framing

Rein and Schön (1993) describe framing as a way of selecting, organizing, interpreting and making sense of a complex reality to provide guideposts for knowing, analysing, persuading, and acting. Our professional frames transpire partly from whom we are, our educational background and training (what we 'know') and our work life experiences. Our objectives, ends and values, as well as the knowledge, understandings, beliefs and theories we possess, all contribute to our *framing* of the problem (Schön 1983, Rein and Schön 1993).

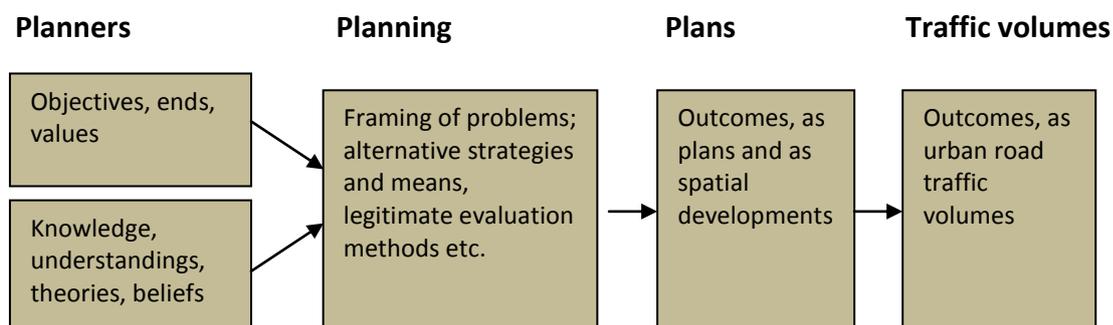


Figure 55: Objectives, values, knowledge and understanding influence how problems are framed, and thereby how planning is carried out and which outputs are produced.

How the problem is framed influences what the problem is understood to be, the choice of alternative strategies and means that are considered, how these are evaluated, what counts

²⁹ Parts of the reasoning in this chapter were also applied in an article in Transport Policy (Tennøy 2010).

as evidence, what are seen as legitimate methods, and thus the alternatives or means that are recommended and implemented, as illustrated in figure 55. Schön and Rein (1994:28) explain that “[t]his sense of obviousness of what is wrong and what needs fixing is the hallmark of policy frames”.

As discussed and demonstrated in previous chapters, planners interacting in plan-making processes have different properties with respect to discipline, paradigm, skilfulness and role, they relate differently to the expert knowledge in question and they enter plan-making processes with different objectives, knowledge and powers.

This means that one may expect planners involved in a plan-making process to frame the problem differently. This could result in what Rein and Schön (1993) describe as *frame conflicts*.

7.3.2 Frame conflicts

Rein and Schön (1993:161) describe how ‘quasi consensuality’ can make discourse difficult: “At the higher level, people may talk past one another, unaware of their actual disagreements. It is only in the everyday business of making and analyzing policy that the clash between frames becomes clearly evident” (Rein and Schön 1993:161). This could have been a description of the situation discussed in the introduction chapter, where there is an apparent agreement on reducing urban road traffic volumes and how this should be done, and where frame conflicts (amongst other things) that becomes visible in the actual plan-making processes may hamper the ability to do it.

According to Rein and Schön (1993:162), frame-critical policy analysts would uncover the multiple, conflicting frames in a given policy dispute: “They would inquire into the sources of conflicting frames in the histories, roles, institutional contexts, and interests of the participants”, and through this one “would explore the ambiguities and inconsistencies contained in conflicting frames and the consequences to which their use may lead”.

While the main aim of Schön and Rein (1994) was to contribute to improve policy-making by enhancing the degree of frame-reflection *in* the policy-making processes, I will use their works as inspiration for discussing why planners make plans which, if implemented, cause growth in traffic volumes. I will try to describe how the main actors framed the problem at hand, where these frames may transpire from, and how this framing caused that they contributed to production of a traffic-increasing plan. This also involves the possibility that problems may consciously be framed in certain ways by certain actors as a tactic to get their will through.

The descriptions of the framings have been formulated as what I understand (on basis of interviews and document studies) would be the stories the planners would tell about what kind of problem they are facing and how it could be solved. This is what Rein and Schön (1993:148) discusses as “problem-setting stories, frequently based on generative metaphors, [which] link causal accounts of policy problems to particular proposals for action and facilitate the normative leap from ‘is’ to ‘ought’”. My version of this is rather rough, since the cases have been described and discussed in detail already.

I have first defined *my* definition of ‘how the problem needs to be framed’ if actions are to be taken which contribute to reducing traffic volumes, the ‘traffic-reducing framing’. As Rein and Schön (1993) explain, there is no neutral position from where one can do frame-critical analyses, we need to define our own framings.

7.3.3 'Traffic-reducing framing' of the problem

The way I have defined the problem in this work, and which I will term 'traffic-reducing framing', can be described as follows (this is a very brief summary of the introduction chapter):

In order to spare future generations for major problems, we need to reduce human-made GHG emissions. In order to reduce GHG emissions from road transport, road transport volumes need to be reduced. Reducing traffic volumes involves among others to develop land use and transport-systems in ways that contribute to less car-dependency and reduced traffic volumes, more or less as described in chapter four. This means that the way we plan and develop land use and transport-systems need to change, and to be differently to what has been the case the last decades. This is the main problem. This requires that reducing traffic volumes needs to be defined as a most prominent objective, expert knowledge regarding how to achieve this need to be applied, and the necessary actions need to be taken.

7.3.4 How planners frame the problem in the cases

Almost all the interviewees find that reducing GHG emissions is an important objective, that reducing traffic volumes should be a part of this, and that they and their organisations will and try to contribute to achieving it. Even so, their framings of the problem in the concrete plan-making processes are not necessarily in accordance with these statements.

The case study illustrates clearly that few of the main actors involved frame the problem as a problem regarding reducing traffic volumes and GHG emissions. Instead, their main framings of the problem, their definitions of what the problem is and how it can be solved, are strongly related to the roles and responsibilities of themselves and their organisations, their discipline and their work life experience.

My retellings of the planners' framing-stories are over-simplified versions of their assessments and judgements in interviews and documents, and it is my interpretations. The planners express rich, complex and often reflective understandings of the situations and of what they could and should do, as (partly) presented in other parts of the dissertation. I refer what I understand as the 'main stories' that can explain why they act in ways contributing to that traffic-increasing plans are made.

7.3.4.1 Objectives related to predictability and equality preserve status quo

In the Tunga case, the case-handler knew there were several and conflicting objectives speaking pro and contra allowing the proposed office developments. She knew the previous political signals and decisions, and not least the established practice. When she found yet another case at her desk, similar to previous cases, she saw no reason to treat it differently from previous cases. Rather, the main problem that needed to be fixed was that these initiators should be treated equally with initiators of previous plans. Predictability and equality are important objectives at the planning authorities.

By *setting the problem* this way, she defines "the ends to be achieved, the means which may be chosen" (Schön 1983:40). She lists previous planning decisions in similar cases in the same area, and develops an argumentation leading towards the conclusion that these initiators should be allowed to build about 50 % of what they suggested, as the others. This is the main reason why *this* plan is made and recommended instead of another plan.

The consequences of framing the problem this way is that an established practice that do not contribute to reducing traffic volumes, but rather to increase them, is upheld instead of being stopped. In this case, it cannot be the responsibility of the case-handler to point out the problematic practice and call for changes. This is the responsibilities at higher administrative levels at the planning authorities, or at the overall plan section. At Tunga, the County Governor finally called for a change.

7.3.4.2 Conflicting frames

Ensuring good and car-less access to retail and service for most inhabitants

In the Økern-case, we found clearly conflicting frames. The problem that needs to be fixed in the sector plan for retail and service in Oslo, is that as many as possible of the inhabitants should have most of the necessary daily retail and services in walking and bicycling distance to their homes. This ensures that most people have easy access to such services, including those that don't drive a car. It also contributes to less car traffic. The main means to ensure this is to uphold and develop a retail structure with many and (relatively) small retail or shopping centres, rather than a structure consisting of few and large centres.

The case-handler is leaning on this understanding and this overall plan when handling the planning proposal for Økern. The problem becomes that the large shopping centre proposed in the plan will affect the retail structure in Oslo negatively and cause longer journeys to and from shopping and services. This will cause high car shares and much traffic, and is not desired. The overall sector plan is meant to avoid exactly this kind of developments.

According to the planning authorities, the main problem that needed to be fixed in the plan-making process was hence to get the shopping centre part of the development plan reduced to about the half of what the initiators had proposed. This also seems to be the main framing of the regional authorities.

The consequences if the case-handler succeeds with solving the problem as she framed it would probably be a traffic-reducing plan. A shopping centre serving the established and developing dwellings and work-places in the close vicinity would have been established, which did not take customers from other centres. This could cause reduction rather than growth in traffic volumes.

Be allowed to build the large shopping centre

The problem that needed to be fixed for the initiators of the Økern-plan, was to get around the municipal sector plan in order to get permission to implement the developers' project. One way of doing that was to *frame* the understanding of their project as in accordance with the overall plans. This was why they produced analyses and argumentation that this large shopping centre does not cause higher traffic volumes as if the same amount of shopping was spread to other locations in the city, that even if it actually produce more traffic and mobile GHG emissions the stationary GHG emissions may be zero, that the large shopping centre will not draw enough customers from local retail centres to cause problems and close-downs for them.

When this was not very successful, the initiators rather tried to reframe the problem to the more diffuse question of whether this is a regional and car-based shopping centre (which cannot be allowed according to overall plans) or if it rather is a large local centre.

The question still remains how the initiators' framed the problem in the first place, since they were willing to act as previously described. Several possibilities exist. One is that the

initiators *fell in love* with the project. They could have reasoned that this is a wonderful project that is good for the area and for the city. It is lucky for the city that these big, powerful and well-meaning developers want to build their showcase-project here at Økern. Almost no other developers would have the financial power to carry out an equally comprehensive, consistent and qualitatively good project here. If we let the municipal sector plan stop the project, this would be a mistake and a loss for the city and the area. This is (more or less) how the initiators' representative explained the situation in the interview. Hence, the municipal plan is a hindrance one need to get around.

No matter what was the underlying reason why the initiators act as they do, they do change the focus from consequences for the overall retail structure, travel behaviour and traffic volumes towards their project, its good qualities, and whether the negative consequences are tolerable. This is in order to get around the overall plans.

If they succeed, and the large shopping centre is built, this will cause high car shares and growth in road traffic volumes. It will probably also cause negative effects on existing retail structure that in turn will cause higher car-dependency and more road traffic.

In similar cases, a framing could be that the developers' benefits are prioritised before societal benefits. The reasoning would be that this large developer, who may be a good customer for years ahead, want to develop a far larger shopping centre than the overall plans allow for. The job is to help them get around the hindrance represented by the overall municipal plan. Whether this causes problem for the area, the environment and the city is not my responsibility.

A third framing in such situations could be to 'prepare for bargain'. If the developers claim that a large shopping centre is necessary, they can eventually and reluctantly agree on a smaller shopping centre development which is still more than the even smaller centre assumed to be optimal by the planning authorities. By starting higher, they may ensure that they have something 'to give away' in the bargains.

7.3.4.3 'All development is good'

The case-handler who was interviewed in Skedsmo explained that location of housing project and consequences with respect to traffic volumes and GHG emissions were normally not an important issue in zoning plan processes, and that the planning authorities would normally not bring this up.

When asking why traffic-increasing plans for housing developments were still made and recommended in Skedsmo, the sum of the many responses from several interviewees was that the overall plan is not very clear on this, it has not been in focus at the planning authorities office, this kind of housing development is understood as good and as the way things are done, it is common practice, and that Skedsmo welcome almost any developer that want to build anything in the municipality.

When getting the cases, the problem that needed to be fixed for the case-handler was hence to arrive at a good project for the municipality and the people that will live in the housing project in the future, and to get the plan approved. This framing does not include considerations related to localisation and increasing road traffic volumes. The consequence is that this was not considered in the plan-making process, and that traffic-increasing plans were made.

7.3.4.4 Nobody framed it as a problem regarding to reduce traffic volumes

NPRA reframed the problem as a road building project

NPRA defined a number of objectives, including reducing GHG emissions in the initiating phases of the project in the E 18-case. They listed a number of possible measures, and they included an alternative without capacity extension in their first alternative generation. In the planning programme, it was decided to assess two different alternatives that differed mainly with respect to road capacity, but where both represented increased road capacity. It was also decided that transport model analyses and cost-benefit analyses would be the applied analytical tools. Hence, the objective as well as the expert knowledge had been ousted. In the on-going plan-making process, the discussions revolve around the design and the capacity of the road.

The problem has been reframed from 'How should the traffic-problems in the west corridor be handled?' to 'How many lanes are necessary on the new road system?' The interesting question is what caused that NPRA framed or reframed the question this way?

The interviews with the NPRA planners bring up several answers. An important assumption is that the local decision-makers have made it clear that they will only accept alternatives with long tunnels in order to improve local environment problems. The traffic safety department at NPRA has expressed that long tunnels require that there are not long tailbacks and still-standing traffic in the tunnels. The NPRA planners also know that expansion of road capacity may contribute to increase traffic volumes. They (or at least one of them) don't think this is an *important* or decisive reason; the traffic volumes will increase whether the road capacity is expanded or not.

The problem that need to be fixed for the NPRA hence regards how to arrive at an agreed design of the road system that satisfy the requirements concerning to improve the local environment, and at the same time ensure sufficient transport quality for all users, and is not too expensive. They can directly affect only infrastructure developments, and this is what they focus on in the plan. The tool they know is transport model analyses, and this is what they apply. The answer can only be a road extension that will cause growth in traffic volumes.

NPRA could have framed the problem as to reduce traffic volumes, which would contribute to achievement of all three main objectives. If they had defined the high traffic volumes as the problem that needed to be fixed, and applied the expert knowledge regarding how to achieve this, they could have arrived at very different solutions and a reduction of traffic volumes.

Local politicians frame it as a local environment problem

The problem that needs to be fixed from the local politicians' point of view is to reduce the local environmental problems inflicted on their inhabitants from the existing E 18. Hence, they frame this as a local environment problem. The politicians have arrived at the conclusion that only long tunnels are an acceptable way of improving the situation. That this also causes growth in traffic volumes locally and regionally and increase GHG emissions are not parts of the discussion, despite that several hearing instances have brought attention to these problems.

Local authorities frame it as 'let the wishes of the local politicians be fulfilled'

The local planning authorities were quite frank in their description of the problem. The politicians have decided that long tunnels are the only acceptable solution, and this is what they try to develop an acceptable plan for. They also aim at facilitating for densification in public transport nodes, for improving the conditions for walking and bicycling and so forth, in order to contribute to reducing traffic volumes. Regarding the road, however, there is no chance that they could suggest a capacity reduction of today's infrastructure, since the political signals was this strong and clear. Their 'problem to be fixed' is to ensure that the will of the local politicians are fulfilled.

Nobody frame the problem as to reduce traffic volumes

An underlying understanding seems to be that the planners doubt if making a traffic-reducing alternative that can be acceptable and adopted is possible. Since this is not an alternative end, they do not consider the means that could have made possible the reduction of traffic volumes. This is to me a main explanation how and why *nobody framed the problem as to reduce traffic volumes*, and why nobody developed an alternative where one applies the measures described in the expert knowledge in order to arrive at a traffic-reducing alternative. This may be seen as a classic example of that one 'at the higher level would like to find a traffic-reducing solution', but when starting the actual concrete planning arrives at the old ways of solving the problem – by building more roads.

7.3.5 Frame conflicts between how the planners frame the problem and how they ought to frame the problem

A main finding from the descriptions above is that almost nobody (the public authorities in the Økern case is the exception) see reducing traffic volumes as a main problem that needs to be fixed in the concrete cases. Even when it is brought into the plan-making processes, the planners involved frame the problem in ways that oust 'reduction of traffic volumes', and they don't consider traffic-reducing measures. This is partly caused by and reinforced by lack of expert knowledge among the planners, and shortcomings of the expert knowledge (as discussed).

This corresponds with the findings in chapter five. The analyses of the survey concluded that a little more than half of the planners related to the new paradigm that involves focus on reduction of traffic volumes and to apply the measures included in the expert knowledge in question.

This means that there is a frame conflict between how the planners *need to frame* the problem in order to contribute to change the ways land use and transport-systems are developed in traffic-reducing directions, and how they *actually frame* the problems at hand in their daily work. This indicates a need for the *planners to reframe the problem* if to contribute to solving the problem of increasing traffic volumes and GHG emissions.

7.3.6 Reframing may be hard – for several reasons

Reframing the problem implies that planning practitioners need to change their ways of thinking and acting. This poses major challenges, which may also be understood as explanations to why the frame conflict occurs. These are related to properties of the planners, as discussed in chapter five and to the expert knowledge as discussed in chapter four.

First, giving the objective 'to reduce road traffic volumes' a prominent position in land use and transport planning calls for playing down traditional professional values and objectives

within most disciplines within the older paradigms. This may be difficult for a number of reasons, as we have seen.

Second, the reframing towards 'land use and transport planning for reduced urban road traffic' requires integration of at least two disciplines or kinds of knowledge; land use planning and transport planning. These were traditionally seen as being relatively independent from each other. This integration implies that the planners need to use new theories and methods, and consider other strategies and means, often in unfamiliar combinations when making plans. It might be expected that many planners will relate to the more mono-disciplinary ways of framing the problem. Reframing the problem hence requires planners to acquire new knowledge. One explanation why the planners frame the problem in ways that contribute to production of traffic-increasing plans may simply be that many planners have not obtained this new knowledge.

Third, coordinated land use and transport planning for reduced traffic volumes are complex matters. All planners involved in plan-making affecting development of land use and transport-systems cannot be expected to have expertise in this field. Many have not been educated in this topic. Since planners often work with several kinds of issues they don't have time to read up on everything. Some are just un-experienced. Reframing the problem from simpler questions related to land use or transport-systems to coordinated land use and transport-systems may be hard for those not very skillful in this topic.

Fourth, the role a planner has in a plan-making process affects whether she finds it more useful to frame the problem as regarding land use and transport planning for reduced traffic volumes.

Last, reframing of the problem requires *development* of new knowledge. New theories, methods and strategies need to be developed and distributed. The methods used for evaluating alternative strategies and means in several of the cases have been developed within the 'old framing' or without consideration for 'reduction of traffic volumes'. Hence, they could not cope with the objective in question, with the means prescribed to achieve this or with the complexity inherent in 'land use and transport planning for reduced urban road traffic volumes'. The expert knowledge in question has certain shortcomings which make it less accessible and applicable in plan-making, as described. This may be part of the explanation why planners don't frame the problem as to reduce road traffic volumes.

7.3.7 Reframing is necessary

It is evident from the empirical findings that there are disagreements among planning practitioners about the importance and realism of the objective 'reducing traffic volumes', that not all practitioners possess or agree with the expert knowledge embedded in the new framing, and that this knowledge may have weaknesses. In this situation it may be expected that the 'new' objective of reducing traffic volumes is played down and that the old knowledge and methods are still applied. This would imply that the ways planning are carried out have not changed and therefore we cannot expect the outcomes of the planning processes to be different from before.

In a situation with competing objectives, and where knowledge is contested, the actors may choose what they consider as valid knowledge based on ideology, interests or position. Those who have power may define what count as valid objectives and knowledge (Flyvbjerg 1998). If the actors who promote objectives and knowledge within the new framing are not the most powerful actors in the game, this may be one explanation why plans resulting in increased road traffic volumes are still made. In the cases considered here, the initiators

possessed the power to define the framing of the concrete problems, and consequently the alternatives that were assessed, the methodology that was applied, the interpretation of the results etc., and hence the outcome in the form of planning proposals.

In order to actually change how land use and transport-systems are planned and developed, planners in various roles contributing to making plans need to reframe their daily problems so that they at least include reduction of traffic volumes as a prioritized objective, and the expert knowledge in question as a tool for achieving this and other objectives.

How and why planners make plans which, if implemented, cause growth in traffic volumes

8. Conclusions: How and why planners make traffic-increasing plans

This dissertation was supposed to answer the following research question: How and why are planners making plans which, if implemented, cause growth in traffic volumes? The problem was conceptualised as a problem of double organised complexity, and the most relevant factors to study were found to be the expert knowledge, the planners and the plan-making processes. The three explanatory factors have been studied abstractly and concretely, inspired by critical realism. Overall and summarising analyses have been conducted in order to arrive at more general answers.

The idea has been to operationalize the broad objective of reducing GHG emissions to objectives regarding reduction of traffic volumes. It has been important to be concrete, and this is why I chose to study zoning plan processes. I wanted to ensure that the discussions revolve around a concrete subject area, and chose the subject I have my main expertise in. This interface required that how-questions as well as why-questions needed to be answered.

The conclusions can now be presented in three different ways: By causal powers, mechanisms and conditions; By how the problem is framed, and; By how planners act when making traffic-increasing plans. Finally I discuss the planners' and the planning researchers' roles when traffic-increasing plans are made.

8.1 Explained by causal powers, mechanisms and conditions

Planning processes may seem irrational and hard to understand, especially for those who have not been involved in them. They do not follow described receipts from A to Z, the tasks involved in making plans are often overlapping, and they often go into iterative loops. Numerous objectives are discussed, several kinds of knowledge and knowledge claims are brought in, and a number of actors can and do exert power in different ways and at different times. The actors involved have different roles to play, and they play the game differently within these frames in the various plan-making processes.

Understanding this as a system of organised complexity and studying it through a critical realism approach have enabled me to opening the black box and describe this system as logical and rational. The parts can be separated in causal powers, mechanisms and conditions, and it is possible to *explain* how plan-making processes may produce traffic-increasing plans. The system is causally consistent, things happen for a reason.

The main cause why an operational plan is made is that somebody wants to carry out a project or to solve a problem, and initiate a planning process in order to be allowed to do so. In the following plan-making process, involving several planners working for different actors, a number of mechanisms may or may not be activated in at least one of the main tasks of plan-making. This may cause that a traffic-increasing plan is made.

The most relevant mechanisms were found to be:

- The objective is not introduced
- The objective is ousted by other knowledge
- The expert knowledge is not introduced
- The expert knowledge is ousted by other kinds of knowledge
- The expert knowledge is applied wrongly

Whether and how these mechanisms are activated, and whether they are counteracted by other mechanisms or allowed to produce traffic-increasing plans, depend on a number of contingent conditions. The explanatory factors studied here were found to be important conditions, which influence whether the mechanisms are activated, and whether they are counteracted or reinforced, and hence whether traffic-increasing or traffic-reducing plans are made.

The expert knowledge, the planners and the plan-making processes have been explored in abstract analyses and concrete studies in order to disclose which *properties* of these factors can contribute to the mechanisms being activated and allowed to produce traffic-increasing plans.

Regarding *the expert knowledge*, the most important properties were found in shortcomings of the knowledge:

- Lack of descriptions of the general knowledge that are accessible for planners and applicable in concrete plan-making processes
- Lack of description of and possibly under-development of the method 'professional reasoning'
- Insufficient empirical knowledge: lacking knowledge, poor assembling and analyses of existing data, poor access to existing knowledge

These shortcomings may cause that the planners are left without good tools for making traffic-reducing plans, and for detecting, assessing and confronting traffic-increasing plans. They make the knowledge and the analyses less transparent and understandable, contributing that fewer understand them as valid and relevant. This can make it easier to oust this expert knowledge from the plan-making processes. This is not least so in complex cases and when confronted with competing and simplified knowledge.

Regarding *the planners*, it was found that properties of their discipline, paradigm, skilfulness and role affect whether they:

- possess the expert knowledge in question
- find the expert knowledge in question relevant and valid for the problem at hand
- possess and rely on other kinds of expert knowledge that they rather want to apply
- want this kind of expert knowledge to be applied
- are capable and skilful enough to apply the expert knowledge correctly
- agree to apply this expert knowledge in this particular plan-making process

How the planners relate to the expert knowledge in questions strongly affects whether they can and will contribute to making traffic-increasing or rather traffic-reducing plans. Since plan-making processes normally involve several planners with different properties, they often also relate differently to the expert knowledge in question. If not at least one planner

in a plan-making process possess the expert knowledge in question, find it relevant and valid, want it to be applied and is capable and skilful enough to use it correctly, then the chances are slim that the knowledge will be applied and the chances higher that a traffic-increasing plan is made. The same is the case if planners involved strongly rely on other kinds of expert knowledge, or strongly disagree that this knowledge should be applied. This affects whether the mechanisms above are activated, and whether they are counteracted by other mechanisms.

For the third explanatory factor, the plan-making processes, it was found that the properties of the objectives, knowledge and powers of the planners involved in a plan-making process together strongly affect what becomes the main objectives in a plan-making process, which expert knowledge is applied and who exert their powers. This affects whether the generative mechanisms are activated and whether they are allowed to produce traffic-increasing plans. A number of relevant properties were disclosed. These may be listed, for each of the interacting planners, as:

- Objectives:
 - Whether they find the objective 'reducing traffic volumes' important
 - Whether their main objectives in the particular cases are competing or conflicting with 'reducing road traffic volumes'
 - How they perceive this objective: what it means; whether it is achievable; whether it is prioritised by politicians
- Knowledge:
 - Whether and to which degree they possess the expert knowledge in question (expert, can use it, know of it)
 - How they perceive this knowledge (relevant, valid, usable, others)
 - Which competing knowledge they possess and know of
 - Which knowledge and methods they apply and support
- Exerted powers:
 - Whether, how and to which degree the various actors exert their direct and agenda setting powers
 - Structural power - exercised in relation to latent or not consciously expressed conflicts

The objectives, the knowledge and the powers of the planners involved reciprocally affect each other, and define which objectives that become prominent and which knowledge is applied. For instance, if objectives regarding reduction of traffic volumes are strongly defined in overall plans, or if the planners agree that this is a prioritised objective, the chances are higher that the group of planners will find traffic-reducing alternatives. The expert knowledge will often be more influential in cases regarding issues where the knowledge is strong than in cases regarding issues where it is weak. If powerful actors promote the objective and expert knowledge in question, the chances are higher that these will be emphasised and a traffic-reducing plan will be made, and so on.

Properties of the expert knowledge in question, as well as properties of the planners involved, are contingent conditions that may affect this process. Together, this defines whether the emerging process is the kind of process that produces either a traffic-increasing or a traffic-reducing plan.

8.2 Explained by how the problem is framed

How and why planners make traffic-increasing plans may also be understood by how the problem is *framed* in a plan-making process. The objectives, ends and values of the planners involved, and their knowledge, understandings, theories and beliefs all contribute to define how they *set the problem*. The discussions in plan-making processes often revolve around how the problem is to be set, what should be defined as the problem that needs to be solved. How the problem is set do strongly affect which measures are considered, which methods are applied and hence which answers, recommendations and plans that can be and are produced.

When traffic-increasing plans are made, this may hence be explained by that the discussions and struggles resulted in that 'reduction of traffic volumes' was not defined as a main problem to be solved, and hence that the traffic reducing measures were not seen as relevant.

8.3 Explained by how the planners working for various actors act

When planners make plans which, if implemented, cause growth in traffic volumes, this may be explained in terms of how planners working for different actors *act* in a plan-making process; whether and how they apply their objectives, knowledge and powers.

The planners working for the municipal authorities may or may not:

- have produced a strong, clear and agreed upon overall municipal plan steering the spatial development in traffic-reducing directions

Initiators of plans that conflict with overall plans may comply with the plan, or they may:

- pretend to comply with the plan, or
- oppose the plan

...by playing on and applying objectives, knowledge and powers in many and diverse ways, as described.

If initiators pretend to comply with the plan or oppose the plan, the planning authorities may respond by:

- pointing out conflicting objectives
- assessing and challenging the knowledge produced by the initiators
- preparing alternative solutions and analyses
- recommending that the plan is rejected

Other authorities and other bodies have, according to the Norwegian PBA large responsibilities, and may:

- deliver statements or formal complaints in planning processes, drawing attention to consequences, alternative etc. that are not adequately handled in the analyses and plan

If an initiator is proposing a traffic-increasing plan, and if the planning authorities and other authorities fail to point out the conflicts of objectives, to require that the objective 'reducing traffic volumes' is included in the considerations, that traffic-reducing alternatives are

included, that the alternatives are assessed and compared with respect to traffic volumes, and that the consequences with respect to traffic volumes are presented to the decision-makers in clear and understandable ways, then the chances are high that a traffic-increasing plan is made.

8.4 Planners and expert knowledge matter

A main reason for conducting this work was to disclose if and how planners and planning researchers matter when plans are made which, if implemented, cause growth in traffic volumes. A clear conclusion in this work is that they (we) do.

Planning was previously defined as to bring knowledge into decision-making in order to improve decision-makers' abilities to make decisions about future actions which contribute to the achievements of their objectives. If we are supposed to help politicians achieve the objective 'reducing traffic volumes and GHG emissions', we must bring forward acceptable and traffic-reducing alternatives, and we must point it out if the politicians are about to accept plans that may cause growth in traffic volumes.

The quality and content of the expert knowledge that planning research produces matters for whether planners can promote the objective 'reducing urban road traffic volumes', oppose traffic-increasing plans with force, and produce relevant and traffic-reducing alternatives. Properties of the planners and how they relate to the expert knowledge in question is often decisive for how plan-making processes can and do proceed, and which plans they can and do produce. This strongly affects how plan-making processes proceed, how land use and transport-systems are developed, and hence whether road traffic volumes and GHG emissions continue to grow or if they rather are reduced.

Many actors and conditions affect planning and planning research. Flyvbjerg (1998) found that in certain situations "power *defines* what counts as rationality and knowledge and thereby what counts as reality" (*italics in original*). This can be read as if it does not matter what planners do, since those with power disregard professional reasoning and do what they would have done anyhow.

This does not take away the significance and importance of how planners and planning researchers think and act, and hence the responsibilities resting on our shoulders. Rather, the findings in this thesis have demonstrated quite clearly that it matters whether planning research produce sufficiently good research and expert knowledge, and how planners act in concrete plan-making processes.

If land use and transport-systems are to be developed in traffic-reducing directions, we - planners and planning researchers - need to do better. We need to improve the expert knowledge, and we need to change the ways we make plans. We need to start producing traffic-reducing instead of traffic-increasing plans. This is *our* profession, we are the experts, and we cannot expect anybody else to come up with knowledge and solutions. We need to lead the way.

How and why planners make plans which, if implemented, cause growth in traffic volumes

9. What - if anything - should we do about it?

Being a planner, and being inspired by critical realism and phronetic planning research, I cannot but asking what, if anything, we should do about it (with reference to Flyvbjerg 1991). Initiators follow their rules and rationalities, and the politicians and the public follow theirs. This is the landscape planners manoeuvre in. A main inspiration for this work was to figure out what planners and planning researchers can do, within these frames, to contribute to traffic-reducing plans being produced rather than traffic-increasing plans.

By describing how this system of double organised complexity works, which factors contribute to traffic-increasing plans being made, and how, the idea was to figure out how these factors could be changed in order to contribute to land use and transport planning steering the development in directions contributing to *reduction* of traffic volumes instead of growth. Since the explorations have been quite concrete, the suggestions of what planners, planner educational institutions and planning research could do to change the current situation, if society so wishes, can be quite concrete as well.

The recommendations have been developed and presented in their respective chapters, and are only summarised and gathered here.

9.1 What should we do about the expert knowledge?

Even if it was found that the expert knowledge in question is good enough in the sense that it can guide planners that aim at contributing to a traffic-reducing land use and transport development, it has shortcomings, as described in previous chapters. These shortcomings regard especially three features of the expert knowledge. If these shortcomings of the expert knowledge were improved, then the chances would increase that land use and transport-systems were developed in less traffic-increasing directions.

This regards *first* that the expert knowledge in question needs to be described in comprehensive and understandable ways that are accessible for planners and applicable in concrete plan-making practices. This regards how and why developments of land use, transport-systems, travel behaviour and traffic volumes are interrelated, how certain developments of land use and transport-systems affect traffic volumes, and how land use and transport-systems ought to be developed in order to reduce rather than to increase car dependency and traffic volumes.

Second, it regards the empirical knowledge of the existence and strengths of the effects of the interrelations in various contexts and under various conditions. More empirical knowledge is necessary. Further, it needs to be gathered, analysed and organised in ways that makes it more usable in plan-making. It needs to be organised and presented in ways and through channels that are applicable and accessible for planning practitioners dealing with concrete problems in various and concrete contexts.

Third, the method that has been termed ‘professional reasoning’ needs to be described, and to be empirically studied and analysed. It need to be improved and developed into a referable and acknowledged method.

These suggestions are in accordance with Schön (1983), who emphasised the importance of offering research regarding overarching theories and methods, which practitioners can apply when figuring out how to set and solve problems in their practice.

If the expert knowledge was improved with respect to these issues, then it would contribute to traffic-reducing plans being made instead of traffic-increasing plans. It would make the expert knowledge more accessible and usable for planners that have not been trained as specialists in this topic; make it easier to explain the knowledge and how it has been applied in order to arrive at particular recommendations; make the knowledge and the methods more transparent; cause that this expert knowledge is not so easily ousted by other knowledge; reduce the opportunities to consciously apply the expert knowledge in faulty ways, and not least; contribute to traffic-reducing alternatives are produced, introduced and called for in planning processes. These may all cause that planners oppose and reject traffic-increasing plans, and contribute to make more traffic-reducing plans.

9.2 What should we do about the planners?

Even though many planners do possess at least basic knowledge regarding how land use and transport-systems ought to be developed in order to contribute to reduce traffic volumes, few planners know the expert knowledge in question well. Few know it well enough to be able to apply it skilfully in discussions of the transport generating potential of a plan or to develop traffic-reducing alternatives and plans. Some planners rather rely on other kinds of knowledge. This is causally related to their discipline, paradigm, skilfulness and role in the plan-making process.

As we have seen, how the planners relate to the expert knowledge in question may strongly affect whether they aim at, believe in and are able to produce plans which contribute to reduction rather than growth in traffic volumes. The current situation could be changed if the understanding of the expert knowledge in question were improved among planners in general. Not least would it be helpful if more planners had thorough and deep knowledge regarding how developments of land use and transport-systems affect travel behaviour and traffic volumes, and how this system ought to be developed and stimulated in order for traffic volumes to actually be reduced.

Such improvements could be achieved if more *planning students* were taught overall land use and transport planning for reduced traffic volumes at advanced levels at the universities. In Norway, planning students at the University of Science and Technology can choose this as a topic in their master degree. Planning students at the other large teaching institutions for planners in Norway, University of Life Sciences, are not offered this as part of their study programmes. If they did, that could contribute to improving the situation.

Many of those working as planners have not been educated as planners, and many of those educated as planners have not been taught overall land use and transport planning. It could hence contribute substantially to improve the situation if post-university courses in coordinated land use and transport planning for reduced traffic volumes were offered.

These are mainly tasks for planning education institutions. It may also be the responsibility of large employers of land use and transport planners, such as NPRA, large municipalities and so forth to call for continuing professional development courses of high quality within this field, and to ensure that their planners attend them.

It would also contribute to raise the level of knowledge of coordinated land use and transport planning for reduced traffic volumes among planners, and to enhance the application of it, if the expert knowledge in question was improved in ways discussed above.

9.3 What should we do about the plan-making processes?

When discussing what should be done in order to for the plan-making processes to produce traffic-reducing plans instead of traffic-increasing plans, focusing on properties of objectives, knowledge and powers of the planners involved, a number of suggestions can be extracted from the previous analyses.

Strong and clear objectives and strategies in overall plans regarding reduction of traffic volumes seem to be almost decisive if to allow public authorities bring this topic strongly into plan-making processes. National planning purviews may be strong tools, but it seems as these are considered more usable and acceptable in situations where such objectives also are stated in influential municipal plans. Planners make the overall plans, and hence they often play an important role by affecting whether these plans become strong tools that steer spatial development in traffic-reducing directions. This regards not least developments of strategies and formal concretisations in maps and purviews. A suggestion for change is hence that the planners work harder to ensure that the overall plans are good steering tools and takes developments in traffic reducing directions. Only planners have the expert knowledge to ensure this.

The objective also need to *be made important* by planners working with zoning plans in various positions, calling for assessments with respect to traffic volumes, calling for and producing traffic-reducing alternatives, addressing this objective in recommendations, making comments, filing complaints and so forth. A suggestion for change is hence that the planners work harder to make the objective ‘reducing traffic volumes’ more important in zoning plan processes and the expert knowledge in question applied and influential. The objectives can only *be* strong and important if politicians too act in accordance with them, but planners can often affect how politicians understand a problem and the potential solutions.

In order for planning authorities and regional authorities to point out conflicts between zoning plan proposals and objectives in overall plans, they need to have at least basic understandings of the expert knowledge in question. In order to call for rejections or changes of planning proposals, or to suggest traffic-reducing or less traffic-increasing alternatives, however, they need to know this knowledge well and be able to apply it in explanations, analyses and alternative generation (‘proficient performer’). It would also be an improvement if the initiators and their consultants mastered this. This has a lot to do with properties of the planners and of the expert knowledge, as previously discussed.

It is striking how much power the initiators have as developers of alternatives and as the ones making and presenting the impact assessments and the plans. It has been revealed that the initiators are not always producing or presenting analyses in honest ways. In order to reduce this problem, one could call for a system allowing only approved professionals (firms) to act as initiators of zoning plan processes. Planners would need to be qualified and knowledgeable in order to be responsible for particular analyses and plans, and planners and planning firms caught in misconduct would “need to lose their approval. An approving-system would need to be developed, including approval-criteria, a system for complaints,

and rules ensuring that initiators that misconduct lose their approval. A similar system already exists for the construction-industry.

There are often large rooms of manoeuvre with respect to how and how strongly planners in various positions exert their powers. This regards whether planners working for initiators exert their many kinds of powers to convince or mislead public authorities and decision-makers. It regards whether planners working for public authorities point out conflicting objectives, bring in alternatives, and assess the analyses conducted by initiators. It regards whether planners working for regional authorities warn about and file formal complaints. A suggestion for change is hence that the planners to larger extent *exert their powers* to point out conflicting objectives, and to explain negative consequences with respect to this objective, in the planning processes. If the objective 'reducing traffic volumes' is stated, strong and clear, and if the planners possess the expert knowledge in question, they may easier exert the kinds of powers that contribute to that traffic-reducing plans are made instead of traffic-increasing plans.

This also illustrates that how, exactly, each planner chooses to carry out their everyday duties strongly affects whether traffic-reducing plans are produced. A planner can work hard in order to contribute to making traffic-reducing plans, search for knowledge, bring up the question in relevant discussions, and point at alternative solutions, or not. It is the sum of how all planners conduct their duties that defines the quality of the plans that are made, also with respect to whether they contribute to growth or reduction of traffic volumes. If traffic-reducing plans are to be made instead of traffic-increasing plans, planners need to change how they conduct their day-to-day duties.

9.4 Planners need to reframe the problem

Another approach to answering the question 'what should we do about it?', within the understanding that reducing traffic volumes is a prioritised objective, is that planners need to frame the problem differently. They need to frame it as a problem of large and increasing traffic volumes, and to see this as what needs to be fixed. They need to learn to apply the tools consisting of the expert knowledge in question, and these tools also need to be further developed. This requires that the planners reframe the problem, and that they do plan-making differently from what they do today.

Or said with the words attributed to Albert Einstein: The world we have created today as a result of our thinking thus far has problems which cannot be solved by thinking the way we thought when we created them.

9.5 There is much work to be done

In order to change plan-making towards production of traffic-reducing rather than traffic-increasing plans, there is much work to be done. There is work to be done for planning researchers, for planning schools and those working there, and not least for the planners in all positions. Changing the way one thinks and acts is no small task. When we know what is at stake, however, it may be argued that it is necessary and worthwhile. This regards the future climate and living conditions on Earth, but also the local environment and quality of life for citizens in the cities, and more.

10. Further research

In the work with this thesis it has been necessary to be stringent with respect to what to bring into the discussions. This means that I have passed many side-roads that could have been interesting to explore, problems that could be interesting to study deeper, and kinds of processes that would have been interesting to study³⁰.

10.1 Studying municipal plans and other overall plans

When I started working with the thesis, a main assumption was that there were clear aspirations in overall plans to reduce road traffic volumes. The case study has illustrated that the overall plans don't necessarily steer in traffic-reducing directions, they are rarely ambitious enough to be able to achieve the overall objectives they are stating, they are often neither strong nor clear, and the politicians are weakening them by not making decision according to them.

To study overall plans in the perspective of whether they are good tools for steering development of land use and transport-systems in directions that contribute to reduce traffic volumes and GHG emissions from transport would have been interesting and could have produced useful findings and recommendations.

10.2 Studying more and other cases

Four cases have been included in the case study, meaning that numerous other cases could have been selected. I have only selected cases that results in plans that are clearly not in accordance with how the expert knowledge in question recommends that development of land use and transport-systems should pursue in order to contribute to reduction of traffic volumes.

It could also be interesting to study cases that *are* in accordance with the expert knowledge and ask how and why planners make traffic-reducing plans. This could regard housing developments as densification in central areas, development of new subway-lines or bicycle-facilities, or adoption of new parking regulations. It could also be interesting to study cases where such initiatives were stopped or hindered, and ask which kinds of problems that occur when traffic-reducing plans are initiated.

It could be interesting to look into cases regarding other issues that those included. To include more cases of the same kinds of issues, such as increasing road capacity on urban motorways or car-based housing developments, could have facilitated interesting comparative studies which could have been expected to be similar with respect to at least some variables, and enable more precise discussions of effects of variations in certain variables. The same could be said of studies of planning processes located in the same municipalities and hence under the same overall plans, planning authorities and political decision-makers.

³⁰ Main findings in this dissertation are recommendations for further research. These are discussed under the heading 'what – if anything – should we do about it?' above, and are not included in the discussion about further research.

10.3 Exploration of structural powers

I never got around to discussing the structural powers influencing the plan-making process in various ways in any depth. To studying these structural powers could enhance the understanding of especially *why* traffic-increasing plans are made, and enable other kinds of recommendations for action than those I arrived at.

10.4 Emergence of low traffic and high traffic cities

When studying cities (instead of planning processes), and defining the causal powers, mechanisms and conditions that cause traffic volumes to increase or decrease, it becomes clear that the sum is more than the parts. Cities *emerge* into one kind of city or another kind, and traffic volumes and further developments in the city are related to what kind of city it is. But what is it that makes some cities become car-cities and others not?

Kenworthy (1990) did an interesting attempt to explaining this, but further exploration is needed in order to achieve a deeper understanding of how and why we find very different kinds of travel patterns, and different kinds of spatial developments, in different kinds of cities. Critical realist understandings of emergence could be a helpful tool in such explorations.

10.5 Complexity theory and critical realism in planning theory

It would be interesting to look more into the discussions going on in planning theory revolving around complexity theory and how it can be applied in and contribute to developing planning theory (see e.g. Byrne 2003, Chettiparamb 2006, Manson and O'Sullivan 2006, Innes and Booher 2010). Several authors have pointed out shortcomings in the epistemology and methodology of complexity theory. The potential of combining critical realism and complexity theory, as done in this thesis, could be further developed. I see promising possibilities for arriving at better approaches to studying spatial developments as well as plan-making processes.

10.6 Explanations related to other factors

As suggested several times throughout this work, there are many aspects and systems that affect plan-making and which kinds of plans that are produced. Changing these could probably also contribute to change planning and plans. This means it could be worthwhile to study them in order to gain deeper understanding regarding how and why planners make traffic-increasing plans. Below, I have listed those explanatory factors I understand as most interesting, but which I will not describe in any more detail.

- How the political decision-makers understand the objective and expert knowledge in question, and how they reason around and frame the decisions they make
- How the private and public initiators of plans understand the objective and expert knowledge in question, and how they reason around the decisions they make
- How the public could be involved in ways that make them respond differently, or which could have contributed to better plans
- How changes of the PBA and the planning system could alter the situation
- The potential of e.g. economic measures in order to reduce traffic volumes
- How other ways of organising the national and global economy could contribute to less traffic and GHG emissions, and more

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Appendix A: Interview studies among planners

A.1 Introduction

The general interviews with planners that were announced in the method-chapter are reported in this appendix. The aim of conducting general interviews with planner were to gain more knowledge of how those doing the plan-making understand the objective 'reducing urban road traffic volumes', how they relate to the expert knowledge in question, how they perceive the knowledge, and how they understand the power situation in plan-making processes. It was also an opportunity to map the background of the planners, how well they know the expert knowledge in question (according to them) and their main references with respect to the expert knowledge.

The interviews have been conducted in two series. The first was done before the start-up of this PhD-work, in 2004 and 2005, but intended to be used in this work. The second was conducted as parts of the interviews for the case study in the PhD, in 2010 and 2011.

The two series of interviews are reported separately in this appendix. Summarising analyses have been conducted within each of the series. Interview guides and lists of interviewees are included.

A.2 Methodology

The interviews have been conducted as semi-structured interviews, mainly at the office of those interviewed. Pre-prepared interview guides were applied, but the conversations were also allowed to follow what the interviewees were interested in and knowledgeable about. The interviewer followed up with critical questions.

All interviewees have not been asked all the questions. The wordings of the questions have not been exactly the same, mostly because the semi-structured form of the interviews. Further, the cases regarded different projects, the interviewees were belonged different places in the system, and they had various competences. All minutes, findings and analyses are organised in a report, which is not included in the dissertation.

Most interviews have been taped. The interviewees have been asked to read and correct the minutes from the interviews, and their proposals for changes have in general been obeyed. The 2010/2011 interviews have been reported to the Norwegian Social Science Data Services according to the regulations.

A.3 The interviews conducted in 2004 and 2005

The 2004/2005 interviews were conducted among professionals involved in overall land use and transport planning, working for different authorities in the Oslo area. The reporting here is based on 12 interviews, conducted in November and December 2004 and January and February 2005. These interviews were conducted in order to be part of my PhD-work, and have not been applied or referred to prior to this.

A.3.1 Summing up the findings in the 2004/2005 interviews

The interviews revealed that the planners involved don't necessarily find that reducing urban road traffic volumes is the main objective in land use and transport planning (even if they may think it should be). Rather, they see the main objectives being to 'make the city work (transport-wise)', 'improvements of local environments' and traffic safety. If reducing

urban road traffic volumes is not regarded as a realistic objective, these objectives require new road capacity on main roads in order to drain traffic from local roads and streets and to improve traffic flow. Hence, they are conflicting objectives with 'reducing urban road traffic volumes'.

When asked whether they find 'reducing urban road traffic volumes' to be a realistic objective, the main impression is that they don't. They explain that economic growth and growth in population and work places will increase transport demand. Hence, as long as people are not willing to turn to walking, bicycling and public transport (implicating that they are not), the growth in road traffic will continue. Several express quite clearly that reducing urban road traffic volumes is unrealistic. Some said that the objective should be abandoned, while one finds it unrealistic but necessary; 'we have to make it!'

The expressed political objective was that road traffic volumes should not increase as a result of public transport taking a higher share of the total traffic. Even though most agreed on this, and many argued that there is a potentially large field of competition between public transport and the private car, in reality only a few believed that implementation of the transport-reducing means would reduce urban road traffic volumes. Some found it hard to believe that the trend in growing road traffic volumes might be broken. Others felt that there is a lack of evidence about the precise effects the means would have on road traffic volumes. Some also stated that they were unsure whether other agencies and/or politicians were willing to, or capable of, using the necessary means, especially restrictive ones.

When asked which means should be applied in order to reduce traffic volumes, most of the planners came up with the whole list of transport-reducing means. No-one mentioned to reduce road capacity, but several emphasised that one should not increase it. They were aware that means need to be used in combination in order to be efficient, and that restrictive means are necessary. When asked whether they think that there are fields of competition between public transport and the private car, all answered yes.

When asked whether one should build more roads, only few totally dismissed this. Even if several of the planners stated that we can and should not try to 'build our way out of traffic congestion', only a minority saw increasing road capacity as a negative thing in itself. Several argued that there is no use in increasing the capacity, but that there are other reasons for building roads. These were mainly related to improving local environment by building tunnels and draining traffic from local streets to main roads, and that it is necessary in order to keep up a well-functioning road traffic system.

When asked why the traffic-reducing measures are not applied (sufficiently), an interesting variation of answers appeared. Some pointed at the politicians and their decisions. Some mentioned pulverized responsibilities - one cannot necessarily rely on that 'the others' can or will do their part. Lack of plans for improvements of public transport services and improving conditions for walking and bicycling was another explanation. Several mentioned that it is hard to get political acceptance for the negative measures, and some complained over coward bosses who refrained from telling politicians what it actually takes. They also mention that the planners are not good enough at telling politicians the consequences of their choices, and it was mentioned that the transport models were not good at handling traffic-reducing measures. One claimed that one can argue that all locations in Oslo are in 'nodal points', and be allowed to build there. Further, certain groups involved in plan-making do not possess the necessary knowledge. The police and the architects were mentioned.

Another kind of explanations was related to prioritisation of other objectives. The measures are not applied because they are not in accordance with considerations regarding local environment and traffic safety. Several expressed in different ways that there are inconsistencies between overall plans and what is approved in zoning plans. For each little project, the deviation and its consequences may seem insignificant, but when summed up this practice causes a development which is something else than what 'everybody' aim at.

Some of the planners expressed that they don't really believe that any measures could cause reduction of urban road traffic volumes; they claim that we don't know enough about the effects of traffic-reducing means. Further, a few of the interviewees from the NPRA explained that they are responsible for the road system and that it works, and they can affect only this. One cannot really know whether those responsible for other measures can or will apply them. Hence, building roads is the only means they can apply.

When asked directly whether planners and politicians possess the expert knowledge in question, most answered that this varies. Some meant that there may be differences between the generations, and others that there are several sub-cultures with different understandings. Some mentioned that there sometimes is a lack of understanding that certain projects and actions actually do generate more traffic. A few working for the NPRA felt that a main problem was that they were not good enough in communicating the knowledge they possess and produce. A few explained that many think they understand how this works, but that when you get a tiny bit deeper or more technical, they are not able to follow the arguments if they become a tiny bit technical. One explained that nobody can argue against traffic analysis, since nobody understands anything of them.

One of the interviewees was quite optimistic and stated that the knowledge is building up – things are getting better! Another claimed that we know what to do, but we don't have very good and exact knowledge regarding the effects of certain measures, which measures needs to be combined in order to achieve effects etc. There is too little evaluation of things which has been done, and of model analyses etc.

The most of the planners answered that the politicians have the power. They have or exert more power regarding agenda-setting and the overall strategies such as defining Bjørvika and Nydalen as urban development areas. Most planners stated quite clearly that the politicians decide and this is how it should be. However, one pointed out that the politicians mess it up by making decisions which causes that their objectives cannot be achieved.

The private and public developers were mentioned as having much power in certain cases. One explained that the public authorities and agencies potentially have a lot of power, especially if they agree. One individual explained that those working with models have a lot of power.

A.3.2 Findings in the 2004/2005 interviews

A.3.2.1 Objectives

What is the main objective?

When asked what the main objectives in land use and transport planning are, some referred to the objectives of their employers, while others referred to their own understanding, and most referred to a mix of this. Only one stated directly that reducing urban road traffic volumes was the main objective, while two named 'a sustainable development'. Several answers revolved necessary in order to reduce traffic volumes, the negative effects of traffic,

or to prevent future chaos on the road ('reduce pressure on the roads'). A few answered that 'balanced growth' is the main objective. This seems to have more or less the same meaning as 'to make the city work' which others answered. Both concern that the transport-systems and land use are coordinated with each other in ways which prevents 'unbalance' (for instance too much traffic on a road), among others by supplying the necessary road capacity. One answered that there are many objectives and no prioritisation, and was clearly frustrated by this. Several others also expressed similar frustrations. On the other hand, one expressed that there was a too clear prioritisation of the zero-vision (nil persons killed or severely injured in traffic accidents) in the NPRA.

Hence, the interviews revealed that the planners involved don't normally see reducing urban road traffic volumes as the main objective. Rather, they see the main objective (at least in a city the size of Oslo) as to prevent future chaos, to 'make the city work'.

Is the objective realistic?

When asked whether they agree that traffic volumes should be reduced, the 2004/2005 interviews revealed somewhat vague responses. This could be explained by their answers concerning the realism in reducing traffic volumes. The responses from most of the interviewees (except one, really) must be interpreted as 'no', they don't see this as realistic.

They explain that the economic growth increases mobility and car use, and the growth in population and work places increase the number of travellers. Hence, as long as people are not willing to turn to walking, bicycling and public transport (implicating that they are not), the growth in road traffic will continue.

They explain that even if the more or less official and stated objective for the Oslo area that 'the growth in shall come as public transport', this will be harder than 'they' believe. In order to achieve this, one needs to apply strong measures, and this will be noticed. Implicit in this is that they don't think the politicians have the guts to carry out the necessary measures. This regards especially the negative measures. This is also stated explicitly by some.

Several state quite clearly that reducing urban road traffic volumes is unrealistic and that the objective should be abandoned, while one finds it unrealistic but necessary; 'we have to make it!'

Competing and conflicting objectives

In their answers to whether 'reducing urban road traffic volumes' is a prioritised and realistic objective, the planners mention other objectives which may be competing and conflicting.

These are local environment, traffic safety (the zero-vision was mentioned by several), the efficiency for commercial transport, and reducing congestions, delays and chaos (now and in the future).

A.3.2.2 Measures and means

Which measures are efficient?

When asked which means should be applied in order to reduce traffic volumes, most of the planners came up with the whole list of transport-reducing means. No-one mentioned to reduce road capacity, but several emphasised that one should not increase it. They were aware that means need to be used in combination in order to be efficient, and that restrictive means are necessary.

Several expressed a strong belief in the necessity and efficiency of fiscal measures, on road pricing (which was a very hot topic at the time) and of parking fees. Almost all mentioned the necessity of steering land use development in less transport demanding directions. Some of the interviewees (who mainly worked with the transport part of coordinated land use and transport planning) expressed frustrations that the development seemed to go in the wrong directions, and others complained that this was 'too much/only politics'. All mentioned improvement of the public transport services as an important measure. Some few emphasised here that it is also necessary to build roads.

Field of competition between private car and public transport?

When asked whether they think that there are fields of competition between public transport and the private car, all answered yes. Some find that there absolutely and obviously are potentially large fields of competition. Others answer that these fields of competition are small and requires quite substantial improvements of public transport services in order to achieve any noticeable effect. A few mentioned that not all those involved in land use and transport planning agree on or understand that these fields of competition exist.

Effects of changes of road capacity

When asked whether one should build more roads, only few totally dismissed this. Even if several of the planners stated that we can and should not try to 'build our way out of traffic congestion', only a minority saw increasing road capacity as a negative thing in itself. Several argued that there is no use in increasing the capacity, but that there are other reasons for building roads.

A few stated that increasing road capacity is the just about the worst thing one could do. This will cause and allow growth in road traffic. Further, it is a wrong way of spending the money. Several mentioned that the municipality of Oslo had stated that they deny increase of capacity over the municipal border, since they do not want to increase traffic volumes going in and out of Oslo. One suggested that surface road capacity should be reduced if the road capacity was increased by new tunnels.

There were several reasons why road building could be reasonable. Several mentioned that building shorter tunnels could free housing areas and centres from through-traffic, and hence improve local environment substantially. This could also improve conditions for walking, bicycling and public transport on the surface. Increasing road capacity on main roads could also contribute to drain road traffic from local streets, which would contribute to local environment improvements as well.

Others argued that increased road capacity will reduce congestions (at least for a while), and hence reduce delays for the private car as well as the public transport. Some explained that since the traffic will continue to grow, the congestion would grow into chaos if the road capacity is not increased. Only one argued for road building in order to improve traffic safety.

Hence, one could summarise, the planners don't think that road building would solve the traffic problems, but many thinks it could be beneficially. The main arguments are that it could contribute to reduce locale environment problems and make the city more liveable, and that it is necessary in order to keep up a well-functioning road traffic system.

Why are these measures not (sufficiently) applied?

When asked why the traffic-reducing measures are not applied (sufficiently), an interesting variety of answers appeared. Some pointed at the politicians, and claimed that their decisions had caused for instance that the public transport services were insufficient. Further, the politicians don't ask for (or ask clear enough for) traffic reduction. Some mentioned that pulverizing of responsibilities was a main reason, and that one cannot necessarily rely on that 'the others' can or will do their part. Lack of plans for improvements of public transport services and improving conditions for walking and bicycling was another explanation.

Several mentioned that it is hard to get political acceptance for the negative measures, and some complained over coward bosses who refrained from telling politicians what it actually takes. They also mention lack of analyses showing the consequences of approved actions, the planners are not good enough at telling politicians the consequences of their choices. It was mentioned that the transport models were not good at handling traffic-reducing measures. One claimed that can one argue that all locations in Oslo are in 'nodal points', in order to be allowed to build there, which often also is what happens. This is a dilemma. Further, certain groups involved in plan-making do not possess the necessary knowledge. The police, which have authority over road signs, barriers and other regulatory measures, and the architects, were mentioned.

Another kind of explanations was related to prioritisation of other objectives. The measures are not applied because they are not in accordance with considerations regarding local environment and traffic safety. The zero-vision is highly prioritised, but it is not climate friendly since it requires measures which increase road capacity. Parking is necessary in order to sell apartments and cars and parking is necessary in order to achieve lively city centres.

Several of the interviewees expressed in different ways that the many decisions regarding smaller projects do not necessarily comply with the agreed overall strategies and plans. There are inconsistencies between overall plans and what is approved in zoning plans. For each little project, the deviation and its consequences may seem insignificant. However, when summed up, this practice causes a development which is something else than what 'everybody' aim at.

Some of the planners expressed that they don't really believe that any measures could cause reduction of urban road traffic volumes; they claim that we don't know enough about the effects of traffic-reducing means. Further, a few of the interviewees from the NPRA explained that they are responsible for the road system and that it works, and they can affect only this. Others are responsible for land use development, public transport services etc., and one cannot really know whether those responsible for those measures can or will apply them. Hence, in order to ensure that they can deal with what they are responsible for (road traffic on main roads), building roads is the only means they apply.

When asked who argued against applying these measures, there were few clear answers. Some mentioned the developers, that they are the ones who want to carry out a project which is not in accordance with the list of measures (build housing in wrong location, build a road), and argue that they should be allowed to.

Do planners and politicians possess the expert knowledge in question?

Several of the arguments concerning why the measures are not applied were related to the knowledge itself, and to which degree planners and politicians possess this it.

When asked directly whether planners and politicians possess the expert knowledge in question, most answered that this varies. Some meant that there may be differences between the generations, and others that there are several sub-cultures with different understandings. Some mentioned that there sometimes is a lack of understanding that certain projects and actions actually do generate more traffic. A few working for the NPRA felt that a main problem was that they were not good enough in communicating the knowledge they possess and produce. A few explained that many think they understand how this works, but that when you get a tiny bit deeper or more technical, they are not able to follow the arguments if they become a tiny bit technical. One explained that nobody can argue against traffic analyses, since nobody understands anything of them.

One of the interviewees was quite optimistic and stated that the knowledge is building up – things are getting better! Another claimed that we know what to do, but we don't have very good and exact knowledge regarding the effects of certain measures, which measures needs to be combined in order to achieve effects etc. There is too little evaluation of things which has been done, and of model analyses etc.

Which arguments are powerful?

A few of the interviewees were asked how one can argue in order to come through with proposals for changes which may contribute to actually reduce the growth in urban road traffic volumes. Local environmental problems and traffic safety was mentioned. One explained that sustainable development and climate are hard to apply as arguments. They are not concrete enough.

A.3.2.3 Power

Some of the planners (if there was time, and if they had opinions regarding this) were asked who has the most power in land use and transport planning. The most of the planners answered that the politicians have the power. They have or exert more power regarding agenda-setting and the overall strategies such as defining Bjørvika and Nydalen as urban development areas. Most planners stated quite clearly that the politicians decide and this is how it should be. However, one pointed out that the politicians mess it up by making decisions which causes that their objectives cannot be achieved.

The private and public developers were mentioned as having much power in certain cases. Still, one explained when asked whether NPRA had too much power, the NPRA cannot just decide that they will build a road with six lanes, a lot of different actors are involved.

The interviewees could see that they have power too. One explained that the public authorities and agencies potentially have a lot of power. If they agree in a case, this will often be the decision too. It was mentioned that the county administration (and others) can pose formal complaints which may stop plans.

One individual, working with transport models, explained that those working with models have a lot of power, since they affect the models, and hence the model-results which are applied and are influential in further planning and decision-making.

A.3.3 Interviewees in 2004/2005

When selecting interviewees, the idea was to include professionals which affect the plan-making and the plans strongly. Hence, the main criterion was *not* to be an expert in land use and transport planning for reduced urban road traffic. The professionals were asked questions regarding how they understand and relate to the objective 'reducing urban road traffic volumes' and the recommendations for 'how to achieve this' based on the expert knowledge in question.

Three of the interviewees worked for the planning authorities in Oslo, in different positions. One was head of the overall plans department, one was the lead professional in land use and transport planning with focus on transport, and one worked at the Fjordby-office and was responsible for 'sustainable transport solutions'.

Among the interviewees, six worked for the NPRA. Three worked for the NPRA's regional office as project leaders for major road investment projects in the Oslo-region. Two worked for the NPRA's region office as project leaders for Oslo-package 2 and Oslo-package 3. One person worked for NPRA nationally, with development of overall transport models.

One interviewee worked as head of a department in the transport and traffic agency of the municipality of Oslo, one for Oslo Public Transport Services, in the planning department, while the last person was head of department for transport in the county administration.

This should provide a good spread among those involved in development of transport infrastructure and the like. However, more professionals working mainly with land use development could have been involved. Not least when it comes to the initiators of plans, one will find variations. Among others one will find more private initiators and their consultants.

The 12 interviewees in 2004 and 2005 were:

- Anders Arild, senior engineer, Municipality of Oslo, Agency for Road and Transport
- Truls Angell, Oslo Public Transport Services
- Erik Dahl, Planning authorities, Municipality of Oslo
- Tore Mausest, Planning authorities, Municipality of Oslo
- Nina Fjeldheim, Planning authorities, Municipality of Oslo, the Fjord city office
- Tom Granquist, Head of Transport agency, Akershus County Administration
- Olaf Fosli, National Public Roads authorities (NPRA), regional office, Project leader Oslo package 2
- Siri Rolland, NPRA, project leader Oslo-package 3
- Oskar Kleven, NPRA, national office, models
- Hege Selbekk, NPRA, project leader Røa-tunnel
- Ivar Øvretvedt, NPRA, project leader E 18 west
- Terje Lundsrud, NPRA, Project leader Bjørvika tunnel project

A.3.4 Interview guide in 2004/2005

The interview guide was not exactly the same in all interviews, but the main topics were as listed here:

Objectives

1. What is the main objective?
2. Is the objective realistic?
3. Competing and conflicting objectives

Measure and means (representing knowledge)

4. Which measures are efficient?
5. Field of competition between private car and public transport?
6. Effects of changes of road capacity
7. Why are these measures not (sufficiently) applied?
8. Do planners and politicians possess the expert knowledge in question?
9. Which arguments are powerful?

Power

10. Who has power?
11. How does this work?
12. Is this OK?

A.4 The interviews conducted in 2010 and 2011

When conducting interviews related to the cases in 2010 and 2011, I also included questions regarding the planners and how they relate to the expert knowledge in question, as well as to the objective 'reducing road traffic volumes', where there was time for it.

A.4.1 Summing up the findings in the 2010/2011 interviews

Among the 22 interviewees in 2010 and 2011, there were three architects, six geographers, nine engineers, one land use planner, one economist and three with other relevant educations. One was economist *and* engineer. Of the 21 interviewees, five can be said to be educated land use and transport planners, according to my judgement.

Between eight and ten of the interviewees agree that they know the expert knowledge well, or that this is among the fields they have expertise in. Five to seven claim that they have no or little expertise in coordinated land use and transport planning at overall level. During the interviews, and when asked directly, all planners express at least a minimum understanding of how development of land use and transport-systems affect travel behaviour and traffic volumes. Most explain mechanisms that are relevant to them in their daily work.

Even though most discuss coordinated land use and transport planning and development with basis in what they usually work with, all express that development of land use and transport-systems need to be comprehensive and coordinated in order to achieve results. All planners seem to know of the expert knowledge, but according to themselves, it varies substantially how well and deep they know it. Regarding the effects of road capacity on traffic volumes, there seems to be a discrepancy between some of the interviewees and the expert knowledge in question and the research it is based on.

Most claim that reduction of GHG emissions is important for them and their organisation. Nevertheless, few claim that this is a main objective, especially when it comes to concrete projects. They were quite concerted when explaining that to actually reducing the road traffic volumes in the present situation is almost impossible. It will be a challenging task to keep the traffic levels at the present levels.

When asked whether planners know and accept the expert knowledge in question, meaning whether *other* planners do so, the most common answer was that: yes, this is something all planners know or should know. They claim that 'all relevant actors', meaning at least all relevant public authorities, apply this knowledge. When asked *how* this knowledge is applied in plan-making, the answers vary a lot, since different tasks and different roles call for different ways of applying the expert knowledge.

Regarding which methods they use in plan-making, many of the planners have problems answering. They do eventually describe the tasks in plan-making (understanding the situation, defining objectives, come up with alternative, assess the effects and impacts, compare the alternatives, recommend an alternative). When discussing 'methods', it seems as if they relate first and foremost to impact assessments. The 'methods' for discussing the problem, defining the objectives etc. seem to be some kind of tacit or silent knowledge – they have ways of doing it (methods) and they do it, but they have a hard time explaining what they actually do. Some few explain that they use professional judgment, discuss with respect to the ABC-principle and the like, but they don't seem to refer to this as 'methods' or 'analyses'.

When asked whether the expert knowledge in question is good enough, the main impression is that the planners agree that these are complex matters, and that we probably should have better knowledge of it. They have, nevertheless, few concrete examples of shortcomings. They call for improved access to empirical data for the topics they work with, which are fit for their contexts, such as how parking restrictions affect traffic volumes and other variables in smaller cities. When asked what the main competing knowledge is, the answers referred to various kinds of issues. Economics, socio economics and the belief in technical fixes are among these.

An interesting finding in this study is that almost none of the 22 planners listed any references with respect to coordinated land use and transport planning and development, that were not public authorities' guidelines, overall plans or the like. This demonstrates a shortcoming of the expert knowledge and its accessibility and applicability.

When asked whether they find that the development is going in the right direction at present, the interviewees explained that when looking at overall policies and plans, we go in the right direction in the sense that there are objectives and calls regarding reduction of GHG emissions and/or traffic volumes. They pointed at objectives defined in their own municipal plans, in County plans, in the National transport plan, in UN and more. Regarding reality, however, and what they actually decide and build, we do not go in the right direction. Almost all planners defended their own projects, which I had defined as traffic-increasing. They explained how and why the project was good and necessary, and even unavoidable.

A.4.2 Description of the findings in the 2010/2011 interviews

A.4.2.1 The planners

Professional background of the interviewees

The interviewees were selected because they are or were central in the four cases studied in the case study. They were more or less directly involved, as initiator, planning authority or commentators, or as consultants for any of these. All interviewees are working as planners, in different roles. Their disciplinary background, defined as their main education, varies.

Among the 22 interviewees in 2010 and 2011, there were three architects, six geographers, nine engineers, one land use planner, one economist and three with other relevant educations. One was economist *and* engineer, and this explains why the numbers don't add up. Of the 21 interviewees, five can be said to be educated land use and transport planners, according to my judgement.

Do they know the expert knowledge in question? Do they know it well?

Between eight and ten of the interviewees agree that they know the expert knowledge well, or that this is among the fields they have expertise in. Only five to seven claim that they have no or little expertise in coordinated land use and transport planning at overall level.

They have different entries to the expert knowledge in question, and this is often related to the kinds of cases they usually work with. This could be road building, shopping developments, housing locations, land use development in general or overall planning.

Some see overall land use and transport planning for reduced urban road traffic volumes in a larger perspective, for instance related to sustainable development and climate changes. Others see it basically as means to solve practical problems related to congestion, building enough housing and accessibility to shopping and services and the like.

How do they explain the expert knowledge in question? What are understood as the main interrelations?

During the interviews, and when asked directly, all planners express at least a minimum understanding of how land use and transport-systems are developed affect travel behaviour and traffic volumes. Most explain mechanisms that are relevant to them in their daily work.

The land use planners explained that densification and right location of new developments affected traffic volumes. Several mentioned the 'ABC-principle'. This seems to be understood mainly as a location tool. The main concern is that new developments should be located in places with good public transport access. Centrality is not mentioned by any. Further, few discuss where businesses (work places) should be located.

Those involved in road planning discusses the effects of development of transport-systems on traffic volumes. All agree that 'we cannot build enough roads to get rid of the problems' in larger cities with pressure on the transport-systems. They discuss measures that the land use planners seldom mention, such as road pricing and access control.

Almost all discusses parking as an important measure for reducing road traffic volumes. Restricted number of parking spaces, and especially pricing of parking, can be used for minimizing the car share and car use. Public transport is understood as an important, but not sufficient measure.

Even though most discuss coordinated land use and transport planning and development with basis in what they usually work with, all express that development of land use and transport-systems need to be comprehensive and coordinated in order to achieve results. The land use planners explains that office developments cannot be allowed at Tunga because the public transport services are not good enough, and the road planners at NPRA claims that the main driver for transport demand is the land use development.

All planners seem to be familiar to the expert knowledge, but how well and deep they know the expert knowledge in question varies substantially. Only one interviewee mentioned that road capacity increases may affect land use developments in ways that cause more road traffic and requires more roads. Some do in reality just tell what they have been told, while others can explain the mechanisms, how they work and how they are interrelated.

Regarding the effects of road capacity on traffic volumes, there seems to be a discrepancy between some of the interviewees and the expert knowledge in question and the research it is based on. Even though the two interviewees representing this understanding agree that supply affects demand, and hence that increased road capacity causes increased road traffic, they question the importance of this mechanism. They do not find that people would start driving their car instead of using other measures. It is rather the changes or increases of activities (population growth, more work places etc.) that cause increased demand for road traffic and hence increased road traffic.

I think their understanding need to include that there is not much competition between the modes of transport. Further, it needs to include that development of road capacity does not affect land use development. They referred to the transport analyses when asked to explain their understanding. The transport model analyses show, in a regional perspective, small differences in traffic volumes with different road capacities, they claimed. This doubt regarding whether increased road capacity actually do cause growth in traffic volumes is still a part of the picture, as it was in 2004/2005, despite all the theoretical and empirical evidences for the opposite.

Do planners in general know and accept the expert knowledge in question?

This question was asked to the planners, and regarded other planners. The main answer to this question is yes, this is something all planners know or should know.

In Trondheim, all planners refer to 'right activity at the right place as a mantra of the planning authorities'. Nobody disagree that location affects car use, but a few discusses whether one should be very strict on where one should be allowed to develop businesses. Because, they argue, the public transport services do not have to be exactly the same in the future as today. By improving or changing the public transport services, other areas may be less car-based, and hence more suitable for development.

Some also refer to (other's) doubts with respect to whether all the development in Trondheim can be solved as densification, or whether some large developments on new land are necessary in order to produce enough dwellings. This was also a topic in Skedsmo, where the planning authorities and the municipal plan aim at building the city 'from the inside and out'.

There are also severe concerns regarding the potential negative effects of for instance reducing parking access, not improving road capacity, not allowing large scale housing developments on new land and other kinds of developments that have been normal and

acceptable until now. It does not seem as the climate threat is understood as concrete and real in the same way.

A few mention that they are supposed to be knowledgeable with respect to so many different topics, such as endangered species, accessibility for all etc., and that it is hard to be on top of everything. Several claimed that they are not experts in overall land use and transport planning for reduced urban road traffic volumes, but that others at the office are, and that they ask them if necessary.

Some questioned how the politicians understand these discussions. They agree on overall objectives regarding reduction of traffic volumes and GHG emissions, but when they are presented for concrete plans that will contribute to achieve this, or if they are recommended to reject a proposal because it cause increased road capacity and GHG emissions, they do not vote in accordance with the GHG emissions objectives. Is this because they don't understand what the GHG emissions reduction targets imply, or are there other reasons why they act this way?

The planners also agree that most planners know that increased road capacity cause or allow (not all agree in 'cause') growth in traffic volumes. Most also agree that they know that reduced capacity cause reduced traffic volumes – 'but the congestion would be terrible'. Several refer to that 'others' say that 'we should not apply congestion as a traffic-reducing measure', while others state this by themselves.

For some, this essentially means that the road capacity should be 'large enough', and that other measures should be applied in order to keep traffic volumes down. In those cases, other measures mainly mean road pricing. The final objective would be to optimise the pricing mechanisms with respect to the cost-benefit ratio in socio-economics.

Some discusses how conscious planners and others are with respect to this. Even though they know that certain land use developments are car dependent and cause growth in traffic volumes, they may be less focused on this if they don't experience congestions and severe local traffic problems.

Who knows and uses this knowledge?

On this question, the main answer is 'all relevant actors', meaning at least all relevant public authorities. Most mention the planning authorities, the County Council, The County Governor's office, and the NPRA. In Oslo some also mention the municipal transport authorities and the public transport company. Regarding transport effects of land use developments, it seems as the planning authorities often rely on NPRA.

One planner, that is well trained in coordinated land use and transport planning, explained that even though we often think we agree when discussing coordinated land use and transport planning and development, we often find that we actually don't agree when we concretise this knowledge for instance in concrete plans.

A.4.2.2 Objectives

What are understood as the most important objectives? Are reduction of GHG emissions and traffic volumes important objectives?

A number of objectives have been listed in the interviews. This regards among others 'that something happens', that the local environment is improved, to develop a good city, traffic

safety, that the transport-system works for all users – also car users, and that the delays of the business traffic is reduced.

Most claim that reduction of GHG emissions is important for them and their organisation. Nevertheless, few claim that this is a main objective, especially when it comes to concrete projects. In the concrete projects, it seems as the local and immediate needs and wishes are prioritised. At least two of the interviewees explained that reduction of GHG emissions cannot be dealt with on project level, it needs to be dealt with at more overall levels.

Do they find that this is a realistic objective?

Only few were asked this question, and all related their answers to the situation in the Oslo area. They were quite concerted when explaining that to actually reducing the road traffic volumes in the present situation with strong population growth is almost impossible. It will be a challenging task to keep the traffic levels at the present levels, and hope that technical developments of cars and fuels will ensure the reductions of GHG emissions that are expressed in the overall plans.

Some few argued that reducing traffic volumes obviously is *possible*, with reference to difference in average car use in different cities and in different parts of cities.

A.4.2.3 Knowledge

How is this knowledge applied in plan-making? Which problems are defined, data applied, consequences assessed, strategies made, etc.?

Different tasks and different roles call for different ways of applying the expert knowledge.

Several planners explained how they needed and used the expert knowledge in order to explain to decision-makers, the public, developers and others how causes and effects are interrelated, and hence the consequences of suggested actions, projects and changes. This regards how the mechanisms work in general, but not least how they work in specific context. Some expressed this as what they do, is to remind decision-makers and others about things they actually know or understand, but which they find convenient to 'forget' in a given situation.

One interviewee explained how the planning authorities had made an analysis in order to demonstrate the consequences in a case where developers, land owners and inhabitants wanted to build more dwellings in a location with hardly no public transport and no activities or services (except from the school). By presenting defined objectives, describing the mechanisms and the context, and do professional reasoning on the basis of this, the planners were able to make the politicians understand the traffic-increasing consequences of allowing further development here. This resulted in that new plans for development in the area were excluded from the municipal plan, and even that some development areas were removed.

Several of those working for the planning authorities did in various ways refer to how consultants use and misuse the expert knowledge in question (and other knowledge) in order to make the project of their employer look better than it is. Positive consequences are presented as larger and more certain than they are, while negative consequences are belittled. In those situations, some describe that they use the expert knowledge in question in order to question these analyses, among other by doing their own analyses. They also mentioned examples of how the problems with lack of land for housing development had been presented as far worse than they in reality are.

Some interviewees describe that they use the expert knowledge in order to screen planning proposals in order to decide whether they are in conflict with defined objectives. They also need the expert knowledge when explaining that this is the case, and what needs to be changed.

In one municipality (Skedsmo) they explained how engaging the planners and their expert knowledge in the municipal plan process changed the focus in the process, how it proceeded, which analyses that were made, how objectives and analyses were documented etc.

In overall plan-making processes, it seems that the most conscious planners use the expert knowledge in question and the like in order to bring about discussions regarding prioritisation between objectives and concerns. One planner explained how they had made a transport strategy partly as part of the municipal plan process, and how this had affected the overall strategies in the municipal land use plan. They were, however, not satisfied with their own analyses regarding to which degree the proposed measures actually would cause the necessary effects, and whether there could be negative consequences they had not disclosed. In order to deal with this, they decided to do a transport analysis (or a land use and transport analysis as it was described). This would help them understand better how the measures worked in their context and in combination with each other. This new knowledge, they planned to use as input to the next municipal plan process in three to four years.

Which methods do they use? What do they consider good methods for analyses in land use and transport planning?

When asked which methods they use in plan-making, many of the planners have problems answering. They do eventually describe the tasks in plan-making (understanding the situation, defining objectives, come up with alternative, assess the effects and impacts, compare the alternatives, and recommend an alternative). When discussing 'methods', it seems as if they relate first and foremost to the impact assessments. The 'methods' for discussing the problem, defining the objectives etc. seem to be some kind of tacit or silent knowledge – they have ways of doing it (methods) and they do it, but they have a hard time explaining what they actually do. Some few explain that they use professional judgment, discuss with respect to the ABC-principle and the like, but they don't seem to refer to this as 'methods' or 'analyses'.

Several interviewees explained how they use simpler calculations in combination with professional reasoning. Many traffic analyses are done on basis of very simple calculations and assumptions, arriving at figures which are suitable for defining whether there needs to be done more advanced analyses. In the Økern case the planning authorities in Oslo showed how they use professional reasoning regarding the general mechanisms, combined with contextual knowledge, in order to do simple calculations of how large the Økern shopping centre could be if it was supposed to attract mainly people living in walking distance to the centre.

Some planners also tell how they use the expert knowledge in question in more advanced transport model analyses, and it was also referred to a retail analysis. All planners discussing transport model analyses mention that they are uncertain, that it is necessary to discuss and control the outputs, and that they must be used with care. Many planners still claim that the large scale transport model analyses are necessary and useful, whether they have any insights in how the models work etc. or not. In the road-case in the case study, the main

actors explained that they first dimension the road system, and then discuss whether applying the other measures could contribute to keep the traffic volumes down.

Is the expert knowledge in question good enough? What is missing? What could be improved?

The main impression is that the planners agree that these are complex matters, and that we probably should have better knowledge of it. They have, nevertheless, few concrete examples of shortcomings. They do, however, often call for improved access to empirical data for the topics they work with, which are fit for their contexts, such as how parking restrictions affect traffic volumes and other variables in smaller cities.

They mention areas where there is lack of empirical as well as theoretical knowledge, such as how to make more people walk and bicycle. They call for empirical data and examples for different topics, such as parking norms, and in different contexts such as different city sizes. There is hence a call for organising the knowledge better, in order to make it more accessible.

One pointed at a few recently conducted studies that clarified and exemplified that dense land use causes less traffic than sprawled land use, as an example that we have few such systematic studies, and that we should have more.

They often claim that the plan-making process would not have been different if the knowledge was better. The ones that claim that overall land use and transport planning is not their main topics seldom come up with weaknesses of the knowledge.

What are the main references for the expert knowledge in question?

An interesting finding in this study is that almost none of the 22 planners could list any references with respect to coordinated land use and transport planning and development, that were not public authorities' guidelines, overall plans or the like.

In Trondheim, some few referred to Strømmen's Dr.ing. thesis from 2001, which is to be expected, since she (Strømmen) works at the planning authorities' office. Some said that they used 'reports from Institute of Transport Economics' (where I work), but they did not mention specific reports. One referred to popular science periodicals like 'Samferdsel' and 'Plan'. A couple interviewees referred to the catalogue of environmental friendly measures that among others NPRA fund and which Institute of Transport Economics organize and update. Most of them could not list a single reference. This seemed to surprise them just as much as it surprised me.

Several explained that there is not much time for reading in the day-to-day work. Since few are educated land use and transport planners, they did not learn to know the literature at university either (instead they learnt to know other literature I guess, regarding road building, geography, architecture etc.). Several do for instance refer to the 'ABC-principle', but not all can explain what that means, and only one could list a reference for it.

They do refer to a number of literature contributions from public authorities. This regards among others national contributions such as the PBA, National policy guidelines for land use and transport planning (Ministry of the Environment 1993), Governmental purviews for shopping centres (Ministry of Environment 2008), National guidelines for climate and energy planning (Ministry of the Environment 2009a), Report no 26 (2006-2007) to the Storting - The Government's Environmental policy and the state of the environment in Norway, Official

Norwegian Report 2003:14 Better municipal and regional planning under the planning and building act (Ministry of the Environment 2003). Several mention various planning guidelines published by the Ministry of Environment.

Several also refer to regional planning and policy documents, such as the regional development plan for Romerike 2005 – 2025 (Akershus County 2004a). They also refer to their own overall plans, especially to the municipal land use plans.

A few mentioned that there is an exchange of knowledge related to the national 'Cities of the Future Programme'. All the interviewees in Trondheim told that it was started a 'planning school' at the planning authorities' office in order to give basic training to those that started working at the office without being trained as planners.

What is the main competing knowledge, and who is promoting this knowledge?

When asked what the main competing knowledge is, the answers referred to various kinds of issues.

Some claimed that a main reason why 'the right and necessary things' are not done, is that politicians as well as the inhabitants don't emphasise problems and issues that will occur in the future. This regarded for instance that the politicians refuse to make the necessary decisions today, and that persons, businesses and municipalities (politicians) argue that they should be allowed to do this and that, without considering what the situation would be like if everybody was allowed to do the same. When the interviewees discussed the lack of future-orientation, this regarded different issues. It may not be a surprise that planners are more oriented towards future consequences than most people, especially when discussing spatial development.

Several mentioned various un-substantiated understandings and myths as 'competing knowledge'. This regarded again different issues. The interviewees mentioned among others myths regarding how and where people want to live, who actually lives for instance in new and central dwellings, the requirements of the developers, what ruins the economy in a development project and what the developers have to be allowed in order to carry out the project, and how hard (complicated) it is to develop the city through densification.

There were also several references to different understandings within the expert knowledge in question. This regarded for instance how to define what is 'good' public transport services, how far people are willing to walk to and from public transport, to which degree indoor bicycle parking will cause more people to bicycle, and the many negative consequences of restrictions on parking.

This was also understood partly as arguments that developers used in order to persuade the planners, the public and others that their project is necessary and good. A frequent discussion is whether a certain location actually has 'good public transport services' or not. Some also mentioned that we need a collection of good examples, for instance of central densification or densification in not-so-dense neighbourhoods, as a counter-argument to developers and others presenting 'as examples' of the same.

The planners refer to economics and socio economics as competing knowledge. They doubt the calculations and arguments, but admit that they know too little themselves to question the claims or to develop counter-argumentation.

The understanding that technical fixes with respect to cars and fuels will ensure that cars don't emit GHG gases in the future, and hence the growth in road traffic volumes will be no problem, do turn up in discussions.

A few interviewees emphasised that there are many objectives and concerns, and which knowledge one relies on and promotes depends on what is understood as the main objectives and the most important concerns.

A.4.2.4 If development goes in the right direction

Do they find that the development is going in the right direction at present?

When asked whether they find that the development goes in the right direction now, the few interviewees that were asked this question expressed themselves differently. The meaning of what they said was, however, quite similar.

They explained that when looking at overall policies and plans, we go in the right direction in the sense that there are objectives and calls regarding reduction of GHG emissions and/or traffic volumes. They pointed at objectives defined in their own municipal plans, in County plans, in the National transport plan, in UN and more.

Regarding reality, however, and what they actually decide and build, we do not go in the right direction. Even though many good things are happening – there is a more positive attitude to the dense and urban, many municipalities want rail, all understand that densification is necessary in order to avoid even higher growth in traffic volumes, most have understood that road capacity itself will not solve the problem and so forth – what is decided and built do to a large degree pull in the wrong direction.

Almost all planners defended their own projects, which I had defined as traffic-increasing. They explained how and why the project was good and necessary, and even unavoidable.

A.4.3 Interviewees in 2010 and 2011

The interviewees were selected in relation to the four cases in the case study. They are hence selected because they were assumed to be central in the cases. Of the 22 interviewees, five were interviewed as case-handlers for the plan-making processes at the planning authorities, seven were working at the planning authorities, and with overall planning and land use and transport planning. Two were working more directly for the politicians (one for the District Council, one for the City Council). Five interviewees were working for commentators, while three were working for developers.

There are two reasons why only three of the interviewees were working for developers. One is that even though the developers constitute the causal powers why the projects are initiated in these cases, there are more and less discussions regarding the cases. In cases where there are no discussions between the developers and the planning authorities regarding a planning proposal, and where there is little to say about proposal and analyses from the developer, the interesting question is why the public authorities did not react to the proposal. Hence, the developers and their motivation for acting as they do are less interesting in those cases (as in Skedsmo and Trondheim). In other cases, the ways the initiators act are an important contributing cause why traffic-increasing plans are made. In those cases, the initiators were interviewed (as in Økern and E 18). In the Trondheim case, I wanted to interview the initiators' consultant, but was not able arrange an interview with them. The 22 interviewees in 2010 and 2011 were:

- Gro Jensen Vig, Planning authorities in Oslo, department for area development, case handle of the zoning plan for Økern senter, architect
- Ole Falk Fredriksen, Civitas, consultant for the developer, civil engineer specialised in water and sewage systems
- Kjersti Granum, Planning authorities in Oslo, department for urban development, case handler of the sector plan for location of retail and services, anthropologist
- Tron Willy Myrén, Bjerke District Administration, case handler for the Økern-case, educated in geography, sociology and societal (not physical) planning
- Arne Kolstadbråten, NPRA region east, case handler for the national road authorities in case Økern, civil engineer, transport planner
- Åse Bollingmo, case handler for the office development case at the Planning authorities in Trondheim, mining engineer and later courses in land use planning
- Randi Storeng, policy adviser at the County Governor's office, Sør-Trøndelag county, working with the office-development cases, geographer
- Marianne Knapskog, the Planning authorities in Trondheim, working among others with how to handle office development in the new overall municipal plan, geographer
- Erling Kristian Skinderhaug, the Planning authorities in Trondheim, working among others with analyses regarding the Tunga area, master in property development
- Dr. Ing. Kathrine Strømmen, working at the Planning authorities in Trondheim, mostly with overall land use planning, engineer and planner
- Lena Skjøllås Bilic, Planning authorities in Skedsmo, case-handler for two of the zoning plans for housing development over-architect, geographer
- Einar Midtsund, policy adviser planning and environment at the County Governor's office, Akershus county, architect and planner
- Sara Polle, policy adviser planning and environment at the County Governor's office, Akershus county, geographer
- Torild Fagerbekk, Head of the Planning authorities in Skedsmo, construction engineer
- Anders Jørstad, working at the Planning authorities in Skedsmo at team overall planning, land use planner
- Øyvind Lesjø, working at the Planning authorities in Skedsmo at team transport, engineer and land use- and transport-planner
- Terje Hansen, Planning authorities in, project leader for the municipal area plan, architect
- Kari Sagbakken, Planning authorities in Bærum, involved in the system analysis, transport and road engineer
- Knut Gløersen, NPRA, project leader E 18, including i.a. the planning programme and the selection report, road engineer
- Anders Jordbakke, NPRA, project leader for the analysis of the future transport-system, resource economist/nature manager
- Ivar Sørli, Municipality of Oslo, mechanical engineer and economist
- Njål Nore, Akershus County, case-handler for the E 18 case, geographer

A.4.4 Interview guide in 2010/2011

The interview guide was not exactly the same in all interviews, but the main topics were as listed.

The planners

1. Professional background of the interviewees
2. Do they know the expert knowledge in question? Do they know it well?
3. How do they explain the expert knowledge in question? What are understood as the main interrelations?
4. Do planners know and accept the expert knowledge in question (asked in relation to the relevant case)?
5. Who knows and uses this knowledge?

Objectives

6. What are understood as the most important objectives? Are reduction of GHG emissions and traffic volumes important objectives?
7. Do they find that this is a realistic objective?

Knowledge

8. How is this knowledge applied in plan-making? Which problems are defined, data applied, consequences assessed, strategies made, etc.?
9. Which methods do they use? What do they consider good methods for analyses in land use and transport planning?
10. What are their main references for the expert knowledge in question?
11. What is the main competing knowledge, and who is promoting this knowledge?

If development goes in the right direction

12. Do they find that the development is going in the right direction at present?

Appendix B: Case reports and internal analyses

B.1 Introduction

The case reports and the internal analyses of each case are presented in this appendix. For each case, the plan-making process is first described. This is followed by the internal analysis. An important approach has been to reveal more about how the various causes and mechanisms manifest themselves in concrete situations under different conditions, and to examine their relative strengths. The aim was also to contribute to explaining how and why a traffic-increasing plan was made in each case. The findings in the case study have been applied in cross case analyses when doing empirical examinations of the explanations developed in the abstract analyses in chapter four, five and six. They have also been important inputs to the overall analyses, discussions, conclusions and recommendations in chapters seven, eight and nine.

B.1.1 The cases

Four cases have been studied. The cases were selected according to the criteria developed and described in chapter two. They were to be zoning plans or other operational plans, regard planning of development of land use or transport-systems, be plans that, if implemented, cause growth in traffic volumes (according to my judgement and the expert knowledge in question), be ongoing or recently adopted, and Norwegian. The most important criterion for case selection was, however, that the planning processes hold interesting debates, conflicts or discussions regarding the expert knowledge in question. This could be an expressed debate in the process, or a disagreement between the plan and what would be the recommendations according to the expert knowledge in question.

Four cases that have been studied:

- Case Tunga: Car-based office development in Trondheim
- Case Økern: Development of a the largest shopping centre in Oslo
- Case Skedsmo: Car-based housing development in Skedsmo
- Case E 18 West: Increased road capacity on crowded urban motorway in Bærum

B.1.2 Methodology

The description of why case study is chosen as methodology, which kind of case study this is, selection of cases and so forth are more thoroughly described in chapter two in the main report.

Data were mainly gathered through document studies and through interviews with planners professionally involved in the plan-making processes.

The interviewees and interview guides are listed in this appendix for each case.

There are many quotes from case documents in the case descriptions and analyses. These are all translated from Norwegian by the author.

B.1.3 Descriptions and internal analyses of each case

For each case, the following issues have been described, discussed and analysed:

- The particular planning process, including what it regards, the main actors, which documents are produced, the main conflicts, etc.
- Effects of the proposed project on traffic volumes
- The relevant objectives, knowledge and powers of the planners directly involved in the plan-making
- How and why the objective and expert knowledge in question were excluded or ousted, who made this happen, and in which of the tasks in plan-making
- How the various planners acted when making these traffic-increasing plans
- Explaining how and why this traffic-increasing plan was made
- Brief analysis of the relevance of the previously developed explanations with respect to the expert knowledge itself, the planners and how they relate to the expert knowledge, and the plan-making processes

Internal analyses are conducted for each case. This enable to produce an explanation in each case regarding which causal powers, working through which mechanisms and under which conditions, that caused that a traffic-increasing plans was made.

In the cross-case analyses conducted included in various chapters in the main report, the findings regarding causal powers, mechanisms and conditions have been discussed and compared in order to gain deeper understanding of how and why plans are made which, if implemented, cause growth in road traffic volumes.

B.2 Case Tunga: Car-based office development

In the Tunga-area in Trondheim, an unintended car-dependent development of area-intensive work-places has been going on for several years. This is not in accordance with intentions and objectives in overall plans and policies. One zoning plan process, resulting in a plan recommending office development, has been studied in depth in order to understand how and why this happens. The next zoning plans in the area were met by formal complaints, calling for overall discussions and analyses. This process has been briefly studied as well, in order to increase the understanding regarding how and why the car-based office-developments had been allowed at Tunga.

B.2.1 Introduction

The planning process in question regards the zoning plan for an office development in the 'Tunga-area' in Trondheim (Magnus Lagabøters veg 4 (ML4)), with room for about 350 work-places.

The area is regulated to industry/businesses in the overall municipal plan, and designated for industry, warehouses and other workplace-extensive businesses. Several public authorities, including the planning authorities, commented in the hearing process that the area is not suited for or meant for office development, since it has poor public transport access and hence will generate much traffic. This will increase the congestion on the already overloaded local transport-system and contribute to increasing GHG-emissions. Further, such development is not in accordance with a number of overall plans.

The planning authorities proposed to reduce the office space by about 50 %. The initiators agreed to this. The zoning plans was presented for the City Council and adopted against one vote (the environmental party - the green ones). Hence, a plan for a car-based office development had been adopted. The question to be answered in the following analysis is how and why this happened.

The zoning plan process is first described. This is followed by an analytical description of the objectives, knowledge and powers of the main actors, of whether, how and why the objective and expert knowledge in question were ousted in the plan-making process, and of how the actors acted when making the traffic-increasing plan, in accordance with frameworks defined in chapter six.

A short description is included regarding the formal complaints filed by the County Governor's office in three cases following the one in focus. The arguments for filing the complaints, the required registrations and analyses and the findings from these are discussed.

This is followed by an analysis leading towards an explanation of how and why a traffic-increasing plan was produced in this plan-making process, and finally which relevance the preliminary explanations regarding the expert knowledge, the planners and the plan-making processes have in explaining this.

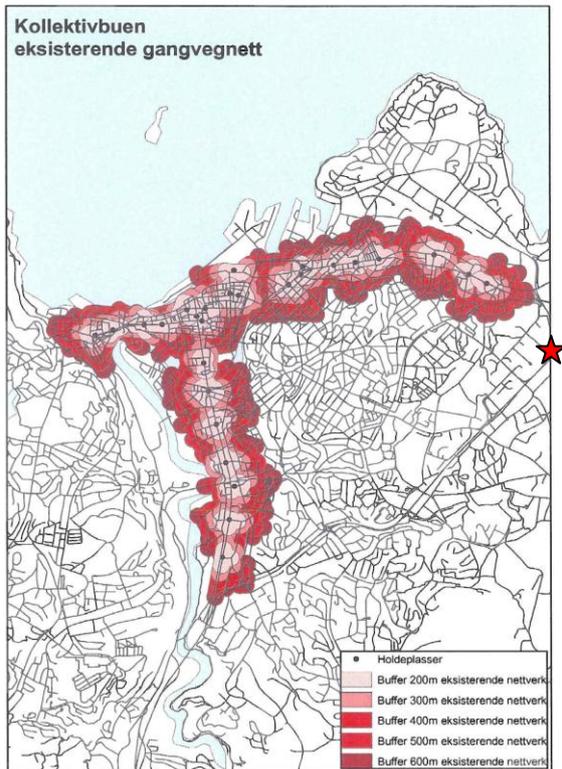


Figure B.1: Illustration of the public transport corridor, existing pedestrian networks, and location of Magnus Lagabøters veg 4 (red star), based on illustration in case-papers (Municipality of Trondheim 2009).

B.2.2 Description of the zoning plan process

B.2.2.1 Overall plans and policies

The overall municipal plan states in its guidelines no. 2.4.9 "Workplace- and/or visitor-intensive workplaces shall be located in areas with good access for pedestrians and good public transport accessibility, primarily within the 'public transport corridor', defined by the areas within 400 meters from the bus corridors from the city centre and to Leangen, Sluppen, Ila and Marienborg [...]" (Municipality of Trondheim 2007).

The overall county plan for land use and transport development states about the same, and refers to the public transport corridor in similar ways (Sør-Trøndelag County 2003).

In Trondheim's 'Environmental package for transport', adopted 24.04.2008, it says that 60 % of the growth in workplace-intensive workplaces shall be located within the public transport corridor (Municipality of Trondheim 2008).

The same is stated in other important and politically adopted documents as well.

B.2.2.2 The project

The planning process in question regards the zoning plan for a combined industry- and office development in Magnus Lagabøters veg 4 in the 'Tunga-area' in Trondheim, with room for about 350 work-places.

B.2.2.3 The main actors

The main actors in this case are the initiators of the zoning plan process (Lade Offset Eiendom as), their consultants (Voll arkitekter as) as formal initiators of the plan, the

planning authorities in Trondheim, the County Governor’s office, and the County Council’s office.

B.2.2.4 The formal process

The ML4 process was a quite simple zoning plan process. It was conducted under the old PBA, which means that a planning program was not required. The project was not large enough to call for a full impact assessment.

Table B 1: The main procedural steps and the main documents in this case.

Date	Procedures	Documents
03.09.2008	Kick-off meeting with the planning authorities (PA)	-
24.10.2008	Letter to alert neighbours and main actors supposed to comment	Letter
27.10.2008	Announcement of planning process	Advert in the main local newspaper
November 2008	Planning proposal sent to the PA	Planning proposal (Voll arkitekter as)
14.01.2009	Revised planning proposal sent to the PA from the initiators	Revised planning proposal (Voll arkitekter as)
31.03.2009	The zoning plan proposal is presented for the public	Zoning plan proposal presented by the PA
31.03.2009-31.05.2009	Public hearing of the planning proposal	Hearing letters; comments, meetings
04.09.2009	Final planning proposal sent to the PA	Final planning proposal
15.11.2011	Processing in urban development committee meeting	Minutes from the committee meeting
19.11.2009	Processing and decision in City Council meeting	Minutes from the City Council meeting – the zoning plan for ML4 is adopted by the City Council

B.2.2.5 Alternatives

The initiators first proposed to build 8.130 m² office space in Magnus Lagabøters veg 4 (Municipality of Trondheim 2009). There is no documentation or argumentation regarding why an office development here is necessary or why this exact size is suggested.

The County Council’s office and the County Governor’s office suggested to reducing the office developments to 25 % of maximum exploitation of the site (3.750 m²) (County Governor’s office 2009). They presented no reason or argumentation why this exact size is suggested. They did present a general argumentation regarding that office developments in this area should be restricted in order to minimise traffic volumes.

The planning authorities suggested to reducing the office space by about 50 % of what was proposed, to 4.500 m². The argument for this was that according to overall plans *most* office developments should be developed in the public transport corridor and not here. However, routines for ensuring that 60 % of/ most of new office developments will be located in the public transport corridor are under development by the planning authorities. In previous cases, the developers have been allowed to develop about half of what they first proposed. The planning authorities choose to follow this practice, and suggest that the developer is allowed to build 4.500 m² offices. The initiators agreed to reduce their proposal to the suggested size.

Nobody suggested that *no* office-developments should be allowed here, or that the proposal should be rejected.

B.2.3 Effects of the planned project on traffic volumes

B.2.3.1 According to overall plans

Several overall plans and policies stated objectives regarding locations of area-intensive workplaces mainly in the public transport corridor, in order to minimise road traffic and GHG emissions. The overall plans hence imply that location of area-intensive work-places in ML4 will cause more road traffic than such work places located in the public transport corridor, and hence should be restricted.

B.2.3.2 According to the initiators

According to the initiators, the office building will (in the original proposal of 8.100 m²) give room for 350 employees (Voll arkitekter as 2008). This increases the demand for public transport as well as the use of roads and bicycle-infrastructure in the area.

The area is classified in the overall plans as not having good public transport access, and this a main reason why workplace-intensive developments are not recommended here. The initiators' consultants describe the public transport in the area thoroughly, and argue that the public transport services are good (Voll arkitekter as 2008).

They have also discussed the issue with the public transport company (Team Trafikk (TT) at the time). They claim that TT is positive to office developments in this area. There are no written records where TT confirms this. According to the initiators, TT finds that the public transport accessibility to the area is good, that the road infrastructure is easily accessible for buses, and that they can improve the public transport services if necessary. This will not have negative effects on the existing bus services in the main corridors, it is claimed.

Since the area is easily accessible by car, the initiators will facilitate increased use of bicycle by allocating much indoor parking space to bicycles. This, together with the possibilities for improving the public transport services may make it less tempting to use the car, they claim.

A simplified traffic analysis is conducted (transparent, easily understandable, simple, realistic assumptions) arriving at an increase in road traffic of about 600 vehicles per day on the main road with 30.000 vehicles per day, or a 2 % increase. This, they claim, will probably not be noticeable.

B.2.3.3 According to commentators

The County Council's office and the County Governor's office had comments regarding the increase of road traffic embedded in the plan presented for public hearing in October 2009 (County Governor's office 2009).

They refer to the overall plans which all say that workplace-intensive developments such as office developments primarily should be located in what is termed 'the public transport corridor' in order to minimise traffic volumes and GHG emissions. They hence express that they find that such location of new offices as traffic-increasing and that other locations are better because they cause less increase of traffic volumes and GHG emissions.

B.2.3.4 According to the planning authorities

The planning authorities refer to the overall plans, and demonstrate that the proposal is not in accordance with these. Location of offices at Tunga is not optimal with respect to the objectives of reducing transport volumes and GHG emissions.

They disagree with the initiators claiming that the public transport services in the area are good. They conclude that “office developments at Tunga will imply increased use of the private car and undesirable GHG emissions” (Municipality of Trondheim 2009:9, translated from Norwegian by the author). They also comment that 2 % traffic increase on the main road cannot be perceived as ‘hardly noticeable’.

B.2.3.5 According to the expert knowledge in question

According to the expert knowledge in question, development of area-intensive work-places in un-central locations lacking high quality public transport services and with relatively few people living in walking- and bicycling distance will cause higher car traffic shares and more road traffic than other locations.

Only parts of the city are directly accessible by bus from this location. The distance is 250 meter to a low frequency bus stop and 750 metres to a higher frequency bus stop. Even though many people live within theoretical bicycle distances, the area itself does not invite to high bicycle shares. The bicycle shares could be high, but given the good access to the main road system and the good parking coverage, the chances are slim.

There is no doubt that location of offices in this area will cause far higher car shares and road transport volumes than location in the public transport corridor, according to the expert knowledge in question.

B.2.4 Analytical description of the objectives, knowledge and power of the main actors

B.2.4.1 Objectives

B.2.4.1.1 The main objectives of the main actors

The initiators entered the process in order to be allowed to develop their property by demolishing existing buildings and build combined industry- and office spaces for letting out on hire. According to the planning proposal, there were no contacts or contracts with future renters yet.

The planning authorities shall handle zoning plans and ensure that these are carried out in accordance with the PBA. They are also supposed to ensure that overall plans and guidelines are obeyed, and that the spatial development proceeds according to these plans. This also involves to ensuring that area-intensive work-places are located at the right place, and that already developed areas are densified rather than that new areas are developed.

The County Governor’s office is supposed to ensure that the national planning guidelines are followed, and that national interests are considered. This also involves national and local objectives about reducing GHG emissions, embedded in national policy documents and planning guidelines as well as in municipal overall plans.

The County Council’s office is responsible for coordinating the spatial development in the county, and to ensure a co-ordinated development of land use and transport-systems.

B.2.3.1.2 Whether reducing road traffic volumes is perceived as an important objective

The initiators do not signal that they find that reduction of traffic volumes is an important objective. Neither do they signal that they find that reducing GHG emissions, traffic on the road system or in the city in general is among their objectives. It is not to be expected that they do.

‘Localisation of 350 new work places outside the public transport corridor’ and ‘Increased pressure on the road system’ are among the headings in the planning proposal sent from the initiators’ consultants to the planning authorities (Voll arkitekter as 2008). They do analyse the potential for growth in traffic volumes (600 cars/day), but they do not mention GHG emissions. It seems as the objective about reducing urban road traffic volumes is not something they find important to contribute to achieving, but rather a stated objective that they need to demonstrate that they don’t conflict with in order to be allowed to carry out their project.

The planning authorities signal that they see reduction of road traffic volumes and GHG emissions as important. They clarify that they do not agree with the initiators that the public transport services in the area are good, and states that lack of good public transport services is the main delimiting factor for development of this property. They further emphasise that a 2 % growth in traffic volumes on the main road in the area will have significant negative consequences.

The case-handler stated in interview that to reducing urban road traffic volumes was an important objective. This was the reason why the initiators were only allowed to build 50 % of what they proposed. This is a politically adopted and well-grounded objective, and she also sees good reasons herself why reduction of traffic volumes would be beneficial for the city. Two additional interviews with planners at the planning authorities (working with overall planning) confirmed this understanding of how the objective is perceived at the planning authorities’ office (this understanding is not necessarily shared by the interviewees).

The County Council’s office and the County Governor’s office presented comments in the hearing, where the objective reducing GHG-emissions was in focus.

B.2.4.1.3 How the objective ‘reducing urban road traffic’ was understood

The initiator and their consultant do not mention total traffic volumes, GHG emissions or traffic generation caused by office developments in this location relative to in the public transport corridor. They probably have a rather undefined understanding of this objective.

The planning authorities do not, in their assessments and recommendations, mention total traffic volumes or GHG emissions. They refer to the transport package which states that 60 % of area-intensive workplaces shall be located within the public transport corridor, and discuss the problem in relation to this statement. In the interview with the case-handler, she explained that ‘reducing urban road traffic volumes’ actually means to reduce the total traffic volumes in absolute numbers.

The County Governor’s office and the County Council’s office both refer to reduced transport demand and reduced GHG emissions. This indicates that they do understand the objective as to actually reduce total traffic volumes in vkm.

B.2.4.1.4 Other relevant and important objectives

In the case-documents, the planning authorities describe that efficient use of the land in areas designated for and already developed with business is a main objective. This means high utilisation of and densities in such areas, in order to spare undeveloped areas elsewhere. This could be in conflict with denying a high number of office-work places at ML4, since that would increase the density and intensity of use of an already developed site.

In interview, the case-handler explains that there should be some office development in this area. The overall plans say that 'most of' and '60 % of' the area-intensive workplaces should be located within the public transport corridor, not 100 %. The city needs a diversity of offices, also with respect to locations, and there may be several reasons why good access by car is wanted. Further, not everybody can use public transport to and from work.

The Tunga-area is designated for 'businesses' in the overall plan, and was intended for warehouses, light industry, workshops and the like. Retail or shopping is not meant to be located here. The market for the kind of business the area is designated for is not very good (according to the property-owners and developers), and hence it is a problem to define what should be allowed here. To allow some developments in this area could then – maybe – be understood as a relevant and competing objective.

A last aspect is predictability and equality. Previous planning proposals similar to this one had been allowed in reduced versions. In order to treat developers equally and just, this proposal should be treated the same way.

B.2.4.2 Knowledge

B.2.4.2.1 Whether the planners involved possess the expert knowledge in question

In the case case-documents, there are references to adopted overall plans requiring that office developments are located in the public transport corridor or in areas with good public transport services. There are no explanations in the case-documents (zoning plans proposal, assessment and recommendations from the planning authorities, comments from other authorities, neighbours and others) regarding how and why certain locations cause less traffic volumes and GHG emissions than others, and no references to literature or the like explaining or documenting this.

The initiator's discussions regard whether the public transport access is good, and how they can facilitate bicycling. There are no cause-effect reflections which indicate whether the initiators or their consultants possess the expert knowledge in question.

The same goes for what the planning authorities write. In interview, the case-handler explains the main mechanism in focus here: one cannot expect high bus-shares on journeys to work at work-places located at Tunga, because the public transport services are not good enough to compete with the private car. Walking distances to bus-stops are too long, frequencies too low, and the bus-connections are in general bad to large parts of the city. The case-handler claims that this is common knowledge at the planning authorities' office, and that 'most professionals' agree as far as she knows.

She refers to discussions with the initiator and the bus-company as examples of other ways of perceiving this. They have stated that the bus services to the area can be improved if office developments are allowed and more work-places established, and that such

developments should be allowed. This is one kind of disagreement, not necessarily about the causal interrelations, but more about how to act in response to such causal interrelations.

Another example is the disagreements regarding whether the bus services actually are 'good'. The case-handler refers to overall plans stating that 400 - 500 meters are an acceptable walking distance to and from a bus-stop with high frequency bus-services. This is not the case in Magnus Lagabøters veg 4.

Two other interviewees at the planning authorities' office, as well as the interviewee at the County Governor's office, expressed that they think that those involved in these kinds of discussions know that location of offices in locations such as Tunga will generate higher car shares and traffic volumes on travels to work than location in the public transport corridor. 'Right activity at the right place' has been a mantra in spatial planning in Trondheim, and everybody involved knows the basic principles, they find.

B.2.4.2.2 How they perceive this knowledge

All the interviewees were asked how they perceive the expert knowledge regarding effects of spatial development and office locations on travel behaviour and traffic volumes.

The case handler felt that the knowledge is good enough. She did not find that lack of general knowledge regarding this had been a problem when handling the case. She claimed that this is not her main expertise, but that others at the planning authorities' office know this well. For her it is enough to know and refer to overall plans. She had no other references than these plans. She did point out that there could be lack of knowledge regarding the actual existing situation, with references to on-going registrations and analyses which had disclosed surprising facts.

Two other interviewees at the planning authorities' office, working with review of the overall municipal plan, answered very similar to this. The general knowledge is good, they are themselves not experts, but there are others at the office that are. They help each other, and rely on previous analyses and plans. None claimed to know or apply more or less academic literature on this topic, except the doctoral thesis of one of the planners at the planning authorities (Strømmen 2001). This thesis focused on the interrelations between location of work placed and traffic generation.

None of the interviewees knew of any competing knowledge that claims that location of offices in areas like Tunga do not generate more traffic than office location in areas like the public transport corridor, but they referred to other perspectives on how to relate to this, as described.

B.2.4.2.3 Which methods for analyses the planners apply or support

The relevant analyses in this case were simple analyses regarding the quality and competitiveness of the private car, public transport and bicycle, as well as simple calculations regarding car traffic generation. These were conducted by the initiator's consultants.

The transport-system is described. Walking- and bicycling infrastructure are described. So is the bus-system, the distances to the closest bus stops, and the frequencies of the bus routes serving these stops. They conclude that the bus services are good.

The traffic generation is calculated as the number of employees expected to drive to work (300 out of 350), multiplied by 2, arriving at 600 new car trips per day in this area. They

conclude that this increase will not be noticeable. They find that most of the new traffic will use the main roads and not the local roads. The traffic is split with 45 % north and 45 % south on the main road, and 10 % on other roads.

The planning authorities do not disagree with the descriptions, but they do disagree with the impact assessments. They find that the public transport services cannot be characterised as 'good', and that a 2 % increase of road traffic on the already overloaded main road *will be* noticeable.

Nobody refers to effects on GHG emissions or total traffic volumes in the assessments of impacts. Neither do they compare traffic generation if the offices are developed here instead of in the public transport corridor, or traffic generation caused by office developments versus other developments on the site.

It is clear from the documents that the analyses are rough and approximate, and hence that they are uncertain. There are no obvious attempts to make the predictions appear more positive or more certain than they are. The method and description of how the analyses have been carried out is understandable. The assumptions, data, analyses and results can be understood and opposed by others.

B.2.4.2.4 How they present the knowledge

In the planning authorities' assessments and recommendations, they write among others that: "Present public transport services implies that high office shares at Tunga will cause extensive car-use and undesirable GHG emissions" (Municipality of Trondheim 2009:9).

B.2.4.3 Power

B.2.4.3.1 Which direct powers the actors have and exert

The initiators were exerting their power to propose a project which they know is not in accordance with the intentions in overall plans and policies. If they knew how previous office proposals in this area have been met, they also had the power to propose an office development that is about double the size that they actually intend to realise, in order to be allowed to build what they actually intended to build (but we don't know if they actually did so). They also had and exerted the power to describe the situation and the impacts of the project with respect to traffic generation in very positive and hopeful ways with respect to existing and future public transport services. Further, the initiators exerted their powers to collaborate with the public transport company.

The planning authorities exerted their power to propose an alternative project (a reduced development), which was accepted. They also exerted their power to review and comment on the descriptions and analyses of the initiators, and to disagree with their assessments of consequences

The County Governor's office and the County Council's office exerted their powers to commenting on the plans, and requiring that the size of the projects was reduced, in order to reduce the negative consequences with respect to traffic generation and increased GHG emissions. They did not exert their powers to stop the project. The interviewee at the County Governor's office explained that this was due to several factors, among others that they were not aware of the actual situation and development in the Tunga-area, and that they in general are restrictive when it comes to applying the formal objection which is their most powerful tool.

In the political decision-making processes, the 'green' parties (but not the labour party that often vote with the green ones) exerted their power to vote against adoption of the zoning plan, and to calling for a more comprehensive analysis of the development and use of land in the Tunga-area. The majority exerted their powers to adopt the plan against the minority's votes.

B.2.4.3.2 Which agenda-setting powers the actors have and exert

The planning authorities exerted their power to set the agenda by calling attention to a number of overall plans and policies claiming that office developments normally are supposed to be located elsewhere because those locations are better with respect to traffic generation and GHG emissions. This forced the initiators to assess the impacts of their project with respect to these issues. This was reinforced by the comments and requirements filed by the County Council's and the County Governor's offices.

The initiators and their consultants did not challenge the objectives or the expert knowledge embedded in the overall plans. They did, however, point at the fact that the plans state 'most of' and 'at least 60 % of' the office developments are to be located in the public transport corridor, and that offices can be developed in other locations if the public transport services are good. They describe the public transport services to ML4 as good, and hence that office development in ML4 is according to overall plans and should be allowed. Further, they suggested to improve the public transport services rather than to deny office developments here. This could be understood as an attempt to change the agenda towards discussions of how large their office development can be rather than whether the plans should be rejected. If this was the intention, they succeeded.

B.2.4.3.3 Which structural powers the actors have and exert

The planning authorities signalled in their assessments and recommendations that a main reason why they don't call for a rejection of the plan is that they are uncertain of what the Tunga-area should be used for. Since they have no clear answers, they have to allow the initiator to develop something. I interpret this as the understanding that the initiators should be allowed to build *something* on their properties, that they cannot be denied to develop their property, may be an underlying structural power that contributes to the plan being adopted.

The question regarding structural powers should have been explored more, but I did not come any further with it in this dissertation.

B.2.4.3.4 Objectives, knowledge and powers in this case

In the table below, the objectives, knowledge and powers of the main actors are listed with reference to the discussions and definitions in chapter six regarding plan-making processes in the dissertation.

Table B 2: Relevant properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes in the case studies.

	Planners working for:	Developer/ initiator	Planning authorities	Important hearing instances	Decision- makers
Objectives	Main objective	Realising their project	Comply to overall plans	Comply to overall plans and guidelines	Reduce traffic volumes – facilitate businesses
	Is reducing traffic volumes important?	No	Yes	Yes	For some
	How they understand this objective	-	Actually reduce	Actually reduce	Some – actually reduce
	Other relevant objectives	Realising their project	Densification, varied properties, equality	Density, respect municipal decisions	Facilitate business development
Knowledge	Possess or know of expert knowledge in question	No	Yes	Yes	Some
	How they perceive this expert knowledge	-	Good enough	Good enough	-
	Main references	-	No, overall plans	No, overall plans, planning guidelines	-
	What are their main expert knowledge	-	-	-	-
	Alternatives they propose and/or support	Full development	50 %	25 %	Majority-50 % Minority-0 %
	Methods they apply and/or support	Professional reasoning, simple calculations	Professional reasoning, simple calculations	Professional reasoning	-
	Causal interrelations they include and/or support	Low quality PT causes high car use	Low quality PT causes high car use	Low quality PT ³⁴ causes high car use	Low quality PT causes high car use
	Types of outputs	Quantitative, traffic generation	Development here cause more road traffic than in the PTC ³⁵	Development here cause more road traffic than in the PTC	-
How they relate to uncertainties	Accept and express uncertainties	Accept and express uncertainties	Accept and express uncertainty	-	
Powers	1. dimension - direct; win or lose in direct battle	Suggest plan Positive presentation Larger first proposal	Review, assess and disagree with analyses Propose alternative	Commenting Propose alternative	'Green': propose rejection Others: adopt
	2. dimension – agenda setting; what it is about	Point at other approaches and previous cases	Point at overall plans and previous zoning plans	Point at overall plans and national guidelines	Some developments should be allowed here
	3. dimension – structural; what one thinks is 'right' or obvious	Developers should be allowed to develop	Developers should be allowed to develop	-	Developers should be allowed to develop

³⁴ PT is short for public transport.

³⁵ PTC is short for public transport corridor.

B.2.5 Whether, how and by whom the objective or knowledge were ousted

In chapter 6 in the main report it was described how the objective 'reducing urban road traffic volumes' and the expert knowledge about how to do it can be introduced to the plan-making process or not, and how they can be rejected, ousted or applied wrongly, in any of the tasks in a plan-making process. Whether they do may strongly affect whether a traffic-increasing plan is made.

In this case, a plan has been made which, if implemented, causes more growth in urban road traffic volumes than if the intentions in the overall plan had been obeyed. The following analysis regards whether this is caused by that the objective or the expert knowledge in question was either not introduced or ousted in any of the tasks in the plan-making.

B.2.5.1 The objective was introduced and understood as important

As we have seen, the objectives about reducing traffic demand and GHG emissions were probably not part of the *problem analysis* or the *definition of objectives* made by the initiators. They were focused on their own objectives underpinning the desire to build 8.000 m² offices on their property.

This objective was, however, brought into the plan-making discussion by the planning authorities references to overall plans, and by the comments of the County Council's and the County Governor's offices in the hearing, pointing at the same plans.

These objectives were concretely manifested in the three mentioned authorities' presentation of competing *alternatives* to what the initiators had presented. These were all office projects that were smaller than the original proposal. The initiator accepted the planning authorities' suggestion. Nobody proposed an alternative with no office development here. A do-nothing-alternative was not part of any analysis.

In the *impact assessments*, consequences with respect to this objective, and potential mitigating measures suggested, were the main issues. It was not done comparisons off the alternatives with respect to their traffic generating potential, but it is clear from the documents that the lower traffic generating potential of the smaller development is the main reason why this is suggested and selected.

The planning authorities' *recommendations* also revolve around this topic. They express doubt regarding what is the right size for an office development, with references to the transport package and its statement that 60 % of new office developments should be located within the public transport corridor. In this part of the document they don't mention reduction of traffic volumes or GHG emission as objectives, but rather to follow the intentions in the policy documents and overall plans with respect to spatial development.

The majority of the politicians follow the planning authorities' advice, and adopt the plan. A minority proposed to reject the plan, and to call for more comprehensive analyses.

This description shows that the objective was introduced in the plan-making process and that it was emphasised throughout most of the plan-making process. The result was a plan which, if implemented, causes more road traffic than if the intentions in the overall plan had been followed and the planning proposal rejected. It will, however, cause less road traffic than the original proposal from the initiators.

B.2.5.2 The expert knowledge was introduced, applied and accepted

One explanation why a plan for office development in this location was adopted could be that the expert knowledge in question was either not introduced or that it was ousted somewhere in the plan-making process.

As we have seen, the expert knowledge in question has not been described or referred to directly in the documents, rather it has been referred to the overall plans stating that area-intensive work-places should not be located in the Tunga-area, due to lack of a competitive public transport service to the area and a non-central location.

There is no real opposition to the expert knowledge. According to the case handler do all involved accept that this is a car-based location, that most people working here will drive, and that office development in the public transport corridor will cause less road traffic.

The expert knowledge in question was hence introduced, applied and not ousted.

B.2.5.3 Competing objectives cause that the plan is made and adopted

The remaining question is why the process produced a plan that cause more traffic than if the overall plans are obeyed or the expert knowledge actually followed.

When asked why this plan was made and adopted, instead of to be rejected, the case handler had multiple and reflective explanations. She referred to the overall plans requiring that 'most of' and 'at least 60 % of' – not '100% of' – area-intensive work-places should be located in the public transport corridor. She also referred to doubts at the planning authorities' office as to whether *no* office development in the Tunga-area is the right answer or if it rather should be allowed some office developments here. Further, she explained that the established practice has become to allow *some* of the proposed area-intensive activities here, and that the property owners don't have many choices and no guidelines regarding what they actually *can* build and develop here.

The planner working with the overall plan at the planning authorities explained that the Tunga area is and have been quite difficult. It was regulated to businesses in the 1960s overall plans. This formally opens for all kinds of business developments, but the area was and is mainly intended for area-extensive businesses. The decision-makers have not been loyal to this intention. IKEA was allowed to build here in 2002, some office developments have been allowed, some plans for retail development have been adopted and so on. This has occurred despite that the planning authorities have explained that this will have negative consequences with respect to defined and prioritised objectives. The established practice has become that the developer are allowed to build reduced versions of their original proposals. A kind of silent transformation is going on, which is not intended or wanted, but which has been allowed for several years. This is. This is hard to stop.

The planning authorities hence feel that the political signals are quite ambiguous, and that a practice have been established which is hard to deviate from without a good and grounded reason. Further, some planners are not sure whether they find that this practice is bad, due to objectives regarding high densities and a varied offer of business properties.

The planning authorities concluded in their recommendations to the decision-makers that in order to follow up the environmental package for transport, it is more relevant to relate to office developments in term of absolute figures rather than as percentages of the total

development (to warehouses, factories etc.). They also comment that the initiator accepted that the proposal was reduced by 50 %. My interpretation is that this implicitly suggests that the initiator knew, on the basis of previous practice, that they would be allowed to build about half of what they suggested, and acted strategically according to this.

This understanding of what has been and is going on in the Tunga-area was confirmed by other interviewees. None had deviating explanations.

The consequences of this situation was compromises, which resulted in plans allowing office developments in un-central locations with insufficient public transport services, and which are defined as traffic-increasing plans in this work.

B.2.6 How did the planners act when producing a traffic-increasing plan

The actions of the planners working for the main actors in this case can be summarised according to the framework defined in chapter 6.6:

- The initiators of the plan proposed a zoning plan that was not in accordance with the intentions and objectives in overall plans, and did hence oppose the overall plans
- The planning authorities responded by pointing out conflicts with objectives in overall plans, by assessing and challenging the analyses and assessments conducted by the initiators and their consultants, and by preparing an alternative (a reduced development)
- The County Governor's office and the County Council's office delivered statements, but not formal complaints, in the planning processes, drawing attention to negative consequences with respect to traffic volumes and GHG emissions and suggesting a reduced alternative
- The initiators agreed to reduce their project in accordance with the alternative proposed by the planning authorities
- The planning authorities recommended the politicians to adopt the reduced planning proposal
- The political decision makers adopted the planning proposal recommended by the planning authorities, against the votes of a large minority voting for rejecting the plan and calling for more comprehensive analyses

The planning authorities as well as important commentators did draw attention to conflicts with main objectives, and they did suggest alternatives. Nobody did, however, suggest that the plan was rejected, or that no office development should be allowed. Hence, this alternative was not presented, assessed or presented as an alternative to the decision-makers. A political party did suggest it, and a large minority of the politicians voted for it.

B.2.7 Formal complaints, comprehensive analyses and overall plans

B.2.7.1 The next zoning plans were stopped by formal complaints

Two zoning plans proposing office developments in the Tunga-area were presented for the public shortly after the zoning plan discussed above, in June 2009. Also in June 2009, a zoning plan for a furniture outlet had been adopted at Tunga. That several plans for workplace- and visitor-intensive developments were adopted and suggested within a short time-span was an eye-opener for the County Governor's office, according to the interviews. They became more aware that an unwanted development could be going on in the Tunga-area. The County Governor's office filed identical formal objections against the two zoning plans, and demanded that comprehensive considerations in the form of an area-plan were made (County Governor's office 2009a).

The overall analyses and processes call for broader and more grounded arguments, and hence more knowledgeable discussions. Studying the process of and following from the formal complaints, can contribute to a deeper understanding of how and why the traffic-increasing office development was allowed in the zoning plan for Magnus Lagabøters veg 4.

B.2.7.2 The formal process

The two zoning plans in question was Ingvald Ystgaards veg 5 (IY5) and Tungavegen 28 and 30 (TV). These plans were presented for the public the month after the ML4 plan. They received formal complaints from the County Governor's office (2009a). Neither the County Council's office nor NPRA had any comments regarding the traffic-increasing potential of the plans for IY5 and TV.

The County Governor's office demanded that comprehensive analyses and an overall plan had to be made before the zoning plans could be adopted by the City Council. The planning authorities' offices were asked to start this work.

The planning authorities presented alternative ways forward to the political Building committee in June 2010. In this document, the problem is described, different ways of handling it under the PBA are outlined, and needs for analyses presented. The Committee agreed with the planning authorities' recommendations.

The planning authorities started the work on the planning program for changes of local planning guidelines in the municipal plan, as well as on the necessary analyses. The planning program proposal for changes of the planning guidelines was presented for the public in March to April 2011 (Municipality of Trondheim 2011). Seven comments were received. Two preliminary analysis-reports were under production when I was doing interviews in Trondheim in June 2011.

B.2.7.3 The main problems in an overall and comprehensive perspective

The planning authorities presented a document to the political decision-making bodies where they describe the problem and suggest how they should work with it (Municipality of Trondheim 2011b). Here, the on-going development and present situation is outlined, making it clear that the planning authorities don't have good data regarding this.

The problem is defined as multi-dimensional:

- Increased workplace-concentration at Tunga will affect the total traffic volumes in the city, and employees working at Tunga will have high car dependency
- High densities on and utilisation of each property is beneficial for society as well as for the property owner
- The competition between the different localisations in the city may involve that developments of workplace- and visitor-intensive workplaces at Tunga will make it harder to achieve a spatial development in accordance with objectives in overall plans
- The total offer of business properties in Trondheim affects the city's competitive powers towards other cities
- Changes in industry and commerce cause that 'production' is conducted in 'office premises' etc., causing confusing with regard to classifications of types of developments

Through readings of the overall analyses, it became clearer for this reader that the planning authorities find (or present the situation as) a main conflict between the two spatial

developments objectives 'densification' and 'right activity in the right location'. Their answer to this is a differentiated densification-policy.

The analyses make it clear that this area never can become as accessible by a competitive public transport service as the locations in the public transport corridor. Location of workplaces at Tunga will cause higher total traffic volumes than locations there. It also clarifies that office- and retail-developments here will reduce such developments in the public transport-bow, where it is desirable for various reasons.

The planning authorities emphasise that the Chief Municipal Executive (the highest administrative position) has been clear in his handling of concrete zoning plans that the city needs a variety of business properties, and that proposal for developments of workplace- and visitor-intensive workplaces shall not as a rule be rejected at Tunga.

The planning authorities suggest that they develop new purviews and/or guidelines for this area to be included in the overall municipal plan. These shall define the total amount of workplace- and area-intensive workplaces at Tunga in absolute numbers.

B.2.7.4 Necessary analyses

In order to be able to suggest these absolute numbers for such developments, data and knowledge is needed. A programme for necessary inquiries and analyses was suggested (Municipality of Trondheim 2011b). This may be understood as representing the kind of knowledge that was lacking when the traffic-increasing plan for Magnus Lagabøters veg 4 was adopted. This analyses programme includes:

- Registration of zoning plan practice the last decade, in order to evaluate whether the present development is in accordance with the stated objectives that at least 60 % of new area-intensive work-places should be built within the public transport corridor
- Analyses of the various properties or sites in the Tunga-area, with respect to their suitability for area-intensive workplaces and to traffic consequences
- Analysis of consequences of increased concentration of workplaces in the Tunga-area with respect to total traffic volumes and GHG emissions in Trondheim
- Analysis of congestion and delays on the local road system and for public transport, bicycling and walking in the Tunga-area, if different spatial development strategies are chosen

The analyses have so far revealed that the number of office-workplaces is far higher than expected, and that the number of such work-places in the area is doubled the last decade from about 2.000 to about 4.000 (Municipality of Trondheim 2011). It was also found that if all developments that are under planning or already adopted are realized, that sums up to about 60.000 m² more or less workplace-intensive developments (*ibid*). It has also been found that 65 % of workplace-intensive and 45 % of visitor-intensive developments, all together 45 % of all developments, have been located in the public transport corridor the last decade (Municipality of Trondheim 2011a). The preliminary analyses suggested that if the on-going development continues, this will contribute to that objectives in overall plans will not be achieved.

B.2.8 Explaining how and why a traffic-increasing plan was made

An attempt can now be made to answer the question of how and why this zoning plan was made, related to the zoning plan process itself as well as the following processes described above.

When aiming at explaining how and why this traffic-increasing plan is made, and after having described the structure of the problem and the relevant conditions, it is helpful to ask the retroductive question: what is necessary in order for a traffic-reducing plan to be made instead of a traffic-increasing plan?

The main answers to that would, according to previous discussions in this dissertation, be that reducing traffic volumes would have to be defined as a prioritised objective. Further, knowledge needs to exist that demonstrates that the traffic-increasing plan is a traffic-increasing plan, and somebody needs to point that out. Knowledge also needs to exist regarding how land use and transport-systems can be developed in order to achieve reduced traffic volumes, and a transport reducing alternative needs to be produced. The traffic-increasing alternative would have to be rejected, and the traffic-reducing alternative would have to be developed and adopted.

B.2.8.1 Important conditions

When discussing the zoning plan process, the remaining question was why nobody had suggested to rejecting the plan – to not allow office developments here. We have now seen that this is caused by conditions situated outside this specific zoning plan process.

Even if the overall plans states that 'most of' and '60 % of' the office- and retail-developments should be located in the public transport corridor, they don't require that 100 % should. An employee at the planning authorities' office, who actually is an expert on the effects of spatial development and locations on traffic generation, expressed in interview that the overall plans are not very ambitious. If 40 % of new office developments are located in places less accessible by public transport than the public transport corridor, the business development in Trondheim will be a development that cause more growth in urban road traffic volumes than necessary, and it will make it hard to achieve the objectives regarding reduced traffic volumes and GHG-emissions stated in the transport and environment package.

Further, the overall municipal plan regulate the Tunga-area to 'businesses', without defining which kinds of businesses. This opens for discussions of office and retail developments here.

It also seems, from the documents and the interviews that the planning authorities don't find that *no* office developments should be allowed at Tunga. Rather, they express that some developments of this kind should be allowed, but that they are unsure how much. The reasons were described above, and regard mainly considerations or objectives that have to do with other things than traffic volumes and GHG emissions.

The planning authorities have in periods aimed at minimising area-intensive developments in the Tunga-area, and recommended against adoption of certain zoning plans. This has, however, been overruled by the political majority.

In retrospective, one could add that lack of overview of the development and the situation with respect to office- and retail developments at Tunga was a contributing factor. As the

County Governor's office started to suspect what was actually going on, they called for a halt in on-going planning processes. The interviewees expressed that 'everybody' were surprised when the inquiries disclosed the extent of the developments at Tunga.

The politicians seem to disagree regarding the development here. In minutes from City Council and committee meetings, one finds that the green parties vote against such developments, while the right wing parties and the labour party vote for. On several occasions the City Council has approved plans for offices and retail at Tunga, also when the planning authorities have clearly explained that this is not in accordance with overall plans and objectives and recommended against the proposals.

During the years, a practice have evolved, where zoning plans proposing office- and retail developments in this area have been allowed in reduced versions. It is hard to change this practice without any clear reason.

Hence, when plans like ML4 are proposed, the planning authorities partly would not and partly feel that they could not suggest or recommend that the plan is rejected. If they did, this would be in direct conflict with previous political signals and established practice.

What was needed was a comprehensive analysis and overall considerations regarding the development in the area. This was what the County Governor's office called for, and that is under production.

B.2.8.2 Causal powers and mechanisms

The main cause why this plan was initiated was that the owners want to develop their property in order to earn money and proposed a planning proposal to do so. The main mechanism through which the plans was made and recommended was that the objective was ousted. This resulted in that nobody suggested a rejection of the plan. The planning authorities recommended the plan and the politicians adopted it.

B.2.8.3 Explanation

The making of the zoning plan in question can now be explained in critical realism terms:

Because of aspects not relevant in this case, the initiators proposed a plan for office developments at Tunga. Because of the conditions (political will, established practices, doubts at the planning authorities office, ambiguous and un-ambitious municipal plan), generating mechanisms were activated (the objective was (partly) ousted. Hence, a rejection of the plan was not suggested by anybody, and nobody filed formal complaints. The planning authorities recommended the politicians to adopt a plan for a reduced office development, which they did.

A plan had hence been made and adopted which, if implemented, will cause more road traffic than if the intentions in the overall plans and/or recommendations based on the expert knowledge in question had be followed.

If the political standing had been different, the practice had not been established or the planning authorities' understandings had been unambiguous, the outcome of the plan-making process could have been different.

B.2.9 Relevance of the preliminary explanations

B.2.9.1 Explanations related to the expert knowledge in question

The first group of explanations which were developed in chapter four regards whether properties of the expert knowledge itself cause traffic-increasing plans to be made. One question is whether this was an important part of the explanations regarding how and why this zoning plan was made and recommended.

As we have seen, the expert knowledge in question have been applied in making the overall plans, stating where office developments should be allowed in order to contribute to minimising the traffic-increasing effects of such activities. In the zoning plan, the actors mainly refer to the requirements for spatial development in those plans, rather than to present and discuss the causal interrelations or to refer to the literature. Nobody opposes the intentions in the overall plans or the knowledge these are based on. Hence, properties of the expert knowledge itself seem to be less important as an explanation in the ML4 case.

B.2.9.2 Explanations related to the planners and how they relate to the expert knowledge

The second group of explanations regards how planners relate to the expert knowledge in question; whether and to which degree they possess it, agree with it, and are willing and capable of applying it.

The interviewees in the case were selected because they are working with or close to the ML4 case or to handling of business-developments in the overall Municipal plan. None but one of these planners claimed to master this knowledge, or to be experts with respect to this issue. They don't apply this knowledge, but refer to other plans where it has been applied. The expert knowledge in question is, however, not challenged in this plan. This means that lack of this kind of expertise among the planners involved is probably not an important part of the explanations regarding how and why the ML4-plan was adopted.

Lack of possession of the expert knowledge in question among the planners involved can be an explanation how and why this practice has been allowed to evolve. Since none of the planners directly involved in the plan-making possess this expert knowledge, know it well or are experts on these issues, this could have caused that they do not enter discussions with initiators, consultants or politicians regarding the stated objectives in the overall plans or the consequences of the development that is actually allowed in the area.

Properties of the planners and how they relate to the expert knowledge in question will probably be more relevant in the comprehensive analysis and overall planning considerations going on. The planner responsible for doing the analysis at the planning authorities' office claims that this is not within his main expertise. Since the interrelations between land use, transport-systems, travel behaviour and traffic volumes form a system of organised complexity which may be hard to understand and analyse for people not knowing it well, this complexity of the issue and the knowledge may cause the responsible planner to not apply the expert knowledge in question or to apply it wrongly. He may also choose to rather rely on over-simplified quantitative transport model analyses.

If the knowledge-transfer system at the planning authorities' office works in the ways several of the planners have explained, the analysis-process will be controlled and affected by someone with expertise in this issue and who master the expert knowledge in question, and hence can ensure that the expert knowledge is applied correctly.

B.2.9.3 Explanations related to the plan-making processes

The explanations why the ML4 plan was made and adopted are mainly to be found in the plan-making processes, or in the conditions shaping the plan-making processes.

An important condition is that the overall municipal plan is ambiguous when it regards office developments at Tunga. First, it states that this area is designated for businesses without concretising which kinds of businesses, and second it requires that '60 % or more of area-intensive work places should be located in the defined public transport corridor. Together this opens for developing offices at Tunga.

It may seem as most actors directly involved find that various competing objectives are at least as important as reduction of urban road traffic volumes, and hence that some office developments should be allowed in ML4 and at Tunga.

The political will of the majority in the City Council clearly has an agenda-setting power here, which together with the planning proposal from the initiators, cause that the discussions revolve around how much office developments that should be allowed rather than if it should be allowed.

In the IY5 and TV cases, planners at the County Governor's office apply the expert knowledge in question in combination with their power to file formal complaints and call for changes. A condition contributing to the ML4 plan was made and adopted could hence be that the County Governor's office (or any of the other authorities with powers to file formal complaints) had not exerted their powers to file formal complaints in the ML4 case or in previous cases. If they had (and which they probably should have according to the planning policy guidelines for coordinated land use and transport planning), the ML4 plan and other similar plans in the area could have been stopped.

B.2.10 Interviewees in Case Tunga

Åse Bollingmo, case handler for the office development case at the Planning authorities in Trondheim

Randi Storeng, Policy advisor at the County Governor's office, Sør-Trøndelag county, working with the office-development cases

Erling Kristian Skinderhaug, planner working at the Planning authorities in Trondheim, among others with analyses regarding office developments at Tunga in Trondheim

Marianne Knapskog, planner working at the Planning authorities in Trondheim, among others with how to handle office development in the new overall municipal plan

Dr. Ing. Kathrine Strømmen, working at the Planning authorities in Trondheim, mostly with overall land use planning (only certain questions)

I was not able to get an interview with the initiators' consultants

B.2.11 Interview guide for case Tunga

Interview guide – office development at Tunga in Trondheim, translated to English.

0. Professional background of respondent

1. This zoning plan

1.1 Why was this plan that helps car-based location of office jobs, and contrary to several overall plans, made, accepted and adopted?

1.2 Did you submit alternative plans? Did you actively do anything to bring up an alternative plan?

1.3 How was the expert knowledge used - from everyone's side?

1.4 What knowledge / arguments / considerations caused that the plan was made and approved?

1.5 What other considerations made/ contributed to that the plan was made and approved?

2. About office developments in Trondheim in general

2.1 Is there still a development going on in Trondheim with car-locations of offices? Why?

2.2 Where? Especially in the Tunga-area, or elsewhere too?

2.3 Who are the drivers of car-based localization of office-developments? Who are the opponents?

2.4 How do they act in order to get such plans adopted?

2.5 Is it initiated any overall planning initiatives for dealing with this? What and who?

3. Objectives

3.1 Do you feel that the objectives of reducing car traffic is an objective or issues in zoning planning? In this plan? Otherwise?

3.2 Is this considered a realistic objective that can be achieved? Do you consider it this way?

3.3 Is the spatial development of office locations moving in the right directions?

4. Knowledge

4.1 Do you feel that it is accepted knowledge that the type of location of office jobs in this plan contributes to increased car traffic, while the location in central locations and locations with good public transport access cause less car traffic?

4.2 Is this well-known and common knowledge? Who does not know this / disagree / think it's insignificant?

4.3 What kind of knowledge base is commonly referred to? Is there literature or the like that you can refer to?

4.4 Who uses this knowledge and argues with basis in it?

4.5 How is this knowledge used? What data are collected, what questions are formulated, which strategies are drawn up, which consequences are considered, which alternatives are compared etc.?

4.6 Is our knowledge in this field (coordinated land use and transport development for reduced traffic volumes) good enough? Theoretical, methodological, accessibility?

4.7 How do you think that new offices shall be located in order not to be car dependent?

4.8 Are there competing knowledge that outperforms this? What, how and by whom?

5. Is there anything else I should know?

How and why planners make plans which, if implemented, cause growth in traffic volumes

B.3 Case Økern: The largest shopping centre in Oslo

Case Økern regards the zoning plan process for a large transformation area at Økern in Oslo. The real estate developer proposed to include a 60.000 m² shopping centre in the 160.000 m² development proposal. The planning authorities referred to overall plans, and proposed an alternative which includes 25.000 m² shopping centre (the total project is still 160.000 m²). The planning authorities' main arguments were that the developer's proposal will influence the retail structure in Oslo negatively, that it will contribute to increased road traffic volumes and that it is not in accordance with overall municipal plans and national purviews. The developer needed to demonstrate in the plan-making process that their proposal was not a regional and car-based shopping centre. If they were not successful in this, public authorities would file formal objections, which could stop the project even if the City Council approved it. This resulted in an interesting battle of knowledge. As this is written, the City Council in Oslo has adopted the plan, and the case is at the Ministry of the Environment for final decision.

B.3.1 Introduction

The zoning plan process is first described. This is followed by an analytical description of the objectives, knowledge and powers of the main actors, of whether, how and why the objective and expert knowledge in question were ousted in the plan-making process, and of how the actors acted when making the traffic-increasing plan, in accordance with frameworks defined in chapter six.

This is followed by an analysis leading towards an explanation of how and why a traffic-increasing plan was produced in this plan-making process, and finally which relevance the preliminary explanations regarding the expert knowledge, the planners and the plan-making processes have in explaining this.

The descriptions and analyses are based on document studies and interviews with the initiators' representative, the planning authorities at overall and zoning plan level, the district administration's planner and the NPRA.

B.3.2 Description of the planning process

B.3.2.1 Overall plans and political steering documents

The *governmental purviews for shopping centres* (Ministry of the Environment 2008) state in §1 that it aims to contribute to a stronger regional coordination of the shopping centres policies. The objectives are to strengthen existing city and town centres, and to contribute to a more efficient land use and to more environmental travel behaviour in order to avoid a development causing urban sprawl, car dependency and worsened accessibility for those without a car. The long term objective is to achieve a more sustainable and robust development of cities and urbanised areas and to limit GHG-emissions.

The rules for development of shopping centres are listed in § 3. They say that shopping centres can only be established or enlarged in accordance with approved county plans or county sector plans which include directions for localisation of retail and other service functions. In areas which are not covered by such plans, shopping centres cannot be established which are larger than totally 3.000 m², or enlarged so that they exceed this. The County Governor can approve to disregard these purviews if, after a concrete analysis, it is found that the development is in accordance with §1 in these purviews.

One of four main objectives in the *comprehensive municipal plan for Oslo* is that “Oslo shall have a sustainable urban development” (Municipality of Oslo 2007: 39). One of the strategies for achieving this is to continue following a coordinated land use and transport development strategy. This explicitly includes among others compact land use development in order to minimize car use. Business, retail etc. should be developed in designated public transport nodes. Økern is one of these.

The overall objective or goal for development of the retail- and centre structure in Oslo is in the *municipal sector plan for localisation of retail trade and other services*³⁶ (Municipality of Oslo 2003) stated as to contribute to a sustainable urban development, with a compact land use and a coordinated land use and transport development. Oslo shall also have an efficient and robust centre structure with vital retail centres. For the inhabitants this means good coverage, proximity and accessibility for all to shopping and service, for the society it means localisations which contribute to improve the environment by hindering urban sprawl, and to reduce travel lengths and car use, and for the retail business it means to offer predictable and favourable conditions as terms for enable them to develop good local services in a suitable centre structure which offers stability over time. A main idea is that regional and car-based shopping centres shall not be allowed in Oslo.

These goals or objectives are well supported by the directions and the binding purviews in the plan, which make the plan a strong and powerful tool for steering retail development. According to the planning authorities (department of urban development), the plan is strong and well functioning. The City Council has mainly been loyal to the plan, and the developers have hence in general accepted it as a strong signal regarding what will be allowed. The planners at the planning authorities know that this is something which is taken very seriously, and they ask the experts in this field for help when necessary. The planning authorities find that the clarity and understand ability of the plan is a strength. Still, it is dynamic since it is designed so that it follows the urban development. It is not detailed, and distinguishes only between two types of goods.

A coarse zoning plan had been prepared and adopted for the Økern area (Municipality of Oslo 2004). This plan discussed and indicated how society (represented by the municipal politicians) wanted this area to develop, the main infrastructure developments and a coarse-meshed land use plan.

The clear and outspoken aim or objective or task of the planning authorities is to make sure that the plans and developments are in accordance with overall plans and policy documents such as the governmental purview, the municipal overall plan, and the municipal sector plan for retail and services. This is stated and substantiated in the planning documents and repeated in interviews with two different planners at the planning authorities.

B.3.2.2 The project

The plan-making process studied here regards the zoning plan for a large transformation area in Oslo. The site is located at Økern in Oslo, about 4 km from the city centre as the crow flies. Currently, the area is dominated by large scale road infrastructure, some shopping, and

³⁶ This is also regarded as a county sector plan, for instance in relation to the governmental purviews, since Oslo is both a municipality and a county.

some small scale industry. Construction works are being undertaken in order to replace the road infrastructure with road tunnels (same or increased capacity).

This will improve the local environmental qualities substantially (especially noise), create new opportunities for development in the area, and even increase the size of available land to build on. Large scale housing and other developments are going on in the proximity of the site. This is understood as densification of land use, and to be in accordance with the municipal plan. This project may be understood as part of a planned and willed expansion of the dense inner city.

A developer has bought parts of the site. They have, in their submitted planning proposal, proposed to build housing, offices, shopping, a hotel, cultural activities and public services (total 163.000 m², site size is about 138 daa, occupancy (TU in Norwegian) 250 %). The shopping centre included in the planning proposal would be the biggest in Oslo, with 60.000 m². All but three shopping centres in Oslo is less than half the size of the proposed centre. The main discussions in the plan-making process regard the dimensions of the shopping centre included in the plans.

B.3.2.3 The main actors

The main actors in this process are the *planning authorities* and the *developer*, Økern sentrum AS v/Steen & Strøm. Steen & Strøm is a Scandinavian (but French owned) retail and real estate company that owns and operates 52 shopping centres in Norway, Sweden and Denmark. In 2006 the shopping centres had 3.300 lessees with total revenue of about NOK 40 billion (according to their home pages in October 2010³⁷).

The formal *initiators*³⁸ of the project are consultants hired by the developer to carry the planning process through. In this case, these are Civitas AS Rådgivergruppen, Ghilardi + Hellsteen Arkitekter AS and Space Groups AS. These have the main responsibility for following procedures, they write up the planning proposal including the impact assessment, they often hire and organise other consultants (for retail analyses, transport analysis, landscape analyses etc.), and they organise and do much of the lobbying and negotiations. In general, one could say that initiators often deputize the developer in the planning process.

With regard to the topic land use development and its effect on traffic volumes (there are numerous other topics and aspects, such as affect on greenbelt, aesthetic values, drainage, polluted grounds etc. which is not considered in my analysis) the *national road authorities* and the *county administration* were important actors here, since they could file, signalled that they would file and did finally file formal objections to the planning proposal.

The role of the *District Council* (the municipality of Oslo is divided in 15 districts) is to take care of the local interests (and they do obviously not necessarily agree on what these are – this is decided through the instruments and systems of representative democracy).

Other *local environment and neighbourhood groups* did participate in this planning process, but did not play a crucial role (as I have understood it). The planning authorities explained that this probably was because there are no close neighbours to this area today.

³⁷ <http://www.steenstrom.no/Toppmeny/Corporate-information/>

³⁸ 'Forslagsstiller' in Norwegian.

B.3.2.4 Main issues

This area and nearby areas are under transformation from not so densely developed brownish areas to something close to an extension of the inner city. This site will be freed from heavy transport infrastructure and road traffic (they go underground), and there is a large potential for development. This is wanted by 'everybody' including not least the municipality in Oslo, district politicians and NPRA (which pay for transforming the transport infrastructure). An important objective, and a main aim for the plan-making process, is hence to arrive at a plan that facilitates fast and good development of this area.

The developers have proposed to build 60.000 m² shopping centre as part of their 160.000 m² project. This is not in accordance with, as described. The planning authorities refer to overall municipal and national objectives and steering documents and claim that the proposed development is not in accordance with these. They claim that the developer should be allowed to build a 25.000 m² shopping centre (of total 160.000 m²) in order to be in accordance with overall plans.

The planning authorities' 'problem' could hence be that this site needs to be developed, but in accordance with overall objectives and plans for Oslo regarding to enhance the existing retail structure and reducing traffic volumes and GHG-emissions. This means a 160.000 m² development, but with only 25.000 m² shopping.

The developer's problem is that according to overall plans and a binding area plan, they are not allowed to build what they have proposed. They need to persuade the politicians and others that what they want to do actually *is* in accordance with overall plans, especially the municipal sector plan for retail and services. If they don't succeed in this, at least two public authorities will file a formal objection with reference to the national purviews for shopping centre developments. If these authorities keep up the objections, and the City Council wants to adopt the plan, the case needs to be settled by the Ministry of the environment which is responsible for the purview.

The main issue in this case hence regards whether the developer should be allowed to build a 60.000 m² shopping centre as part of their project. The main discussions regard whether the developer's planning proposal includes a regional, car-based shopping centre which contributes to increase urban road traffic volumes and to negatively affect the existing retail structure in Oslo.

B.3.2.5 The formal process

The main procedural steps and documents produced can be summarised as in the table below. During the process, there have also been several meetings between the developers/initiators and several of the public authorities involved which are not listed here.

At the home pages of the Planning authorities in the Municipality of Oslo one gets access to 'saksinnsyn', which is a data base covering all cases which pass through the agency. A lot of the correspondence and documents related to the cases is found here³⁹. For this case there were 178 listed units at 12.08.2010. The first was from Steen & Strøm Norway AS to the planning authorities, dated 02.11.2006 and titled 'zoning plan proposal – Økern centre' (my

39 <http://web102881.pbe.oslo.kommune.no/saksinnsyn/main.asp>, ID number 200612026 gives access to all documents in the case.

translation). The last listed document (this is written in September 2010) is sent from the City Council department for urban development to the NPRA at 16.06.2010 and is titled 'Copy of letter to the NPRA – regarding objection – Økern centre' (my translation). The 178 units suggest that a lot of information have been exchanged. A lot of this is formal exchanges, such as comments in public inquiries. It will not be made any attempt to give a full record of the communication going on and all the documents produced in the case. Instead, the main procedures of the formal planning process and the main documents produced are presented.

Table B 3: Summary of the main procedural steps and the main documents in this case.

Date	Procedure	Document
02.11.2006	Announcement of planning process	Letter to the planning authorities (PA) from the developer
27.06.2007	Planning program proposal sent to PA from the initiators	Planning program proposal
03.06.2008	Formal planning program announced by the PA	Formal planning program
13.02.2009	Planning proposal sent to the PA from the initiators	Planning proposal
04.06.2009	The planning proposal is presented for the public	'Planning proposal for public inspection – Økern senter – zoning plan with impact assessment'
08.06 – 12.08-20089	Public hearing of the planning proposal	Hearing letters; comments, objections etc.
19.02.2010	The formal planning proposal is presented to the City Council by the PA	'Økern senter Planning proposal to the City Council Zoning plan with impact assessment'
10.05.2010	New version of impact assessments sent to the City Council administration	'Consequences for retail, transport and environment based on new population prognoses for Oslo'
09.03.2011	Processing in urban development committee	Minutes from the committee meeting: Adopted, and sent to Ministry of the environment
13.04.2011	Processing and decision in City Council	Minutes from the City Council meeting: Adopted, and sent to Ministry of the environment
-	Processing and final decision in the Ministry of the environment	-

The case has, as described above, a background and history which includes national and municipal overall plans and policy documents. It also includes the Økern area plan which is statutory (Municipality of Oslo 2004), and which was suppose to clarify for potential developers how the municipality of Oslo wanted this area to be developed.

B.3.2.5.1 Planning initiative

The formal start of this case is when the developer notifies the planning authorities that they will make such a zoning plan (02.11.2006, as described above). Few days later the initiators send the more formal 'planning initiative' and notify affected actors and the public through at least one local newspaper that the planning is starting (required in the PBA § 12-8). As required in the PBA (2009: §12-8), the initiator, the planning authorities and other public authorities which are affected by the proposal carry out a meeting where the planning proposal is discussed and where the authorities account for existing plans and other issues

which may be important to know when making the plan. Following this meeting, the authorities send statements accounting for their preliminary comments and advices.

B.3.2.5.2 Planning program

The initiators worked out the *planning program proposal*, sent to the planning authorities 27.06.2007. This was sent on public inspection/inquiry, as the planning and building act requires (§4-1 and §12-8). Several comments were received. Among others did the NPRA state that it could be necessary for them to make a formal objection if the developers kept the idea of developing 60.000 m² shopping centre. It is emphasised that the consequences of establishing a shopping centre this size in this location need to be thoroughly analysed, especially with respect to effects on the retail structure in Oslo, to the local traffic situation, to total traffic volumes and whether this is in accordance with the municipal sector plan for retail and services.

The planning authorities summarised the comments etc. in 'Økern centre. Settling of programme for the plan-making' (Municipality of Oslo 2008a), which is the presentation of the *formal planning program*. Here is defined which effects and impacts need to be examined and analysed before the planning proposal can be developed and presented for a public inquiry. This is an important document, where the society (authorities, the public, neighbours) defines which knowledge is necessary 'in order to improve the decision-makers' abilities to make decisions about future actions which contribute to the achievement of their objectives'. The initiators now produced the planning proposal, including the analyses and impact assessments which were required in the planning program. At 13.02.2009 a planning proposal was sent from the initiators to the planning authorities.

B.3.2.5.3 The planning proposal made public

At 04.06.2009 the planning authorities made public 'Planning proposal for public inspection – Økern senter – zoning plan with impact assessment' (Municipality of Oslo 2009). The reference alternative had been developed to an 'Alternative 2' with drawings etc. There were no real differences between the previous reference alternative and alternative 2. It is not common that the planning authorities develop their own alternatives in zoning plan processes. In interview, the case handler explained that this was done in order to allow the County Council to choose between two development options, where one is an alternative which is in accordance with previous decided overall plans.

Everybody was invited to comment on the plan, and several did. The comments were mainly from other public authorities. Three formal objections according to the planning and building act (§§ 5-4 – 5-6 and 12-13) were filed, from the NPRA, the national railway authorities and the County Governor's office. The initiator summarised the contributions, and commented upon each of them, and send this to the planning authorities.

A number of different changes and adjustments were then discussed with the commentators. As a result of these changes the railway authorities withdraw their formal objection, and the road authorities withdraw their objections to alternative 2. This meant that two formal objections to alternative 1 in the planning proposal remained. Both were related to the dimensioning of the shopping centre and how this is not in accordance with the municipal sector plan for location of shopping and service in Oslo.

B.3.2.5.4 Plan and recommendations

The planning authorities wrote up the *formal planning proposal* in order to present it for the City Council (Municipality of Oslo 2010). The facts of each of the two proposals are presented, as is the formal process and a summary of the proposals and their assumed impacts. Then follow a summary of the comments and objections made throughout the process. It includes a summary of the 22 comments made in relations to the notification of the start of the planning process in 2007, comments to the announcement of the planning program in 2008 and to the public inquiry of the planning proposal in 2009 (24 comments including three formal objections). Then follow the initiators comments to the comments, and the planning authorities' comments to the comments and to the initiators comments to the comments. The planning authorities' judgement or evaluation of the original zoning plan proposal from the developer, with 60.000 m² shopping is presented. Important overall national and municipal aims and objectives are accounted for, and it is shortly explained which effects and impacts the proposal will have with respect to different objectives.

The planning authorities' proposal ('alternative 2') is presented, and it is explained why this will contribute to achieving the defined objectives in a better way. The stated argument for bringing forward an alternative 2 is the overall aims and objectives, as well as the purviews, which are stated in the municipal sector plan for location of retail and service. The two different proposals for zoning plans are presented (zoning plan maps with formal purviews), and finally the planning authorities recommendations to the City Council. They strongly recommend that the initiator's proposal is rejected, and that their own alternative is adopted.

B.3.2.5.5 Final lobbying

In May 2010, the initiators sent a new version of the impact assessment, '*Consequences for retail, transport, and environment based on new population prognoses for Oslo*' to the City Council administration (ncm development and norsam 2010). Here it is claimed that new prognoses for population development show stronger growth than previously expected. This means more people living within what is defined as the primary market area (four city districts), and hence lower car shares on travels to and from the shopping centre. In the final calculations they arrive at a lower traffic generation in 2030 than in 2015. Hence, they claimed to have demonstrated that the car shares on travels to and from the centre will be lower in 2030 than in 2015. The planning authorities were not asked to comment on these calculations.

Short time before the Standing Committee on urban development made their recommendations to the City Council, the initiators sent a final note. They presented calculations that seemingly demonstrated that the planning authorities had done the calculations wrong (Civitas 2010). They claimed that the correct size of the shopping centre, when applying the planning authorities' assumptions, were close to their own proposal. They had, however, made major faults in their calculations, as will be described. The planning authorities were not asked to comment on these calculations either.

B.3.2.5.6 Decision made

In April 2011, the plan was adopted by the City Council. Since the regional authorities upheld their formal complaints throughout the statutory negotiations, the plan was sent to the Ministry of the Environment for final decision.

B.3.2.6 Two alternatives

In accordance with the planning programme, two alternatives were proposed in the planning process. One was the proposal from the developers and the other a reference alternative made on the basis of the coarse but binding area plan from 2004. The reference alternative was upgraded to an 'Alternative 2' by the planning authorities and included in the zoning plan before the public hearings (Municipality of Oslo 2009). According to the case handler at the planning authorities, it is rather rare that they choose to develop their own alternative. They felt, however, that it was necessary in this case in order to offer the decision makers an alternative development proposal. If they had not done it, the decision makers would only have had the choice between to accept or deny development.

The planning authorities' alternative (25.000 m² shopping, totally 160.000 m² development) is similar to the 2004-plan, and generated on the basis of directions in the municipal sector plan for location of retail and service and data about location of residences now and in a not-so-distant future, as well as detailed knowledge about the number of residences within real walking and bicycling distances, data about turnovers in shopping centres and simplified figures of how people spend their money (based on analyses in the municipal sector plan)⁴⁰.

The developer's proposal has been generated through an economic feasibility study. A main argument that the developer proposes such a large (the biggest in Oslo) shopping centre, is that this is necessary in order to make it economically feasible to build an aqua-land and a building for 'cultural activities' in the project. It is explained in the initiators' planning proposal that "The initiator has assessed different alternatives which can justify these expenses. The proposal is based on 60.000 m² shopping as a carrying element for implementation of these investments" (Space group et al. 2010:50). There are no clear references to specific analyses or documents showing how these assessments are done. In the Planning authorities presentation of the planning proposal to the City Council it is stated (Municipality of Oslo 2010:39) it is mentioned that this claim has not been further substantiated.

B.3.3 Effects of the proposed project on traffic volumes

B.3.3.1 The initiators' alternative is understood as 'the traffic-increasing alternative'

Transport generation from the project, both directly related to the functions located here and indirectly and more long term related to effects of changes of the retail structure on road traffic demand, is a major topic in this plan and in the planning discussions.

According to the expert knowledge in question, as described in chapter four, the planning authorities' alternative generates less traffic. This is because this alternative supports the overall strategy of offering shopping and other services within walking- and bicycling distance. A very large shopping centre, as proposed by the initiators, will necessarily need to draw customer from a larger area, causing lower walking- and bicycling shares and higher car-shares. It will probably also cause that smaller centres and local shops are closed down,

⁴⁰ *Turnover (NOK)* = number of people within 1 km and 2 km (persons) x percentages of spending at this centre (%) x spending per persons in such centres (NOK/person)

Centre size (m²) = Expected turnover (NOK)/Necessary turnover (NOK/m²)

and hence forcing people to travel further distances, and more by car, in order to do their shopping.

The initiators claim that if this large shopping centre is not built here, people will travel to some of the other few centres in the neighbour county Akershus in order to do their shopping (implying that people want to and will do a substantial part of their shopping trips to the three largest centres in the region), and hence causing more traffic than if a very large shopping centre is built at Økern.

The planning authorities' proposal is understood as the alternative that generates less traffic. This is the understanding of the planning authorities, other public authorities and the analyses produced by the initiators' consultants. The initiators do, however, present their analyses as if they show that their alternative does not generate more traffic than the alternative.

The initiators do not substantiate their basic assumption (that people will travel to the bigger shopping centres to shop if a 60.000 m² shopping centre is not realised) with empirical findings, while the planning authorities do substantiate their claims.

The developers' alternative which includes a 60.000 m² shopping centre is hence understood as the traffic-increasing alternative here. The analyses aim to explain how this plan came to be made and presented for (but not recommended by planning authorities) the City Council.

B.3.3.2 Knowledge battle regarding effects of the alternatives on traffic volumes

This plan-making process is especially interesting in the context of this dissertation because the initiators needed to prove – with the help of references to and production of – analyses, data and knowledge, that their proposal does not represent a 'regional car-based shopping centre'. This caused an interesting knowledge-battle. This battle is the main focus in the description and analyses of this case.

The following description of this battle is quite detailed and elaborate. In order to demonstrate how knowledge actually is applied in the process, I see no other ways than to also study 'little things' and to describing what is done. Referring to it in more general or aggregate terms will not suffice. Further, a quite broad presentation of the various ways in which knowledge production and presentations have been twisted seemed necessary. This means that the following descriptions of what has been going on in the plan-making process are quite lengthy.

B.3.3.3 Knowledge and understandings embedded in the overall plans

The knowledge and understanding embedded in the overall plans, the governmental purview etc. are basically the same kinds of understanding as described in the dissertation (chapter four), maybe with less focus on development of transport-systems.

B.3.3.3.1 The municipal sector plan

The municipal sector plan for location of retail and service in Oslo accounts for the understandings of how localisation of retail and services affect the retail structure, the accessibility to retail and traffic generation caused by retail shopping, as well as the empirical knowledge in an Oslo-context. It does, however, not refer to theoretical knowledge, or to empirical knowledge from other cities or to more general empirical knowledge.

B.3.3.3.2 Empirical knowledge underpinning the sector plan

This empirical knowledge, and the understandings based on it, is accounted for in five chapters⁴¹. In chapter three, data showing status and development for retail in the area is presented. Development over time, distribution in the region and in the city and changes of these are described. The data are mainly gathered from the national bureau of statistics and from the municipal data bases (data regarding land use and population).

In chapter four, the centre structure in Oslo is described, mainly based on a register over shopping centres and retail facilities (Andhøy) and a retail analysis carried out for Oslo. It shows location, size etc. of the centres, defines the centre hierarchy, and discusses variations of the centre structure within the three transport corridors in Oslo. It also discusses structural changes over time and direction of development. Data for localisation of shopping is combined with GIS information regarding where people live, and the accessibility to shopping from dwellings are analysed (several analyses). The analysis concludes that the accessibility to shopping in Oslo is good, and that the structure in general is good and should basically be developed in the same directions. The analysis also points at challenges to this; where the most severe is that the smaller centres seem to be ousted by the larger. If this continues, the average travel distance to shopping will increase.

In chapter five, regarding transport and accessibility, the main analyses referred to are accessibility analyses combining land use data and a transport model (EMMA), analyses of data from a number of shopping centres in the city regarding parking, a retail analysis (a survey) in Oslo, and registrations of customers and cars to and from a number of shopping centres in the city (including distribution over week and day). Based on this, an analysis is carried out, which concludes that localisation of shopping in areas where many people have walking and bicycling distances between their dwelling and the shopping centre causes traffic volumes and parking needs to be low, and that larger shopping centres cause more traffic due to longer travel distances. In chapter six, about retail travel in Oslo, travel survey data for Oslo, drawn out of the national travel survey, are presented.

In chapter seven, the data and analyses are presented in relation to each other. It is shown that people prefer to do their shopping close to where they live, and that they only travel longer if they need something special which is not available 'nearby'. It is found that how people travel depends on the kind of activity they are travelling to and from and where they live – the last also affecting travel distances (in accordance with the description in chapter three). On short travels, people prefer to walk. On longer retail travels they go by car. Public transport is more seldom used for shopping travel, especially when this is the only purpose of the trip. The larger shopping centres have the highest car shares.

On this background, the objectives, purviews, and directions described above are presented in the sector plan. The underlying data gatherings and analyses can be summarised as: an accessibility analysis, a retail survey, analyses of travel survey data, registration of customers, cars, and parking spaces at selected shopping centres, and analyses of register data (Municipality of Oslo 2003a).

⁴¹ Descriptions of methods, together with more results, maps etc, are presented in a more detailed 'Part II Background material' to the plan.

B.3.3.3.3 Analysis as professional reasoning

The analyses in the sector plan are an example of what was previously termed 'professional reasoning'. The necessary definitions are stated. The more overall trends of development with regard to important issues such as land use development, transport corridors etc. are described, and the role and position of retail and location of retail in this picture are described. The situation is described with the help of different kinds of empirical data for e.g. location of retail, turnovers, travel behaviour etc. Developments of retail in different parts of the city and in different kinds of retail centres are discussed, as is what is well functioning and what needs to be taken care of in the plan (the problem definition). The goals and objectives are then defined, and the purviews and directions are presented which shall ensure that development is going in that direction. These also include the map showing location of existing and future retail centres.

B.3.3.3.4 The main understandings of the sector plan

Readings of the sector plan, and interview with a representative from the department responsible for the municipal sector plan, have disclosed the understandings and knowledge embedded in the plan. This includes among others that the chances are higher that people walk or bicycle on a journey if the journey is short than if it is long, and that more people will use public transport on a journey if the services are good than if they are bad. Hence, if a shopping centre is located in walking and bicycling distance from as many customers as it needs to provide for the necessary turnover, and if it is located in an area well served by public transport, fewer will use car on their travel to this shopping centre than if the location had the opposite characteristics (in the Norwegian debate one often discusses 'external shopping centres').

Following from this, it contributes to less car use if the retail centre structure consists of many smaller retail centres than of few big ones, and if these are located in the public transport nodes and in densely populated areas. Fewer and bigger centres would increase the average travel distances from the homes in the city to the nearest shopping opportunity, and hence increase car use on shopping journeys.

In order to be profitable, a shopping centre needs a certain turnover per square metre, and data exist regarding how much this approximately is in various contexts. Given that one knows approximately how much the average person spend on shopping (and there are good data for this as well) at different kinds of centres (regional city centre, local shopping area, nearest grocery store etc.), one can make rough calculations regarding the number of customers needed for the profitability of the centre. This background information is described and analysed in the municipal sector plan, and is regularly updated. This updating is normally based on information from Statistics Norway and about planning initiatives reported to the planning authorities.

The sector plan states that the customers should live in walking or bicycling distance to the centre. The dimensions of a retail centre are hence defined (according to the municipal sector plan) by the number of people living in walking and bicycling distance from the centre.

An important condition for this to work is that only the main city centre of Oslo is allowed to grow big enough to be a regional shopping centre which to a large extent attracts customers from outside its own 'neighbourhood'. It is of course acknowledged that there is competition between centres, but also that most people do much of their shopping at the nearest facility.

It is also acknowledged that people do shop other places than at their nearest centre. Still, as the overall planner at the planning authorities explained, since this is happening in more or less similar ways all over the city one still can define the size of the centres based on the number of people living in walking and bicycling distances from the each centre. The 'leakages' to other centres will more or less nil each other out.

B.3.3.3.5 This strategy has created the present retail structure

This way of thinking and acting regarding the retail development in Oslo is what has created the structure one finds today, and which in the analysis is found to be a good and in general satisfactory structure which serves the objectives of the sector plan well. This also makes the sector plan dynamic, since the maximum size of the shopping centres changes as the population size and retail structure change. However, if major changes are implemented in this system, for instance that a new regional shopping centres which draws large parts of its customers from other centres' market areas is established, this will affect the whole retail structure. The smallest centres may be forced to close down, and others may offer less than today. Both of these effects would cause that people need to travel longer distances in order to do their shopping, which also would cause more road traffic. Hence, it is an important part of the Oslo plan that *only the city centre is allowed to grow big and regional*. This is in accordance with the understanding of the city as a complex and dynamic system.

By deciding the location of the shopping centres (marked on map), as well as the criteria for their dimensioning, Oslo has created a steering instrument which allow the city to develop a centre structure with many and smaller shopping centres rather than few and large ones. According to their own analyses, this will contribute to a centre structure which ensure good accessibility to necessary services for the inhabitants, and which requires rather low car use on travels related to shopping.

This is also recognised several times in the developers' analyses and descriptions, where it for instance is expressed that the longer journeys the higher car shares, the higher share of the customers living close to the centre the less car use, the bigger centre the higher car use and so forth.

The initiators expressed in interview that they find the sector plan to be un-democratic. It is too rigid due to political directives regarding how the retail structure is supposed to develop. The initiator doubts that there can be any real planning and steering of retail development, but agrees that some kind and degree off steering is both necessary and desirable.

B.3.3.4 Objectives and intentions in the initiator's presentation of their proposal

The initiator's objectives are described in the initiators presentation of the planning proposal (Space group et al. 2010). In section 2.2 Objectives, it says that the owners of the site want to develop an urban centre in Groruddalen, in accordance with the intentions in the coarse zoning plan which was approved in 2004.

Further, it says that Økern centre shall be a 'future oriented place', which includes development of Økern as a nodal point in the urban structure, a needs-oriented place development, development of a diverse supply of activities etc. with retail as the motor. Økern centre shall also be societal and environmentally sustainable. This includes that it will have a broad spectre of useful functions for society, contributing to strengthen Groruddalen as economic priority-area, and allow only as low as possible GHG-emissions from transport and stationary energy consumption. Achieving these objectives requires a strong and

feasible financial investment, and owners with a long time horizon, in order to ensure a comprehensive realisation of all parts of the plan.

According to the initiators' proposal, economic analyses (not presented, no references) have concluded that in order to make a broader societal programme work at Økern centre, with a public bath, parks and well visited cultural institutions etc., it is absolutely necessary that the developers are allowed to build 60.000 m² retail facilities. This is a crucial point which is repeated throughout the analysis and their main objective in the zoning plan process.

According to the developer's own figures, this would make Økern the largest shopping centre in Oslo. It would be more than double the size of all shopping centres in the city except three⁴² (ncm development and norsam as 2010).

One would expect that the main objective of the developers is to realise their project, while the main objective of the initiators would be to get the developers' project through the planning process fast and without being modified too much. This is, however, my assumption. It is not written or expressed anywhere.

B.3.3.5 The developers main reasons why this is a good proposal

The initiators' reasoning why the planning proposal is in accordance with governmental and municipal objectives as listed in relevant plans etc. is presented in their planning proposal (Space group et al. 2010:49-51).

B.3.3.5.1 A missing link – a necessary completion of the retail structure

It is first stated that developing a centre which includes retail at Økern is in accordance with overall plans and directions. The main argument presented why it is right, useful, and necessary to develop a very big shopping centre here is that centres of this size and localisation are a missing link in the centre hierarchy in Oslo. It is stated that between the level of regional centre where the city centre of Oslo is the natural number one, and the local centres spread out in the urban structure and where the inhabitants do their daily and weekly shopping, it is natural that a level of larger shopping centres of a size between these appears. Økern can become a centre like this. It is further argued that a shopping centre of this size in Oslo – with good public transport services and many people living nearby – will be a competitor to more car-based centres located outside the borders of Oslo municipality. Hence, this is the better location for a very big shopping centre. The developers hence argue that shopping centres like this do not mainly compete with the local centres or with Oslo city centre, but rather with large and car-based shopping centres outside Oslo.

B.3.3.5.2 It will not affect existing retail structure

A second argument is that the strong population growth in Oslo and in this area in particular defines the economic and planning arguments for a substantial development at Økern. The growth in purchasing power will ensure that even if a new centre is built, it will not affect the existing retail structure.

42 These area Alna senter (52.000 m²), Stovner senter (35.000 m²) and Storo shopping (which recently was expanded from 17.000 to 28.000 m²).

B.3.3.5.3 The size is necessary in order to finance other activities

The third argument is that developing this area with the local infrastructure, buildings and premises for cultural activities and societal functions, requires a substantial retail development in order to be economic feasible. The developers hence need to be allowed to build 60.000 m² retail.

B.3.3.5.4 It will reduce GHG emissions

It is argued that this is an environmental sustainable development because an economically solid developer will ensure the most environmental and climate friendly development which includes the best available technological solutions. Further, they claim that localisation of the proposed activities at Økern makes it possible to achieve a modal split with high shares of public transport, walking and bicycling. It is concluded that by developing the nodal point Økern in an area with high expected population growth, "it is possible to achieve low GHG-emissions from transport as a result of relatively low traffic work" (Space group et al. 2010:50).

This discussion is concluded by a statement that 60.000 m² retail is a necessary condition for ensuring an integrated and successful development of Økern centre. If this is not allowed, there will probably be no development. "The proposal rests on 60.000 m² retail as the carrying element for implementation of the investment" (*ibid*). This statement has not been substantiated in analyses known by the planning authorities.

B.3.3.5.5 A good project for the city

The initiator put much weight in the interview on explaining why the developers (and the initiators) find this to be a good project for the city and the area. He explained that Steen og Strøm see this as their major Environment and society project, which they will also use in branding, to show that they give something back to society and that they are environmentally responsible. They find that they give Oslo something that it misses and needs, and which will make Oslo a better place, and which will be an attraction in its own right. They also see themselves as the large and responsible firm which take responsibility in an area which is hard to develop due to massive investment needs, and where they are willing to take on the risk in order to secure a development which is a benefit for the area and the city, for environment and society. They want to build something with high qualities and which gives something back to the city – but in order to do that they need to be allowed to build 60.000 m² shopping. A smaller project could not become the attraction and the outstanding benefit to the city as the larger project could.

The initiator admits to have been sceptical regarding the size of the shopping centre at first. After having understood that shopping centres in other municipalities draw customers from some of the city districts in Oslo, and that some of these centres could be allowed to be built even bigger, he found that it would be beneficial to allow big centres in Oslo as well. He explains that the developers and the initiators do think that building a 60.000 m² shopping centre here will not cause negative effects on the retail structure or cause more growth in urban road traffic volumes than other locations or developments, and hence that the major benefits following from the realisation of this project should be welcomed by Oslo and the City Council.

B.3.3.6 Knowledge and understandings in the developers' impact assessments

The analyses carried out by the developer's consultants in order to assess the consequences of the proposal are presented and discussed in section 9, impact assessments, in their

planning proposal (Space group et al. 2010). The 25.000 m² alternative presented as basis for the 2004 coarse zoning plan for Økern (Municipality of Oslo 2004) is used as the reference alternative or 'do-nothing alternative'. A number of different topics are assessed, but only some few will be commented upon here (retail structure, total traffic volumes and GHG-emissions).

The first discussion regards whether the proposed development is in accordance with prevailing overall plans etc. It concludes that the developer finds the planning proposal to be in accordance with the *intentions* in these plans, but that they are aware that the planning authorities disagree with this, and that the point of disagreement is the dimensioning of the shopping centre or (another way of understanding it) the land use mix on the site.

The initiators argue that the retail analyses show that development of 60.000 m² shopping in this area will not have negative consequences for Oslo city centre or for the local shopping centres in the area, and that the traffic analysis show that location of 60.000 m² shopping in this location not will cause higher total traffic volumes (vkm) than any other location of this shopping. It is made clear that a plan including only 25.000 m² shopping centre will not be implemented by this investor group.

In sections 9.3 and 9.4 in the planning proposal, the consequences with respect to retail development and traffic is more thoroughly described and discussed, with references mainly to the retail analyses (ncm Donaldson 2009 a and b) and the transport analysis (norsam AS and Rambøll Norge AS 2009). These are described at the following pages.

B.3.3.6.1 Assessments of consequences for the retail structure

Definitions of markets – not regional

The dispute regarding the size of the shopping centre is not least related to the statement in the purviews in the municipal sector plan, regarding that regional and car-based shopping centres shall not be allowed in Oslo.

The initiators claim that their analysis shows that the proposed shopping centre will not be a regional shopping centre. According to their analyses, 50 % of the turnover will come from customers living within 2 km from the shopping centre, and 84 % of the turnover will come from customers living in what they have defined as their primary market area⁴³ in 2015/2020.

In order to arrive at this conclusion, a number of operations needed to be conducted. ncm Donaldson (2009a:8) explains that "The market basis for the centre is a function of how the market area is delimited, how many who (in the future) live in the area and the retail demand per capita. The competition in the market area defines how large part of the demand which can be assumed to fall to this centre". A brief summary from the retail analysis (ncm Donaldsons 2009a) will be given regarding how they arrived at their conclusions.

⁴³ In a report presented in May 2010 by ncm Development and norsam as, new prognoses by Statistics Norway for population growth in Oslo had been taken account for. Based on tables 5 and 6 page 15 I find that according to the new calculations made by the initiators consultants, 16% of the people in the market area will live within 2000 m as the crow flies in 2015, while 55% will live in the primary market area. The numbers for 2030 are 14 % within 2000 m and 57 % in the primary market area.

First, the *primary and secondary markets were defined* by the consultants. It is explained that “In the view of communications, distances, location and size/commercial influence on other retail centres, we have chosen to define the market area for this project as follows:” (ncm Donaldson 2009a:8). Then follows a list of urban districts which are ‘defined’ as within the primary market area (seven of the 15 urban districts in Oslo in ncm Donaldsons 2009a, reduced to five out of 15 in Space group et al. 2010) and within the secondary market area (three more urban districts in ncm Donaldsons 2009a, four in Space group et al. 2010). Hence, the total market area covers nine (or ten) out of the 15 urban districts in the city. It is further explained why each of these areas are included, with basis in existing retail structure in each area.

Second, the *population size* and the main characteristics (age, income) of the population are described. Data from Municipality of Oslo, Statistics Norway, and ncm Donaldsons own prognoses for housing development (which housing projects are included are listed) have been applied in order to arrive at these figures. Unfortunately it is not referred which data are collected from which source.

Third, and based on what is described above, the number of residences within five different areas – within 500 m (as the crow flies), 500 - 1250 meters, 1250 - 2000 meters, within the rest of the primary market area and within the secondary market area - are listed for 2006 and 2015/2020.

Fourth, the *shopping demand in the total market area* was predicted for 2006 and 2020, based on population size and on Statistic Norway’s survey of consumer expenditure (adapted by the consultants to existing and expected income level in the market areas). The chosen growth in income was 1,8 % p.a. The demand from the total market area was then calculated to NOK 17.800 million in 2006 and NOK 25.400 million in 2020 (a 42 % increase).

Fifth, the existing and expected retail structure in the market area are described.

Sixth, the probable turnover for the 60.000 m² shopping centre is estimated to be NOK 2.500 million ex VAT. This is 10 % of the assumed turnover in the total market area in 2020 or 30 % of the growth in the area from 2006 to 2020.

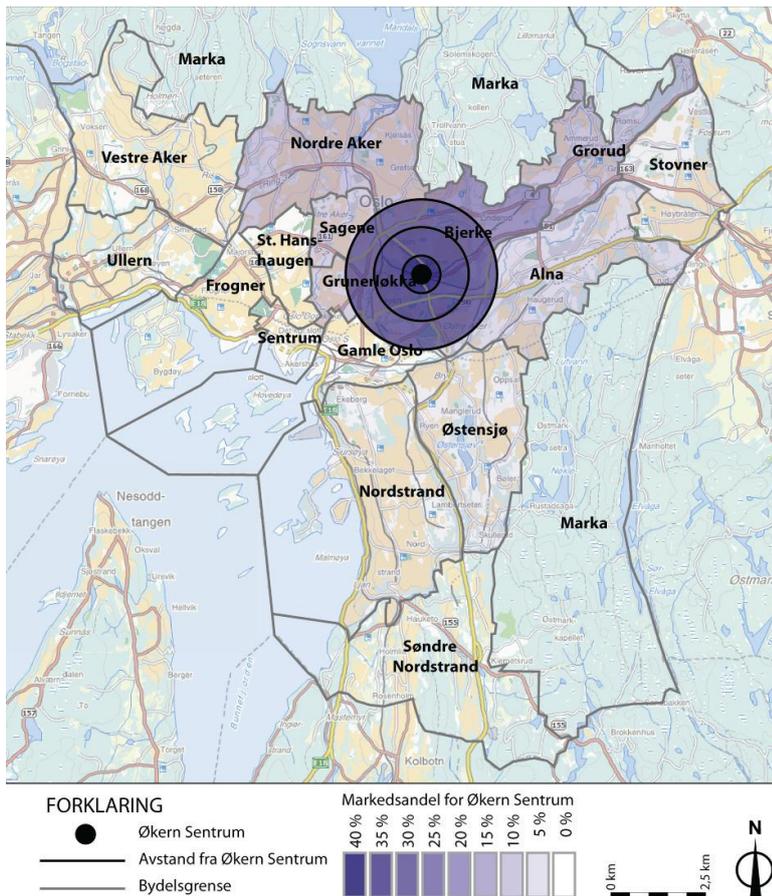


Figure B.2: Market shares within market areas defined by the initiators' consultants (facsimile from Space group et al. 2010:76).

It is explained that one has arrived at the estimated NOK 2.500 million turnover by calculating the demand in each of 13 different areas with the centres market share in each of these areas and summarise it (ncm Donaldsons 2009a:19). These market shares are presented in a map (ncm Donaldsons 2009a:20), see below. There are, however, no indications regarding how one has arrived at these market shares. Probably, it is an illustration of the market shares assumed by the consultants, and which are used in the further calculations. This map is also used in Space group et al.'s (2010) impact assessment.

Seventh, the turnover from each of the three areas within 2000 meter were summarised, and this sum was divided by the probable turnover for the centre. It showed that 50 % of the turnover will come from customers living within 2 km from the shopping centre (as the crow flies). The share of the turnover within the primary market is calculated in the same way, arriving at 84 % of the turnover coming from within the defined primary market area. This is defined as local by the initiators, not as regional.

Impact on existing retail structure

The impact of the 60.000 m² shopping-centre on existing retails structure is then assessed. This is done by calculating existing and future purchasing power in the area, as well as the share of the total demand which would be spent in the various retail centres, before and after introducing the Økern centre (based among others on what is described above). These calculations are not presented in the retail analysis or in the impact assessment because "The tables are a good help for the consultant when analysing the streams of purchasing power, but they are hard to understand for others. Hence, we have chosen to omit the

tables here, and confine ourselves to present the shares for the retail centres in a before-and after situation” (ncm Donaldsons 2009a:21). The result of this assessment is the table below, showing the market share of 12 different ‘retail alternatives’ before and after introduction of the new Økern centre. This table is the basis for discussions regarding effects of the proposed future Økern centre on the city centre and on other retail centres, and is a main focal point for discussions in the impact assessment.

Innkjøpsalternativ:	% av etterspørsel 2006:	% av etterspørsel 2020:
Økern Sentrum	1	10
Storo Storsenter	5	5
Linderud senter	2	2
Stovner senter	4	4
Bryn senter	3	3
Manglerud senter	3	3
Tveita senter	3	3
Alna – Furuset området	20	20
Oslo sentrum	15	12
Primærområdet ellers	23	20
Sekundærområdet ellers	17	15
Utenfor markedsområdet ellers	4	3
Sum	100	100

Tabell 9.3-3 prosent andel av etterspørsel som vil tilfalle det enkelte handelsted (Kilde: ncm Donaldson)

Figure B.3: Table presented in the retail analysis and in the impact assessment, showing percentual share of demand in different retail areas before and after introduction of the Økern centre (facsimile from Space group et al. 2010:77).

The very coarse table shows that a 60.000 m² shopping-centre at this location will reduce the market share of ‘other parts of the primary market’ in the defined market area (9 out of 15 urban districts in Oslo) with 3 percent points, in ‘other parts of the secondary area’ with 2 percent points and in Oslo city centre with 3 percent points. This is summarised by the initiators as: “One understands that the retail centres mainly will maintain their market share” (Space group et al. 2010:77).

It is explained that this will not have any negative consequences on the retail in the city centre or the more fine grained retail structure. Even if ncm Donaldson (2009a) find that the relative market share of the retail will be reduced in the city centre and other centres, the total turnover will rather increase than decrease, since the total shopping volume will increase because of the population growth and because of increased purchasing power per capita. This is the main argument in this discussion. Space group et al. (2010:77) states that “because of the findings in the analysis and the large expected upturn in demand, ncm Donaldson are certain that the project will not affect the centre structure in the market area”.

Access to retail and services by foot and bike

The proposal is assessed with respect to the objectives in the municipal sector plan for retail and services. It is concluded that since the population growth within 2 km will be about 30.000 people, and since ncm Donaldson (2009a) found that 84 % of the turnover comes from customers located in what they understand as ‘the primary market area’ (seven out of 15 districts), “there are reasons to claim that the proposed project will be located within reasonable distance from the residence of the customers” (Space group et al. 2010:77).

Hence, it is claimed, the planning proposal contribute to achieving the first objective in the plan, that the population shall have good and well functioning retail and service in reasonable distance from their home.

The second objective states that “Retail centres shall be accessible by foot or bicycle for as many as possible, and have good accessibility to the public transport-system” (Municipality of Oslo 2003:45). The developers claim that this is met since there is a subway stop close to the centre, bus routes pass by and there will be built bus lanes as part of the new road system in the area. Developments of the subway will probably improve the subway services. It is also planned as new bicycle- and walking path which pass by. A new bridge for bicyclists and pedestrians will be built, which makes the area accessible by foot and bike for more people (they get shorter distances and a more comfortable route).

A robust centre structure

When assessing the proposal against objective three, regarding that Oslo shall have a robust centre structure which emphasises development of vital and attractive retail centres and social meeting places, the developers describe their aim to develop Økern to a societal and environmental sustainable place and centre, which is an asset to the city and to people living in the area. They emphasise that these dimensions of the retail centre is crucial for the realisation of the centre.

As regards objective four, that Oslo city centre shall have the position as the dominating regional centre, it is simply referred to the retail analysis and claimed that Oslo city centre is robust enough not to be affected by this project.

Possible under-coverage

The initiators' also assessed the reference-alternative, where 25.000 m² of the 160.000 m² development is shopping centre, and which is proposed and recommended by the planning authorities. These assessments were done in similar ways, and the main findings were that if only 25.000 m² of new retail is built, under-coverage of retail will occur in the area (ncm Donaldsons 2009b).

B.3.3.6.2 Assessment of traffic generated by the retail facilities

Local traffic

According to the initiators, the development of this site with 60.000 m² retail and also other public functions such as a public bath or an aqua-land, will mainly cause local traffic. It is assumed that high shares of the traffic generated further away will be done by public transport. Even so, Space group et al. argue (2010:93) that they should be allowed to build 1.600 parking spaces for the shopping traffic rather than the 900 spaces they are allowed in accordance with the parking directions of Oslo (all together they want to build 2.250 parking spaces⁴⁴).

⁴⁴ In the parking regulations for Oslo, this area is defined as inner city, where maximum norm for parking for shopping centers is 15 parking spaces per 1000 m² (Municipality of Oslo 2004a). If all the 160.000 m² were shopping centers, and the maximum inner city norm was follows, this would allow for 2.400 places.

Traffic predictions based on the retail analyses

It is referred to a traffic analysis conducted by norsam as and Rambøll as (2009). The transport infrastructure and systems in the area are described, as are the planned and expected developments of these. When predicting the traffic generated because of the project, three different approaches were applied. One traffic analysis was made with basis in the retail analysis, the second in empirical data for traffic generation caused by different land uses and the third based on the number of parking spaces and empirical data regarding how many car trips each parking space generates.

The traffic analysis based on the retail analyses is based on a number of assumptions and sets of input data (norsam as and rambøll 2009:18-28). The number of people living in different areas, based on distances from the Økern centre (radius, as the crow flies) for the zone closer than 2 km to the centre and on district for the others, are listed (13 zones all together). These figures were partly taken from the retail analyses. The population data for each zone were multiplied with the market shares for the centre in each of the 13 zones. These market shares are the same as defined in the map in figure B2, and which are probably assumed by the consultants (there are no references to how they are constructed).

Together, this results in a table (norsam and rambøll 2009:24 table 8) showing the number of trips from each zone per day to the site and related to shopping. The 'estimated modal split' on shopping trips to Økern senter for people living in the 13 different zones are then applied (it is not explained where these modal splits are coming from, no documentation) for calculating the number of people arriving at the shopping centre per day by car. All together, 53 % of the customers, or 24.450 persons, arrive by car. Without explaining how, they arrive at 18.810 cars/day which gives a 41 % car driver share for all customers to the shopping centre. My guess is that they have counted 1,3 persons per car (since $24.450:18.810=1,3$).

Traffic predictions based on empirical data from other retail centres

In the second analysis, the car share is assumed to be 45 %, with reference to an analysis of empirical data regarding the modal split on travel to and from shopping centres located in areas with various centrality (central, medium central, external) and with various public transport accessibility (good, medium, bad). This analysis was carried out by the Institute of Transport Economics, but does not exist as a published report or similar. It is explained that Økern centre has been defined as being located in a central/medium central location and with good public transport services, but it is not said who has made these definitions. The car share on travels to and from the shopping centre was on basis of this assumed to be 45 %⁴⁵. The traffic generation related to the shopping centre was (with this car share) calculated to 18.400 cars/day (applying 60.000 m², 106 person trips per 100 m², 1,4 person per car, 0,9 % correction) (norsam as et al. 2009:42).

Traffic predictions based on number of parking spaces

I was not able to find the description of how the calculations based on the number of parking spaces was done, but in the planning proposal it is referred that this calculation

⁴⁵ In a report presented in May 2010 by ncm Development and norsam as in 2010, new prognoses for population growth in Oslo and in this area had been taken account for, resulting in changes of the estimates for car shares from 53 % to 50 %. This resulted in prognoses of 23.420 cars trips/day in relation to the shopping centre in 2030.

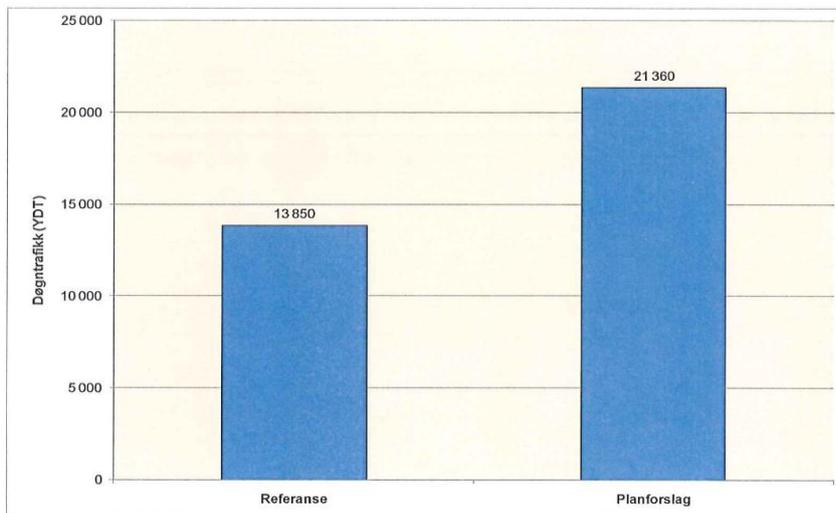
results in 16.500 cars/day (Space group et al. 2010:87). This means that they calculate circa 10 car trips per parking space per day (five cars arriving and leaving per parking space).

Conclusions

It was concluded that the traffic generated by the 60.000 m² shopping would be somewhere between 16.000 and 19.000 cars/day, while the 25.000 m² shopping centre in alternative 2 would generate 7.700 cars/day (norsam AS and Rambøll Norge AS 2009). It was not explained or referred how the traffic generation in the reference alternative was calculated.

B.3.3.6.3 Comparison of the total developments in the two alternatives

When comparing traffic generated by the total development of the site (both about 160.000 m² – but with different land use mix) in the proposal and the reference-alternative, it was found that the developers’ proposal would generate approximately 21.400 cars/day, while the reference-alternative would generate approximately 14.000 cars/day. Hence the traffic generated in the initiators’ proposal is 50 % higher than in the reference-alternative (Space group et al. 2010:86-90).



Figur 9.4-9 Beregnet døgtrafikk (YDT) for bilreisende

Figure B.4: Daily car traffic generated by the two alternatives (the total of 160.000 m²), with the 25.000 m² shopping centre alternative at left and the 60.0000 m² shopping alternative at the right, facsimile from Space group et al. (2010:90).

B.3.3.6.4 Comparison of GHG-emissions of the two alternatives

Still, the initiators claim that their project is more climate friendly than an alternative development. This is because it is assumed that the very solid owners will construct and run the buildings in ways which causes zero stationary GHG-emissions. In comparison, it has been calculated that ‘an average’ development will cause approximately as much GHG-emissions from stationary as from mobile energy consumption in the reference alternative (Space group et al. 2010:102). When adding up the stationary (which is 0 in the main proposal) and the mobile GHG-emissions, one arrives at the conclusion that the main proposal will cause less GHG-emissions than the reference-alternative (there is no way Oslo municipality can include this zero GHG-emissions promise from the developers in the zoning plan in a binding way).

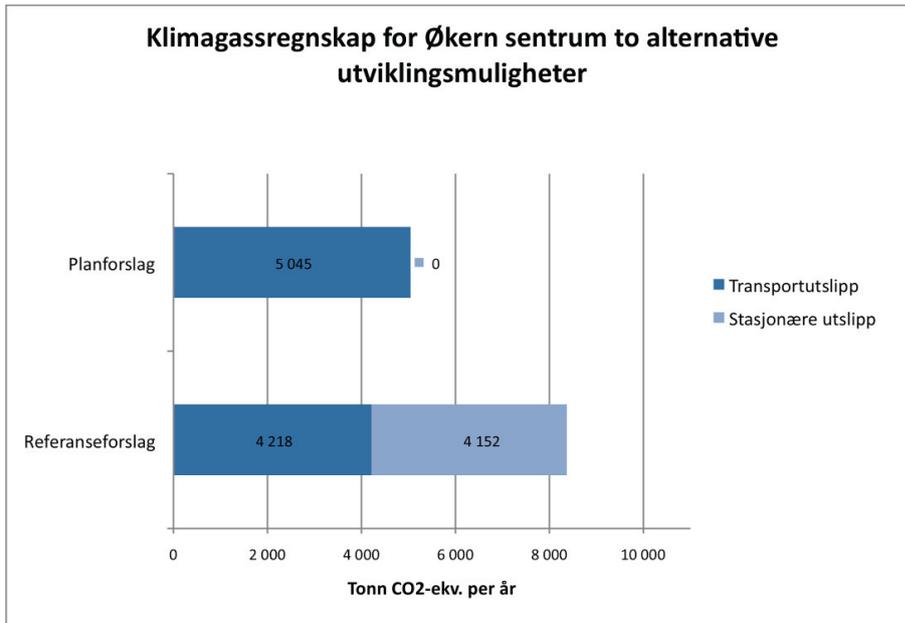


Figure B.5: Climate effects of the two alternatives (facsimile from Space group et al. 2010:102). The initiators' alternative are on top, the planning authorities' alternative below. Dark blue represents mobile GHG emissions, lighter blue the stationary GHG emissions.

B.3.3.6.5 Comparison with location of the activities elsewhere

In another comparison, the developers' proposal was compared to a reference proposal where one applied 'average' (without references, unfortunately) traffic generation figures in order to calculate total vkm per year caused by the development (Space group et al. 2010: 99-100).

The traffic generation was calculated by applying average numbers for trip production, modal split, and travel lengths. The developers' consultants arrived at the result that the proposed development at Økern will cause 30,4 mill. vkm per year, while alternative localisation of the same functions calculated on the basis of figures for average traffic generation will cause 25,4 mill vkm/year⁴⁶. This means that the developers' proposal would cause 12,6 % more vkm and GHG-emissions per year than a random and average localisation of the same functions. If looking at traffic generated only by the 60.000 m² shopping centre, it was found that to locate it at Økern would cause 7 % more traffic than if it was 'averagely' located.

⁴⁶ In a report presented in May 2010 by ncm Development and norsam as in 2010 (p 23-24), new prognoses from Statistics Norway for population growth in Oslo and in this area had been taken account for, resulting in an estimate of 19,9 mill. vkm/year in 2030 related to the shopping centre. This is less than the 23 mill. vkm/year calculated for an average reference location of the shopping calculated in Space group et al. (2020:100). It is, however, not made new calculations for the alternative, and hence there is no actual alternative to compare the new numbers with.

Formål	Spesifisering	PLANFORSLAG			REFERANSE			DIFFERANSE
		Planforslag Mill kjt.km pr. år	Korreksjon Mill kjt.km pr. år	Sum Mill kjt.km pr. år	Referanse Mill kjt.km pr. år	Korreksjon Mill kjt.km pr. år	Sum Mill kjt.km pr. år	
Bolig		1,07		1,07		1,78	1,78	-0,71
Handel	Detaljvarer	24,70		24,70	23,00		23,00	1,70
Kontor		3,31	14,36	17,67	13,36		13,36	4,31
Næring	Hotell / konferanse	0,62	0,00	0,62		0,62	0,62	0,00
Næring	Restaurant / servering	0,35	0,00	0,35		0,35	0,35	0,00
Næring	Privat / off. sevice	0,06	0,00	0,06		0,06	0,06	0,00
Næring	Badeland	1,66		1,66	1,66		1,66	0,00
Almennyttig	Privat / off. sevice		0,48	0,48	0,54		0,54	-0,06
Kultur	Kino	0,05	0,00	0,05		0,05	0,05	0,00
Kultur	Musikkskole	0,02	0,00	0,02		0,02	0,02	0,00
Kultur	Bibliotek	0,01	0,00	0,01		0,01	0,01	0,00
Kultur	Museum	0,06	0,00	0,06		0,06	0,06	0,00
Kultur	Diverse	0,04	0,00	0,04		0,04	0,04	0,00
Totalt		31,95	14,84	46,79	38,56	3,00	41,55	5,24
Relativt				112,6 %			100,0 %	12,6 %

Tabell 9.5-2 Sammenlikning 3 av Trafikkarbeid (Kilde: Norsam as)

Figure B.6: Comparison of traffic volumes generated by the initiators' proposal and a reference proposal where 'average' traffic generation figures were applied (facsimile from Space group et al. 2010: 100).

B.3.3.7 The planning authorities' assessment of the initiators' proposal

In the planning authorities' presentation of the planning proposals to the politicians (Municipality of Oslo 2010), the main contents of the developers' presentation of the proposal and their assessment of it is first presented together with a short summary of the comments from other public authorities, the public etc. Then follow the planning authorities' assessment of the proposal.

B.3.3.7.1 Negative effects on the existing retail structure

Their main points regard the size of the proposed shopping centre. They claim that a 60.000 m² shopping centre at Økern is a regional, car-based shopping centre, which will affect the retail centre structure in Oslo in a negative way. Hence, it is not in accordance with the municipal land use plan or the municipal sector plan for location of retail and services, and hence not with the governmental purviews.

The objectives in the municipal sector plan are listed, before it is explained that Oslo has a well functioning centre structure at present, with 66 retail centres of different types and sizes outside the dense inner city, as well as main shopping streets in the inner city and inner city centres. Further, it is claimed that 85 % of the population has one or more centres within 1,5 km walking distance. The municipal sector plan, it is emphasized, aims at allowing all of these centres to be vital and strong. The main idea is to support a balanced retail centre development in all parts of the city, where all the retail centres mainly address their local markets. It is pointed out that a 60.000 m² shopping centre will be the biggest in Oslo, and at more than twice as big as all but two of the existing centres.

B.3.3.7.2 A regional and car-based shopping centre

The planning authorities claim that a 60.000 m² shopping centre at Økern will require a turnover which presupposes that customers need to be attracted from far outside what the planning authorities consider to be 'local'. The public transport services in the area are good,

but not good enough to be competitive for customers to the centre from most of the market area, and large parts of the primary area has bad public transport accessibility to the centre. Moreover, only 4 % of the population in the total market area and 6 % of the population in the primary market area live within walking distances to Økern centre, according to the planning authorities. Hence, the centre will be car-based.

Furthermore, the densest populated areas within a two km radius (as the crow flies), where 50 % of the turnover is supposed to be caught, are areas which have good and well functioning retail services today. The public transport accessibility between these areas and Økern are in general not very good, and only one area could be understood as being within walking distance from Økern. Two new local centres are planned within the 2 km as the crow flies radius.

B.3.3.7.3 Different measuring of distance to shopping and hence how many live in walking distance

As I understand it, a main reason why the planning authorities and the developers arrive at different results regarding the tolerable size of the shopping centre is to be found in the discussions regarding what is a local and what is a regional centre. 'Within 2 km' is an important notion. The planning authorities count people living within 1 km and 2 km real walking distance (along existing and future streets) of a shopping centre as 'belonging' to the centre and to be the primary market for the centre. Hence, their judgements regarding maximum size of a centre is based on the number of people living within one and two km *real walking distances*. The developers, on the other hand, calculate the number of people living within a 2 km radius '*as the crow flies*' as the 'local population', and use these number (50 % of the turnover) as an argument in the discussion.

The planning authorities presented their numbers in the 2004-plan, but the developers' consultants chose to produce other numbers. The differences are quite large. The planning authorities arrive at 1.250 people living within 1 km and 20.600 between 1 and 2 km, all together 21.850 in 2006, while the numbers are 4.700 and 34.200, all together 38.900 people in 2025. Measured this way, 6 % of the population in the developer's primary market area and 4 % of the population in the total market area live within walking distance (2 km).

These figures are quite different from the figures used by ncm Donaldson (2009:11), which found that there would be 41.694 persons living within 2 km today (12 % of the 330 359 persons in the market area) and 58.419⁴⁷ in 2015/2020 (16 % of the 366 409 people in the market area) (ncm Donaldsons 2009a:11). The differences are about 20.000 for both.

This means that ncm Donaldson counts about twice as many persons living within 2 km radius 'today' as the planning authorities do in 2 km real walking distance, and about 50 % more in the future. Whether one measures 'real' travel distances or '*as the crow flies*' does hence make a real and important difference when it comes to people living 'in walking distance' from the centre. One could probably derive from this that when the initiators arrive at 50 % of the turnover is collected within 2 km distance as the crow flies from the centre, the turnover collected within real walking distance is the half, namely 25 %.

⁴⁷ Mention the accuracy of the numbers.

Since the amount of customers living within walking distance is this low (4 % in the planning authorities calculations), and since the public transport accessibility to the centre is not very good, one understands that travels to and from the centre will be mainly car-based. Hence, the planning authorities conclude, this is a regional and car-based shopping centre, and allowing it would not be in accordance with municipal or governmental plans and not contribute to achieve the stated objectives and goals.

B.3.3.7.4 A centre this big will unbalance existing structure

The large area Økern centre needs to attract customers from in order to achieve the necessary turnover is also what implicates that this is a regional centre. The planning authorities explain how and why allowing a shopping centre this size will unbalance the existing centre structure, with basis in the explanations in the municipal sector plan (which is described above). The turnover required by a centre this size will affect retail in the city centre and outside.

Another aspect is that the market area covers among others Groruddalen, which is a part of the city one aims to vitalize and make more attractive, among others by stimulating development of retail, services, cultural activities etc. in several local centres. It also covers the dense inner city, where one also aims at keeping and developing the vital smaller centres and shopping streets. It is hence especially negative to weaken the market shares of these areas.

The planning authorities also point at some problematic sides of the developers' *presentation* of the effects of the new centre on the existing ones. Important reductions in market share and incomes for smaller centres may not show in the coarse table. They explain that since the results from the analyses are presented in whole percentages, and since the market share for each centre is small, severe reductions in turnovers for each of the affected centres may be concealed in these numbers. If, for instance, the market share for a centre is reduced by 0,5 % of the retail in the market area (10 out of 15 of the urban districts), this means a lot for that centre. Even so, it would probably not show in the tables showing effects of establishing the new centre on the existing centres. It is also demonstrated that allowing this centre will reduce the market share of the main city centre substantially (as the retail analysis also show).

It was found that the city centre's market share in this area would be reduced by 3 percent points from 15 to 12 %. This may seem a small change, but in reality it means a 20 % reduction of the market share in this area⁴⁸. It also means a reduction of the market share for 'the rest of the primary areas' by 15 % and for 'the rest of the secondary areas' by 13 %. Hence, the planning authorities conclude, allowing a shopping centre this size *will* affect the existing retail centre structure and the city centre negatively and it *will* hinder positive developments which one aims and struggles for in other parts of the city.

B.3.3.7.5 Aim at what is desirable in a comprehensive perspective

In the conclusion of this discussion, the planning authorities emphasise that societal planning is not mainly about what is realistic to accomplish, but rather about what is desirable in a comprehensive perspective. They strongly recommend that the proposed centre should not be allowed.

⁴⁸ Because 3 is 20 % of 15.

B.3.3.8 The planning authorities' presentation of their own proposal

In their presentation of the planning proposal to the City Council, the planning authorities also present their 'Alternative 2'. This includes the same total amount of development at the site (about 160.000 m²), but with only 25.000 m² of these for shopping development.

When explaining how they arrived at this proposal, the planning authorities refer to the municipal sector plan, the objectives stated there and the knowledge embedded in the plan, as accounted for above. They calculate the maximum dimension of the shopping centre based on the criteria defined in the municipal overall sector plan. This means that the maximum shopping centre size is calculated based on the number of people living in actual walking and bicycling distance from the centre in the future.

The number of people who live within one km and two km real walking distance of the site today and in 2025 was defined with the help of geographical information systems (GIS) and data of location of residences, as well as known plans and probable developments in the area. This was combined with empirical data regarding average spending in this kind of centres, and the future turnover of the centre was calculated based on this.

Turnover (NOK) within walking and bicycling distance =

number of people within 1 km x percentages of spending at this centre (100 %) x spending per persons in such centres (NOK/person) +

number of people within 2 km x percentages of spending at this centre (30 %) x spending per persons in such centres (NOK/person)

The share of how much of their spending people will use at centres located 1 and 2 km from their residences will obviously vary, depending among others on location and content of nearby shopping centres and a lot of other factors. However, since 85 % of the people living in Oslo have a centre located maximum 1,5 km from their residence (Municipality of Oslo 2003) and people do most of this kind of shopping in their nearest centre, the overall planner argued in interview, one can assume that this evens out more and less.

Figures for average turnover per square metre for such centres was collected, and the size of the future centre – given that it served people in walking and bicycling distance, and have somewhere near average turnover per square meter – was calculated.

Centre size (m²) = Turnover (NOK) within walking and bicycling distance/Average turnover in similar centres (NOK/ m²)

It was calculated that there would be need for a 20.000 to 24.000 m² centre in 2025 (Municipality of Oslo 2010:30).

By not allowing the centre to be bigger than this, one ensures that the centre does not need to draw customer from outside walking and bicycling distance, and also that it probably will not be attractive for people living other places to travel the extra distance in order to do their shopping at this centre rather than at the centre closest to where they live. Still, it will be big enough to serve the local market.

B.3.3.9 The initiators' faulty explanations of why the planning authorities arrive at smaller dimensions

In a final note to the Standing Committee on urban development (Civitas 2010), the initiators explain why the planning authorities arrive at a lower figure for maximum size of a shopping centre than they do. They compare two different calculations, arriving at different results.

The planning authorities do calculations for 2025: 4.700 persons (within 1 km) x 1,0 (do 100 % of this kind of shopping here) x 55.000 NOK/year (buying power) + 34.200 persons (living between 1 and 2 km from the centre) x 0,3 (do 30 % of this kind of shopping here) x 55.000 NOK/year = NOK 822 mill/year (the total buying power in 2025). NOK 822 mill/ 40.000 NOK/m²/year (the necessary turnover) = 20.750 m².

The initiators do calculations for 2030. They have found that according to Statistics Norway (no references), there will be 65.658 persons (living within 2 km from the centre as the crow flies) x 0,31 (average share of the buying power in this area – from their own analyses) x 78.581 NOK/year (buying power included growth of 1,8 % per year) + 22.634 persons (in Bjerke outside the 2 km circle) x 0,2 (market share) x 78.581 = 2.275 mill NOK/year. NOK 2.275 mill/ 40.000 NOK/m²/year (the necessary turnover)= 56.875 m².

The initiators conclude that since the planning authorities use 'real walking distances' instead of 'as the crow flies', don't adjust the number of people sufficiently and don't adjust the figures for buying power (discounting), the differences between the two calculations become this large.

There are, however, two major flaws in these calculations. If calculating the figures in the initiators' calculations, the right answer (according to my calculator, triple-checked) is NOK 1.955, not NOK 2.275. This would reduce the 'necessary' size of the shopping centre to 1.955 mill/ 40.000 = 48.875 m².

Further, one would expect that it is correct to discount the turnover with about the same rate as the buying power. For the ten largest centre in Norway, the growth in turnover per m² was 2- 3 % per years from 2005 to 2007 (Institut for Bransjeanalyse 2006, 2008), only to present one example. If we use the same growth rate (discount) for the turnover as for the growth in buying power, the 'necessary turnover' in 2030 will be 57.150 NOK/m²/year.

This would mean that the correct calculations, based on the initiators assumptions and data, would be 1.955 mill NOK/ year / 57.150 NOK/ m²/ year = 34.200 m². If they have calculated for 2025 instead of 2030, the initiators would probably have arrived at about the same figures as the planning authorities. They would for sure if they included only people living in walking and bicycling distance according to the planning authorities assumptions.

If we use a buying power of NOK 78.581 and a necessary turnover like 57.150 in the planning authorities' calculations, we still arrive at about 20.750 m². If we apply 55.000 and 40.000 in the initiators calculations, we arrive at 34.000 m². It does not matter which increase of buying-power that is used, because the necessary turnover will increase at the same rate.

It is hard to understand how neither the initiators themselves nor the ones receiving and using these figures (the politicians), detected these simple but very significant faults in the data, assumptions and calculations.

B.3.3.10 Regional authorities filed formal objections

Throughout the planning process, especially the NPRA, the County Governor's office and the municipal transport authorities have claimed that the initiators' planning proposal is not in accordance with the municipal sector plan, the national purviews or the national guidelines for land use and transport planning. They claimed that the calculated traffic levels were too low because the car shares were assumed to be low. A shopping centre this size, and in this location, would be a car-based regional shopping centre, they claimed. In other words, they agreed with the planning authorities in this question.

Among others the NPRA and the County Governor's office are entitled to file formal objections which can put the decision in the hands of the Ministry of the Environment. They signalled from the start that they would probably file such a formal complaint if the proposal was upheld (60.000 m² shopping centre), and they did file their objections during the process (County Governor of Oslo and Akershus 2009, NPRA 2009cb).

In the interview with the NPRA, they explained that the initiators' proposal is clearly not in accordance with the overall sector plan for retail and services. It includes a shopping centre which will be regional and car-based, and which hence will contribute to increased road traffic in total and in the local area. If the City Council in Oslo wants to adopt this zoning plan, they first need to do the overall discussions regarding the retail structure and development in Oslo, and include the necessary changes in a new overall plan for location of retail. They find that in this question they are in line with other public authorities with responsibilities in this field, such as the County Governor and the local transport authorities.

B.3.3.11 The District Council recommended the proposal

The District Council recommended the City Council to adopt the suggested proposal with certain changes (the social left party voted against). The case handler explained that this could be explained in different ways - related to problem solving in the area, distribution of responsibilities and communication. The District Council impatiently want development and improvement to happen in this area, and feel that the public authorities are not taking responsibility for making that happen. Hence, they welcome the proposal from the developers.

Second, the proposal includes facilities for cultural activities and an aqua-land or a public bath, which will be very welcome in this part of the city which (or so is the understanding) is under-facilitated with public meeting places and activities. Third, the responsibilities of the District Council is local, hence they give priority to the local rather than to the city wide or global aspects of the problem.

Fourth, the case-handler also explained that while the initiators had informed and communicated with the District Council from the start, the planning authorities had only met at the City Council once – after having been invited by the district administration to do so. The written material from the planning authorities is not always understandable for the Council members, and needs to be interpreted by the administration. Several of the other interviewees expressed that their impression of the local understandings of this question were similar to this description.

B.3.4 Analytical description of objectives, knowledge and power of the main actors

B.3.4.1 Objectives

B.3.4.1.1 The main objectives of the main actors

The initiators

The initiators entered the plan-making process in order to be allowed to realise their plans for 160.000 m² new developments at Økern, including a 60.000 m² shopping centre. In their presentation of the planning proposal (Space group et al. 2010), it says that the owners of the site want to develop an urban centre in Groruddalen, in accordance with the zoning plan from 2004. To allowing only as low as possible GHG emissions from transport and stationary energy consumption are among the objectives stated in the planning proposal.

One would expect that a main objective for the developers is to realise their project, while the main objective of the initiators would be to get the developers' project through the planning process fast and without being modified too much. This is, however, not written or expressed anywhere. It is hence my assumption.

The planning authorities

The clear and outspoken aim or objective or task of the planning authorities is to make sure that the plans and projects are in accordance with overall plans and policy documents such as the governmental purview, the municipal overall plan, and the municipal sector plan for retail and services. This is stated and substantiated in the planning documents and repeated in interviews with two different planners at the planning authorities. This includes that there should be a 160.000 m² development at Økern, but that only about 25.000 m² of this should be shopping.

These overall plans and purviews all aim at reducing transport demand and car dependency, by offering necessary retail and services to the inhabitants that is easily accessible without car. This is in order to be able to achieve the main objectives in the municipal sector plan for retail and services. A main idea is that regional and car-based shopping centres shall not be allowed in Oslo.

The main objective for the planning authorities could hence be understood as to make sure that a planning proposal for development is made and adopted, but that the dimensions of the shopping centre included in the plans are in accordance with the municipal sector plan, about 25.000 m².

The District Council

The district politicians have different objectives. According to the case documents (Municipality of Oslo 2009a), as well as to interview with the case-handler in the district, an important objective in this case was to ensure that *something* good is going to happen here – and soon (for reasons presented above).

Regional authorities

Among the NPRAs' responsibilities is to see to that the national road systems are not overloaded. This includes to draw attention to and (sometimes) to filing complaints against spatial development plans that will cause such overloads.

The County Governor's office is supposed to ensure that the national purviews and guidelines are obeyed, including that the plan for the shopping centre is in accordance with the municipal sector plan. The objective is to strengthen existing city centres and local

centres, and to avoid car dependency and worsened access to shopping and services for those that don't can or want to drive a car.

B.3.4.1.2 Whether reducing road traffic volumes is perceived as an important objective

The initiators do not seem to perceive reduction of traffic volumes or to minimise the transport demand as an important objective, but they do state that reducing GHG emissions is. They find in their analyses that to develop 60.000 m² out of the 160.000 m² as shopping centre causes more road traffic than to develop 25.000 m² shopping centre, in all the ways they calculate this. However, they claim, since they plan to develop a shopping centre causing zero tons stationary GHG emissions, their proposal is still the more climate friendly.

The two main objectives of the planning authorities have, according to the interviewees, been to hinder that the development at Økern causes increased road traffic and negative effects on existing retail structure.

The interviewee at NPRA explained that they focus both on that which is clearly their responsibility, mainly local traffic problems such as congestion in general, delays for public transport and safety for all. They do, however, also focus on more overall issues such as total traffic volumes, GHG emissions and centre-structure. Objectives related to the latter kind of issues were the reason why they filed a formal complaint in this case.

The County Governor's office claims in the formal complaint that the initiators' alternative represents a regional, car-based shopping centre, that is not in accordance with neither the municipal sector plan nor the governmental planning guidelines.

B.3.4.1.3 How they understand the objective 'reducing urban road traffic'

None of the actors seem to be very conscious in how they understand 'to reduce urban road traffic volumes'. The exception is the interviewee at NPRA, who differentiates clearly between local problems and traffic volumes on one side and total traffic volumes and overall issues on the other.

B.3.4.1.4 Other relevant and important objectives

There are a number of other relevant objectives involved in the discussions regarding development of Økern centre.

All the public authorities emphasise that to ensure that the plan is in accordance with the municipal sector plan is an objective in itself, not least since this is established in the national guidelines and hence their responsibility to safeguard.

It is a clear understanding among the interviewees working for public authorities that it is an important objective for the politicians is to ensure that something happens at Økern. This is an objective that the initiators emphasise that the developers can contribute to achieve. They underline several times that a large and solid investor, like the developers, also may ensure a number of benefits (no stationary GHG emissions, public bath and other public facilities, underground parking for the whole area etc.). The interviewee at the NPRA explained that an often mentioned argument for allowing the developers to build what they have proposed, is that if they are not allowed to do that, the development of the Økern area will take place as several smaller developments. That will not be as fast, comprehensive, aesthetic etc., is the message.

To keep up the existing retail structure, is an important objective for the planning authorities, for more reasons than to keep traffic volumes down. This regards to ensure good access to retail and service, stability and predictability for those running businesses, and to safeguard the position of the city centre.

B.3.4.2 Knowledge

B.3.4.2.1 Whether the actors possess or know of the expert knowledge in question

The planning authorities

In the planning proposal presented for the public, as well as in the final planning proposal sent from the planning authorities to political processing, there are strong references to overall plans and their requirements related to retail development (especially the national purviews and the municipal sector plan) and to the knowledge embedded in the analyses and the plans.

However, the planning authorities have also explained in the planning proposal how and why a 60.000 m² shopping centre will cause more traffic and have negative effects on the existing retail structure. This is done in accordance with the expert knowledge described in chapter four in the main report. They do describe the comprehensive and overall strategy, involving a spatial structure with many small centres, causing that most people living in Oslo to have at least one centre located within walking distance from their homes. This will cause short trips and low car shares on retail travels, as well as good access to retail and services without car.

They describe how a centre of 60.000 m² will need to recruit customers from a large area in order to achieve the necessary turnover, causing higher car shares and longer travel distances than a smaller centre getting customers from a smaller area closer to the centre. They do substantiate this by explaining which concrete areas the centre will have to get customers from, illustrating in an understandable way that many of the future customers probably will use car.

Further, they describe how a large centre will affect the existing retail structure, and cause reduction or close-down of smaller local centres in the vicinity of Økern. This will in turn cause that people have to travel longer, and more by car, in order to do cover their retail and service needs (e.g. how land use development cause changes in use of the city which cause changes of travel behaviour and traffic volumes).

In their own analyses and calculations, they calculate how many people live in *real walking distances* (not as the crow flies which the initiators do) from the centre, which is in accordance with the understanding that distance matters for modal split.

The planning authorities hence use professional reasoning based on the expert knowledge in question explaining how certain changes cause multiple and iterative effects, rather than detail focused calculations regarding certain effects. They do include simple and understandable calculations.

In interview, the case handler at the planning authorities demonstrates her insights by explaining how developing shopping centres of different sizes affect existing retail structure as well as traffic volumes differently. She does, however, explain that her own, as well as the planning authorities' competence when it regards transport analyses could have been better. Regarding assessments of the transport analyses and the like, the planning

authorities have leaned on the competences of the NPRA. Regarding shopping centres, where they draw customers from and the effects on existing retail structure and on travel behaviour and traffic volumes in general, the planning authorities have strong expertise she claims.

The National public Roads Authorities

The case-handler at the NPRA explained that they had assessed the transport analyses. He did explain the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes in accordance with the description of the expert knowledge in chapter four, and did his reasoning on basis of such understandings.

The initiators

The initiators' (or their consultants') analyses do in several ways build on understandings similar to those embedded in the expert knowledge in question. In their planning proposal (Space group et al. 2010), they do seemingly follow the same lines of professional reasoning as the planning authorities and others do.

The initiators do calculate the number of people living in different distances from the proposed centre, and they do assume that people in general use their closest shopping centre more than others. Based on this, they do assume certain market areas in different areas, and they do produce an analysis resulting in a table showing how the proposed centre affects the centre structure. Based on these figures, they conclude that the changes are small and insignificant (which the planning authorities disagree with, as described).

They do, however, emphasise that future growth in buying power will reduce negative effects on centres in the vicinity, so they uphold their turnover. The planning authorities argue that this causes all the growth to be canalised to the Økern centre. This will cause lack of development and growth in the centres that Økern takes market shares from, causing stagnation, reductions and possible closedowns. This is not a desirable development for those centres, for the inhabitants, for the city or the environment. These kinds of 'effect of effects' analyses are not conducted at all by the initiators.

The initiators do in parts of their argumentation emphasise that this centre compete with the large regional centres in the neighbouring municipalities, and hence that it does not have negative effects on the smaller centre and that it reduces traffic volumes because people travel shorter and by other modes to Økern than to any of the other centres in the neighbour municipalities. They do however conclude their discussions regarding effects of the Økern centre on the retail structure that "The effects over county-borders are not significant" (Space group et.al. 2010:77). This means that there is not much competition between the proposed centre and those centres, even if it is presented as to mean that the centre does not attract customers from outside the municipality/county (Oslo is municipality and county).

The initiators also assume that the closer people live to the shopping centre, the lower is the car shares and the shorter is the car trips, in accordance with the expert knowledge in question. They do, however, assume very low car shares on travels of the length that is assumed in their market assessments, but it is not explained why they do so. Further, they use the number of people living within '2 km as the crow flies' as an element or argument in the discussions regarding road traffic volumes. It is hard to understand how this can be significant in understandings being in accordance with the expert knowledge in question.

In many ways it may seem as the public authorities and the initiators basically agree when it regards the understandings of the system and how it works, and that the disagreements regards data, assumptions and methods. They do disagree when it comes to the number of people living in the proximity of the centre, the effects of changing buying power, market shares, what are reasonable car shares on travels to and from the large shopping centre and more.

B.3.4.2.2 Which methods for analyses they apply or support

A distinct difference between the methodological approach of the planning authorities and the initiators, is that the planning authorities methods are designed to figure out how big the shopping centre should be in order to contribute to fulfilling the main objectives (retail structure, traffic volumes) in overall plans, while the initiators methods are aimed at figuring out the consequences of a defined proposal on certain variables (retail structure, traffic volumes) and whether these are tolerable.

The unknown or dependent variable in the planning authorities' analyses is the size of the shopping centre, while the unknown or dependent variables in the initiators' analyses are the consequences with respect to traffic volumes and effects on existing retail structure.

The initiators' consultants have conducted retail analyses and different kinds of transport analyses. The planning authorities have conducted analyses aimed at figuring out how big the shopping centre can be if it is supposed to serve those living in walking- and bicycling-distance from the centre.

The overall analyses, judgements and assessments have been undertaken on overall level in the planning authorities' method, leaving the main discussions at zoning plan level to regard data, assumptions and calculations. In the initiators approach, the mechanisms and interrelations need to be defined in the zoning plan discussion.

This could be understood as the main power battle, regarding whether the understandings defined in the overall plan are accepted as valid, or whether they are to be questioned in a number of analyses and calculations carried out by the initiators in each specific case.

B.3.4.2.3 The main differences

The initiators explain in a note to the Standing Committee on urban development (Civitas 2010), that the reason why the planning authorities arrive at a lower figure for maximum size of a shopping centre here are that they use 2 km real walking distances while the initiators use 'as the crow flies'-distances, that they have different figures for the number of people living in the area (the planning authorities have not used the last prognoses from Statistics Norway for 2030), and the planning authorities have not adjusted the figures for buying power.

As we saw above, since the turnover also changes, and may be assumed to follow about the same growth rate as the buying power, adjusting the buying power does not change the calculated size of the shopping centre. A major critique from the initiators against the planning authorities calculations has been that they don't adjust the buying power to 2030-level. In this dispute it seems to be safe to give the planning authorities right.

There will always be discussions regarding whether to calculate the population in 10, 15 or 20 years. In their final notes, ncm development and norsam as (2010) and Civitas (2010), use 20 years and 2030. The planning authorities use 15 years and 2025. The initiators use the

latest prognoses, but prognoses are always uncertain, and more uncertain the further into the future one looks. That is not least the case in this part of Oslo, which is under major transformation, as described. Hence, it is not strange that the planning authorities use more conservative number and the initiators more optimistic.

Main differences between the two are hence the number of people one need to assume will be customers at the shopping centre, and where they live. The planning authorities dimension the centre on basis of how many people that live within 1 km and between 1 and 2 km of the shopping centre now and in an assumed future, assumed future market shares based on empirical knowledge and logical reasoning, and buying power per person based on empirical data. Dimensioning the centre for these people ensure that many can walk and bike, and that the centre does not represent significant competition to any of the other centres.

The initiators, on the other hand, define 2 km as the crow flies from the centre and define this (for some unaccounted for reason) as a significant area, within which the market area for the shopping centre will be averagely 31 %. The rest of Bjerke district will do 20 % of their shopping here, but nobody else (I guess this means that the 'competing with the regional shopping centres in other municipalities' is abandoned - but this is my assumptions, it is not expressed anywhere). In earlier analyses and versions of the proposal the initiators had included larger areas, but as they shift from 15 to 20 years, and as they adjust the number of people living in the area, the necessary market area becomes smaller. Still, the area is significantly larger than the area the planning authorities count as 'within walking and bicycling distance'.

The 2 km-discussion is the one that disclose the differences between the two ways of understanding the situation. The planning authorities use 1 km and 1 – 2 km because 1 km often is understood as the maximum walking distance one can assume, and because this contributes to keep the dense centre structure with good access without car for the population. There is a reason why 1 and 1-2 km is chosen. It is very hard to understand why the 2 km 'as the crow flies' radius that the initiators use were chosen. It has no significance whatsoever.

If leaning on the argumentation from Civitas (2010), a conclusion would be that if one understand that the turnover per m² needs to increase more or less at the same rate as the buying power, and look away from the differences caused by the two calculations being done for two different years, the main difference is that the developers include people living further away from the centre than the planning authorities as future customers of the shopping centre.

The planning authorities commented in the planning proposal that "In public planning, the crucial point is not necessarily whether a project is realistic, but rather whether it is desirable in a comprehensive perspective" (Municipality of Oslo 2010:29).

B.3.4.2.4 How they perceive the expert knowledge in question

None of the central planners, except from the planner at the NPRA, seem to have a close or deep understanding of the expert knowledge in question (the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes). When asked how they perceive the expert knowledge, the interviewee at the District

administration doubted that there is any 'objective' or general knowledge regarding how the size of a shopping centre affects traffic volumes and existing retail structure.

The interviewee at the NPRA explains that we do know what it takes to achieve reduction of GHG emissions from road traffic, based on general and empirical knowledge. He did not find that the discussions in this case would have been different if we had more or better knowledge; the developers want to do something else than what is defined in the overall plans. In general, he finds that knowledge is important in such cases, and that empirical data regarding among others walking and bicycling could have been better.

B.3.4.3 Power

In this case, all actors exert direct and agenda-setting powers. I did not come around to discuss the structural powers at work.

B.3.4.3.1 The initiators

The developers and initiators have a number of ways of exerting powers in order to win in direct conflicts with the planning authorities. In this case they have exerted their power to include desirable elements in the proposal in order to make it more tempting. They do mention public bath, cinema and library. Later in the process, they apply their power to change their project, by complying with the formal complaints to some degree and reduce the shopping centre to 55.000 m².

The initiators, being the consultants of the developers, make the plans and the analyses. Obviously, they use the power that gives them to set the agenda for the planning process by proposing the 60.000 m² shopping they want to build rather than the 25.000 m² that the overall plans call for. Further, they produce a number of analyses which is understood by this author, as well as the interviewees, to be 'twisted' in order to make the project appear as causing less negative consequences with respect to traffic volumes and existing retail structure than it in reality will. This could also be termed exertion of manipulating power, according to the terminology defined in chapter six.

The initiators have and exert the power to stop and to threaten to stop the development if they are not allowed to build what they have proposed. The initiators explain that the developers may have to stop their project, or to take out desirable elements (such as the public bath) if they are not allowed to build 60.000 m² shopping and uphold the proposed number of parking places. This also represents agenda-setting power, since it contributes to change the discussions from whether a large centre should be allowed to how to ensure that a good project is developed fast.

The initiators have and exert their power to lobby their project through different channels. The main channels in this case are directly to the politicians, first in the District Council, later the City government and finally in the Standing committee on urban development and the City Council. They promote not only their project, but also the objectives they claim that their project can contribute to fulfil and their ways of understanding reality (e.g. that a big shopping-centre here mainly takes customers from car-based shopping centres in the neighbour municipalities rather than nearby local centres). Hence, this is also exertion of agenda-setting power.

The initiators exert their power to ignore the comments and formal complaints from the relevant authorities, probably because they get signals that the District Council politicians and the City Council politicians (blue wing majority) will accept their proposal.

They also exert their power to challenge the understandings, objectives and knowledge in the overall plans, as well as the concrete analyses conducted in this specific case, and the expertise of those making and assessing analyses at the planning authorities and the other public authorities. This is an example of exertion of agenda-setting power.

One could conclude that the initiators have exerted a wide variety of the powers they possess.

B.3.4.3.2 The planning authorities

The planning authorities exert their powers as well. They call attention to the objectives in municipal and national plans and purviews, and hence apply their strongest agenda setting power. Further, they assess whether the proposed project is in accordance with the overall plans, and call attention to the fact that it is not.

They do control that the plans and assessments are made and described satisfactorily, and they call for analyses of certain topics (consequences for retail structure and traffic volumes, among others). They do, however not, assess the analyses conducted, among others because they lack the competence. They get help from the NPRA to assess the traffic analyses. They notify the initiators and their consultants, as well as the readers of the planning proposal including the decision-makers, that they disagree with assumptions and data that are central in the analyses and arguments presented by the initiators.

The planning authorities do use their power to present their own alternative and their own analyses. This does not happen very often, according to the case-handler at the planning authorities' office. Finally, they use their powers to recommend the politicians strongly and clearly to not accept the initiators' plan.

The planning authorities can apply their powers in these ways because the main objectives are clearly stated and defined in overall plans, they have and use the necessary capacity and expert knowledge (mainly) to do follow-up, and because they have experienced that the decision-makers in previous cases mainly have been loyal to the overall plans and to recommendations from the planning authorities.

B.3.4.3.3 Other authorities

The other authorities entitled to comment on plans have used their powers to comment on programmes and plans, and the NPRA and the County Governor's office have used their strongest power tool – the formal complaint.

B.3.4.3.4 The City Council

The City Council politicians have been rather passive in the planning process. They have probably listened to the District politicians in this case, rather than to the planning authorities. Judging from the initiators' strategies, they have probably not signalled that the overall plans have to be obeyed.

In the final phase, after the planning authorities had sent the case over, the City government were more active. They exerted their power to call for a new analysis (Space group et al. 2010). Further, they asked the initiators to comment on two new alternative proposals, both

for 55.000 m² shopping centre, whereof one with reduced number of parking places for the shopping centre. Based on these new analyses and proposals, they had discussions with the authorities that had filed formal complaints in order to arrive at an agreement. The authorities upheld their complaints. This is in accordance with statutory requirements for negotiations in cases with formal complaints.

The Standing committee applied their powers to call for analyses and information from the developers, but not from the planning authorities. Finally, the majority in the City Council applied their powers to adopt the plan against the recommendations of the planning authorities, formal complaints from other authorities and a minority of the politicians.

B.3.4.4 Objectives, knowledge and powers in this case

In the table below, the objectives, knowledge and powers of the main actors are listed with reference to the discussions and definitions in the dissertation chapter six.

Table B 4: Relevant properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes.

	Planners working for:	Developer/ initiator	Planning authorities	Important hearing instances	Decision-makers
Objectives	Main objective	Realising project	Following plans, achieving public objectives including minimising traffic	Minimise transport and GHG emissions	Several, should be related to overall plans, dependent on political colour etc.
	Is reducing traffic volumes important?	No	Yes, stated at national, county and municipal level	Yes, stated at national, county and municipal level	Are the ones which have stated the objectives in overall plans
	How they understand this objective	-	Not very clear on this	NPRA and CG ⁴⁹ : actually reducing, GHG- emissions	Some – actually reduce
	Other relevant objectives	Minimising GHG emissions	Development in the area	Ensure the interests they are responsible for (roads, transport, climate)	Facilitate business development
Knowledge	Possess or know of expert knowledge in question	To some degree	Yes	Yes (NPRA)	Probably not, informed by planning authorities' presentation of proposal
	How they perceive this expert knowledge	Not asked	Good enough	NPRA: good enough	-
	Main references	None	None	None	None
	What are their main expert knowledge	Various	Planning, retail development	Planning (NPRA and CG)	Diverse

⁴⁹ CG is short for County Governor's office.

How and why planners make plans which, if implemented, cause growth in traffic volumes

	Alternatives they propose and/or support	Large	Small	Small	Large (majority)
	Methods they apply and/or support	Transport analyses, retail analyses, professional reasoning	Overall analyses, calculations of dimensions, professional reasoning	Commenting, assessments of traffic analyses	-
	Causal interrelations they include and/or support	All, but only direct	All, indirectly, iterative	NPRA: All, indirectly, iterative	-
	Types of outputs	Consequences, quantitative	Dimensions, quantitative	Whether proposal is in accordance with overall plans	-
	How they relate to uncertainties	Hide	Open	-	-
Powres	1. dimension - direct; win or lose in direct battle	Threats to stop the project, offer good things, employ consultants, affects input, interpretations, presentations	Has the formal authority in the planning process, chose to propose their own alternative, not recommend the initiators' alternative	Did warn about and apply formal complaint	The City Council do make the decision. Each politicians has less power
	2. dimension – agenda setting; what it is about	Have lead; define main alternative, produce and present analyses and findings Lobby – what is the project about, what is the world like, what is important?	Overall plans and policies are supposed to have strong agenda setting power Assess whether important factors are included, well enough analysed, procedures followed	Strong within their areas	Make it a political case – or not, bring chosen aspects and interest into the planning process and public debate
	3. dimension – structural; what one thinks is 'right' or obvious	-	-	-	-

B.3.5 Whether, how and by whom the objective or knowledge were ousted

In chapter six it was described how the objective 'reducing urban road traffic volumes' and the expert knowledge about how to do it can be introduced to the plan-making process or not, and how they can be rejected, ousted or downplayed, in any of the tasks in a plan-making process. Whether they do, may strongly affect whether a traffic-increasing plan is made.

In this case, the initiators have produced a proposal which, if implemented, causes more growth in urban road traffic volumes than if the intentions in the overall plan had been obeyed. The following analysis regards whether this is caused by the objective or the expert

knowledge in question being either not introduced or ousted in any of the tasks in the plan-making.

B.3.5.1 The objective was introduced and understood as important

B.3.5.1.1 Minimising growth in traffic volumes was defined as an important objective

Problems like 'to reducing urban road traffic volumes' or the need to stop the increase of GHG-emissions were probably not defined as an important *problem* by the developers when they first analysed the situation and figured out that they would propose to build the biggest shopping centre in town at Økern. These kinds of problems were, however, direct causes that the governmental purviews and the municipal sector plan were made, and probably prominent in those plan-making processes.

The *objective* of reducing (or not un-necessarily increasing) urban road traffic volumes became a prominent objective in this planning process together with the objective of protecting existing retail structure. The main reasons were that they were clearly stated in national purviews and overall plans, that the planning authorities signalled from the start that the project would be assessed with respect to these objectives, and that the NPRA and the County Governor's office signalled that they would file formal complaints if the plan was assessed as 'regional and car-dependent'.

One would expect the main objective of the developers to be to be allowed to build the centre in order to earn money for the owners of the company. According to the planning proposal, and interview with the representative for the initiators, defined objective for the developers also were to contribute to the development of this area with 'retail as motor', by building a centre with good and exciting architecture, room for public activities, underground parking etc. They also stated in their planning program that the project was to be sustainable, to be within defined overall plans, and to cause as low as possible GHG emissions related to transport and stationary energy consumption.

The main discussion in this process regards whether the developers' proposal contributes to the achievement of the objectives 'reducing urban road traffic volumes' and 'protecting existing retail structure', or if they rather contributes to the opposite.

B.3.5.1.2 The planning authorities' alternative is a direct response to the objective

The importance of the objective of reducing urban road traffic volumes was manifested by the planning authorities developing and proposing their own *alternative*. According to the case-handler at the planning authorities, they seldom to this in zoning plan cases. In this case, however, they found that it was necessary to present a second 'development-alternative', in order to allow the politicians to choose between two different developments of the area rather than 'to develop or not to develop'.

B.3.5.1.3 The objective defined which impacts that was assessed

This also called for and opened for an analysis of the planning authorities' alternative, where they used the number of people living in walking and bicycling distance to the centres as dimensioning criteria, and an *impact assessment* focusing on traffic volumes and retail structure. The initiators' analyses of effects of their project were also focused on traffic volumes and retail structure, since these were promoted as important objectives by the public authorities. In order to be allowed to build 60.000 m² shopping, they would need to convince that this did not cause growth in traffic volumes and negative effects on the existing retail structure.

B.3.5.1.4 Comparison

The initiators' consultants have done several analyses which include *comparisons* of the two alternatives with respect to effects on traffic volumes. They all showed that the initiators' proposal caused larger growth in road traffic volumes than the alternative. There have not been conducted quantitative analyses that compare the effects on existing retail structure. Rather, the planning authorities and the initiators have conducted analyses of their respective proposals with respect to this.

B.3.5.1.5 Recommendations

In their *recommendations*, the planning authorities as well as the NPRA and the County Governor's office focused on effect on traffic volumes and GHG emissions, and on existing retail structure, when they recommended the politicians to not adopt the initiators' planning proposal but rather the planning authorities' proposal.

B.3.5.1.6 The objective was understood as important throughout the plan-making

Hence, the objective 'reducing urban road traffic volumes' were introduced in the plan-making process, and the public authorities ensured that the initiators had to relate to this objective throughout the process.

B.3.5.1.7 The expert knowledge and the power distribution contributed to making the objective prominent

The expert *knowledge* in question contributed to making this objective prominent in this case. The existence of theoretical and empirical knowledge regarding how location and dimensioning of new shopping centres affect existing retail structure, travel behaviour and traffic volumes were main reasons why the municipal sector plan and the national purviews were made. Inclusion and description of this knowledge in the municipal sector plan ensured that it was available for the planners handling this case at the planning authorities' office and hence that those objectives were made prominent in the process. The existence of expert knowledge regarding effects on retail structure at the planning authorities' office enabled the planning authorities to make efforts in order to ensure that these objectives were placed on and kept on the agenda in the planning process. If this knowledge was not present, these objectives would not have been made prominent.

The *power* distribution ensured that the objectives were in focus here. The planning authorities could lean on overall plans which stated these objectives, and which were binding. They ensured that the size of the shopping centre and how that would affect retail structure, traffic volumes and GHG-emissions, had to be thoroughly analysed, by including this in the planning programme. This was reinforced by a number of other authorities commenting that these were important topics to analyse. The County Governor's office and the NPRA stated early that they would file formal complaints if the proposed size of the shopping centre was upheld. This made it absolutely mandatory for the developers to assess the consequences of their proposal with respect to the objectives regarding traffic volumes and retail structure. If the authorities did not have these power tools or if they chose not to apply them, these objectives would probably not have been made prominent.

B.3.5.2 The objective was challenged by competing objectives

B.3.5.2.1 That something good happens here fast

There were, however, additional and competing objectives in the plan-making process. The '*problem* to be solved' is not mainly to reduce traffic volumes. Rather, a main aim is to ensure that this area is developed with high density, and soon.

The developers and the initiators do obviously know this, and they do emphasise the necessary financial strength of this particular developer, the benefits of developing the whole area comprehensively as one project, and the possibilities for developing public activities as part of the project. They do, in the planning proposal, explain that they need to be allowed to build 60.000 m² shopping centre in order to be able to carry out the project. They repeat several times throughout the process that if they are allowed to build only 25.000 m² shopping, the project is not economically sustainable, and cannot be accomplished.

The formally defined objectives include this concern. An important objective - or part of the strategy - in overall municipal plans, as the planning authorities describe it (Municipality of Oslo 2009), is to develop the Økern area as a dense nodal-point. This is part of a strategy that includes developing the city as densification in existing centres with good public transport access to the rest of the city. The NPRA spend large sums on bringing the through-traffic underground, in order to allow for a dense and urban development here. 'Everybody' wants the Økern-area to be developed. The initiators argue that a 60.000 m² shopping centre is necessary in order to achieve this, at least if including public bath etc.

In this case, the main competing objectives could hence be understood as to 1) Ensure that something is developed fast, and to 2) Ensure that the retail-part of the development does not cause growth in traffic volumes and negative effects on the retail structure.

The two *alternatives* may be understood as emphasising each of the two competing objectives.

B.3.5.2.2 No comparisons with respect to the second objective

None have done real *comparisons* between the alternatives with respect to the chances for developments, except from the economic analyses the initiators refer to (but never have presented for the plan-making process despite that this have been called for by the planning authorities) which conclude that a 60.000 m² shopping centre is absolutely necessary in order for the total project to be economically viable. It is, however, reasonable to conclude that the chances are higher for a fast and comprehensive development of the Økern area if this developer is allowed to build what they have proposed than if they are not allowed to. The interviewees working for the planning authorities and the NPRA were, however, not in doubt that this central area of Oslo will be developed anyhow.

The public authorities emphasise the negative effects this will cause on total traffic volumes and existing retail structure, and claim that a 25.000 m² shopping centre is right. They did not, and cannot be expected to present any analyses showing that a 160.000 m² development is feasible with only 25.000 m². However, one can argue that the evidences speak for themselves, since offices and housing are constructed all over Oslo which are not supported by the incomes from a 60.000 m² shopping centre. The public authorities are probably right in what they say in interviews, that this area for sure will be developed by others if these initiators don't do it.

B.3.5.2.3 Different recommendations

In their *recommendations*, the developers emphasise that they can and will develop this area as a good contribution to the city, and that the proposal "will not have negative consequences with respect to environment and society" (Space group et al. 2010:129). They recommend that their proposal is adopted.

The planning authorities emphasise that the initiators' proposal will have strong negative effects with respect to traffic and retail structure and strongly recommends the decision makers to not adopt the plan. They also emphasise that their alternative proposal facilitate development of the area without causing those negative effects.

Hence, the objective 'to ensure that something good is developed here fast' is a competing objective to 'reducing urban road traffic volumes'.

B.3.5.3 Redefining the main objectives

In their discussions and reasoning, the initiators present their project as 'a large local centre' in contrast to the regional centre that the municipal sector plan establishes that is not desired. In the planning proposal sent to the planning authorities (Space group et al. 2010), in the analyses prepared for the City government⁵⁰ after the planning authorities had sent the case over (ncm Development and norsam as 201) and in the final note to the Standing committee on urban development (Civitas 2010), they claim that this is 'a large local centre'.

This way they can turn focus away from the traffic generation number and the effects on retail structure, which has been demonstrated by among others their own analyses, and discuss whether the centre is local or regional. In this perspective the 'two km as the crow flies' discussions make sense, since they can argue that 'within 2 km' is local.

B.3.5.4 The expert knowledge in question was introduced and applied, but challenged

B.3.5.4.1 Problem and objectives

The expert knowledge in question had been applied when developing the overall national purviews and municipal plans. This in turn enabled *objectives* stating that traffic volumes need to be reduced and how land use and transport-systems need to be developed in order to contribute to this. On basis of this, Oslo had arrived at a strategy for developing 'many and small' centres rather than 'few and large', in order to ensure good access to shopping and services for all as well as low traffic volumes related to shopping travels.

The municipal sector plan demonstrates a fine example of a plan which includes the interrelations between development of land use, transport-systems, travel behaviour and traffic volumes, including the multi-level interrelations, the dynamic, the complexity and the iterativity of the system. It also defines an easy-to-understand framework for planning and steering retail development in directions causing less traffic and undermining of the client base of other shopping centres nearby.

B.3.5.4.2 Alternatives

The developer had made an economic feasibility study, and found that they had to build 60.000 m² shopping in order to be able to realise the rest of the project. They had hence applied other kinds of expert knowledge in order to arrive at their *alternative*. The planning authorities had arrived at their planning proposal by applying the expert knowledge in question and dimensioning the shopping centre with respect to the number of people living in real walking distance from the centre. Hence, the planning authorities ensured that an alternative based on the expert knowledge in question was introduced in the process.

⁵⁰ Oslo has a parliamentary system.

B.3.5.4.3 Impact assessments

Which impacts to assess

In the discussions regarding which *impacts* that should be *assessed*, there were no doubt that effects on traffic volumes and retail structure should be assessed. Further, the expert knowledge in question was applied, at least to certain degrees, by both parties. They did, however, arrive at different answers.

The planning authorities apply the expert knowledge in question

Except from the analysis the planning authorities conducted in order to dimensioning the size of the retail centre in accordance with the municipal sector plan, the initiators and their consultants conducted and presented most of the calculations and quantitative analyses in this case. The retail analyses and the traffic analyses are included in this discussion.

The planning authorities made simple calculations in order to define the maximum size of the shopping centre. These calculations are only parts of a larger analysis including among others the understanding that many smaller centres will allow walking distances for more people than few and big ones, and hence that centres should be dimensioned with respect to the number of people living in walking and bicycling distance from it.

The initiators apply a simplified understanding of the expert knowledge in question

The initiators' retail analyses and traffic analyses do to a certain degree include the expert knowledge in question, or at least it uses parts of it or build upon it. It is, however, clear from studying the analyses that the more long term, iterative and indirect interrelations are not included in the calculations done in the transport analyses or in the retail analysis. This regards interrelations between how development of a large shopping centre in this location affect where people shop and their travel behaviour, and how this in turn affects the retail structure (land use) which affect travel behaviour etc. This means that only the simplest understanding of the model in chapter four in the dissertation is applied by the initiators (or at least this is how it is presented in the analyses).

One could agree that the initiators apply the expert knowledge in question when claiming that traffic volumes would be reduced if the big centre is built because people will travel shorter distances and less by car in order to visit this centre rather than other centres the same size that are located further away and in other municipalities. This does, however, imply that a large portion of the population actually do travel long distances in order to visit a mega-centre rather often. This is not likely, according to travel surveys (see e.g. Engebretsen, Strand and Hanssen 2010). If this was to be a good argument, it would have required that the extra traffic caused by people travel longer to the Økern centre rather than the (eventually closed down) closer centre was out-weighted by the reduction caused by people travelling here rather than to other mega-centres further away. The initiators present no evidence whatsoever that this is the case.

Data and assumptions chosen to produce certain results

Regarding input data and assumptions, the initiators use car shares that are quite optimistic with respect to the large market area these first analyses were referring to. Further, they present car shares including both drivers and passengers, which make the car shares appear higher and more trustworthy than they in reality are. Several commentators explained that the car shares were too low in the initiators traffic calculations, but this was ignored by the initiators.

Further, the initiators measure the number of people living within a 2 km radius as the crow flies rather than in real walking distance when doing their calculations. It is hard to understand how 2 km as the crow flies is a significant distance, with basis in the expert knowledge in question. In planning analyses regarding traffic generation, real walking distances are usually applied. This is because choice of traffic mode varies with actual travel distance (as the crow flies has no logical connection here). The figures for 'the number of people living within 2 km from the centre' are higher than if one uses 2 km from the centre in real walking distances.

Especially these two factors cause that the traffic analyses of the initiators produce to low traffic generation volumes, according to the NPRA and to my own evaluation of the analyses.

B.3.5.4.4 The findings are interpreted and presented as less severe than they are

Further, the initiators' interpretation and the presentation of the findings make them appear far more scientific and certain than they in reality are. It takes quite some work to understand what are based on chosen assumptions and what are based on 'facts' and analyses. For instance are the market area, the market shares in each areas and the car share on travel journeys assumptions made by the ones doing the analyses. This is not clarified. Rather it is obscured, and the analyses are presented as certain, objective and scientific.

The presentations of the findings, and the consequences of these, are not clarifying either. For instance, the initiators arrive at a table showing changes of market shares for various retail centres including among others the city centre. They conclude that since the changes in percentage points are quite small, this shows that the centres uphold their market share. The planning authorities explain that such changes represent large parts of these centres turnover, and are quite significant and can cause closedown of the centres. Hence, the way the findings were presented and explained made the impression (it was also outspoken) that there will not be negative effects on the existing retail structure when their findings, in fact, demonstrated that it will.

The same regards traffic volumes. The analyses showed that the initiators' alternative caused quite much more traffic than the public authorities, whether one calculated the whole 160.000 m² development or only the shopping centre. As an answer to this, the initiators presented a figure comparing the GHG emissions caused by the two alternatives, where there were assumed a certain GHG emissions level for the 25.000 m² shopping centre, while those emissions were 0 from the 60.000 m² shopping centre. This causes that when summarizing the stationary and mobile GHG emissions, the large centre cause less GHG emissions than the smaller one.

In their summarizing of the impact assessments, the initiators conclude that the proposal is in accordance with the governmental purviews because "... the retail analysis shows that the project will not have negative consequences for Oslo city centre and for other centres in the district, and because the traffic analyses show that this project will not cause higher traffic volumes than if the shopping was done other places in the city. The initiators hence conclude that the project is in accordance with the municipal sector plan for development of retail and services" (Space group et al. 2010:59).

In their final proposal to the Standing committee on urban development, they present calculations which have major flaws (they have calculated the figures wrongly, and they have

assumed that buying power increase but not the turnover per m²). They also use the two km as the crow flies assumptions, and the most optimistic population prognoses, arriving at necessary size of the shopping centre is about 56.000 m². If the obvious flaws are corrected, my calculations show about 34.000 m². If they used less optimistic prognoses and included only people living in real walking distance according to the planning authorities' assumptions, they would have arrived at about the same number.

B.3.5.4.5 The expert knowledge have been applied, but attempt has been made to apply it wrongly

The analyses and predictions made in the planning process are capable of dealing with the problem of reducing road traffic volumes and GHG emissions from road traffic volumes. However, as argued above, the initiators are applying the findings in an attempt to make it appear as if their proposal does not generate more traffic than the alternative – even if the analyses clearly show that it will. Here, I would argue that there is an attempt to misuse the knowledge in order to mislead the decision-makers, or at least to confuse them and to give the ones who need an excuse to approve the plan just that (an excuse).

In this case, the planning authorities and others that commented on the plans ensured that the expert knowledge in question was applied throughout the plan-making process, even though other knowledge was applied too. Especially the planning authorities and the NPRA pointed out faults in input data, assumptions, interpretations and presentations in and of the analyses.

I conclude that the initiators throughout the impact assessments have applied as optimistic figures and assumptions as possible in order to demonstrate that their proposal is in accordance with the overall plans. Their analyses do, however, show that this is not the case. The initiators then present their findings as if they actually *do show* that their proposal is in accordance with the overall plans even when their own analyses clearly show that they are not. They have been explained how and why this is the case.

B.3.5.4.6 How objectives and power affect the use of knowledge in this case

It is obvious here that the *objectives* made most prominent in the planning process did call for application of this expert knowledge. When these objectives were defined, it followed that the planning programme identified that these topics needed to be assessed, and hence that such knowledge would be necessary to apply.

In this case, the municipal sector plan and the national purviews were important *power* tools when the planning authorities defined which issues needed to be included in the planning programme and hence which knowledge needed to be applied. Since the planning authorities and the authorities entitled to file formal objections asked for such analyses or knowledge production, there was no way the initiators could have gotten away with not accomplishing this.

This case is, however, also a very clear demonstration of how the initiators use their power and the power tools embedded in their role to define the knowledge production - which alternatives that are assessed, which knowledge is applied in the assessments and how the knowledge produced is interpreted and presented. In another setting with weaker public authorities they could have been able to define the knowledge production and presentation far stronger.

B.3.5.5 Objectives and knowledge have been 'twisted'

The main aim of this analysis is to figure out whether and how the objective and the expert knowledge have not been introduced to the plan-making process, or if they have been ousted in any of the tasks in the plan-making process.

The objective has been twisted

The discussions above have demonstrated that the objective of reducing traffic volumes (here translated to development of a retail structure that is not car-based) has been in focus throughout the plan-making process.

One cannot say that the objective has been ousted either. The initiators claim through the planning process that they agree with the objective, and that their project is in accordance with this. The objective has, however, been attempted redefined from focusing on effects on existing retail structure and traffic volumes towards a discussion whether this is a 'local' or a 'regional' centre. This could be done because a central definition in the overall plans is that 'regional and car-based retail centres' shall not be developed. This change of focus with respect to the objective does have implications with respect to how the analyses are conducted, as I will return to.

The objective is *challenged* by objectives related to making something happen here fast. The initiators explain repeatedly that the total project can only be realised if the developers are allowed to build 60.000 m² shopping. Hence, the objective of minimising traffic volumes and the objective to make something good happen here fast are competing objectives. When the municipal decision-makers finally adopted the plan, this was probably a main reason.

The expert knowledge have been twisted and challenged by questionable analyses

Regarding the expert knowledge in question, the planning authorities have applied this in the overall plans as well as in their alternative definition, calculations, argumentation and reasoning in this case. The knowledge-base is documented in the municipal sector plan (Municipality of Oslo 2003, 2003a). Hence, the expert knowledge was introduced, and never really ousted.

The initiators apply expert knowledge related to economic feasibility when dimensioning their shopping centre proposal and knowledge related to retail development in much of their argumentation and reasoning. None of this is documented.

The initiators also apply the expert knowledge in question in their traffic analyses (conducted by other consultants) and in their argumentation and reasoning. They do however apply the knowledge in ways which are meant to present their project in accordance with the overall plan. This is not least clear when seeing how they interpret and present their findings.

Further, by changing the focus of the objective towards 'a large but local shopping centre' instead of the traffic generating potential of the centre, they can introduce their analyses focusing on how many people that live within 2 km 'as the crow flies', rather than on the real walking distances that actually affect which mode people choose.

Hence, even if the initiators seem to relate to the overall objectives and the expert knowledge in question, they are actually applying and playing on objectives and knowledge in order to get their project through. How this is done will be described in detail in the next chapter.

The political decision makers bought it

The Standing committee called the initiators to present the proposal for them, and the initiators also prepared the 'faulty note' described before (Civitas 2010). The Committee recommended the City Council to adopt the plan. They did so, against two votes, from the Socialist Party (which is the 'greenest' of the parties). Later, the City Council adopted the plan against only the Socialist parties' votes.

The majority remarked that the main reasons why they recommended the City Council to adopt the plan, among others were that this is an expansion of the inner city that is in accordance with overall plans, that the retail analyses show that the large centre will not affect the market shares for the City centre or other shopping centres in the vicinity, and that the new centre instead will compete with regional centres in the neighbour municipalities. They also emphasise that the District Council is positive to the plans, and they agree that it is important that the area is developed and improved as fast as possible.

Hence, the initiators had been successful in their strategy of twisting objectives and knowledge. The political decision makers listened to them, rather than to their own planning authorities, the NPRA and the County Governor.

B.3.6 How the actors acted when producing this traffic-increasing plan

This case offers a view into an interesting battle between strong developers and initiators at one side, and strong planning and other public authorities at the other, both sides applying knowledge production and knowledge discussions as main tools in their struggles to achieve their objectives.

In the following chapter it is described and analysed how the main actors acted and reacted when trying to convincing each other, important commentators, and decision makers that they are right. References are made to the abstract discussions in chapter 6.6 in the main report.

B.3.6.1 The initiators oppose the overall plan *and* pretend to comply with it

As have been demonstrated, the initiators present a planning proposal that is not in accordance with the overall plans, here represented by the Municipal sector plan for retail and services. The planning authorities, as well as the City Governor's office and the NPRA agree that the planning proposal is in conflict with local, regional and national plans, guidelines and purviews.

The initiators agree that they oppose the overall plan, but not the *intentions* of the overall plans. They are at the same time expressing that they do comply with the overall plan and they are undermining the current understanding and practice of the overall plan.

B.3.6.2 The initiator pretend to comply with the overall plan

A lot of the effort laid down by the initiators in the plan-making process regards to demonstrate that their planning proposal is not in conflict with the overall plans by showing that it does not cause negative effects on the existing retail structure and that it does not cause more growth in traffic volumes than the alternative plan. If not, their zoning plan cannot be adopted unless the sector plan is changed.

When doing this, they apply at least two of the tactics mentioned in chapter 6.6; to produce analyses making the project appear as having less severe consequences than it will, and to

present the analyses and the findings in ways that make decision-makers and others believe that the proposal is, or could be, in accordance with the overall plan.

B.3.6.2.1 Manipulating data and analyses in order to arrive at less severe impacts

Traffic analysis based on retail analysis

The initiators' consultants calculated traffic generation numbers in three different ways, as described in the presentation of the plan. One was based on the retail analysis, which defined the market shares in different zones and how many people that live there now and in the future, arriving on the number of trips to and from each zone and the shopping centre. This was calculated with assumed modal splits for each zone. One arrived at the number of car trips to and from the centre that will be generated from each zone, arriving at the traffic generation (vkm/day) related to the shopping centre.

These calculations were based on a series of assumptions and input-data, some without any references or documentation. This goes for instance for the market share in each zone (and hence the number of trips) and the modal split for these trips in each of the 13 different zones (and hence the car share), meaning that the resulting traffic numbers are totally dependent on the assumptions made by the professionals doing the analyses.

This analysis concludes that there will be 18.810 car trips/day related to the 60.000 m² centre, which gives a car driver share (what is usually mentioned car share) of 41 %. In the traffic analysis report it is reported a 53 % car share, which is quite confusing and could cause people to believe that this was the car driver share. While 53 % is a low but possible car share, 41 % is unlikely. In the last impact assessment report, presented in May 2010, the number of car trips calculated in the analysis represents a 38 % car driver share in 2015 (ncm development and norsam as 2010). In 2030 the car traffic generated by the shopping centre will be reduced by 20 %, according to the same calculations, which means a 31 % car driver share - or car share as we usually say (my calculations, based on data in the analysis).

According to the planning authorities' estimates, only 4 % of the people in the total market area defined by the initiators' consultant live in real walking distance from the centre (2 km), and I found that less than 11 % of the *customers* will do so in 2025⁵¹. The initiators found that 50 % of the turnover is collected from within 2 km as the crow flies from the centre, and the planning authorities' found that the number of people living within 2 km real walking distance is about half the numbers of those living within a 2 km radius. Hence, one could say that 25 % of the *turnover* is collected from people living in walking distance from the centre.

This, together with the fact that public transport accessibility from several of the important market areas is not and will not become good enough to compete with the car, and the fact that the initiators include a high number of parking places, make it easy to agree with the planning authorities (and all the transport and traffic authorities which have commented on the planning proposal, throughout the entire process) that the car volumes generated by the 60.000 m² shopping centre probably will be substantially higher than the 41 % car share and the 18.810 car/day which the initiators' consultants arrived at. This is also in accordance with findings in recently published research regarding travel behaviour and shopping centres

⁵¹ 11 % is my calculation, where I have divided the 38.900 people the planning authorities have calculated to be living within 2 km in 2025 on the 366.409 people the initiators assume will live in the total market area in 2015/2020 (ncm Donaldsons 2009a:11).

(Engebretsen, Hanssen and Strand 2010 and Engebretsen and Strand 2010). It is also sustained by the national travel survey, where it was found that the car share becomes higher than walking share as the travel length exceeds 1 km, while at 2 km the car share is more than 50 % (Vågane 2006).

The transport analyses are hence produced on the basis of car shares that are undocumented, unlikely, and which the transport authorities claim are too low. Hence, the traffic numbers that the initiators present are too low.

Traffic analysis based on empirical data

The second way of calculating traffic volumes was by using empirical data for car shares at shopping centres located in different places in the urban structure in Scandinavian cities of various sizes. Økern centre was in this analysis defined as having a central/ middle central location and to be served 'good' (best mark) by public transport. Hence, it was assumed a 45 % car share. It was not given proper references for the data which these assumptions were built upon (they have never been published) neither in the transport analysis report nor in the impact assessment. The data was made available for me by TØI (which had done the analysis). They show that the shopping centres defined as having 'good' public transport services mainly are centres located in the city centre (such as 'Steen og Strøm Stormagasins' in Oslo city centre and 'Stavanger Storsenter' in Stavanger city centre). Locations which have been classified as 'central' are all city centres (again are 'Steen og Strøm Stormagasins' in Oslo city centre and 'Stavanger Storsenter' in Stavanger city centre examples).

The person who had carried out the analysis at TØI underlined that it was a coarse and 'unscientific' analysis which cannot be used in order to determine or assume future car shares at the Økern centre. Hence, the 45 % car share cannot be understood as a scientific or well grounded assumption for future car share at Økern.

My judgement is that Økern just as well could have been defined as being located 'medium central' (such as Arken senter in Bergen and Stovner senter in Oslo) and be 'medium served' by public transport (such as Lillstrøm Torv in Lillestrøm and Stovner senter in Oslo) in the future. According to the empirical data this would mean a car share between 55 and 60 %.

Among others the NPRA and the municipal transport authorities claimed several times in their comments to the planning proposal that they disagreed with this assumption, and that the car shares used in the calculations should be higher. This is also my judgement.

Transport analysis based on number of parking places

I found no documentation of this analysis, and can hence not evaluate it.

To low differences in traffic generated by the smaller and the bigger centre

Another problem, which is not notified by any of the commentators, is that the same modal splits are used in the traffic analyses for both the 25.000 m² and the 60.000 m² alternatives. This is done even if it is rather obvious that a smaller centre at a certain location will have lower car shares than a bigger. This is because it draws customers from a tighter area, allowing more walking, bicycling, and public transport (on their way to or from a public transport journey (for instance job – shopping – home), as is also understood by the initiators as well as the planning authorities. This is consistent with recent empirical findings which show that the car share increases as the size of the centre increases (Engebretsen and Strand 2010, Engebretsen, Hanssen and Strand 2010).

The alternative with 25.000 m² shopping holds more housing and offices at the site, which in itself would reduce the car traffic generated because of the shopping, because people living or working here would not drive here to shop. Hence, the differences between the traffic generated from the smaller and larger centre should be larger than the analyses shows (which showed that the alternative with the bigger centre generates 50 % more traffic).

According to the initiators, this reasoning is wrong, since the situation with a 25.000 m² shopping centre would be that many people living close to the centre would choose to travel farther to other, bigger centres to do their shopping. This is not substantiated by any empirical data or theoretical reasoning. There are four centres which are 25.000 m² or larger in Oslo, and 11 in the surrounding county Akershus.

Manipulated input data and assumptions cause too low traffic numbers

I conclude that the data applied for the transport analysis are of low quality and manipulated in order to arrive at lower traffic generation figures than what is realistic to expect, and smaller differences between the larger and the smaller centre, mainly because:

- The car shares applied in the first transport analysis are based on data not accounted for (especially market shares and modal splits for the 13 different areas)
- The car shares applied (41 %) are unlikely, since few people live in walking distance and the public transport connections to the centre are not very good from important market areas
- In the calculations based on empirical data about travel behaviour at other shopping centres, a non-scientific analysis of too few data items are applied
- The judgement made in this analysis do define the location of Økern to be more favourable in terms of centrality and public transport accessibility than it is or will be, hence the assumed car shares are to low
- In both analyses, the same modal split with the same car share are applied for both alternatives, even if a smaller shopping centre will have lower car share than a larger one

This would mean that the traffic shares and traffic numbers systematically are calculated to low, since the equation for daily car traffic basically is:

$$\text{numbers of cars} = \text{number of customer} \times \text{car share}$$

B.3.6.2.2 Presenting findings in ways which make the project appear more in accordance with the overall plan than it is

The initiators' analyses show that the project is not in accordance with overall plans

Even if the developer's consultants do apply assumptions and input data which make the project appear more in accordance with the municipal sector plan than it is, deliberately or not, they do arrive at results which show that their proposal *will* affect the retail structure negatively and that it *will* cause more traffic than the planning authorities' alternative as well as alternative locations of the activities proposed at the site. The main findings of *the initiators' analyses* can be summarised as follows:

- The primary market area of the centre includes five urban districts in Oslo, and the secondary market area additional four, hence the total market area covers nine out of 15 urban districts in Oslo (Space group et al. 2010:73) – this is considered 'regional' by the planning authorities

- The 60.000 m² shopping centre will reduce the city centre's share of the market in the market area (nine out of 15 urban districts) by 20 %, 'the rest of the primary area's share by 13 % and 'the rest of the secondary area's' share by 12 % (Space group et al. 2010:77, Municipality of Oslo 2010:29)
- In total (all 160.000 m²), the developers' proposal will cause about 54 % more traffic than the reference-alternative (Space group et al. 2010: 97)
- Compared to 'averagely traffic generating' localisation of the proposed functions in the city, the proposed project will cause 12,6 % more vkm and GHG-emission caused by transport, while if looking only at the shopping centre the figure is 7 % (Space group et al. 2010:100)

The initiators claim that their analyses do show that the project is in accordance with the municipal sector plan

Despite these findings, the initiators repeatedly claim that their analyses *do show* that the project is in accordance with the municipal sector plan and the governmental purviews.

I find it hard to understand this in other ways than that the initiators know that their analysis show that their proposed project is not in accordance with the municipal sector plan (since their analyses show so), but that they still *say* that their findings are in accordance with the sector plan. I find this to be an un-truthful presentation of the impact assessments. Some examples will be elaborated below.

The initiators claim that their project will not have negative effects on the retail structure despite that their analyses show that it will

The planning authorities pointed out in their presentation of the plan for the City Council, that the initiators present the results from the retail analyses as an argument that the proposal will not cause negative effects on the retail structure even though the retail analysis shows the opposite.

For instance, the retail analysis concluded that a 60.000 m² shopping-centre will reduce the market share of 'other parts of the primary market' in the defined market area (nine out of 15 urban districts in Oslo) with 3 % (from 23 to 20 %). This may sound as a small change, but represents in reality a 13 % reduction⁵² of the market share in this large area. This could very well mean that smaller centres disappear and that larger ones need to reduce their breadth.

It is hard to understand this in any other way than that the initiators claim that the project will *not* cause negative effects on the retail structure even if they know that they have arrived at findings saying that the proposed project in fact *will* change the retail structure in affected areas in ways which are not in accordance with the municipal sector plan. This is not least so since the planning authorities and others repeatedly have pointed this out.

Confronted with this in the interview, the initiator explains that they *do* think that the growth will ensure that there will not be negative effects on the retail in the city centre or on the smaller centres in the vicinity of Økern senter. The growth in purchasing power will ensure that there are enough turnovers to sustain the existing retail structure and a 60.000 m² Økern senter, according to him.

⁵² Since 3 % is 13 % of 23 %.

He also explained that there has been a discussion between the initiators' consultants and the planning authorities regarding whether increased purchasing power per capita is a valid argument why the retail volume can expand. The initiators want to apply other figures for purchasing power than the planning authorities allows in the calculations, while the planning authorities claim that the turnover per m² in the centres also need to increase. As concluded above, since both the purchasing power and the turnover per m² need to be discounted by about the same figures, this is not a valid argument.

The initiators claim that their project is not more traffic generating than the alternative despite that their own analyses show that it is

Regarding traffic volumes and GHG-emissions, the initiators claim that their proposal is not more traffic generating than other developments, despite the findings listed above. When confronted with this in interview, the initiator point at the figures for traffic volumes generated by the retail facilities in their proposal, compared to the traffic generation if the retail were located elsewhere in the city and causing *average* traffic generation. He claims that the difference between them (7 %) is so small that it is reasonable to claim that their proposal does not produce more traffic than 'any other' developments.

Example of cherry-picking of results?

This could also be understood as an example of 'cherry-picking'. A number of different calculations are done, and the figure presenting the proposal in the better light is chosen to represent the findings.

Bringing in other elements in order to reduce the significance of differences in traffic generation

When confronted with their calculations showing that alternative 2 (all 160.000 m² including the retail) causes less traffic volumes, the initiator refers to the figure showing that alternative 1 causes less GHG-emissions in total because one will ensure that the stationary GHG emissions are zero in alternative 1 while a project built by other developers would cause average GHG emissions. Hence, even if alternative 1 generates more mobile GHG emissions, it will produce less GHG emissions in total, because of the zero stationary emissions. It is, however, not possible to make this a binding regulation in a zoning plan, or to fulfil it in reality. In interview, the initiator appears convinced *and* convincing on this topic.

The initiator points at the May 2010 report (ncm Development and norsam as 2010), where new calculations done for 2030 (applying new population prognoses from Statistics Norway) show that the 2030 traffic volumes will be 20 % lower than the 2015 figures. These calculations are, however, even more uncertain than the 2015-calculations. Further, it is not made comparable calculations for the alternative based on these new data.

Faulty calculations in final presentation to the Committee

As described above, the initiators presented calculations to the Standing committee on urban development that was faulty calculated and which used discounted figures for the purchasing power but not for the turnover per m². I guess this is sloppy work by the initiators.

Deliberate presentation of findings in ways that make the project appear more in accordance with the overall plan

All together this leaves the impression that the initiators state that their project does not cause negative effects on the retail structure and the traffic volumes, and that it is in accordance with the overall plans, despite that they know that this is not true.

The initiator disagrees strongly with this in interview. He claims that the growth in purchasing power actually will ensure that the 60.000 m² shopping centre will not affect the existing retail structure negatively and that developing this mega-centre will not cause more traffic than if the shopping was located elsewhere.

My understanding is anyhow that the initiators deliberately present the findings in their impact assessments in ways which are meant to make the project appear more in line with the municipal sector plan and the national planning guidelines than it in reality is, instead of presenting positive and negative consequences of the project more neutral (as they are supposed to according to the PBA).

B.3.6.3 Opposing the overall plan by playing on objectives

The initiators also opposed the overall plan by playing on objectives. An important strategy was to focus on the objective 'to make something good happen here fast'. It is underlined several times that this is a strong and willing developer that is able to take on this big project, but that this can only happen if they are allowed to build 60.000 m² shopping.

The initiators turn focus away from discussions regarding comparisons between the two alternatives with regard to traffic volumes, access to retail and services and maintenance of the existing retail structure by changing focus towards the expression 'a regional and car-based shopping centre'. This allows the initiators to make discussions based on their proposal, rather than on the overall plans and the planning authorities' alternative.

B.3.6.4 Opposing the overall plan by playing on knowledge

The initiators also *oppose* the municipal sector plan, and how it has been understood and practiced. A main approach that the initiators apply is to oppose the plan by playing on knowledge in several ways.

B.3.6.4.1 Weakening the authority of the overall plan

The initiators claim that the overall plan is based on an insufficient understanding of how the retail-market functions, and hence which centre-structure that is adequate in Oslo. They claim that the large shopping centre is a missing link in the centre hierarchy, and that this causes that people from Oslo travel to the large shopping centres in other municipalities. This cause longer trips and higher car shares than if they did this shopping at Økern. They do not present any documentation that this is the case, or to which degree they assume that this happens.

B.3.6.4.2 Making it appear as the project has less severe impacts than it has

As described above, the initiators have applied data and assumptions that are undocumented, unlikely and presented as more scientific than they are in their analyses of effects of the project on the retail structure and the traffic generation. This causes the analyses to show that the impacts of the project are less severe than they in reality are, and the analyses and findings more objective, scientific and certain.

This is a way of opposing the overall plan by making it appear as the project has less negative impacts with regard to objectives defined in the overall plans than it have.

B.3.6.4.3 Changing focus from overall plan to project

Another way of understanding what is going on is that the developers/initiators do shift the focus of the discussion from the structure approach of the municipal sector plan (many small rather than few large centres) to a project approach (are the negative consequences of the proposed centre tolerable?), from the complex to the simple or from the overall to the local.

Hence, the overall understanding of the complex system and 'what one should do' with respect to development of the retail structure in Oslo in order to reduce or delimit traffic volumes is attacked by analyses regarding bits and pieces of the structure and the explanations out of context.

The reasoning behind the municipal sector plan for location of retail and services rests on knowledge regarding how the complex system of land use, transport-systems, travel behaviour, and traffic volumes affect each other in dynamic and iterative ways, more or less as described in chapter four in the dissertation and in the previous description of the municipal sector plan. In order to understand how and why one has arrived at this plan (basically – many smaller rather than few large centres) for 'what to do in order to' develop the retail structure in ways which do not contribute to negative effects on the existing retail structure and growth in road traffic volumes, one would need to have or to gain some understanding of this complex system. This can be termed 'the curse of complexity'; it is a complex system and hence it is hard to understand and not least to *explain* it⁵³.

In the planning proposal and the impact assessment, calculations and analyses are carried out which regard for instance whether another location of this shopping centre will cause more or less traffic than if located here. This is hence a discussion regarding what is the better location of a mega-centre in Oslo, while the overall discussion regards whether one would allow such centres in the structure at all. In this case we have, however, seen that this analysis showed that the proposed location is worse than an average location, but that the initiators are presenting their findings as if it was not.

By steering the discussions towards the partly effects of this centre, the more complex and basic discussions regarding the retail structure is avoided.

B.3.6.4.4 Applying knowledge in ways which make other actors not understand the negative effects of a project

Another way of concealing the negative impacts is to present the analyses and results in incomprehensive ways. The first impression when reading the initiators impact assessment in the planning proposal is that it is clear, transparent, and comprehensible. When going deeper in the material and trying to examine input-data and assumptions, however, it becomes clear that it is not.

Totally non-transparent calculations of effects on existing retail structure

⁵³ Among the tactics applied is to attack the overall understanding of the complex system and 'what one should do' with respect to development of the retail structure in Oslo in order to reduce or delimit traffic volumes by attacking bits and pieces of the explanations out of context. The curse of complexity also allows the initiators to get away with analyses and findings which cannot be examined at all, and also to avoid that the analyses are scrutinised. Our interviewee at the planning authorities explained that it was too hard and time consuming to dig into the initiators' analyses, point out what is problematic or wrong, and bring forward an alternative analysis (even if they actually did so in this case).

One example of this is how the consultants arrived at the effects on the existing retail structure of establishing a 60.000 m² shopping centre here. The analysis is based on data for present and future population in Oslo (from Statistics Norway and information regarding planned housing developments). Based on assumptions or data which are not described, the primary and secondary market areas for the centre are defined. ncm Donaldson (2009a:8) states that “In the view of communications, distances, location and size/commercial influence on other retail centres, we have chosen to define the market area for this project as follows:”, and then follows a list of urban districts which are ‘defined’ as within the primary market area. A map is presented showing the market share for the centre in 13 different zones.

There are no references to, descriptions of or definition of how one has arrived at these market shares in each zone⁵⁴. The expected turnover is calculated to be NOK 2 500 millions, based on market shares, population data and statistics and prognoses for consumer expenditures. Based on this, the market share of the turnover for eight specified shopping centres in the vicinity, Oslo city centre, ‘other retail in the primary area’ and ‘other retail in the secondary area’ and ‘outside the market area’ (all together 12 zones) are calculated for 2006 and 2020. The differences between the 2006 and 2020 market shares for each zone is presented as the consequences of the Økern centre on the existing retail structure.

How these calculations are carried out is not accounted for in the retail analysis or in the impact assessment. All together, this makes the calculations and analysis of the effects on the existing retail structure completely non-transparent. There is no way anybody can figure out how one has arrived at the effects and whether one finds the analyses to have been carried out in scientifically or professionally sound ways. This, of course, opens for bias and manipulations, and hence leaves the analysis without credibility.

No references for basic data

A second example regards how the assumption of a 45 % car share was arrived at in the transport analysis based on empirical data. The planning proposal refers to an analysis carried out by Institute of Transport Economics, and one is given the impressions that this is a serious and scientific analysis. However, there are no references to publications including the data or the analysis, since it has never been published. This means that the reader cannot look into the data and analysis in order to judge whether one finds the data and analysis trustworthy, and hence it is non-transparent. In fact, the initiator refers to a non-published work, and only by asking the researcher which did the analysis, I was able to retrieve this information. He explained that the analysis was not good enough for basing predictions about the future upon, which is contradictive to the impression given by the initiators.

Presenting car shares as shares for drivers and passengers

A third example regards how the car shares are used and presented. As previously described, it is claimed that a 53 % car share is applied. Usually, the car share refers to the car driver share. Here, however, it has been used for drivers and passengers (Norsam AS/ Rambøll AS 2009: 26-28). Hence, when one has calculated 1,3 person per car (not mentioned or explained), the traffic volumes are reduced to 18.810 and the car driver share to 41 % (and in later analysis to 38 % and 31 %). It is not said anywhere that the applied car driver share is

41 %. This is confusing and may be misleading for the ones reading and judging whether they agree on the analysis. In interview, the initiators' representative claimed that they had applied a 53 % car share in the first calculations and 50 % in the latest. This could mean that the presentation of the analyses has confused the initiators too.

Non-transparent analyses, undocumented data and assumptions, confusing presentations

Among others these examples demonstrate that the initiators' analyses regarding traffic generation and effects on existing retail structure are not transparent. Important assumptions and input data applied in the calculations are not accounted for and/or accessible and the reader cannot check the calculations. Hence, the reader cannot judge whether the calculations are carried out in professionally or scientifically sound ways, and hence whether it is credible, likely and trustworthy. They may be just 'made up' by the consultants, or consciously biased – there is simply no way of telling.

The main critiques regarding transparency, comprehensibility and credibility found here hence regards the following:

- The retail analysis is based on data for which there exist no references and which are not accounted for in other ways (market areas, market shares in each of the 13 areas)
- There are no accounts or descriptions of how the calculations of market share with and without introduction of the 60.000 m² Økern senter are carried out, neither in principle nor in detail
- It is given the impression that the 45 % car share applied in the transport analysis based on empirical data from other shopping centres is more scientific and certain than they in reality are
- It is not accounted for how one arrived at modal splits in 13 different zones in the transport analyses based on the market analysis
- In the same analysis it is easy to mistake the car shares applied in the calculations to be 53 % instead of 41 %

My judgement is that the initiators' analyses do not inform the reader in ways which makes her understand what the main issues are, how analyses are carried out, what has been found and how this affects the main issues. Hence, the analyses and their findings do not contribute to the comprehensibility of the case, the issue, and the consequences. Since the analyses are not transparent or comprehensible, they have no credibility.

B.3.6.4.5 Is the knowledge used in order to confuse or to enlighten?

When studying the documents in this case, and especially the planning presentation made by the initiators of the project, one does get the impression that it in some parts are written in ways which are meant to confuse rather than to clarify.

The initiators present their analyses as showing that their project does not have negative effects with respect to retail structure and traffic volumes

When reading the initiators' discussions regarding the disagreements between them and the planning authorities (and other public authorities), one finds that this is presented as if the analyses made by the initiators' consultants concluded that the initiators' proposal does *not* have negative effect on the retail structure and that it does *not* cause more growth in urban road traffic volumes than would the alternative. This could be understood as if different professional milieus (the public authorities versus the consultants) are reaching different conclusions when trying to analyse the consequences of the proposal, while in fact the same

conclusions are reached, since the initiators' analyses show the same as the planning authorities claim. This is confusing rather than clarifying.

The initiators state that their analyses show that the proposal is in accordance with the overall plan

When commenting on the planning authorities' alternative, the initiators declare "The initiator has accomplished a thorough retail analysis which concludes that the proposal is in accordance with the municipal sector plan for location of retail and service" (Space group et al. 2010:37). This will be the largest shopping centre in the municipality. In the initiators' analyses, nine out of the 15 urban district in Oslo is defined as part of the market area for the centre (Space group et al. 2010:73-75).

The initiators insist that it is a "large local centre" (*ibid*:42). The municipal sector plan clearly indicates that 'local' means within walking distance – which is maximum 2 km real walking distance. The initiators repeatedly put weight on that 50 % of the turnover will be collected from people living within 2 km from the centre *as the crow flies* (and even more in 2015), but explaining in interview that this is not meant to say anything about the walking and bicycling shares. The different references to the 2 km are a source of much confusion when trying to understand the case, the disagreements, and what is the more sensible understanding.

Further, the initiators do not mention that *their analyses* do show that the project actually *will have* undesirable effects on the retail structure – as is clearly pointed out by the planning authorities. In interview, the initiator claims that this is because they find that the growth in purchasing power guarantees that the negative effects will not occur.

Claiming to have good documentation regarding assumptions when they do not

The initiators' response to the comments regarding that the car share applied in the calculations (45 %) are wrong, is that: "The national road authorities question whether the chosen assumptions in the transport analyses are correct, and find that both the walking-, bicycling- and public transport shares are optimistic chosen. The initiator has done a lot of work on this topic, as the documentation shows" (Space group et al. 2010:30). They do, however, not refer anything they have found in the analyses and which counters the NPRA' claim. Instead they reinforce their claim by name-dropping, stating that: "The modal split analysis is accomplished in cooperation between Institute of Transport Economics/ncm Donaldsons/Norsam, and is later judged and quality assured several times. Since a large share of the travellers have short distance to Økern, a high walking and bicycling share will be possible. Low public transport shares are related to that the system is not completed. The initiators hence don't find it necessary to change the transport share which has been assumed" (Space group et al. 2010:42). As previously described do the affected authorities not agree with these assumptions. Again the initiators do not attempt to answer the critique, they simply declare that they don't recognise it. This is not clarifying – it is confusing.

Assuming large reduction in stationary GHG emissions

The initiators' transport analyses show that the initiators' proposal (the whole 160.000 m²) does generate more than 50 % more traffic and hence GHG-emissions than alternative 2, and that the initiators' alternative will produce more GHG-emissions than 'random' localisation of their whole project as well as the retail facilities (Space group et al. 2010:102).

This is, however, turned around in the planning proposal by assuming that the initiators' project will produce zero stationary GHG-emissions, while another project would produce almost as much stationary as mobile GHG-emissions (as previously shown). Hence, the initiators' project would cause least GHG-emissions. In the initiators' discussions regarding GHG-emissions in chapter 5, this is described as: "The initiator has carried out calculations of GHG-emissions which show that the project will not cause higher GHG-emissions than the reference alternative" (Space group et al. 2009:42). This may confuse the discussions regarding the GHG-emission consequences of the project.

Bringing in last minute prognoses

In May 2010, after the planning authorities have sent the planning proposal to the City Council, the initiators bring in an analysis regarding the effects of new prognoses for population growth in Oslo. This confuses the reading and understanding of how the discussion is going and which knowledge claims which are more and less valid and documented even more.

Before the Standing committee on urban development are to process the case, another note is presented by the initiators (Civitas 2010), presenting the faulty calculations described above. This is totally confusing, since it presents the situation as if the planning authorities have done severe faults in their calculations and assumptions. In reality, it is the developers that have conducted such mistakes. The planning authorities were not asked to comment on either of these calculations.

Stating promises that the zoning plan cannot bind the developer to carry out

The planning proposal for alternative 1 includes promises which a zoning plan cannot bind the developer to carry out. One example of this is that the project will be built in ways which allows it to cause zero stationary emissions (this is hardly practically possible anyhow), another example is the aqua-land which is promoted strongly in the process. From the planning proposal one may get the impression that these are secured by being included in the zoning regulations and regulations regarding the sequence of implementation, while the fact is that such issues cannot be decided in zoning plans (according to the PBA and the planning authorities in Oslo). This may confuse decision-makers and others to believe that more is secured through the zoning plan than what is the reality.

Presenting their findings as something else than they actually have found

As I read this case, the developers/initiators have presented their findings as being something else than what they have actually found, that the proposed project is presented as being more in accordance with the municipal sector plan than it is, that the developers/initiators avoid to clarify when their findings and presentations of these are criticised, and that they rather repeat their own versions (but louder!) when confronted. Hence, I conclude, the ways the developers/initiators have used knowledge and analyses in this case caused confusion more than enlightenment and clarification.

As previously mentioned, the planning authorities do in their presentation of the proposals summarise and present these discussions in clearer and more understandable ways, which should allow interested politicians (and others) to understand the main discussion lines (Municipality of Oslo 2010:27-31).

B.3.6.5 Opposing the overall plan by playing on power

The initiators have applied most of the ways of playing on power described in chapter 6.6 in order to get their projects through. They have:

- threatened to stop the project
- offered extra benefits in the project (public bath)
- lobbied, by promoting the benefits of their project among others to the District Council and the City Council
- promoted their understanding of what are the relevant objectives and knowledge
- decided to ignoring to comments and directions from planning authorities and others

How the initiators exert their powers in order to achieve their objectives was quite thoroughly described above, and this will not be repeated here.

B.3.6.6 The planning authorities pointed out conflicting objectives

In this case, the planning authorities have clearly pointed out that the project is in conflict with the overall plan, and how. The case-handler explained in interview that they had been careful to focus on what they understood as the main conflicts with overall plans, and to put less effort on less important issues, in order to enable politicians and others to understand what the main conflicts were.

B.3.6.7 The planning authorities challenged the knowledge produced by the initiators

The planning authorities applied knowledge in order to challenge the developers in this case. They proposed an alternative plan, and they did their own assessment of this as an alternative to the analyses conducted by the initiators' consultants.

B.3.6.7.1 The planning authorities present simple and easy-to-understand analyses focusing on the main issues

The simple and straight forward analysis accomplished by the planning authorities in order to arrive at the recommendable dimensions for a future shopping centre here are, compared to the analyses described above, quite transparent. It appears clearly that these are rough estimations, and it is easy to understand the logics of how the dimensioning is calculated. It is also easy to overview the input data and assumptions applied, and to judge whether one find these reasonable. There are, however, not references for the origins for some of the main input-data such as figures for average turnovers. This could easily have been added, and would have made the analysis more credible.

The planning authorities' description of the planning proposal, first in the planning proposal presented in the public hearing and later in the presentation to the City Council, hence adds to the comprehensibility. It increases the readers understanding of what is proposed, which are the main issues, the main consequences and the main disagreements. According to the case handler at the planning authorities, they had consciously focused on 'the main issues'. This allows them to present quite clearly the differences in understanding and recommendations between the planning authorities and the initiators/developers in this rather complicated case.

B.3.6.7.2 The planning authorities and others confronted the initiators with weaknesses in their analyses

The initiators and their consultants have been confronted with weaknesses in their analyses from among others the planning authorities and the NPRA. They chose, however, to disregard this. They did not defend or explain their own numbers – they just kept them.

In interviews, the public authorities explained that this is to be expected. The initiators and the consultants work for the developer. Even if the PBA put the responsibilities for making the impact assessments on the developers, implying that positive and negative effects should be honestly assessed and presented, it seems to be a widespread understanding that the impact assessments made by the developers in general are biased.

This was also the findings in a project regarding planning of shopping centres in Norway. Tennøy et al. (2010) found that among planners in the 13 largest cities in Norway, many expressed that they knew that the analyses presented by developers and initiators were uncertain, subjective, and biased. Several had the understanding that the retail analyses were consciously carried out and presented in ways which were meant to present the developer's project desirable rather than to assess positive and negative impacts as objectively as possible.

None of the interviewees believed that the disagreements in this case were results of differences in understanding or kinds of knowledge. They were rather related to differences in objectives – what the different parties want to achieve. They described the involved firms as 'serious' and 'competent', but explained that since they are appointed by the developer they will promote the objectives of their employers rather than of the overall plans. Hence, they do 'twist' the analyses and the results in ways which make them appear more favourable for the developers' project (all the interviewees independently used the same term, which may be translated to 'twisted'⁵⁵). This goes more for the initiators 'writing up' the plan and the impact assessments than for the consultants who do the analyses.

When asked how they reacted to disputed and biased input data, calculations and impact assessments in zoning planning documents, the two interviewees at the planning authorities separately explained that they do discuss this in meetings, but unless something can be pointed out as clearly false, it is hard to make the developers change what they have written in the planning document. Several of the interviewees expressed that there is a wide field between what is completely right and what is completely wrong, and it may be hard (and time consuming) to pinpoint exactly what is wrong and to prepare the evidences and arguments to prove this.

It rarely happens that the planning authorities or any of the other authorities do thorough evaluations of the consultants' analyses, and it is even rarer that they do their own analyses in order to test or oppose the developers' analyses (as they did for the dimension of the shopping centre in this case). Hence, they seldom evaluate the quality of the analyses which the plans build upon and following from this they don't judge the quality of the analyses or pinpoint what is wrong. All but one of the interviewees in this case had not done any scrutinising of the analyses themselves, since (according to them) this was outside their main

⁵⁵ 'Vridd' in Norwegian.

competences. They had, however, had specialists at their respective offices to look into the analyses, and had delivered comments and objections on the basis of this.

The initiator commented in interview on the accusations of their ‘twisting’ of input data and analyses. He explained that which answers or results which come out of the analyses naturally depend on which questions you ask. A resourceful developer/initiator will obviously make sure that ‘the good sides’ of the project are well illuminated. He expressed that he did not believe that consultants who you can order certain answers from would stay long in business. People disagreeing with the findings, researchers or others will eventually disclose attempts of cheating. In order to survive in the business you need to be serious.

B.3.6.7.3 The planning authorities made clear recommendations

The planning authorities also applied their powers to pose a clear recommendation to not adopt the proposal made by the initiators, and to rather adopt the planning authorities’ proposal.

B.3.6.7.4 The conditions were right

The planning authorities could do a thorough job in this case because the conditions were right. They felt that they had a strong and clear overall plan to lean on, the necessary expertise at the planning authorities’ office and they used the necessary capacity to deal with this plan. Further, previous experiences had shown that the politicians used to be true to this plan.

B.3.6.8 Other authorities applied knowledge and power

Other actors did contribute in this plan-making process. A number of authorities and others commented on the planning proposal several times throughout the planning process, and brought in important aspects and understandings.

The County Governor’s office as well as the NPRA stated from the start that they would need to file formal complaints if the initiators decided to uphold their proposal to develop a 60.000 m² shopping centre as part of the plan, and recommended to comply to the planning authorities advice to include only 25.000 m². In the final hearings, the two authorities did use their strongest power tool – the formal complaint.

B.3.6.9 The political decision-makers

The decision-makers in the City Council were apparently quite passive in this process. After the case had been sent to the City government, they started the negotiations in order to remove the formal complaint, as they are supposed to according to the PBA. In this phase, the initiators produced a new assessment which was presented for the complaining authorities. The City government also asked the initiators to present slightly reduced proposal and with less parking. Finally, the City government recommended the City Council to adopt the initiators’ plan reduced to 55.000 m².

B.3.7 Explaining how and why a traffic-increasing plan was made

As explained and substantiated above, the understanding here is that the initiators’ proposal including a 60.000 m² shopping centre is the more traffic-increasing alternative. This means that if this alternative is proposed, adopted and implemented, a plan has been made which cause growth in traffic volumes. The following discussion hence regards how and why this alternative was made, and how and why it was upheld despite the reactions from the planning authorities and others.

B.3.7.1 How the initiators proposed and upheld the traffic-increasing alternative

The main cause or reason that this plan was initiated is that the developers want to develop the site and earn money. They also claim that they want to develop something good for the city that will be a contribution to Oslo in its own right.

The developers and their initiators (hired consultants, as the case normally is) are explained by the planning authorities that a shopping centre the size they want to build is not in accordance with overall plan, and can hence not be accepted. The planning authorities have national and municipal policies, strategies and plans to lean on and expertise in the field, and use their power as planning authorities to ensure that the objective of reducing urban road traffic volumes and GHG-emissions and to strengthen the existing retail structure are made prominent objectives in the planning processes.

The initiators are warned that formal complaints will be filed. The developers decide to continue the process and try to get their project true. It is not clear from the documents or the interviews why they take this risk.

The planning authorities decide to propose an alternative 2. This includes a shopping centre dimensioned in accordance with the overall plan and the methods developed for doing such dimensioning. They arrive at 25.000 m² as the right size.

Now the developers need to convince a number of authorities (formally the City Council, the authorities that filed formal complaints, the Ministry of the environment) that the 60.000 m² shopping centre is in accordance with the overall plans. If not, a change of overall plans will be necessary in order to make it possible for the City Council to adopt a legally valid plan. This is made harder by the introduction of the planning authorities' alternative, since it means that they also need to demonstrate that their own alternative does not have worse consequences with respect to the main objectives.

The initiators conduct a number of analyses regarding effect on traffic volumes and retail structure, which shows that the initiators' proposal do contribute to negative effects on existing retail structure and traffic volumes and hence is not in accordance with the overall plans, while the planning authorities' proposal does not. As a response to this, the initiators present their analyses and findings *as if* they show that their proposal is not in conflict with the overall plans. They state clearly that this is the case.

The initiators also argue that they will bring good things to the area, but that this requires that they are allowed to build 60.000 m² shopping. If they are not allowed to build the large shopping centre, there will be no development.

The planning authorities try to answer to these distortions of the debate by explaining what is wrong, how and why it matters, in ways which do clarify the case for those who listen.

After the case was sent from the planning authorities, the initiators' produced even more analyses, which (in short) says that they have got new figures regarding population developments in Oslo, which shows that their proposal does contribute even less to negative effects on retail structure and traffic development and GHG-emissions. The final note accuses the planning authorities and others to have miscalculated the necessary dimensions of the shopping centre, and substantiate this by severely faulty calculations.

B.3.7.2 How this was done

B.3.7.2.1 Strategic misrepresentation

One way of understanding what is going on is that the developers and the initiators consciously are lying with numbers. This would include that they consciously choose input data and assumptions which contribute to make the calculations showing results which make the project appear less in conflict with overall plans than it in reality is, that they cherry-pick the most favourable figures and emphasise these, that they present what they have found in ways that are not in accordance with what they actually have found etc. All this has been documented in the Økern case. Hence, there seems to be no way around explaining how the developers/initiators act as that they are doing 'strategic misrepresentation' as Flyvbjerg et.al. (2002) would express it – or that they are 'lying with numbers' as Wachs (1989) would say. "The most efficient planner is sometimes the one who can cloak advocacy in the guise of scientific or technical rationality" (Wachs 1989:477).

B.3.7.2.2 Causing confusion

Another way of describing or explaining what is going on is that the developers/initiators more or less consciously apply *confusion* as a tactic in order to allow the decision-makers to conclude in accordance with the developers' objectives.

Oreskes and Conway (2010) claim that creation of doubt regarding important causal interrelations has been used as a strategy for misleading the public and to defer necessary decisions and actions in several important policy fields, worldwide and for decades. They describe among others how the tobacco industry has contributed to spread doubt regarding the health effects of smoking and passive smoking, and how the oil-industry and others have done the same regarding whether man made climate changes are real.

Following this line of thought, the initiators in this case need to create confusion and doubt regarding whether a 60.000 m² shopping centre at this site actually *will* cause negative effects on the retail structure and increase of road traffic volumes. If they cause enough doubt, the decision makers can ignore the evaluations from the public authorities and vote for approval of the project. If this was the case here, it has been done well. The impact assessments in this case can absolutely cause confusion and doubt, and this is created in several different ways.

The mix of twisted input data and assumptions, in-transparent calculations and analyses, claims that their findings show something else than they do, cherry-picking selections of findings to enhance and creative ways of making the project appear less in conflict with the sector plan than it is, creates in itself a heavy smoke-screen which has taken this experienced researcher several weeks to overview and to describe to a certain extent.

This can be an efficient way of creating doubt and confusion among those which are not very knowledgeable in the field or can spend a lot of time on reading and understanding what is really going on, such as politicians, the public, and the press. Since they can or do not go behind the smoke screen, they will not be able to understand that one knowledge claim may be stronger and more valid than the other, and that one way of understanding and calculating effects may not be equally valid as another. Instead they may understand it as a dispute between experts regarding equally valid and honest knowledge claims.

This may provide those which for some reason want to accept the proposal with a reason or excuse to adopt it, even if they are warned and aware that this will contribute to growth in

urban road traffic volumes and GHG-emissions and to negative effect on the retail structure. By creating the understanding that the professionals disagree and that one cannot know what is 'right' or 'wrong', decision makers can decide to choose to believe in one or the other of the parties, or to disregard this kind of information.

B.3.7.2.3 Changing focus from overall plan to project

Another way of understanding what is going on is that the developers and the initiators shift the focus of the discussion from the structure approach of the municipal sector plan (many small rather than few large centres) to a project approach (are the negative consequences of the proposed centre tolerable?), from the complex to the simple or from the overall to the local.

Hence, the overall understanding of the complex system and 'what one should do' with respect to development of the retail structure in Oslo in order to reduce or delimit traffic volumes is attacked by quantitative analyses regarding bits and pieces of the structure and the explanations out of context.

The reasoning behind the municipal sector plan for location of retail and services rests on knowledge regarding how the complex system of land use, transport-systems, travel behaviour, and traffic volumes affect each other in dynamic and iterative ways, more or less as described in chapter four in the dissertation and in the previous description of the municipal sector plan. In order to understand how and why one has arrived at this plan (basically – many smaller rather than few large centres) for 'what to do in order to' develop the retail structure in ways which do not contribute to negative effects on the existing retail structure and growth in road traffic volumes, one would need to have or to gain some understanding of this complex system. Hence, it is hard to understand and not least to *explain* the reasoning and knowledge that the overall plans are built upon.

In the planning proposal and the impact assessment, calculations and analyses are carried out which regard for instance whether another location of this shopping centre will cause more or less traffic than if located here. This is hence a discussion regarding what is the better location of a mega-centre in Oslo, while the overall discussion regards whether allowing such centres in the urban structure is desirable at all.

By steering the discussions towards the partly effects of this centre, the more complex and basic discussions regarding the retail structure is avoided.

B.3.7.3 Why the initiators and developers act as they do

B.3.7.3.1 Falling in love

One understanding could be that the developers and/or the initiators believe strongly that the proposed project is very good for the area and for the city, and are acting on basis of their enthusiasm for the project. They have fallen in love with the project. This could cause a 'pink glasses syndrome', which involve a tendency to see and to present the positive effects of the project as stronger - and the negative effects as smaller and more negligible - than they in reality are.

The main impression from the interview with the initiator is that the developers as well as the initiators are convinced that the project will benefit the Økern area as well as the city of Oslo. They understand that their project will cause effects which the public authorities have stated that they will not accept and that it is not in accordance with what is pictured in the

overall sector plan for location of retail and services. However, they think that what they are offering is better than what one is aiming for in the overall plan, that the benefits of their project will over-shadow the costs. If they can only convince 'the others' to see the good qualities of the proposed project, they will understand that this is a good project that should be implemented even if it is not in accordance with the existing binding overall plan.

In an understanding like this, the municipal sector plan, the focus of planning authorities and other public authorities on whether the project is in accordance with the municipal sector plan for location of retail may be seen as pure bureaucratic hindrances which are stopping a great opportunity for the city of Oslo.

Hence, one may be willing to twist data, calculations, presentations of analyses etc. in ways which make the project appear less in conflict with the sector plan and hence allow the City Council to adopt it – or one could more or less consciously do it because one does not see or want to see the negative consequences.

B.3.7.3.1 Prioritising own benefits before societal benefits

Another understanding could be that they want to be allowed to realise their project in order to make money or in order to achieve something else which is useful for them. This would mean that they act in order to gain benefits for themselves, even though they know that this would cause negative consequences for the city and the environment. It would not be an un-expected behaviour for a developer to put benefits for themselves before benefits for society.

If we assume that the developers act in accordance with this, and would do what is necessary in order to get their will through even though it has negative consequences for society and environment, and they think they would get away with it, this could explain that they manipulate the impact assessments. This would be most profitable for the initiators as well, now and with regard to future commissions.

B.3.7.3.3 Preparing for bargain

A third way of understanding this is that the developers claim that a 60.000 m² shopping centre development is necessary, carry out all the tactics mentioned above, in order to establish a room for bargain. They can eventually and reluctantly agree on a 50.000 m² development which is far more than the 25.000 m² offered. By starting higher, they may ensure that they have something 'to give away' in the bargains.

B.3.7.3.4 A mix of reasons

In the Økern-case, it may seem as if all the above described explanations why the developers and initiators act as they do are relevant.

B.3.7.4 Explanation

That a zoning plan including a 60.000 m² shopping centre was made and presented for the decision-makers can now be explained in critical realist terms:

The initiators proposed a plan including a 60.000 m² shopping centre, because this was beneficial for them (for reasons not relevant in this discussion). Because of the conditions (clear overall plan, strong and knowledgeable planning authorities, a second alternative, warnings of formal complaints), the initiators needed to activate the mechanisms 'ousting the objective' and 'ousting the expert knowledge in question' in order to get their project

approved. They did so by applying and playing on objectives, knowledge and powers in diverse ways.

Because of the conditions, the planning authorities could activate counteracting mechanisms 'to make the objective prominent' and 'to apply the expert knowledge correctly' throughout the plan-making process. This was reinforced by the regional authorities. Because of conditions related to the developers/initiators and how they understood their chances to get the plan adopted, they still upheld their proposal.

The two alternatives were presented for the decision-makers with formal objections and strong recommendations from the planning authorities to not adopt the traffic-increasing plan. Hence, one of the alternatives presented was a plan which, if adopted and implemented, will cause growth in urban road traffic volumes.

B.3.8 Relevance of the preliminary explanations

B.3.8.1 Explanations related to the expert knowledge in question

An interesting question in the context of this dissertation is whether properties of the expert knowledge in question, as described in chapter four, may contribute to explaining how and why a plan was made which, if implemented, cause growth in urban traffic volumes in this case.

There are no reasons to claim that properties of the expert knowledge in question cause planners not to apply it, since the knowledge actually is applied. One may, however, claim that the expert knowledge is ousted by competing knowledge and applied wrongly in the initiators planning alternative and analyses. One reason how and why this can be done, is the complexity of the reality that the expert knowledge describes, and hence the expert knowledge itself. The planning authorities do explain as clear as they can how and why the large shopping centre will cause negative effects on existing retail structure and growth in traffic volumes, and how and why the competing alternative has less negative consequences. It still requires knowledge and thinking to understand the implications of this reasoning.

The complexity does also allow the initiators to cause confusion and to change focus by applying and playing on objectives and knowledge. Since few are able to look through the smoke-screen, or even to disclose the most obvious faults (as committed in Civitas 2010), the initiators can present their project as acceptable, necessary and in accordance with overall plans.

This discussion did also reveal shortcomings of the expert knowledge. If the effects of new retail centres on existing retail structure were better understood and described, the knowledge would be harder to disregard and it would be harder to cause confusion. Further, if the methods for assessing such effects were better developed and described, it would be harder to present confusing, in-transparent and misleading analyses. More and better empirical knowledge would improve our understanding of the problem, strengthen the argumentation and reduce the uncertainties. It would be harder to apply the expert knowledge in faulty ways if the expert knowledge in question was presented clearer, deeper, more understandable and with basis in well organised and analysed empirical data.

There are disagreements regarding which knowledge and which answers are more valid in this case. This could be understood as a signal that the quality of the expert knowledge in

question is not good enough. On the other hand, the analyses which are done by the consultants do actually show the same effects and tendencies as the planning authorities claim. It is more in the interpretation and presentation of the knowledge the differences appear. Or – as several of the interviewees expressed it – it is not about the knowledge but about what one wants to achieve.

B.3.8.2 Explanations related to the planners and how they relate to the expert knowledge

Another interesting approach in the context of this dissertation is whether properties of the planners and other professionals involved in the plan-making, and how they relate to the expert knowledge in question, may contribute to explaining how and why this traffic-increasing plan was made.

Neither the case handler at the planning authorities nor the initiators' project leader, have formal competence in overall land use and transport planning for reduced traffic volumes. This also goes for the various consultants the initiators have used (as far as I have been able to find out). The case handler appears knowledgeable in interview, but refers to the overall sector plan in all questions related to underlying understandings of how the system works. She claims to not be very knowledgeable with respect to effects on transport or traffic, but more knowledgeable when it regards effects on existing retail structure. The interviewee at NPRA is trained in overall land use and transport-planning, and has contributed in questions related to traffic and transport volumes.

The quality of the professional discussions could probably have been of higher quality if the involved actors had been even better trained in and knowledgeable about how developments of land use, transport-systems, travel behaviour and traffic volumes are interrelated. The analyses and conclusions of the initiators could have been clearer and less biased if the initiators were more knowledgeable. Biased data and assumptions, misleading and in-transparent analyses, confusing presentations of the findings of the initiators could have been disclosed more clearly if the involved public actors were specialists in this topic.

In this case, there has been demonstrated a clear will from the initiators to manipulate data and assumptions, as well as interpretations and presentations of findings, in ways that present the situation differently than if a more honest application of the knowledge had been chosen. This could be counted as an example of planners that don't want the expert knowledge to be applied. In this case, this is probably because the role as initiator requires that one puts the role of the developer higher than objectives in overall plans. Further, the discipline of the project leader (not planner), may cause that he feels less obliged by the norms and standards of the land use and transport planners to act in accordance with more or less agreed knowledge and norms.

This case demonstrates clearly two *different framings* of the problem. This may also be seen as a situation with *clashes of expert knowledge*, where the expert knowledge in question clashes with an adjusted knowledge regarding retail development and a twisted version of the expert knowledge in question.

B.3.8.3 Explanations related to the plan-making processes

A last question is whether and how properties of the plan-making process, including the objective, knowledge and powers of the actors, and how they interplay, can contribute to examining how and why this traffic-increasing plan was made. The answer to that is obviously yes.

As thoroughly described, discussed and analysed above, the objectives and the expert knowledge in question were introduced into the process through the overall plans, through the comments from a number of commentators, by the introduction of a second alternative as well as other acts by the planning authorities and by the warnings of formal complaints as well as the actual formal complaints filed by the NPRA and the County Governor's office. The objectives and the knowledge were never really ousted from the process. The objective was, however, met by the competing objective of 'ensuring that something good happens here fast'.

Further, the initiators manipulated analyses and results by applying faulty or over-optimistic data and assumptions (according to the commentators as well as the expert knowledge in question), by interpreting these in ways clearly supporting their proposal, and by describing their findings as something else than they in reality have found. They also presented clearly faulty calculations. Further, the initiators brought in competing knowledge regarding retail, and claimed that the planning authorities' lack of knowledge in this field was a severe problem.

All together the initiators were able to create an understanding that in order for something to happen at all at Økern, these developers needed to be allowed to build 60.000 m² shopping. They were also able to present their analyses and findings in ways that made it appear as this would not cause significant negative effects on existing retail structure or larger growth in traffic volumes than 'the alternative' (although it in fact will). Further, they claimed that the planning authorities are not able to dimensioning a shopping centre (in note where they themselves make basic mistakes that cause their calculations to present totally wrong answers, see Civitas 2010).

Except from the last calculations, this is clever and good done. It convinces the majority of the politicians, even though it does not convince the knowledgeable planners at the planning authorities and the NPRA.

B.3.9 Interviewees in the Økern case

- Gro Jensen Vig, Planning authorities in Oslo, department for area development, case handle of the zoning plan for Økern senter
- Ole Falk Fredriksen, Civitas, consultant for the developer, one of three formal initiators of the planning process
- Arne Kolstadbråten, National road authorities region east, case handler for the national road authorities in case Økern
- Tron Willy Myrén, Bjerke district administration, case handle in the district administration in case Økern
- Kjersti Granum, Planning authorities in Oslo, department for urban development, case handler of the sector plan for location of retail and services

B.3.10 Interview guide in the Økern case

The interview guide was adjusted in order to fit each of the interviewees and their role in the plan-making process. The main issues that were discussed were the ones listed in the simplified interview guide.

0. Information about the interview, professional background

1. The plan-making process

1.1 Why have you and your employer acted as you have in this process? Could you do have done something more or something else? In case, what were the reasons why you did not?

1.2 Is the 'Sector plan for location of retail and services in Oslo' good enough? Does it need to be strengthened or improved or changed in any way?

1.3 Has things been going on in this process, which does not show in the case documents, and which I should know about? Meetings - lobbying - others?

1.4 If the political decision-makers adopt the plan, what are the main reasons for that? Who has done their job well enough? Have the decision-makers been informed about the consequences of the project they may adopt?

2. The planners and the analyses

2.1 What do 'the others' want? Do they actually imagine that the world works differently (they have / emphasise a different knowledge), or do they focus on other objectives (what are these)?

2.2 Is the impression that the developers and their consultants do analysis and present results as clearly and honestly as they can? No lies and deception?

2.3 In this case there are clear discrepancies between the perceptions with regards to, among other things, how to measure '2 km from the centre', whether a car share of 45% is realistic, and whether the reduction of market share by 3 percentage points is significant or not. Is this due to deliberate selection in order to make the project look good, or due to actual differences in professional understandings?

2.4 Are there any other errors or omissions that should be mentioned and emphasised in the production or presentation of the analyses?

2.5 Has there been any actual and real discussions which do not appear in the documents but that can shed light on this?

3. The expert knowledge in question

3.1 Are they educated as planners themselves? Do they know the expert knowledge in question well?

3.2 How do they describe the system (land use, transport-systems, travel behaviour, traffic

How and why planners make plans which, if implemented, cause growth in traffic volumes

volumes), and what needs to be done in order to achieving the objectives (focus on reducing urban road traffic volumes)?

3.3 What are the key objectives in this process, and in general? Are the climate change objectives important? Who argues that they are?

3.4 If they are planners and possess the expert knowledge in question, how and where did they learn it, and what are their main references?

3.5 What are good methods for analysing whether a given measure contributes to achieving, or that it does not have negative effects with respect to prioritised objectives (traffic volumes, retail structure)?

3.6 Is our knowledge in this field (coordinated land use and transport planning for reduced traffic volumes) good enough? Theoretical, methodological, accessibility?

B.4 Case Skedsmo: Car-based housing development

Despite objectives and strategies regarding to steer land use developments in traffic-reducing directions, the housing development in Akershus is still to a significant degree taking place as low density development in car-based locations. This causes growth in road traffic volumes. This car-based development goes on parallel with housing developments as densification in central parts of the municipalities. In order to figure out how and why plans for car-based locations of housing developments are made in Akershus, the municipality Skedsmo was chosen as case. A case study including the plan-making processes for three zoning plans were conducted. The on-going municipal plan process seemed to represent a change in how Skedsmo relates to this issue, and this process was studied as well in order to enhance the understanding.

B.4.1 Introduction

B.4.1.1 Present development in Akershus

The continuous growth in road traffic volumes in Akershus, the county surrounding Oslo, has been addressed for years (or decades?). The development is caused by the combinations of population growth, large investments in road infrastructure, lack of investments in and maintenance of the railway system and the public transport services in general, and the land use development in the municipalities in Akershus which to a significant degree has taken place as low density sprawl.

These processes are interrelated. The land use development (together with other societal processes such as the strong economic growth) has caused growth in traffic volumes, which caused congestions and local environment problems. The transport authorities have responded by increasing the road capacity, and hence they have caused and allowed the transport pattern to be more car-based. This, together with the kind of land use development that the municipalities have decided and allowed, have caused and allowed an increasingly more car-based spatial development, which has called for more roads, and so forth.

In the planning strategy and planning program for the latest regional planning process, where the counties Oslo and Akershus are supposed to present a joint land use and transport-strategy, reducing GHG emissions is a main objective (Municipality of Oslo and Akershus County 2011). Oslo and Akershus have both stated that they will reduce the levels of GHG emissions to 50 % of 1990-levels within 2030. At present, the trends go in the opposite directions. The transport sector produces almost 80 % of the GHG emissions in Akershus, and it is growing (Akershus County 2011). Hence, in order to reduce the GHG emissions, the traffic volumes need to be reduced.

This is formulated as “to reduce the total travel demand through a more land use and transport efficient spatial development”, and “to increase the shares of travel by foot, bicycle and public transport” (Municipality of Oslo and Akershus County 2011:18). One may notice that here, as in many similar documents, expressions like ‘reducing traffic volumes’ or ‘reducing the car shares’ are not used.

Despite long term objectives of reducing the (growth) in urban road traffic volumes, among others through a more transport efficient land use development, housing and businesses are continuously being developed in car-based location, demanding and causing growth in road

traffic volumes. More than 50 % of the growth in population and work places took the previous decade took place in non-central and car-based areas, as the figure shows. Within the definitions applied here, large parts of what is defined as 'central areas' is in reality car-based areas and 'with public transport' does not represent public transport services that can compete with road traffic⁵⁶.

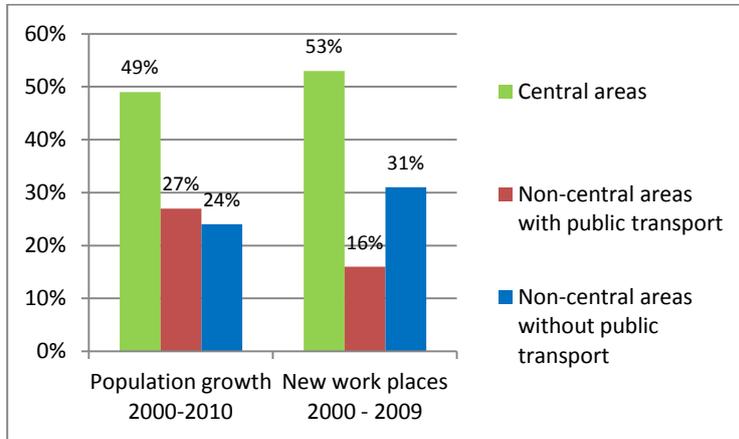


Figure B.7: Population growth and new work places in areas of different centrality in Akershus County, based on data from Furu (2010).

When asked whether the spatial development in general, and more specific the housing development, still is going on in car-based locations and in ways that cause growth in road traffic volumes, the interviewees at the county administration agree that it is. There is work going that aims at concentrating more of the spatial developments in the most central areas in the county, and in several of the municipalities there are much development taking place as densification and infill in the most central areas. Still, they agree, there are a lot of developments taking place as sprawl and in car-based locations.

B.4.1.2 Present development in Skedsmo

Among the municipalities in Akershus that have been working more focused with land use and transport development for reduced transport demand and car dependency, is Skedsmo. In their previous overall municipal plan, under which the three zoning plan processes were carried out, they defined that most new developments in the municipality should take place in the most central parts of the municipality, Strømmen and Lillestrøm (Municipality of Skedsmo 2006).

⁵⁶ 'Central' is in that study defined as within two km from one of the six regional centres in Akershus, or within one km from a municipal centre, high important railways stations or nodal points for public transport services (Furu 2010:1). Non- central with public transport is defined as urbanised areas with bus service with frequency of 1 bus per hour throughout the day, or more and within 500 meter of 'other railways stations' and important bus stops. Non-central without public transport is defined as non-urbanised areas or urbanised areas without public transport services.



Figure B.8: Skedsmo is located in Akershus. The main centre Lillestrøm is about 20 km east of the city centre of Oslo (map from ‘Gule sider’).

When looking at the data for location of population growth in Skedsmo, we find that 35 % of the population growth came in non-central locations in this municipality in the previous 10-years period. This is far less than the average for Akershus.

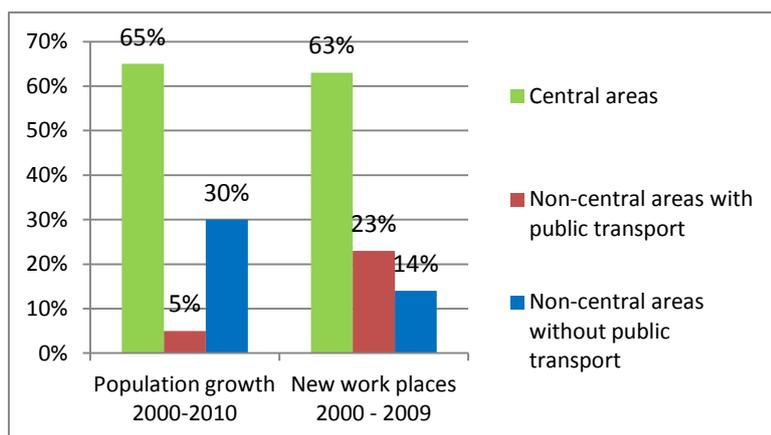


Figure B.9: Population growth and new work places in areas of different centrality in Skedsmo, based on data from Furu (2010).

Still, 35 % of the population growth came in car-based locations, which has caused the traffic volumes to grow rather than to be reduced.

In order to explore and explain how and why plans for car-based housing developments are made, Skedsmo hence seemed to be an interesting municipality to study. They have objectives and strategies related to steer spatial developments in traffic-reducing directions. Still, their land use development takes place in ways which cause growth in traffic volumes. The question is how and why this occurs.

When studying zoning plans for housing projects in car-based locations, it turned out that there was little debate regarding location and traffic generation, and no references to overall plans, objectives or strategies regarding this. As this study was conducted, they were carrying out and concluding their municipal plan process, where they seemed to focus more on the issues under discussion here. Hence, I also included a study of the municipal plan process in this case study.

The housing developments in the new overall plan (2011) are coloured bright yellow in the map below. The densification areas are not clearly marked. The three zoning plans that have been studied are labelled I, II and III.

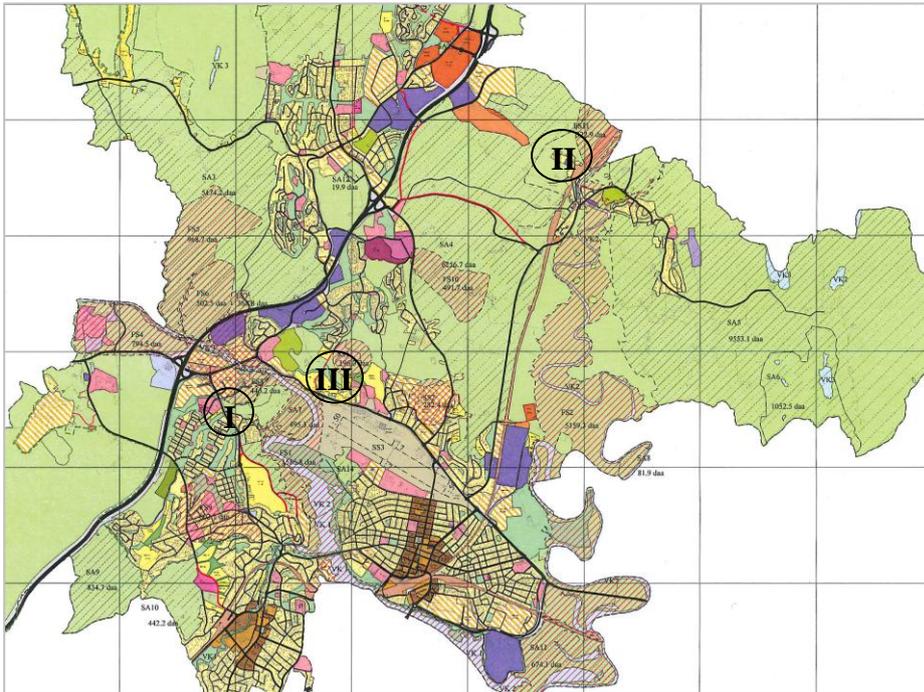


Figure B.10: Municipal plan for Skedsmo (2011), where future housing developments are bright yellow. The location of the zoning plans discussed are labelled I, II, and III.

B.4.1.3 Organisation of the chapter

In the next sub-chapter, the three zoning plan processes will first be briefly presented one by one. These presentations also include a short discussion of how and why they were made, and why they were recommended by the planning authorities. The results of the analysis called for a study of the municipal plan process, which follows in the next chapter. Finally, an analysis is conducted in order to answer to how and why traffic-increasing plans for housing developments are made in Skedsmo. The descriptions and analyses are based on document studies and interviews with planners at the planning authorities' office and in the county administration.

B.4.2 Description of three zoning plan processes

Three zoning plan processes for housing developments were chosen for the case study. They were chosen because they (according to my judgements) were car-based located housing developments, because they had been conducted quite recently and because they were different: with respect to their size; how car-based they were, and; which parts of the municipality they were located in. Two of the cases had the same case-handler (who I interviewed).

B.4.2.1 Overall plans and policies

Regional plans and overall municipal plans call for a coordinated land use and transport-development that contributes to reduce transport demand, traffic volumes and GHG emissions, as described (Municipality of Skedsmo 2006, 2009a, Municipality of Oslo and Akershus County 2011, Akershus county 2011). In the analyses prepared in relation to making of the latest municipal plan (Municipality of Skedsmo 2010) it is also referred to the

governmental purviews for coordinated land use and transport planning (Ministry of the environment 1993), governmental purviews for shopping centres (Ministry of the Environment 2008), and national planning guidelines for climate and energy planning (Ministry of the Environment 2009a) as important frames and premises for steering of land use and transport-systems developments through the overall plan.

B.4.2.2 Zoning plan I: Valstadbråten

B.4.2.2.1 Description of the project

This is a zoning plan proposal for development of seven detached single-families houses on relatively large private sites, in an area dominated by similar housing developments (Municipality of Skedsmo 2008, 2009). The zoning of the area is changed from area for public building and facilities to (mainly) housing. It says in the presentation of the planning proposal from the planning authorities to the political decision-makers that the change of zoning is not in accordance with the overall municipal plan, but that it is politically decided that the area is to be developed with housing⁵⁷. The municipality is the owner of the area.

The location of the site is about four km from the main municipal centre Lillestrøm which has frequent train- and bus services to the whole region, two km from the rail station at Strømmen with about four train departures per hour to Oslo, and about 0,6 km from Olavsgaard public transport node for regional buses. There is bus to Lillestrøm at the main road passing the site. The site has good access to the main road (E6).

This is hence a location from which travels may be conducted by public transport and bicycle to Lillestrøm, and by public transport to Oslo city centre or other places along the main public transport corridors. It is, however, a location which is defined as car-based in this dissertation. Even though it is possible to go by bike and public transport, there is no retail and services, work places or the like in actual walking distance, and the location and the surroundings call for use of the car. Further, most destinations are more easily accessible by car (including good parking access) than by public transport, bike and foot. The exception is trips to and from the city centre of Oslo, where parking access is not good, but which is accessible by train and regional bus.

The question asked here is how and why this plan for a car-based housing development was made and recommended adopted.

B.4.2.2.2 The main actors

The main actors in this case are the municipality of Skedsmo's department for property as owner of the site and initiators of the project and the planning authorities in Skedsmo. The County Governor's office and the County Council administration were not very active in this case.

B.4.2.2.3 The formal process

The planning process in this case was straightforward, and the main events are listed in the table below. Since Skedsmo municipality was both developer and initiator in this case, there was no separate 'planning proposal'.

⁵⁷ Politically decided 03.05.06 against the votes from the Socialist party (SV).

According to the planning documents listed above, there are no indications that consequences with respect to the traffic generating potential were assessed, or that there were discussions regarding whether the location of the new dwelling is in accordance with overall plans.

Table B 5: Summary of the main procedural steps and the main documents in the case 'Valstadbråten'.

Date	Procedure	Document
12.04.07	Announcement of planning process	In the newspapers 'Romerikets blad' and 'Aftenposten'
12.04.07	Notification to main authorities entitled to comment	Letter dated 12.04.07
30.04.08	The plan is processed in 'Formannskapet'	Minutes from the meeting, including the planning authorities presentation of the case
Spring 2008	Public hearing of the planning proposal	Planning proposal, which is the document presented for 'Formannskapet'
15.09.2009	The zoning plan is adopted by the Municipal Council	Minutes from the meeting, including the planning authorities presentation of the case

The comments from various authorities and others are listed in the case documents (Municipality of Skedsmo 2008). The County Governor's office and the County administration both commented that the densities should be higher since the location is relatively close to the public transport nodal point at Olavsgaard, in order to reduce the demand for developing non-developed land in the future.

B.4.2.2.4 Effects of the planned project on traffic volumes

According to overall plans

According to the 2006 municipal plan, the majority of the development in the municipality is supposed to be located in and close to Lillestrøm and Strømmen, in order to among others reduce the growth in traffic volumes. According to this, the planning proposal is not in accordance with a development that contributes to reduce urban road traffic volumes.

According to the initiators

The initiators have not assessed the traffic generation potential of this project. It is not mentioned in the case-documents.

According to commentators

The comments from the County Governor's office and the County administration both seem to be based on an understanding that this location is not car-based, since the location is relatively close to the public transport nodal point at Olavsgaard. Hence, it should have a denser development. This would imply that they find this to not be a traffic-increasing plan, or that they don't focus on this aspect.

According to the planning authorities

The planning authorities do not mention the traffic generation potential of this project.

According to the expert knowledge in question

As presented in the description of the project, the location of this housing project is judged by me as mainly car-based. One may reach a number of destinations by public transport from here, and especially for travels to work in the very centre of Oslo city and in some of the other centres quite far away one may expect a certain public transport share. One may also expect a certain bicycle share on travels to work in the area, to Lillestrøm and to Kjeller.

It is, however, reasonable to assume that this area is and will be mainly car-based, and that trips for shopping, leisure, visiting, work and others will be mainly car-based. This is because few if any such activities are to be found within realistic walking distance, and because the public transport services are not competitive with the private car in this car-based area.

In the region Romerike, 61 % of all trips are made as car driver, 12 % as car passenger 7 % as public transport passenger, 15 % by foot and 5 % by bicycle (Gripsrud and Vågane 2007).

B.4.2.2.5 Alternatives

There were no other alternatives than the one proposed, and nobody suggested other alternatives.

B.4.2.3 Zoning plan II: Leirsund

B.4.2.3.1 Description of the project

This is a planning proposal for development of 16 dwellings built as one- and two-family houses (Skjeseth og Solvang arkitekter AS 2007, Municipality of Skedsmo 2008a). The site was designated for housing in the overall municipal plan for Skedsmo (2006), but not zoned for this purpose (it was 'un-zoned').

The site is located 3-400 meters from Leirsund train station, with one train departure per hour to Lillestrøm, Oslo etc. There are no bus services in this area, and there are no retail services of any kind. The closest centres are Lillestrøm (about 5,5 km) and Skedsmokorset (about 4 km). The closest school is about two km away.

B.4.2.3.2 The main actors

The area covered by the zoning plan has several owners. The developer is Nedre Enger AS (a property company). The initiators running the case are Skjeseth and Solvang Arkitekter AS. Other important actors are the planning authorities in Skedsmo.

B.4.2.3.3 The formal process

The formal process is quite straightforward. The initiators proposed the plan, there were no protests during the public hearing, the planning authorities recommended that the plan was adopted, and the politicians adopted it.

Table B 6: Summary of the main procedural steps and the main documents in the case 'Nedre Enger'.

Date	Procedure	Document
15.11.2006 and 17.11.2006	Announcement of planning process	In the newspapers 'Romerikets blad' and 'Aftenposten'
17.11.2006	Notification to main authorities entitled to comment, neighbours etc.	Letter dated 12.04.07
03.10.2007	Planning proposal received by the planning authorities	Planning proposal from the initiators
12.12.2007	The plan is processed in 'Formannskapet'	Minutes from the meeting, including the planning authorities presentation of the case
03.01.2008 to 05.02.2008	Public hearing of the planning proposal	Planning proposal, as presented in 'Formannskapet'
19.11.2008	The zoning plan was adopted by the Municipal Council	Minutes from the meeting, including the planning authorities presentation of the case

B.4.2.3.4 Effects of the planned project on traffic volumes

According to overall plans

According to the planning proposal presented by the planning authorities to the politicians, this area is designated for housing in the municipal overall plan (Municipality of Skedsmo 2007). This is, however, not in accordance with the intentions in the overall plan regarding to steer the majority of the developments towards the central parts of the municipality, and to areas with access to retail, services and work-places, and with good public transport services.

This is also the conclusion in the analysis conducted by the planning authorities as part of the plan-making process for the 2011 overall municipal plan (Municipality of Skedsmo 2011a). The analysis reasons that since the public transport services in Leirsund are of low quality (one train departure per hour), and since there are no work-places and no services in the area or within working- and bicycling distance, housing developments at Leirsund will be car-based.

According to the initiators

According to the initiators, the 16 dwelling will cause about 50 – 60 new car trips per day on the local road (Skjeseth og Solvang arkitekter AS 2007). This was corrected to 80 car trips per day in the planning proposal. This seems to be too low. 80 car trips per day represents five car trips per dwelling, meaning 2,5 to-and-from journeys (to and from work for instance) per dwelling. According to the national travel survey, people above 16 years do averagely 1,8 car trips per day in Norway (Denstadli et al. 2006). The calculations for traffic generation are, however, only applied for discussing whether it is necessary to widening the road, which it is not.

According to commentators

None of the commentators discussed the traffic generating potential of the zoning plan. The county administration comments that the plan is in accordance with the overall municipal and county plan, according to the planning proposal presented for the politicians (Municipality of Skedsmo 2008a). The County Governor's office arrives at the same conclusion (*ibid*).

According to the planning authorities

The planning authorities do not mention the consequences with respect to traffic generation in the planning documents. They do not focus on discrepancies between the planning proposal and the intentions for spatial development in the municipal plan. This was confirmed by the case-handler in interview.

According to the expert knowledge in question

As presented in the description of the project, the location of this housing development is car-based. The only public transport service is the train, with one departure per hour. There are no work places and no services in walking- or bicycling distance. Hence, this is a very car-based location. This means that it is a plan for a car-based development, understood as a traffic-increasing plan in this dissertation.

B.4.2.3.5 Alternatives

No other alternatives are suggested or presented.

B.4.2.4 Zoning plan III: Nitteberg

B.4.2.4.1 Description of the project

This is a zoning plan for a large housing development on 'new land' (Code: Arkitektur AS 2006, Municipality of Skedsmo 2007). The existing use and regulation of the area before the planning process was initiated was mainly to farmland. The area is about 150.000 m², and it is proposed to construct 400 – 500 dwellings. There will be a mix of single-family and two family detached houses, row-houses and low residential blocks.

The site is located at Nitteberg, about three km from each of the three centres Lillestrøm, Strømmen and Skedsmokorset. The site is close to the large work place 'Institute for Energy Technology', as well as several related business and higher education. In the planning documents, offering attractive housing for highly educated people working here is promoted as an important objective. Three bus-lines pass the area, and there is a grocery shop close by.

B.4.2.4.2 The main actors

The main actors in this process are the housing cooperative at Romerike as developers and initiators, and the planning authorities. The regional authorities did not play important roles in this case.

B.4.2.4.3 The formal process

The first time this zoning plan was proposed, the land was used for farming, and it was designated for this in the overall municipal plan ('LNF-område' in the terminology of the Norwegian PBA). The political decision-makers called for an impact assessment of the planning proposal. This was presented for the decision-makers in 2005, and accepted. The zoning was re-defined to housing in the 2006 overall municipal plan. The zoning plan studied here was proposed in 2006, and adopted in 2007.

Table B 7: Summary of the main procedural steps and the main documents in the case ‘Nitteberg’.

Date	Procedure	Document
2003	Planning initiative	-
June 2003	Zoning plan proposal sent to the planning authorities	Zoning plan proposal
25.08.2004	Zoning plan proposal processed by politicians, call for impact assessment	Minutes from meeting
24.08.2005	The impact assessment is accepted by the political decision-makers	Minutes from meeting, impact assessment document: ‘Nitteberg boligområde – Kjeller, Skedsmo kommune. Konsekvensanalyse (Asplan Viak AS 2005).
23.08.2006	The political decision-makers decide that the zoning plan proposal can be presented for public hearing	Minutes from meeting
11.10.2006	The 2006 overall municipal plan is adopted	‘Municipal plan 2006 – 2017’, where Nitteberg is zoned for housing
07.11.2007	The zoning plan is adopted by the Municipal Council	Minutes from the meeting, including the planning authorities presentation of the case

B.4.2.4.4 Effects of the planned project on traffic volumes

According to overall plans

According to the 2006 municipal plan, the majority of the development in the municipality is supposed to be located in and close to Lillestrøm and Strømmen, in order to among others reduce the growth in traffic volumes. Whether three km from Lillestrøm is understood as ‘close to Lillestrøm’ is hard to tell. Since the area was re-zoned to housing in the municipal plan, one may assume that the politicians understand this as in accordance with the objectives in the overall plans.

According to the initiators

According to the traffic analyses conducted by the initiators’ consultant, the average car share on journeys to and from this area will be 55 % (Asplan Viak AS 2005), which is lower than the average for the region Romerike which is 61 % (Gripsrud and Vågane 2007). Asplan Viak (ibid) found that the expected traffic volumes to and from Nitteberg will be 1.320 cars per workday and 1.200 cars per average day.

They do not discuss the traffic-increasing potential of this project compared to if the project was located elsewhere in the municipality. This would be relevant, since the size of the housing development on this site could cause that other housing projects in other locations were postponed or not proposed.

According to commentators

According to the summaries in the document presenting the zoning plan proposal for the political decision-makers (Municipality of Skedsmo 2007), none of the commentators discussed the traffic generating potential of the project or whether the localisation is in accordance with the intentions in the overall plans. The County Governor’s office and the County administration both commented that they appreciate the high densities of the developments, since this contributes to reduce the pressure on farmland and other green areas.

According to the planning authorities

In their discussions and recommendations, the planning authorities do not discuss the traffic generating potential of the project, or whether construction of 500 dwellings in a car-based area is desirable and in accordance with overall plans.

According to the expert knowledge in question

As presented in the description of the project, this housing development project is located about three km from the closest centres, which means that most trips to and from those centres, for work, shopping, services and leisure, will be made by car. There is bus-connection to Lillestrøm (the main public transport nodal point) and to Oslo. Hence, many trips *can* be made by public transport or by bike. However, the majority of trips to and from this area will be car-trips, and this is will be a car-based housing area. Hence, this is an example of a plan that causes growth in traffic volumes.

B.4.2.4.5 Alternatives

Only one alternative was presented in the planning process.

B.4.3 The relevant objectives, knowledge and powers of the main actors in the three zoning plan processes

B.4.3.1 The objectives of the main actors

Objectives were in general not clearly discussed in the presentations of the planning proposals to the politicians or in the planning proposal prepared by the initiators. It is stated that the intentions with proposing the plans are to be allowed to develop housing on the site, probably in order to earn money (the latter is not expressed, but assumed by me).

The planning authorities do not present or promote any other objectives in the zoning plans. The County governor's office and the county administration can be understood as to promoting the objective of protecting farmland and green areas from development, by calling for higher densities in two of the three cases.

Reducing road traffic volumes is not mentioned by any of the actors in any of the cases. It could be understood as included in the county actors' comments, which focus on the location 'relatively close to' public transport (including the train station at Leirsund). According to the case-handler for two of the cases, one is aware that housing located like these are car-based, but this was not in focus in these plans.

There is no basis for discussing how they relate to the objective 'reducing urban road traffic volumes' in this case, the answer would have to be that they don't relate to it.

The main objective in all cases are to develop housing, and nobody seems to promote any competing objectives.

B.4.3.2 The expert knowledge

When reading the planning proposals, one finds no traces that the expert knowledge in question has been applied in order to assess whether the location of the projects, or to develop housing in these areas, will cause growth in traffic volumes. This is as expected, since there is no focus on this objective in the cases.

B.4.3.3 Exerted powers

In these cases, nobody needed to exert their powers strongly. The initiators exerted their power to propose plans, the planning authorities exerted their powers to process them

according to the PBA, and the majority of the Municipal Council exerted their powers to adopt them.

This also means that the planning authorities, as well as important hearing instances, did not exert their powers to assess whether the projects were in conflict with objectives regarding spatial development and reduction of traffic volumes. They could have exerted agenda-setting power by pointing at overall plans and calling for such assessments, but did not. According to interview with the case-handler, this was mainly because this was not in focus in these plans.

B.4.3.4 Objectives, knowledge and powers in the three zoning plan processes

In the table below, the objectives, knowledge and powers of the main actors involved in the zoning plan processes are listed with reference to the discussions and definitions in chapter six in the main report.

Table 8: Relevant properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes in the case studies.

	Planners working for:	Developer/initiator	Planning authorities	Important hearing instances	Decision-makers
Objectives	Main objective	Realising project	Facilitating the production and adoption of a zoning plan	Spare farmland, avoid local traffic problems	Facilitate development in Skedsmo,
	Is reducing traffic volumes important?	No	No	No	No
	How they understand this objective	-	-	-	-
	Other relevant objectives	-	Development in Skedsmo	-	Enough housing
Knowledge	Possess or know of expert knowledge in question	-	To some degree	It does not show	Probably not
	How they perceive this expert knowledge	-	Good enough	NPRA: good enough	-
	Main references	-	Governmental purviews, guidelines etc.	Governmental purviews, guidelines etc.	-
	What are their main expert knowledge	Architects?	Geographer	Geographer, architect	-
	Alternatives they propose and/or support	Only one alternative	Only one alternative	Only one alternative	Only one alternative
	Methods they apply and/or support	Traffic calculations	None	Only commenting	-
	Causal interrelations they include and/or support	Access to public transport reduces car-dependency	Quality of transport facilities affect choice of transport mode	High densities in developed areas cause less need for new land	-
	Types of outputs	Traffic figures	-	-	-

	How they relate to uncertainties	-	-	-	-
Powers exerted	1. dimension - direct; win or lose in direct battle	Have lead; define main alternative, produce and present analyses and findings	-	Do comment, but not with respect to localisation and traffic volumes	The municipal Council makes the decision. Each politician has less power
	2. dimension – agenda setting; what it is about	Same as above	None exerted with respect to localisation and traffic volumes	None exerted with respect to localisation and traffic volumes	-
	3. dimension – structural; what one thinks is ‘right’ or obvious	Developers should be allowed to develop	Planning authorities are supposed to steer development	Regional authorities should not intervene too much in municipal cases	All (most kinds of) development is welcome

B.4.4 Whether, how and by whom the objective or knowledge were ousted

The objective ‘reducing urban road traffic volumes’ was never introduced in these plan-making processes. Neither was the expert knowledge regarding how to achieve it. This can be explained by lack of focus on this in overall plans, and in general.

B.4.5 How the actors acted when making the traffic-increasing plans

In these cases, none of the actors had focus on reducing traffic volumes or on the overall spatial development, and hence they never considered this as a problem.

- The initiators of the plan proposed a zoning plan that was not in accordance with the intentions and objectives in overall plans, and did hence oppose the overall plans
- The planning authorities did not point out conflicts with objectives in overall plans
- The County governor’s office and the County Council’s office did not deliver comments regarding the car-based location of the proposed housing development
- The planning authorities recommended the politicians to adopt the reduced planning proposal
- The political decision-makers adopted the planning proposal recommended by the planning authorities

B.4.6 Explaining how and why traffic-increasing zoning plans are made in Skedsmo based on studies of three zoning plans

B.4.6.1 How and why the three plans ended up as traffic-increasing plans

To answering the questions how and why the three traffic-increasing zoning plans for car-based and traffic-increasing housing locations were made and recommended in Skedsmo may be easier that in the previous cases.

The short story of how the traffic-increasing plans were made

The short story is that in all three cases, a developer initiated a plan for a housing development that has, judged by me with the help of the expert knowledge in question, a car-based location. During the planning process, nobody pointed at this as a problem or issue, nobody referred to objectives in overall plans regarding reduction of growth in traffic volumes and less car-based localisations of new developments.

Hence, these variables were not identified, predicted or assessed. There were no assessments or discussions in the plan-making processes regarding whether the proposed projects were in accordance with the objectives in the overall spatial plans, or whether they would contribute to growth in road traffic volumes. Neither were there any comparisons between the proposed projects and potential or concrete alternatives (for instance whether the large development at Nitteberg may delay housing developments other places in the municipality which are less car-dependent). In their recommendations, the planning authorities did not discuss the traffic-increasing potential of the housing developments, and they did recommend the political decision-makers to adopt all the three planning proposals.

When trying to explain how and why this was the case in these three plan-making processes, interviews with the planners are useful. The case-handler for two of the zoning plans explained that the traffic-increasing potential of the projects normally was not an important issue in the zoning plan discussions unless it causes problems in the local traffic system, for traffic safety etc. The planning authorities do not bring this issue into the zoning plan processes.

The more complex story regarding 'why'

When asked *why* this is the case, the answers are many and regard different kinds of issues. The bullet-points below sum up suggestions put forward by interviewees in the county administration in Akershus and in the planning authorities in Skedsmo:

- The 2006 municipal plan was more focused on allowing 'things to happen' than to steer development in particular directions, and did hence not call for focus on such problems and discussions
- Akershus and Skedsmo are car-based, and it is hard to change the thinking and imagine totally different futures in the day-to-day planning and decision-making
- Developments are still carried out in accordance with plans that were made before one started focusing on problems related to sprawl and to low density developments
- It is hard to take already regulated areas out of the overall municipal plans
- We (the planners) may not have clarified the consequences with respect to traffic and climate well enough
- Low density developments on new land is the traditional way of developing housing; by expanding existing areas, building on the ridges in order to save farmland, and that land-owners are allowed to sell land for development when it is 'their turn'
- Often the case is that somebody propose a small project which is insignificant, then somebody else in the area do the same etc., and then a development has started which sometimes is hard to get a grip on
- Many people want to live like this, with a one-family house in green surroundings
- This is also a kind of ideal among some planners and many politicians
- Some don't want Skedsmo to become more urban, they want it to 'remain countryside'
- One argument is that the housing areas or the small communities need to develop and grow in order to keep activities, schools etc., even though they are car-based located
- It is in general hard for politicians to reject proposals for development
- Some places (but not in Skedsmo) the land-owners are the main driving forces for such developments

- Counter-arguments against central densification are among others that only elderly people move into the new central flats, and hence this does not contribute to reduced traffic volumes [*sic*]⁵⁸
- In this region, the main road system (E6) has been developed before the rail-system, and this causes pressure for a more car-based developments
- The less central, the cheaper are the sites – this causes a pressure outwards
- It is less complicated to develop projects on new land than as densification in urban areas
- Protection of high quality farmland is often in conflict with central densification

In the interviews, the planners often mention combinations of these issues when explaining how and why traffic-increasing plans are made.

Hence, when developers propose housing project in car-based locations, this will often not be understood as a proposal that needs to be more thoroughly analysed with respect to whether it is a development that cause growth in traffic volumes. Rather, it is a proposal that is in accordance with how one expects housing developments to proceed. If any of the involved actors question whether this is desirable and/or in accordance with municipal plans or more overall plans, guidelines and purviews, they may understand it as useless to bring it up.

B.4.6.2 Causal powers, conditions and mechanisms

The causal powers for these three projects to be proposed, was that the developers wanted to develop housing on the sites, probably in order to earn money (I write ‘probably’ because this objective is never expressed in the zoning plans or elsewhere, but rather implicitly understood). The reasons why the projects were proposed in these car-based locations were in two cases that the land-owners wanted to develop their land. In the third case (Nitteberg) it is not clear why this site was selected. One may say that the sites for development were selected without considerations to whether they were car-based and traffic generating or not. The public transport accessibility is described in all three cases.

When asking why the planning authorities do not bring in the objective ‘reducing urban road traffic volumes’, national purviews or overall municipal plans into the plan-making processes, several of the reasons listed as bullet-points above probably play a part. In interviews with the case-handler, she explained that this normally is not a central issue in zoning plans, at least not in the ones she has been working with. This was confirmed by others at the planning authorities’ office.

The bullet-points above do probably also represent important parts of the conditions which cause that the developers think they will be allowed to develop housing in these car-based locations, and hence that it is worthwhile to propose it. One condition was that the 2006 municipal overall plan, which was in force when the three zoning plans were adopted, was not (according to my reading of it) very clear on the objectives related to spatial development and traffic volumes.

A main strategy for spatial development in the overall plan is that “the majority of the new developments in the plan-period shall take place as densification in the central areas of

⁵⁸ This is probably also related to a (mis-)understanding that older people do not drive.

Lillestrøm and Strømmen in accordance with adopted guidelines and plans” (Municipality of Skedsmo 2006:19). The formulation of the objective is, however, not equally clear. It states that “The spatial development in the municipality will be based on a development on existing built areas, as part of a comprehensive, regional urban spatial structure, based on principles for sustainable development” (*ibid*). Hence, neither the developers nor the planning authorities nor the politicians have had a clearly expressed objective to relate to, even though they had a strategy pointing in a certain direction.

It is also interesting to ask why the regional authorities, which among others are supposed to ensure that the national policy guidelines for coordinated land use and transport planning is considered, did not react to the car-based location of these developments. In their comments to the plan, these authorities have applauded dense developments, and sometimes called for denser developments, without discussing the car-based locations. It seems as if it is possible to arrive at the site by public transport, the location is understood as good and acceptable in this respect. In interviews with the advisor responsible for the region Romerike, which Skedsmo is a part of, she expressed that she finds areas like Nitteberg to be questionable with respect to whether it is ‘right location’ where housing development should be allowed. The reasons listed in the bullet-points above are probably relevant for explaining how and why the regional authorities act as they do as well.

Since no-one focus on the objective ‘to reduce urban road traffic volumes’ or the deduced ‘to develop housing in locations that are not car-based’, there is no reason to bring in the expert knowledge regarding how developments of land use, transport-systems, travel behaviour and traffic volumes affect each other. One could also ask whether the causal relations go in the opposite direction. That would involve that lack of expert knowledge regarding these interrelations caused that the overall plan, its objective and strategies, did not focus on ensuring that land use and transport-systems were developed in traffic-reducing directions. Yet another explanation is obviously that this objective was not prioritised when the 2006 plan was made.

B.4.6.3 Explanation

That zoning plans for car-based housing developments were made and recommended in Skedsmo can now be explained in critical realist terms:

The developers proposed plans for housing developments in car-based locations because this was beneficial for them (for reasons not relevant in this discussion). Because of the conditions (lack of clear objectives and strategies in the overall plan, planning authorities not focusing on this, other authorities not focusing on this etc.), the mechanisms ‘the objective was not introduced’ and ‘the expert knowledge was not introduced’ was activated. Hence, to rejecting the plans was not proposed, discussed, analysed, assessed or compared to the proposed projects. No mediating powers intervened (this could have been the regional authorities or others pointing at national guidelines and the like).

The planning authorities recommended the politicians to adopt the plans, which they did. Hence, plans had been made which, if adopted, will cause more road traffic than if the national guidelines and/or the recommendations based on the expert knowledge in question had been followed.

B.4.7 Relevance of the preliminary explanations

B.4.7.1 Explanations related to the expert knowledge in question

All those that have been interviewed in this case know that the further from the centre new housing areas are located, the more car-based they are, and the more traffic-generating. Further, they all claim that this is common knowledge, which everybody that is professionally involved in planning know or should know. They agree that the locations in the three zoning plans are car-based, even though some argue that one may use bicycle or public transport to and from Nitteberg and maybe Valstadbråten.

In general, they find that our knowledge regarding the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes are good enough, even though it could be improved. This concerns among others the preciseness of the knowledge regarding how dense, how central etc. the development ought to be in different contexts.

Those working directly with the zoning plans claim that overall land use and transport planning is not their main field. From the planning documents we see that other actors did not bring this knowledge into the discussions either.

If the knowledge was more and better available for planners for instance through guidelines, if it was more precise in its advices etc., it may have had more influence. In that case, the lack of application of the expert knowledge is caused by properties of the expert knowledge itself.

B.4.7.2 Explanations related to the planners and how they relate to the expert knowledge

The case-handler interviewed is not educated as planner (but as geographer), and she claimed that overall land use and transport planning is not here special field. There are others at the planning authorities' office who deals with overall planning, localisation, transport etc., she explains. She does have knowledge of the interrelations between location of housing and the traffic generating potential, but seems to not see this as part of her responsibility when working with zoning plans.

One may hence expect that she does not bring the issue into the plan-making process, and that she does not call for application of the expert knowledge in question in order to analyse the traffic-increasing potential of the projects etc. This is also the case, according to herself and to the planning documents.

As reported above, none of the commentators commented that the locations were 'wrong' according to the expert knowledge in question and the overall plans anywhere in the process, and none at the planning authorities' office made any notice of it. This may either be because those working at the planning authorities' office did not possess this kind of knowledge, because this kind of expert knowledge was not acknowledged at the office, or because the consciousness with respect to these issues (location, traffic volumes, and GHG emissions) was low.

B.4.7.3 Explanations related to the plan-making processes

The case-handler in two of the cases explained that whether the location was car-based as well as the traffic generating potential of the projects were not a topic in her cases, and that it normally was not an issue in zoning plans in Skedsmo. The lack of response from others at

the planning authorities as well at the regional authorities' office contributes to the understanding that this is the case.

One way of understanding what happened in this case, was that the overall plan does neither focus strongly on avoiding localisation of new developments car-based locations nor on reductions of (growth in) traffic volumes. A main explanation how and why the three plans for car-based housing developments were made and recommended in Skedsmo could then be that reducing traffic volumes was not a major topic in overall plans, and hence not among the planners at the planning authorities or among the hearing instances. Hence, it was not focused upon as an objective in the zoning plans, it was not brought into the discussions and it was not addressed.

B.4.8 The municipal plan process

Before concluding how and why the three zoning plan processes resulted in traffic-increasing plans, I now turn to the municipal plan process. This process was on-going when this case study was initiated and it had been concluded when the case study was concluded. The study of the municipal plan process is used as a contrast in the final analyses of the three zoning plan processes.

B.4.8.1 Description of the municipal plan process for Skedsmo

B.4.8.1.1 The plan

This is the Municipal plan for Skedsmo, including the general plan 'Development in Skedsmo' and the Municipal land use plan including purviews and the map (Municipality of Skedsmo 2011, 2011b, 2011c). According to the foreword in the municipal plan, this plan focuses more than previous municipal plans on the urban development in the municipality, which areas are supposed to be used for urban development, and how these areas should be used. It has also been produced a climate and energy plan for Skedsmo, and a transport strategy (Municipality of Skedsmo 2009b).

A main problem, as addressed in the municipal land use plan, is to develop a framework for meeting and steering the strong growth that is expected in ways which contribute to achieving the objectives of the municipality. The analyses and the plan were also, according to the case-handler for the municipal plan, a response to problems that repeatedly had occurred in zoning plan processes, and which needed to be debated at a more overall level.

Clear objectives regarding reduction of traffic volumes and GHG emissions were introduced, the strategies were directed towards steering localisation of housing and other activities to the central part of Skedsmo, and the planning authorities hope and think it will be a better tool for steering the development in right directions. The actual plan is, however, quite similar to the previous one with respect to localisation of new housing developments.

B.4.8.1.2 The main actors in the municipal plan process

The main actors in the planning process for the municipal plan are the municipal politicians signalling what they understand as important, discussing proposals and problems along the way, suggesting changes, and finally adopting the plan, and the planning authorities which lead the process and make the plan.

The County governor's office, the County Council and the NPRA play important roles, through commenting on the proposals and give notice about formal complaints regarding

land use developments that is not in accordance with the objectives in the municipal plan and which will cause growth in traffic volumes.

It does not seem, from my studies, that the public has influenced the plan-making and the plans very much in Skedsmo, even though they have been actively invited and have contributed in discussions and analyses.

B.4.8.1.3 The formal process

The process leading towards the proposal for the municipal plan included analyses of the different areas in the municipality, and analyses and impact assessments of various issues. There have been two formal public hearings, where a number of actors have been asked to comment on the plan, and there have been a number of meetings with the inhabitants, those running businesses in the area etc. The political decision-makers have called for changes in the plan.

The planning authorities promoted the advantages related to a dense and urban development instead of sprawl, in order to achieve a more attractive city, reduced traffic volumes and reduced GHG emissions. Analyses were undertaken for each of the clusters in the municipality, discussing whether and how these should be further developed, and which consequences that would have in a coordinated land use and transport development perspective.

In the first proposal that the planning authorities presented for public hearing and eventually for the political decision-makers, some tightening up of the areas for housing development had been made (Municipality of Skedsmo 2010a). This meant that some 'yellow areas' had been removed, and that small scale housing development would no longer be allowed in areas where it would have been allowed before.

In their processing of the plan, the politicians introduced a number of proposals for areas to be zoned as housing. Most of them were rejected through the voting, but a number of areas were approved and taken back into the plan (Municipality of Skedsmo 2011g).

The changes called for a second public hearing. In this process, the County governor's office, the County Council and the NPRA all commented that the land use map was no longer in accordance with the overall objectives in the municipal plan or with national guidelines and the like (Municipality of Skedsmo 2011d). Each of these authorities filed formal complaints against various numbers of the development areas for housing and businesses that had been included. The arguments for the complaints varied, but included among other protection of valuable farmland, that the proposed developments were not in accordance with defined objectives in the municipal plan, that it was not in accordance with the coordinated land use and transport development strategies or with the land use strategies.

The NPRA also included arguments regarding that the developments are car-based, and that developments in such locations will cause growth in traffic volumes. Further, all these actors pointed at the fact than that impact assessments had not been conducted for the areas that had been re-included in the plan.

The municipal administration advised the political decision-makers to accept the comments and complaints, and take these areas out of the plan, which they did (Municipality of Skedsmo 2011e, 20011f). The plan they adopted was hence quite similar to the one the administration had suggested in the first place (Municipality of Skedsmo 2011b, 2011c). This

is a plan with several car-based housing areas, but which is better than it could have been with respect to this.

It will be interesting to follow the development, and see whether the politicians stick to the plan in future zoning plan processes where land-owner and developers agree that they want to develop a certain site or plot, and whether and how the planning authorities and the regional authorities choose to apply their powers in order to ensure that the plan is obeyed.

B.4.8.1.4 Effects of the new municipal plan on traffic volumes

The reasoning in the planning analyses, as well as in the planning documents, is mainly in accordance with the expert knowledge in question, as described in chapter four. The methods applied are various kinds of professional reasoning based on this expert knowledge, knowledge regarding objectives, and knowledge regarding the physical context. In the final plan, the future housing developments are still to a large degree car-based located, as are many development areas for businesses. The better facilitation of central developments may increase the chances to develop these areas first, or to develop Skedsmo 'from the inside and out' as they express it at the planning authorities' office.

Further, as the case-handler for the municipal plan explained, the municipal plan process had contributed to professional development among those working with planning in the municipality, to clearer defined objectives, to a more explained and substantiated plan, and not least to an enhanced consciousness regarding spatial development, traffic volumes and GHG emissions. This may (and that is the hope of the planning authorities) contribute to a stronger enforcement of the plan, meaning that planning proposals that are not in accordance with the municipal land use plan are rejected. This would be a substantial increase of the traffic reduction potential of the plan.

There are stated objectives regarding reduction of GHG emissions and traffic volumes in the municipal plan, and strategies to achieve this, which may be understood as if following these strategies, reduction of traffic volumes and GHG emissions will be achieved.

The municipal map still has large areas for housing developments that will be mainly car-based, and which hence contribute to increased traffic volumes. This is hence a plan for increased road traffic volumes, and not for reduction of traffic volumes. It is nevertheless a less traffic-increasing plan than the previous plan, and the plan-making process itself has probably caused changes that will contribute to reduce the growth in road traffic volumes.

B.4.8.2 Analytical description of the objectives, knowledge and power of the main actors in the municipal plan processes

B.4.8.2.1 Objectives of the main actors in the municipal plan process

The main objectives of the main actors

The municipal plan process is very much about defining the objectives for the future development in the municipality, and the municipal land use plan process is very much about figuring out which consequences this will have with respect to future land use developments and about how the land use ought to be developed in order to achieve those objectives. The land use development strategies are (supposed to be) strong steering signals for how society wants the physical development in the municipality to occur in the foreseeable future.

In the general municipal plan *the politicians* soon arrived at a number of objectives (Municipality of Skedsmo 2011). Under the heading 'Urban Skedsmo' one finds: a sustainable and urban development of Skedsmo where the majority of the development in the planning period is steered towards the central parts of the municipality defined by Lillestrøm, Strømmen and Kjeller; environment and climate friendly transport solutions, and; an urban green structure. Among the strategies under the heading 'business development' is to facilitate urban and central developments of offices and businesses.

In order to achieve this, four strategies are defined: A comprehensive development model; An urban structure; Green structure, and; Coordinated land use and transport development. The latter includes steering developments to the most central areas, to not develop car-based shopping centres, and to define public transport corridors and allow land use developments located to the public transport nodes. This also includes to improving the conditions for bicycling, walking and public transport, use and active parking policy and "give lower priority to the private car than other modes of transport" (Municipality of Skedsmo 2011:16).

The most direct objective formulations related to reduction of traffic volumes and GHG emissions are found under the heading 'Environment, climate, energy' (Municipality of Skedsmo 2011:19-21). It is referred to the Kyoto protocol, to Norway's commitments, and to the amount of GHG emissions Skedsmo can produce in order to be in accordance with the Kyoto protocol. It is explained that the emissions have been reduced since 1991 in Skedsmo due to improvements related to handling of garbage (this is exclusive indirect emissions related to use of electricity as well as energy applied for producing goods elsewhere which are consumed and used in Skedsmo). 70 % of the emissions in Skedsmo is from transport, and emissions from transport have increased by 50 % from 1991 to 2007. Concrete objectives for reduction of GHG emissions are defined; including among other that the emissions shall be 50 % lower in 2030 than they were in 1991. In order to achieve this, five strategies are listed. Strategy three is 'coordinated land use transport planning', and to follow-up the transport strategy.

When discussing transport and climate, it is stated that the objective is to reduce GHG emissions from mobile sources so these are 20 % lower than in 1991 in 2030. This is to be achieved among others by working towards objectives such as "in 2020 are car trips to and from Oslo and to and from other municipalities at Romerike are reduced by 20 % and bicycle trips increased by 20 % in relation to 2007 and public transport shares increased by 20 % in relation to 2011" (Municipality of Skedsmo 2011). Three strategies are listed: to follow the guidelines for coordinated land use and transport planning by concentrating new development centrally and around public transport nodes, to improve public transport services and to improve conditions for walking and bicycling.

The objectives related to reduction of GHG emissions are tougher and more concrete than in the previous municipal plan. Skedsmo are also among the few municipalities that have formulated a concrete objective related to reduction of traffic volumes. According to the Head of Planning and Business in Skedsmo, as well as the environmental planner (both in telephone conversations), these objectives were based on the municipal Energy- and climate plan. This planning process had been started before the municipal plan process. The objectives were formulated in a planning proposal. The politicians called for a tougher plan that achieved the objectives faster. They also suggested more measures to be included in

the plan. The objectives and reasoning from the Energy- and climate plan were included in the municipal plan.

The land use map is to a large degree similar to the previous plan with respect to housing development, even though it has been tightened up to a certain degree (Municipality of Skedsmo 2011c). One may hence claim that the stated objectives and the increases consciousness regarding GHG emissions, traffic volumes and spatial developments are not clearly and directly reflected in the land use plan.

The *County governor's office, the County Council and the NPRA* focused on objectives related to protection of farmland, central location and localisations that are not car-based or cause more road traffic. These were the areas where the regional authorities put most pressure, and which had the most influence in the plan-making process.

From the minutes from the political meetings where the municipal plan was processed, we see that there were several proposals for including various areas for housing, business, golf and other activities (Municipality of Skedsmo 2011e, 2011g). Even in the meeting where the land use plan was adopted, more than 30 different proposals were voted over and almost all were rejected (Municipality of Skedsmo 2011e). This probably expresses that *land-owners, project owners and others* ask their local representatives in the Municipal Council to promote their case, which the politicians do. However, according to the head of planning authorities in Skedsmo, such cases were rejected to a much higher degree now than it has been done in previous plans. It seems as if the politicians take more responsibility for the whole municipality rather than for only 'their area'.

Why this objective became more important

The reason why these considerations became more focused in this planning process and this plan was, according to the case-handler for the municipal plan, more involvement of the planners, a stronger focus on professional knowledge and analyses, and a stronger focus on steering documents from the government and the county.

The case-handler for the transport strategy explained that the transport team at the planning authorities had understood that if the strong population growth that was predicted and wanted in Skedsmo actually happened, they would face severe problems related to transport and traffic. Hence, they had initiated the work with the transport strategy, which had a strong focus on the relations between spatial development and traffic volumes (Municipality of Skedsmo 2009b). This strategy was the foundation for the main strategies in the municipal plan – to build Skedsmo from inside and out and to aim at steering as much as possible of the growth to the central areas of Lillestrøm.

The readings of the documents confirm that these concerns were initiated more strongly through discussions, analyses, and plans regarding transport, energy and climate than through the discussions at the planning authorities. This is based on the observation that the objectives of reducing traffic volumes and GHG emissions are clearly expressed only in those parts of the plan, and not in the land use development parts of the plan.

How the objective 'reducing road traffic volumes' is understood

When asking the head of the planning authorities (in March 2011, in the middle of the municipal plan process) what is meant by 'reducing urban road traffic volumes', she said that this means that the total traffic volumes should not increase. Since the population is expected to grow, this means that the average travel lengths by private car per person have

to be reduced. She expected the traffic to grow the next five years, but to slow down and stop after that. In the final plan, it is clearly expressed that the objective is to reduce the number of car trips to and from Oslo and to and from other municipalities at Romerike by 20 %. This probably means an actual reduction of the locally generated traffic, but not the through-traffic which the municipality has no control over.

Competing objectives

When asking whether there are competing objectives, the case-handlers for the municipal plan and the transport-strategy explain that 'to ensure that something happens' has been the major objective. The main idea in the previous plan was to facilitate development in Skedsmo, without much consciousness of what kind of development this was or where it was located. In the 2011 plan they were much more focused on how they could and should steer the development in directions which was the better for Skedsmo, the region and even the world (GHG emissions).

B.4.8.2.2 Knowledge of the actors in the municipal plan process

Whether and how the expert knowledge is applied

The expert knowledge in question was partly applied in the discussions of what the problems are, in definition of objectives, in discussions of alternative strategies for land use developments, in analyses of consequences if choosing different alternatives (for instance in the analyses conducted for each of the clusters in the municipality) etc. This was done in the initiation of the process (Municipality of Skedsmo 2008b), when suggesting strategies for the municipal plan (Municipality of Skedsmo 2009a), and not least in the plan description (Municipality of Skedsmo 2011). It was also done through analyses and discussions regarding each of the main areas in the municipality (see e.g. Municipality of Skedsmo 2011a).

The ways they apply the expert knowledge is often not very clear or distinct, but rather intuitive and tacit. The case-handler for the municipal plan meant that it was the planners from the municipal transport authorities' office who bring the more clear and precise objective definitions and professional knowledge of this into the municipal plan process. This was confirmed by them.

Whether the actors possess or know of the expert knowledge in question

The head of the planning authorities finds that those working at the planning authorities' office are fully aware of the interrelations between spatial development (location, density) and development of travel behaviour and traffic volumes. She also thinks that among others the regional authorities, the NPRA, and the public transport authorities apply this expert knowledge. This is also the understandings of the others that were interviewed at the planning authorities' office; the case handler for two of the zoning plans and the case-handler for the municipal plan, as well as the interviewees in the county administration.

Further, the head of the planning authorities explained (when interviewed in March 2011, in the middle of the municipal plan process) that many politicians do not yet fully understand these interrelations. Many have a 'car-based' way of understanding the physical surroundings and development, as well as which possibilities there are for future developments and consequences of these. It is the planning authorities' job, she argued, to enable the politicians to understand that they can do other prioritizations and achieve desirable results. It is important to provide the politicians with a good and knowledge-based basis for decisions. This was also emphasised by the case-handler for the municipal plan.

How and why planners make plans which, if implemented, cause growth in traffic volumes

The case-handler for the municipal plan felt that the professional planners were allowed to present and use their expert knowledge more in this process than in previous processes.

This was confirmed by the case-handler for the transport-strategy. He also explained that even though many of those working for the planning authorities know of the interrelations between development of land use, transport-systems, travel behaviour and traffic volumes, and few argue against it, few (maybe only he) possess deeper knowledge of this topic, and are able to conduct analyses and the like. He also explained that even though many think they possess this knowledge, and even though one get the impression that everybody agreed on it, when it comes to concrete cases one realises that there are many and sometimes severe differences in understandings of what 'coordinated land use and transport-development' actually means. This regards for instance what can be defined as 'central' and 'good public transport services'. It is also hard to find data and knowledge regarding similar cities with respect to context, size etc.

How they perceive this expert knowledge

The head of the planning authorities also finds that there is a lot of and good knowledge. The problem is rather to coordinate all that needs to be coordinated, since real life coordinated land use and transport development is complicated. The other two interviewees at the planning authorities expressed that they had not experienced that lack of knowledge with respect to this had been a problem in their work.

The case-handler for the transport strategy, who has been conducted much of the land use and transport analyses and plan-making related to this topic, felt that the expert knowledge has several shortcomings. One regards access to empirical knowledge and data regarding similar cities. The other is some kind of description of the knowledge which explain what is 'central' and what is 'good public transport services' etc. in different kinds of cities.

Which methods that have been applied

In their analyses, the planning authorities at Skedsmo have applied the expert knowledge in question, and conducted professional reasoning in good ways. The problems, objectives and alternatives are clearly discussed and presented. Consequences of certain decisions (dense versus sprawled) are discussed and explained, for each area, with respect to local as well as regional and global considerations.

The case-handler for the municipal plan process explained that the reason why they did these analyses, and applied this knowledge, mainly was requirements in the new PBA, and the stronger focus in the plan-making process on regional development, overall plans, purviews, guidelines and the like. These brought in a stronger focus on for instance reduction of (the growth in) traffic volumes, as well as how the spatial development needed to be in order to contribute to such development. This was reinforced by the impact assessment requirements in the PBA. All this called for application of the expert knowledge in question.

The case-handler for the transport strategy explained that they had applied the expert knowledge in question, together with relevant contextual knowledge about Skedsmo in a process involving deep and sometimes hard discussions among professionals who has knowledge in this field, before arriving at the strategy (a main objective, five sub-objectives, and recommendations for physical developments in order to achieve the objectives.)

How the knowledge is presented

The planning authorities produced and provided a number of good, clear, and well-communicating analyses explaining the alternative development directions, and their consequences (see for instance the analysis of Leirsund, Municipality of Skedsmo 2011a). They emphasised the advantages of choosing densification and central location instead of sprawl and development in all parts of the municipality. This was included in the municipal plan descriptions.

The case-handler for the municipal plan explained that the politicians expressed that they appreciated the clear and professional judgements and assessments of the situation, of the alternative solutions, and of the proposed plan. This makes them more secure with respect to whether the plan they adopt will contribute to achieving the most important objectives. This is also a main reason why the politicians seem to respect the plan and its main ideas. He also explained that this enhances the responsibilities of the planning authorities to present 'true' and good knowledge.

B.4.8.2.3 Exerted powers in the municipal plan process

Planning authorities

This seems to be a case where the planning authorities have applied knowledge as a strong power-tool in order to make a plan which brings in objectives that call for a more central, collected and urban development in Skedsmo. This contributes to achieving several objectives, among others those related to road traffic volumes and GHG emissions.

The planning authorities exerted agenda setting powers by making strong references to overall purviews and guidelines as well as to regional plans and objectives, by setting coordinated land use and transport planning for (among others) reduced urban road traffic volumes in focus from the initialisation of the municipal plan, and through keeping this up throughout the plan-making process by bringing in analyses, discussions and visions. They also exerted direct power in the form of production and presentation of various analyses as well as the plan itself.

The case-handler for the transport strategy illustrated how knowledge had been a power tool in this plan-making process. He explained that the Leirsund analysis lifted the discussions to a more objective and rational level, and revealed the consequences of the different alternatives with respect to car dependency and traffic volumes. This allowed those politicians who did not have personal engagements there to understand that further development of this cluster was not desirable. Suggestions for further development in Leirsund were hence rejected, and they even removed one housing development regulation from the previous municipal plan.

Politicians

The right wing politicians exerted, according to the minutes from the City Council meetings, direct powers to suggest to including new areas for development in the plan. The left wing politicians exerted direct powers to reject almost all of them through voting. This resulted in a second version of the municipal plan which included more development areas than suggested by the planning authorities, and hence a more car-based development. The politicians also exerted direct powers by adopting the plan.

Regional authorities

The regional authorities exerted their direct and agenda-setting powers to file formal complaints against almost all the development areas the politicians added in the municipal

plan proposal (if including the comments from all three regional authorities). This gave the politicians two choices – to do a new turn of plan-making including impact assessments, public hearings etc., or to obey the regional authorities and remove the latest included development areas. They chose to do the latter. Hence, the regional authorities had forced the municipal politicians to adopt an overall plan that was different than what they would have adopted if the planning authorities had not filed formal complaints.

Structural powers

This challenges the structural powers involving that land-owners and developers that want to develop something should be allowed to do so if this does not cause known, direct and large problems for others.

B.4.8.3 Whether, how and by whom the objective or knowledge were introduced and *not* ousted in the municipal plan process

From the documents and interviews this analysis builds on, it seems as a main reason how and why reduction of traffic volumes and GHG emissions and a spatial development leading towards this became important issues was, that this was introduced to the process and written into the plan by the planners at the planning authorities.

The case-handler for the transport strategy explained that they saw and communicated that problems related to transport would occur in the future if the present development continues (Municipality of Skedsmo 2009b). The case-handler for the municipal plan explained that they focused more than before on overall plans, purviews, requirements and recommendations of various kinds, which emphasised this kinds of problems and objectives.

The planning authorities initiated analyses, and conducted several of them, focusing on how development of the different parts of the municipality would affect future traffic volumes. Hence, there was a call for applying the expert knowledge in question. This knowledge already existed in the planners at the planning authorities' office and their collaborators, and could be engaged in the work.

The planning authorities' analyses concluded that the better strategy in order to avoid future transport problems is to build Skedsmo 'from the inside and out', and that the more central the developments are located, the better. They recommended this alternative for future spatial development of Skedsmo. This is in accordance with the agreed recommendations for traffic-reducing land use and transport development, as listed in chapter four.

When the plan was challenged by a political majority in the municipality, the regional authorities ensured that the objective, knowledge and solution were not ousted. According to the case handler for the municipal plan, they probably saw that there were attempts in the municipal system to turn the development in accordance with regional plans and strategies, and followed up on that. The plan that was adopted was a plan that steer housing developments in ways that will cause less growth in traffic volumes than pervious plans as well as the plan that was sent to public hearing in February/ March 2011. It is still a plan where a large part of the housing developments are (mainly) car-based located.

Hence, this was a plan-making process where the objective 'reducing urban road traffic volumes' was introduced, and where it was kept prominent throughout the process – even though this required some fighting. It was a process where the expert knowledge was brought in and applied in several and good ways. These were the main mechanisms through

which a plan was made and adopted which contributes to less traffic volumes than previous plans (at least slightly, and at least when studying only housing developments in detail, as it has been done here).

B.4.8.4 How did the actors act when producing this municipal plan

If relating to the discussions in chapter 6.6, the ‘bullet point version’ of the story of how the actors acted could be as follows:

- The head of planning authorities decided to include her office in the making of the municipal plan
- The transport team pointed at future transport problems if the development continues as present
- The transport team initiated analyses and produced a transport strategy, with the help of the expert knowledge in question, which formed the foundation for the main spatial strategies in the municipal plan
- The planning authorities decided to obey the signals regarding traffic-reducing spatial development from national and regional authorities, and make a plan that was more in accordance with these
- Hence, they applied the expert knowledge in order to define problems, objectives and alternatives, and to analyse what they should do as well as the consequences of these choices
- They presented their findings in clear and understandable ways to the politicians and inhabitants, and discussed even the negative consequences (for instance that a number of land-owner cannot expect to be allowed to sell land for housing)
- They made a plan where housing development is steered in directions causing somewhat less growth in urban road traffic volumes than previous plans (it could have been even better, though)
- The politicians proposed changes which would increase the traffic generating potential of the plan
- The planners at regional level responded by exerting their direct and strong power tool – the formal complaint – in order to ensure that the less traffic-increasing solutions were upheld
- The planning authorities advised the politicians to accept the signals from the regional authorities
- The politicians decided to take most of the disputed areas out of the plan
- Hence, a somewhat less traffic-increasing plan was made and adopted

B.4.8.5 Explaining how and why this municipal plan was made in Skedsmo

That a municipal plan for a less car-based housing development were made and recommended in Skedsmo can now be explained in critical realist terms:

The time had come for revision of the municipal plan in Skedsmo. This was the main cause why the planning process was initiated. The mechanisms ‘the objective reducing traffic volumes were introduced and not ousted’ was triggered by inspiration from national and regional emphasis on reduction of traffic volumes and GHG emissions, as well as the initiative from the transport team to focus on future traffic problems and how they can be avoided.

Because of the conditions (the professionals and their knowledge was brought more into the plan-making process, knowledgeable planners), the mechanisms 'introduction and application of the expert knowledge' was triggered. The planning authorities applied the expert knowledge in question and produced relevant, clear and understandable analyses, plans and recommendation in the municipal plan process. When these were challenged by a political majority, the regional authorities pointed out that the plan was in conflict with the objectives, and hence could not be approved. The politicians accepted the complaints, and adopted the less traffic-increasing plan, in accordance with the recommendations from the planning authorities.

B.4.8.6 Relevance of the preliminary explanations in the municipal plan process

When studying the municipal plan process it is relevant both to ask how and why the change towards more clear and ambitious objectives regarding GHG emissions, traffic volumes and spatial developments happened, and to ask how and why a plan still was made which steer housing developments in car-based directions.

B.4.8.6.1 Explanations related to the expert knowledge in question

It seems as the existence of usable and accessible expert knowledge was necessary in order to make the objectives of changing the spatial development in more traffic-reducing directions in Skedsmo more prominent, and to enable production of a plan that draws more in that direction than the previous plan did. The existence of this knowledge was hence necessary in order to arrive at the adopted plan, and in order for it to be adopted.

When asking why car-based housing developments still are included in the plan, the answer is probably to be found in consciousness and old way of thinking rather than in shortcomings of the expert knowledge. There is for instance in the discussions regarding localisation in accordance with the ABC-principle presented tables for how far from high frequency public transport stops dwellings should be located in order to facilitate that the inhabitants use public transport instead of car. If somebody had applied these tables in analyses regarding whether the housing development areas in the plan are car-based, they would easily have found that they are.

Only one of the interviewees at the planning authorities saw himself as expert in overall land use and transport planning. The 'non-experts' with respect to this had not experienced that shortcomings or weaknesses of the expert knowledge in question, or lack of such knowledge, had been a problem in any way in the plan-making process.

The case-handler for the municipal plan expressed, however, that there was lack of understanding regarding how developments in various areas affected other areas, and which measures that were better to apply. This may be understood as an expression for shortcoming of the expert knowledge itself, or for lack of this knowledge at the planning authorities.

The case-handler for the transport strategy felt that the expert knowledge has several shortcomings. One regards access to knowledge and data regarding similar cities. The other is some kind of description of the knowledge which explain what is 'central' and what is 'good public transport services' etc. in different kinds of cities.

He also explained that even though many of those involved know of the interrelations between developments of the expert knowledge in question, few possess deeper knowledge

of this topic, and are able to conduct analyses and the like. Even though one get the impression that everybody agree on what 'coordinated land use and transport-development' actually means, one often see that when it comes to concrete cases there are many and different understandings. This regards for instance what can be defined as 'central' and 'good public transport services. It is also hard to find data and knowledge regarding similar cities with respect to context, size etc.

B.4.8.6.2 Explanations related to the planners and how they relate to the expert knowledge

Among the three interviewees that had been directly involved in the municipal plan process, and who had been selected for interview because I understood them to be central actors, two agree that they have been trained as planners and one of these that he has formal training in coordinated land use and transport planning. They are all experienced planners. One may still expect the skilfulness and knowledge with respect to the expert knowledge in question to vary. All three work for public authorities.

The focus on a spatial development which minimise car-dependency and growth in traffic volumes seem to have originated from the transport team. The concrete reduction objectives (Municipality of Skedsmo 2011:20) seem to have been introduced by the municipal department of environment. It seems as bringing in the professional milieu at the planning authorities' office, this objective and this expert knowledge were automatically and somewhat collectively engaged and employed. Some few main persons in the milieu possessed knowledge about the objectives and requirements, as well as the expert knowledge in question, and were able to bring this into and apply it in the plan-making process.

If planners in the milieu had not possessed this knowledge, and if the planners in the milieu had not respected this milieu, or if the planners involved had not called for this knowledge, other kinds of knowledge might have had stronger influence, and another plan could have been made.

B.4.8.6.3 Explanations related to the plan-making processes

When discussing the case with the case-handler for the municipal plan, he was clear that a main reason how and why the focus shifted and the plan was improved with respect to the issues discussed here was that the head of the planning authorities engaged and involved a number of planners at the office in production of the municipal plan. This involved a more professional and analytical approach, which included an orientation towards governmental and regional initiatives, plans, purviews, and other requirements.

The case-handler for the transport strategy pointed at the initiative made by team transport with respect to analysing arising transport problems, and their recommendations for how to deal with this through spatial developments, formed the basis for the further discussions in the municipal plan process.

One may, on the basis of this, claim that the planners to a larger degree than politicians or administrators do see for instance reduction of traffic volumes or protection of farmland as relevant and important objectives, and that professional planners feel that it is their duty to bring forwards such objectives. If this is the case, the objectives in question may be understood to be 'embedded' in the planners and 'released' in this plan-making process. One may also assume that all planners involved to a higher degree than the population in

average, including the politicians, possess the expert knowledge in question. Further, they have easier access to this knowledge through persons, written knowledge etc.

In this case they were also allowed to exert the direct and indirect powers of pointing at overall plans and requirements and to make the analyses and the planning proposal. Hence, that professionals and their expert knowledge were engaged in the plan-making process is probably a main explanation. If this had not happened, the plan would have been a more traffic-increasing plan.

When the municipal politicians decided to include new and traffic-increasing development areas, this was stopped by the regional authorities. If they did not have the powers to file formal complaints, or if the objectives were not as clearly formulated as they were in the municipal plan, they could not have filed these complaints. If the formal complaints against re-introducing traffic-increasing development areas in the plan had not been made, these areas would have been included, and a more traffic-increasing plan would have been made.

When asking how and why the traffic-increasing housing development areas are still included, the answers are probably to be found in the bullet points listed when discussing how and why the zoning plans ended up as traffic-increasing plans. The case-handler for the transport strategy explained that land owners, developers and others are used to and pleased with how things have been, since this suits them. Hence, they are critical to the changes proposed in the municipal plan.

B.4.8.7 How the municipal plan and the process may affect future zoning plan processes

The municipal plan defines the frames for future zoning plans, and it is through these zoning plans the future physical development in Skedsmo will actually be decided. An interesting question is hence whether and how the new municipal plan, and the process through which it was made, will contribute to a less car-based development in Skedsmo in the future.

The municipal land use plan (the map and the purviews) itself still contains car-based housing developments, and may in that sense contribute to a car-based development. There have, however, been stated concrete objectives regarding reduction of traffic volumes and GHG emissions, and clearer strategies regarding how to achieve this. The municipal plan has hence become a stronger tool for steering developments in those directions, for the planning authorities, for other municipal authorities, for regional authorities and for politicians that aim at achieving these objectives. Whether this becomes a powerful tool depends on whether and how these actors apply it, and whether the local politicians respect the plan they have adopted.

Further, the new municipal plan does facilitate the central development Skedsmo aims at achieving in a better way than previous plans. This may allow the municipality to point at such locations when developers want to construct housing (or other activities), and to argue that there is enough capacity for housing developments without allowing new and large development sites outside the central areas of Skedsmo (this may even contribute to reduce consumption of farmland).

According to the case-handler for the municipal plan, this plan is better explained and substantiated than former municipal plans have been. This makes it a stronger tool in debates, and not least a better tool for the case-handlers for zoning plans. They can (and shall) now use the reasoning, explanations and arguments from the municipal plan when

heading and commenting on zoning plan proposals. This allows even those that are not experts in this field to be responsive to issues regarding car-based location, growth in traffic volumes and in GHG emissions. The expert knowledge has been made more accessible and available.

This also increases the predictability of the planning authorities in planning processes. This may cause developers to focus on central projects rather than to fight the municipal authorities in order to be allowed to carry out more peripheral projects.

The planning authorities conducted a number of analyses related to the municipal plan, including a transport strategy and a strategy for energy, climate and environment. They did most of this work by themselves. According to the case handler for the municipal plan, this has contributed to development of the knowledge and self-confidence among those working at the planning authorities and other relevant authorities, as well as to enhance their consciousness regarding these (and a number of their) issues.

This also enables them to be more precise in their requirements for analyses and the like to initiators and their consultants, and to question plans and analyses that are presented for them. According to the case handler for the municipal plan, they are fully aware that the consultants are speaking the case of their employers, and hence that one as a rule can expect the analyses to underestimate the negative consequences of a project and to over-estimate the positive.

As a follow-up of the transport strategy, a transport analysis will be conducted in order to assess the transport consequences of the population growth and spatial development in Skedsmo. Team transport hope to start the process of making a transport plan with an action plan, which can be an important contribution to the next municipal plan process.

According to the head of the planning authorities and the case-handler for the municipal plan process, there has been much public interest and debate regarding this plan and what it aims at achieving. This may have contributed to enhancing the understanding and consciousness regarding these issues among the politicians and the general public as well, breaching the grounds for them to understand and accept why certain projects cannot be allowed. This may cause that more zoning plans proposing housing developments in car-based locations that are not zoned for housing in the municipal plan may be rejected.

Hence, even if the municipal land use plan still allows car-based housing developments, it has become a stronger tool for steering the development in the opposite direction. Further, the plan-making process has enabled the planners to help this development occur. Whether this will be the result depends on whether and how this tool is applied by planners in various positions.

B.4.9 Re-analysing the objectives, knowledge and power of the main actors of the zoning plan processes

Re-analysing the three zoning plans, with the municipal plan process as backdrop, may allow clearer analyses regarding how and why the traffic-increasing housing development plans were made and adopted can be made. The main finding is that this supports the previous findings.

B.4.9.1 Objectives in the processes

The main objectives of the developers were and are to develop housing in order to earn money and probably also to contribute to society in good ways. The objective 'reducing traffic volumes' was not present at all in the zoning plan processes, while it was introduced as clear and prominent in the municipal plan process.

The lack of consciousness regarding reduction of traffic volumes, GHG emissions and less traffic-increasing spatial developments at the planning authorities' office became more visible when compared with enhanced consciousness regarding these matters in the municipal plan process. This was also directly expressed by the case-handlers for the zoning plans and the municipal plan.

The regional authorities were concerned with objectives regarding that new development areas being car-based (but not very clearly, except from the NPRA) in the municipal plan process, while they in the zoning plan processes were more focused on objectives regarding high densities in development areas in order to hinder consumption of farmland, and of local traffic problems.

B.4.9.2 Knowledge in the processes

The professional reasoning with the help of the expert knowledge in question applied in the municipal plan process is a contrast to the lack of such analyses in the three zoning plans. In those cases, simple traffic calculations were applied for arriving at the direct traffic generation related to each project. This could be an indication that the expert knowledge in question is not available enough for those planners that are not experts in this specific field.

The problems, analyses, findings, plans and recommendations are clearly expressed in the new municipal plan, even though it may be much to read if one aims at reading and understanding it all. This knowledge can be applied by planners in future zoning plan processes. This was not the case for zoning plans being made under the previous municipal plan. Hence, this problem was not addressed in the zoning plans, and the plan-documents did not inform readers and decision-makers about the traffic generating potential of locating developments that way.

B.4.9.3 Power in the processes

In the zoning plan processes, nobody used their powers with force. Everybody played their part, nobody protested, and traffic-increasing plans were made and recommended.

In the municipal plan process, the planning authorities applied the expert knowledge in question as power tool in order to put traffic-reducing spatial development on the agenda, and to persuade the involved actors that this is a right and good development for the local, regional and global society and environment.

When the politicians proposed changes of the municipal plan which would have turned into a more traffic-increasing plan, the regional authorities filed formal complaints. In the zoning plans, they argued to increase the number of dwelling in each plan, despite the car-based location, instead of comment on the traffic-increasing potentials of such projects.

This demonstrates that the planning authorities as well as the regional authorities could have used knowledge, comments and complaints in order to stop the previous car-based zoning plans for housing developments, but did not.

B.4.9.4 Conditions causing and allowing that traffic increasing plans were made

The main mechanisms allowing the three traffic-increasing zoning plans for housing developments to be made and recommended in Skedsmo, was that the objective reducing urban road traffic volumes and the knowledge of how to do it was never introduced in the planning processes.

Based on the previous analyses, the main conditions allowing the causal powers to work through these mechanisms and produce traffic-increasing plans can be summarised:

- There was no strong focus on reduction of traffic volumes or on traffic-reducing spatial development in the overall municipal plan or from the leaders in the system, and hence there was not a strong consciousness with respect to this among the case-handlers for zoning plans
- The case-handlers working with the zoning plans were not specialised in overall land use and transport planning, and did not have the necessary expert knowledge in this field to take independent initiatives with respect to this
- Nobody in the planning system pointed out that the plans were in conflict with for instance national purviews for coordinated land use and transport planning, meaning that a number of authorities did not apply their powers in order to maintain their responsibilities

Since there was no focus on this issue, and since the expert knowledge in question was not applied, plans were made which cause growth in urban road traffic volumes. If any of the above listed points had been different, this may have caused that the traffic-increasing plans were not made and recommended.

B.4.10 Relevance of the preliminary explanations

One may claim that if the *expert knowledge* regarding the interrelations between spatial developments, development of transport-systems, travel behaviour and traffic volumes were more accessible, as guidelines from the Ministry of Environment or a 'text book' for planners for instance, the planners involved could have been more conscious with respect to this. This could also clarified which kinds of land use and transport development which actually cause less transport demand and growth in traffic volumes, and which that cause growth in traffic volumes. More precise empirical knowledge, preferably organised with respect to main features of the context of different cities and towns, would have been an improvement too.

Explanations related to *the planners* may be relevant here. None of the planners or other professionals involved reacted to the car-based development proposed in the zoning plans. The case-handler in the municipality explained that 'it was not in focus'; also meaning that she did not focus on it. Even though one cannot blame the case-handlers for the result, one may suggest that if the case-handlers were better trained in the interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes, as well as the interrelations between traffic volumes and problems with respect to the environment and the climate, they may have been more aware and hence brought this issues into the discussions.

The same probably goes for the other professionals involved in these processes, and which did not point out the fact that these projects were car-based and traffic-increasing, and hence in conflict with national purviews as well as with regional plans. The case-handler for

the zoning plans expressed that the focus on these issues in the new municipal plan may cause higher awareness of this in future zoning plan processes.

In the plan-making processes, none of the planners involved promoted the objective 'to reduce urban road traffic volumes', none of them brought in or applied knowledge regarding how to achieve it, and none of them exerted their powers to bring this on the agenda. Hence, traffic-increasing plans were made and recommended.

B.4.11 Interviewees

Lena Skjøthå Bilic, case-handler for two of the zoning plans, planning authorities in Skedsmo

Anders Jørstad, case-handler for the municipal plan, planning authorities in Skedsmo

Øyvind Lesjø, case-handler for the transport strategy, planning authorities in Skedsmo

Sara Polle, policy adviser – planning and the environment, Akershus county administration

Torild Fagerbekk, Head of the planning authorities in Skedsmo

Einar Midtsund, policy adviser – planning and the environment, Akershus county administration

I also had short, but useful conversations on phone with Head of planning and business in Skedsmo, Andreas Bjørnnes and Environment planner Sigrid Louise Bjørnstad.

B.4.12 Interview guide Skedsmo

Position and professional background of the respondent

1. About housing development in Skedsmo

1.1 Is housing in Akershus still developed as sprawl and in car-based localities? Why?

1.2 Is housing in Skedsmo still developed as sprawl and in car-based localities? Why?

1.3 Can you mention concrete developments? Are there conflicts regarding these developments?

1.4 Why do they choose to build spread (old plans, ideals of living in the green, ideals of balanced development, strengthening all parts of the municipality, filling up the schools, landowner-driven, policy makers, others?)

1.5 Who are the main driving forces for sprawled housing developments in car-based locations?

1.6 How do they act in order to get approval for such plans?

2. In a chosen zoning plan (which is example of car-based housing development)

2.1 Why was this plan, which is an example of car-based housing development, and contrary to the overall plans, made and recommended to be adopted?

2.2 Did you submit an alternative? Did the planning authorities actively use any measures in order to bring up an alternative to the plan?

2.3 How was expert knowledge applied - from everyone's side – in order to get their will through?

2.4 What knowledge /arguments /considerations were decisive, and caused that the plan was made and recommended?

2.5 What other considerations contributed to the plan was made and recommended?

3 Objectives

3.1 Is reduction of road traffic volume and objective in Akershus? In Skedsmo?

3.2 Is this an important topic in zoning plans?

3.3 Is this a realistic goal - can it be achieved? What will it take?

3.4 In which direction does the trend go now (plans, traffic volumes)?

4. Knowledge

4.1 Is it accepted knowledge that housing developments as sprawl and in car-based locations cause more road traffic than housing development as densification in and close to the main centres?

4.2 Is this common and accepted knowledge? Who does not know this/ disagree with it / think it's insignificant?

4.3 What kind of knowledge base is it referred to? Is there literature or the like that you can refer to?

4.4 Who possess, apply and argue with basis in this knowledge?

4.5 How is this knowledge applied – what data are collected, which questions are formulated, what strategies are drawn up, which consequences are considered, what alternatives are compared, etc.?

4.6 Is our knowledge in this field (coordinated land use and transport planning for reduced traffic volumes) good enough? Theoretically, methodologically, accessibility?

4.7 How do you think new housing should be located so that they will not be car-dependent and traffic-increasing?

4.8 Is there competing knowledge that outperforms the expert knowledge in question?

How and why planners make plans which, if implemented, cause growth in traffic volumes

What knowledge, in which way, and with what consequences? Who brings in this knowledge, and promotes it?

5. Is there anything else I should know?

B.5 Case E 18: Increased road capacity on urban motorway

The traffic and environment problems on E 18 west of Oslo have been addressed for two decades. Alternative ways of dealing with the problem have been discussed in a number of regional plans, large zoning plans and the like. The NPRA have worked with plans for increasing the road capacity for at least 15 years. The professional milieus have analysed the problem several times, and every time arrived at the same conclusion: increasing the road capacity on E 18 west will not in itself solve the problems. NPRA initiated in 2009 a new planning process for E 18 west, and the plan-making in this process is in focus here. New analyses have been presented of the effects of increasing the road capacity, and it has been found that the new road capacity may worsen several of the problems they are supposed to solve if additional measures are not implemented. The NPRA propose to construct a new road with increased road capacity. Nobody has called for or presented alternative solutions with reduced traffic capacity. The question here is how and why the professional planners produce this planning proposal. The process is on-going.

B.5.1 Introduction

The descriptions and analyses are based on document studies and interviews with planners at the planning authorities' office and in the county administration.

B.5.1.1 Development in the west corridor

The continuous growth in road traffic volumes in Akershus, the county surrounding Oslo, has been addressed as problematic for years (or decades). The development is caused by the combinations of population growth, continuous investments in road infrastructure, lack of investments in and maintenance of the railway system and the public transport services in general, and the land use development in the municipalities in Akershus which at least partly has taken place as low density sprawl.

These processes are interrelated. The land use development (together with other societal processes such as the strong economic growth) has caused growth in traffic volumes, which caused congestions and local environment problems. The transport authorities have responded by increasing the road capacity, and hence they have caused and allowed the transport pattern to become more car-based. This have caused and allowed an increasingly more car-based spatial development, which has called for more roads, etc. This, also stimulates to a more car-based spatial development, and the municipalities have decided and allowed this to happen.

E 18 west of Oslo is an urban motorway, passing the municipalities Asker and Bærum west of Oslo, and eventually crossing under the city centre of Oslo on its way to Sweden and Europe. It has been congested for many years, and the road and the traffic are understood as local environmental problem in Bærum.

Alternative ways of dealing with the problem have been discussed in a number of regional plans, transport analyses, large zoning plans and the like, and the NPRA has worked with plans for the road system for about 20 years. The professional milieus have analysed the problem several times. They have arrived at the same conclusion every time: increasing the road capacity on E 18 west will not alone or in itself solve the problems.

An expected continuation of the strong growth in population and work places in Oslo and Akershus is an important backdrop for the plan-making processes discussed here. The west corridor municipalities, and not least Oslo, have experienced a strong population growth the last 20 years, and this is expected to continue. The road traffic has had a strong and steady growth in Akershus, and GHG emissions caused by road traffic in Akershus increased by 45 % in the period 1991 – 2004 (NPRA 2009a).

The traffic in the west corridor is mainly local traffic, in the sense that about 40 % of the trips both start and end in Asker or Bærum and 45 % either start or end in one of the municipalities Asker and Bærum (NPRA 2009a). Only 14 % of the trips go straight through the two municipalities without stopping. 65 % of the trips in the two western municipalities are made by car.

The plan-making process discussed here regards the planning initiative that was initiated by NPRA in 2009, and which is supposed to end in an area plan for the west corridor. The question is how and why the professional planners involved have produced the analyses, the planning programme and the proposals recommending alternatives involving to increase road capacity on this congested urban motorway, which will cause and facilitate substantial growth in traffic volumes.

B.5.1.2 Previous planning initiatives

The history of the planning process in question is long, and it involves numerous political and professional aspects. It is also more or less directly connected to a number of other planning- and policy-processes. The presentation of the case here is narrowed down to the discussions regarding how to solve the problems related to traffic and environment in the west corridor, and to the latest plan-making process for the corridor and for E 18.

Some of the history of the project is anyhow included, in order to define the background of the process that is described and to increase the understanding of how and why plans are made which cause growth in urban road traffic volumes.

This regards the planning going on until 2002, where the second impact assessment of two alternatives – with and without substantial increase of the road capacity – was concluded. Further, the Oslo package 3 process, and its impacts on this project, has been described briefly.

B.5.1.2.1 Discussions, analyses and plans for E 18 west 1994 - 2002

What could and should be done in the West Corridor

The discussion regarding what to do about the E 18 west situation has been going on for many years. I conducted in previous works a study of the process revolving around the second phase of the impact assessment of the E 18 West corridor, which was approved in 2002 (Tennøy 2004b). The focus was on how transport analyses were applied as tool in the plan-making processes and planning analyses, and how this affected the planning and the plans.

Calls for alternatives to increase of road capacity

The short description of the west-corridor case in the 2004-report was that this was a process revolving around how to solve the problems related to congestion and the environment. Building more road capacity had been the obvious solution in the past. In this case, there was a clear political will to find alternatives to increasing road capacity, since it

was evident that this would increase the overall traffic load in the region as well as in the inner city of Oslo (Municipality of Oslo 1994, 1997, 2001, Akershus county and Municipality of Oslo 1997, NPRA Oslo and NPRA Akershus 2000, Akershus County 2003).

There were calls for development of objectives related to reduced transport demand, reduced car use, increased shares of all other means than the private car etc., as well as for analyses regarding which measures that could and should be applied in order to achieve this. All major measures were mentioned: land use development, improvement of public transport services and conditions for walking and bicycling, as well as physical and fiscal restrictive measures on road traffic. It was a clear requirement from Oslo that the traffic loads on the inner parts of Oslo should not increase.

Two alternatives

The NPRA was asked by the responsible political bodies, supported by the local and regional planning authorities, to conduct analyses of two alternative strategies. Alternative 1 involved new E 18 with increase road capacity on most of the distance. Alternative 2 involved to reduce the delays for the bus traffic with the help of as little as possible expansion of the road system (NPRA Oslo and NPRA Akershus 2000).

Criticized transport analyses

The NPRA solved the task by applying model based transport analyses, concluding that road traffic volumes will continue to grow no matter what means are used in order to reduce the road traffic volumes.

The analyses were criticized by a number of actors, for a number of reasons. When looking into the transport analyses and how they are described in the planning documents, it became clear to me that transport-reducing means (such as improved public transport services, land use instruments or parking restrictions) were not really included or considered in the analyses (Tennøy 2004b). The main reasons for this were given by the NPRA Oslo and NPRA Akershus (2000) as: the models used for the analyses could not cope with such means⁵⁹ (or the necessary combinations of means); that such means were not within the responsibilities and control of the NPRA, and that one could not find clear theoretical evidence that such means would affect road transport demand or traffic volumes.

After lengthy discussions, the final analysis was run as a 'fixed matrix' analysis; the same amount of traffic was run against three different road systems. Results from this analysis were used in the further cost-benefit analyses etc. as basis for decision-making. The recommendation from the NPRA was to build the road system with the highest capacity, despite the fact that this would eventually increase urban road traffic volumes (this was anyhow concealed by the fact that fixed matrix analyses were applied). Several actors

⁵⁹ The transport model used in the case has been developed for the Oslo-area, and is used when doing analyses of large scale transport infrastructure changes in this area. Similar models are used in many other urban areas. One could argue that the analyses would have been carried out in a better way if a more updated or advanced model had been used. Still, models can probably not be developed far enough to be able to deal with the complex interrelations between development of transport-systems, land-use, travel behavior and traffic volumes. There is no room for substantiating this claim here, but this is dealt with in detail by Næss (2006a) and Tennøy (2004b).

disagreed strongly to the analysis and the recommendations, and the project or plan was let to rest for a while.

Interesting findings when evaluating the assessment

Several findings from the case study are interesting in the context of this work. The NPRA had the lead in this planning process, and their main method was model-based transport analyses. Designing, running, interpreting and commenting on the analyses occupied a great deal of the planning capacity put into the process by the various actors. In spite of expressed shortcomings of the models, the transport analyses were used as the main (or only) method for evaluating potential strategies and means (*ibid*).

It was also clear from the documents that the planners supervising, running, using and presenting the outcomes of the transport analyses did not see 'reducing urban road traffic volumes' as an important or realistic objective, and they did not see the transport-reducing means as an efficient way of achieving this objective. Their expressed understandings of the relations between increased road capacity and traffic volumes, the field of competition between car and other modes of transport, and the long term interrelations between land-use development, transport-systems and transport volumes, clearly indicate that these planners had not 'reframed the transport problem' (as discussed in chapter five in the main report) (*ibid*).

On the other hand, throughout the process, the planners working for the local (Oslo) and regional planning authorities demonstrated that they *did* see reduction of road traffic demand as a realistic objective and that they *had* reframed the problem. Nonetheless, their theories, knowledge, arguments and methodologies evidently did not challenge the results from the model-based transport analyses (*ibid*).

B.5.1.2.2 Oslo package 3 – including E 18 west

Introduction of Oslo package 3

Several initiatives were made in 2003 – 2004, discussing how to deal with the future transport situation in Oslo and Akershus. These were related to among others the on-going work with Akershus county plan and the national transport plan (NPRA 2003, Akershus County 2004).

The existing toll road system was supposed close down in 2007. This, together with an expected strong growth in the numbers of inhabitants and workplaces in the city and the region, caused concerns with respect to the capacity of the total transport-system.

Broad approach

The main actors in the area started working on an Oslo package 3, which included overall planning for handling the expected growth in transport demand and a new toll road system or congestion charging (NPRA 2004a). They discussed challenges related to land use and transport development, and arrived at five strategies: Land use developments that contribute to reduce car transport demand; Improving the strength of public transport, cycling and walking as an alternative to the car; Regulating the road traffic, especially in the central parts of the region; Development of a road system that is balances with respect to capacity; Financing and organising of coordinated efforts within land use and transport planning.

Several alternatives – with few variations

Soon after, NPRA started the work on running model analyses of examples for four different Oslo package 3 alternatives (NPRA 2004). They were termed 'Reference', 'Road', 'City' and 'Public transport'. The land use development prognoses applied were the same for all four alternatives. The public transport services were basically the same for three alternatives, while 'Public transport' was better. The road investments varied from NOK 23 billion in 'Road' to 6 billion in 'Reference'. All alternatives had more road investments than the reference alternative. 'Regulation of car use' regarded pricing of parking and road pricing. The prices used for parking in the calculations were lower in 'Reference' and 'Road' than in the other alternatives. There were rather large variations in prices in the toll rings.

Hence, the variables road system, public transport services, parking prices and toll road prices varied in the calculations. All effects of land use development were kept exogenous, despite the clear emphasis on coordination of land use and transport development in the underlying works. Measures like parking access, conditions for walking and bicycling, physical regulations of the car traffic and the like were not included or considered in the analyses either.

There were given no reasons why certain variables were kept exogenous, while others were included in the analysis. The reason was probably that the transport models don't cope very well with these variables. The exception was land use development, where it was explained that the overall municipal land use plans showed that the planned land use development was in accordance with the ABC-principle. I guess this was interpreted as if the land use development plans were optimal and could not be substantially improved.

Based on this, analyses were run, and the results were presented (Civitas 2004). It was found that the growth in traffic volumes (vkm) will continue no matter which of the alternatives that is chosen. Alternative 'Public transport' results in a 16 % increase of road traffic from 2005 to 2025. 'Road' results in a 25 % growth and 'City/dense' in 19 %, while the 'Reference' alternative results in a 30 % increase of total traffic volumes in the region.

Reduced to two alternatives

A report based on several analyses, among others those mentioned above, presented a comparison of two alternatives – 'Reference' without toll road from 2012, and 'Oslo package 3' with toll road (NPRA 2006). The same variables do and do not vary in these analyses as in the previously mentioned ones, except that parking prices do not vary. The same kinds of model analyses are run.

It is found that the growth in traffic volumes is rather high, but slightly lower with or without Oslo package 3 (with toll road). The traffic in the inner city of Oslo and on local streets will grow more than the average traffic growth. The growth in GHG emissions will continue. These results are made very clear in the report.

Oslo package 3 adopted – with E 18 west as a main assumption

In October 2006, the politicians in Akershus County, and in Oslo, Bærum and the other municipalities formally agreed that they wanted the Oslo package 3 to be implemented (it is the road pricing or toll road that is the main point here). They put together a long list of transport projects they wanted to realise through Oslo package 3 financing. A main assumption from the right wing parties is that E 18 West is to be included and to be prioritised (Akershus County Council 2006).

Approval by the Storting

The Storting approved Oslo package 3 step 1 in the spring 2008. In March 2009, the Ministry of Transport presented a White paper regarding Oslo package 3 step 2 (Ministry of Transport 2009). The project, its history, financing, projects etc. are presented and discussed. It is laid down that "New technology can reduce emissions per vkm, but in order to achieve the GHG objectives that are defined locally as well as nationally, it is absolutely necessary to reduce the road traffic" (Ministry of Transport 2009:9).

E 18 west is given extra attention. It is explained that local authorities have decided that substantial shares of the investments in the package are to be used for building E 18 in the West corridor, and that this is an important assumption in the local agreement. Hence, they expect that this will be part of the package.

They state that the transport-system in the West corridor have to be developed within a comprehensive strategy focusing on reduced growth in road traffic and increased public transport shares. An objective is to change the relative travel time ratio between car and public transport, among other by giving priority to bus traffic, to ensure that buses run independently of the congestion in the car traffic system, and by improving the access by rail. The development of the traffic system in the West corridor needs to be combined with other land use and transport measures. These are mainly controlled by local authorities, it says.

In the Action Programme for Oslo package 3 from 2010, the objectives are defined (with reference to the White Paper) as: Rush hour delays shall be reduced; Business transport and public transport shall be prioritised, and; Conditions for walking and bicycling shall be improved (Akershus county et al 2010). E 18 West is included.

B.5.2 Description of the planning process studied here

B.5.2.1 Overall plans and policies

In the planning strategy and planning programme for the latest regional planning process, where the two counties Oslo and Akershus are supposed to present a joint land use and transport-strategy, reduction of GHG emissions is a main objective (Municipality of Oslo and Akershus County 2011). Oslo municipality and Akershus County have both stated that they will reduce the levels of GHG emissions to 50 % of 1990-levels within 2030. This is formulated as "to reduce the total travel demand through a more land use and transport efficient spatial development", and "to increase the shares of travel by foot, bicycle and public transport" (Municipality of Oslo and Akershus County 2011:18).

Municipality of Bærum (2009) has stated in their energy and climate plan that they will reduce their GHG emissions by 20 % within 2020 (with 2008 as reference year). This is repeated in the municipal plan (Municipality of Bærum 2010a:152).

At present, the trends go in the opposite directions. The transport sector produces almost 80 % of the GHG emissions in Akershus, and it is growing (Akershus County 2011). Hence, in order to reduce the GHG emissions, the traffic volumes need to be reduced.

B.5.2.2 The project and the plan-making process discussed here

The planning process that is the object of this case study regards development of E 18 west between Lysaker and Slependen. This section of the road passes through the municipality of Bærum, and is a main source for local environment problems.

The road has today five to six lanes, and the traffic load is almost 90.000 cars per day on the heaviest sections (NPRA 2011a). There are public transport lanes all the way (except at every exit) in direction towards the city centre of Oslo, but only at short stretches in direction out of the city. More than 100 busses per hour are crossing the Lysaker river in the morning and the afternoon, and 10 % of these are regional express buses (*ibid*). The buses carry more passengers than the train at this crossing.



Figure B.11: E 18 west, photo from NPRA (2011).

The plan-making process that is discussed is supposed to conclude with an agreed municipal area plan for a new E 18 in Bærum with approved impact assessments. It started when NPRA (2009a) initiated an analysis of the future transport-system in the west corridor. This was done as a response to the fact that E 18 west is included in the action programme for Oslo package 3. The work has been conducted in dialogue with Municipality of Bærum, as well as with Oslo and Asker municipalities, Akershus County, and others.

Based on their analysis, the NPRA (as initiator of the plan) developed the planning programme together with Bærum municipality and other sector authorities. The planning programme is supposed to describe which alternatives that will be assessed, which impacts or effects which are relevant, and which methods and tools that will be applied in the analyses.

The planning programme was presented for public hearing in November 2009 (NPRA 2009b). Akershus County, the County Governor's office, Municipality of Oslo, the national train company NSB, and the public transport administration company Ruter were among those who commented on the planning programme, and asked for changes. The planning programme was adopted by Municipality of Bærum (2010) in March 2010, without any changes.

Following from this, NPRA initiated an analysis aimed at selecting the alternatives that best contribute to fulfil the defined objectives. This was presented for a limited public hearing, and received a number of comments. This report is used in the further plan-making process that will eventually lead to a municipal area plan for the E 18-corridor in Bærum. This plan-making process is on-going.

Table B 8: The main procedural steps and the main documents in this case

Date	Procedures	Documents
December 2000	NPRA deliver Impact Assessments round 2	Impact assessment phase 2 E 18 West Corridor. Main report Holmen – Framnes.
02.11.2006	Municipal and county politicians adopt Oslo package 3	Minutes from the Akershus County Council Minutes from Oslo City Council
March 2009	Oslo package 3 is approved by the Storting	Report to the Storting from Ministry of Transport
June 2009	New analyses of future transport-system by NPRA	'E 18 West corridor, analysis of future transport-system'
28.10.2009	Planning programme for E18 in Bærum is presented for public hearing	'Planning programme for the E18-corridor in Bærum', NPRA
10.03.2010	The planning programme is adopted by Bærum Municipal Council	'Municipal area plan for E 18 West corridor Lysaker – Slepanden – Planning programme
February 2011	Analyses conducted in order to select alternatives for further analyses	'E 18-corridor in Bærum. Basis for selection of alternatives. Report', by NPRA
Forthcoming	Municipal area plan for the E 18 corridor in Bærum, for public hearing	Work in progress

B.5.2.3 Main actors

The main actors in this case, as it is delimited here, are the NPRA as developers and initiators of the project and the plan, and the planning authorities in Bærum Municipality which are the responsible planning authorities for the case as studied here.

Other important authorities and commentators are Akershus County and the County Governor's office as bodies responsible for coordinating land use and transport development at a regional level and to ensure that GHG emissions are reduced. Oslo Municipality is involved as the actor that may receive the negative effects of the project, and the Ministry of Transport approves the Oslo package 3 that finance the project. The latter three actors are entitled to file formal complaints in the planning process.

B.5.2.4 Alternatives

B.5.2.4.1 Eight alternatives reduced to four in the initial analysis

The process started out in the analysis of the future transport-system, with a broad description of the problem (NPRA 2009a). The report also includes a discussion of objectives, and a description of which measures that are possible and necessary in order to achieve the objectives.

Eight concepts (alternatives) are defined in the report. The same land use development is assumed in all concepts, based on the municipal land use plans. All concepts also assume public transport lanes of high standard along E 18 in both directions, some other infrastructure developments for public transport, tariffs and ticket systems as today, and continuous bicycle lanes along E 18.

- Concept A: *Restrictions on car traffic* include no other road infrastructure developments than the high standard bus lanes in both directions. It is said that it is important to optimise the road pricing, but no other traffic-reducing measures are mentioned.

- Concept B: *Develop the road system for car travels* include two variants (B1 and B2) of increase of road capacity by constructing more lanes, with or without tunnels, includes no road pricing or the like
- Concept C: *Public transport, walking and bicycling* includes a cross connection for motorised traffic, a high quality local and regional bus system, and the network of bicycle lane is developed in accordance with municipal plans, includes road pricing
- Concept D: *Restrictions on road traffic combined with facilitating public transport and bicycle* combines A and C, this concept includes no road pricing or the like
- Concept E: *Somewhat increased capacity for car traffic on E 18 combined restrictions* increases road capacity with one lane (totally six lanes for cars), combined with implementation of traffic-reducing measures (not defined), includes road pricing
- Concept F: *Somewhat increased capacity for car traffic on E 18 combined with long tunnel passing Sandvika and restrictions* is the same concept as E, but with the long tunnel, includes road pricing
- Concept G: *Somewhat increased road capacity for cars on E 18, with tunnels passing Sandvika and Høvik* is similar to F, but with the extra tunnel, includes no road pricing or the like
- Concept H: *Balanced combination of road construction, strengthening of alternative modes of transport, and restrictions* involves restrictions as in A (not defined, but probably road pricing and pricing of parking), road construction as in E, public transport measures as in C and D and measures for walking and bicycling as in C, includes road pricing

There were no alternatives actually reducing the road capacity, which could have been a response to the objective regarding reduction of GHG emissions. Further, none of the alternatives included all the restrictive measures combined with maximum improvements of other modes of transport than car in order to minimise or reduce total traffic volumes. Neither was there any alternative designed to have enough capacity to remove congestions.

The alternatives were evaluated with respect to their contribution to achievements of the defined objectives. The method applied for this was a simplified version of 'professional reasoning'. Concepts A, B1, and C were excluded. B1 and C were excluded because other concepts fulfil the same objectives – and to a higher degree. A (the only concept with no road capacity increase for car traffic) was excluded because it does not offer enough improvements of the alternative modes of transport to maintain the mobility when restrictions on car traffic are implemented.

The six remaining concepts were analysed with the help of transport models. The models could, however, not respond to the differences between the alternatives, except from the differences with respect to road pricing, and to a limited degree the road capacity. It was recommended that the concepts D, E, F and G should be considered in the planning programme. Concepts B and H were excluded because other concepts fulfil the same objectives – and to a higher degree. It is hard to see any connection between the transport analysis and the selection of concept alternatives.

B.5.2.4.2 Two principles suggested in the planning programme

In the planning programme (NPRA 2009b), the four concepts are reduced to two main principles and a do-nothing-alternative. The do-nothing-alternative includes land use development in accordance with adopted municipal land use plans, certain investments in

public transport infrastructure, un-changed tariff- and ticketing systems, 15 minutes frequency on the western subways, and increased frequency on train services (quite similar to the former alternative A).

The two alternative principles include these entities. In addition both principles include public transport lanes of high standard along E 18 in both directions, continuous bicycle lanes along E 18, cross connections between Fornebu and Stabekk and Stabekk and Bekkestua, and a new highway intersection between E 18 and E16.

What separates the two principles is that Principle 1 involves expansion of today's E 18 to six car lanes, while Principle 2 involves construction of new E 18 with eight car lanes. Two of these lanes in both alternatives will be continuous on- and off-lanes. Two of the lanes in the eight-lane version would be designed as local roads at tunnel stretches.

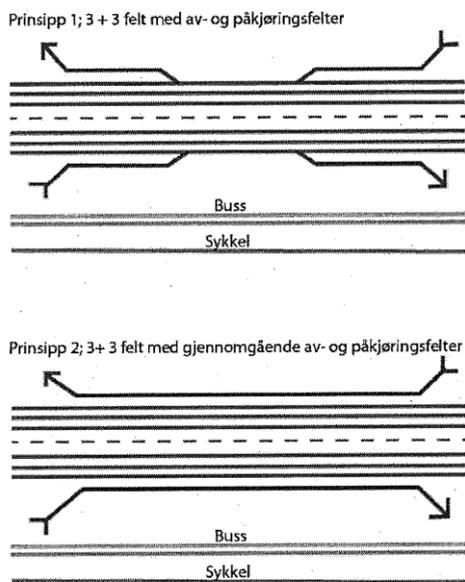


Figure B.12: Principles for the six lane alternative (top) and the eight lane alternative, facsimile from NPRA (2011). The principle is somewhat different at tunnel stretches.

B.5.2.4.3 Expanded to five alternatives and reduced to two in the selection report

In the selection-report pursuing the approval of the planning programme, these two principles were combined with alternative designs on two sections of the road, where the discussions regarded whether to construct tunnels and whether the tunnels should be long or short. This added up to five alternatives that were discussed.

It was recommended that two alternatives are selected and further analysed:

B1: Expansion of today's road system to six lanes, and with short tunnel passing Høvik

B3: Expansion of today's capacity to eight or ten lanes (on tunnel stretches: six continuous lanes in tunnel, two continuous on- and off lanes on top of tunnel, and potentially two extra lanes deigned as la local road on top of the tunnel, on daylight stretches: six continuous lanes, two continuous on- and off lanes), and with short tunnel passing Høvik and long tunnel passing Sandvika

It was clear from the discussions of the selection report that especially Bærum municipality (the political authorities) was not willing to accept a proposal almost without tunnels, and

hence that B1 was not acceptable for them. They recommended that B3 and another alternative with more and longer tunnels were included in the further planning process.

B.5.2.4.4 The minimum version was dismissed in the municipal area plan

Following from this, according to the project leader in NPRA, it was decided in NPRA to not develop alternative B1 further in the plan-making process leading to the municipal area plan. Rather, they work with B3 and a version of B3 including a longer tunnel. It is also discussed whether it is necessary with four lanes for car traffic on top of the tunnels, or if two fields are enough.

This means that the alternatives discussed at present are a new road system with altogether eight or ten fields, whereof six in tunnels. Two tunnels are included, one passing Sandvika (2,7 km) and one passing Høvik, and there are discussions going on regarding the length of the latter of these. The project also includes high standard bus lanes and bicycle paths all the way.

B.5.3 Effects on traffic volumes

All qualitative descriptions and all quantitative predictions agree that the transport demand and the traffic volumes will increase in the west corridor because of population growth etc. The qualitative descriptions list measures that can contribute to delimit the growth in traffic volumes (NPRÅ 2009a). The quantitative analyses show that the traffic growth will be higher with increase of road capacity and without road pricing or the like (NPRÅ 2009a). The differences are substantial. The growth in total traffic volumes in Oslo and Akershus are almost 60 % higher in the alternatives without road pricing and with maximum road capacity increase than in the other alternatives (an increase of 3,8 million vkm per day versus 2,4 million vkm per day) (NPRÅ 2009a:91).

The final analyses in the selection report NPRÅ (2011:68) conclude, anyhow, that the traffic will grow by about 30 % within 2030, and that there are only small differences between today's road system, the alternatives with six, and the alternative with eight to ten lanes. There are, however, far more congestion in a situation with six lanes than with eight lanes.

The 'finding' that there are no significant differences between the alternatives with respect to traffic volumes is not in accordance with the state-of-the-art expert knowledge in the field (or with NPRÅ the results from the 2009 analysis). It says that reduced congestion cause reduced travel time by car, which improves the competitiveness of the car with respect to other modes of transport and reduced general travel resistance, and hence increased road traffic. Further, it says that reduced travel distance by car cause and allow urban sprawl and location independent of possibilities for using public transport, bicycling and walking to and from activities, and hence cause increased car demand and car use (see chapter four).

It is a well-known fact that lack of sensibility with respect to congestion and delays for car traffic are among the transport models' weaknesses (see i.e. Flyvbjerg et al. 2002, Tennøy 2004b, and Flyvbjerg 2005). This is called attention to in the comments among others from NSB. This may explain the discrepancy between the findings in the analysis and the state-of-the-art expert knowledge in this field. There are, however, no indications in the two NPRÅ reports concerning the inaccuracy and uncertainty of the transport models.

Since the alternative(s) that still are included in the plan-making process involve at least 30 % increase of the road capacity, and since increased road capacity in pressured urban

transport-systems causes and allows growth in traffic volumes, it is understood here that this is a plan-making process that propose a plan which, if implemented, will cause growth in urban road traffic volumes and GHG emissions.

B.5.4 Analytical description of the objectives, knowledge and power of the main actors

When asking how and why a plan is made which cause growth in urban road traffic volumes, the objectives, knowledge and powers of the main actors are relevant. When mapping these according to the framework in chapter 6.4, interviews with main actors provided necessary and interesting insights that could not easily be read from the documents in the case.

B.5.4.1 Objectives

B.5.4.1.1 The main objectives of the main actors

The main objectives of the initiators of this plan, the NPRA, are developed with basis in relevant overall plans and policy-documents, as well as laws and regulations (NPRA 2009a). They arrive at effect-objectives with indicators, which in turn are translated to requirements. The objectives are listed as follows (NPRA 2009a:46):

- A transport-system with improved accessibility and reduced travel times
 - o Reduced rush hour delays, prioritisation of business traffic and public transport
 - o Facilitate increased shares of travels by public transport, walking and bicycling
 - o Facilitate concentrated development of housing, work places and service in important nodal points
- Reduce environmental problems caused by road traffic
 - o Restrict the traffic load in the inner city streets in Oslo
 - o Reduced local air pollution and noise problems
 - o Reduced GHG emissions from transport
 - o Reduced barriers
 - o Delimit through-traffic in housing areas

These objectives are reflected in the planning programme and in the selection report.

According to the interviews, especially with the planners in NPRA and in Bærum, the local focus is mainly on the local environment, concretised as tunnel lengths.

The main concern of the NPRA is that the road and the road transport-system 'have to work' for all users, especially for the business traffic, the through-traffic and the public transport. This regards especially the predictability and the stability of the transport quality. The NPRA explain that this can be achieved by road pricing and access control, together with other measures, but that some increase of road capacity is necessary anyhow. This is among others in order to achieve balanced capacity in the road transport-system in the region. Further, if they build long tunnels, they need to have enough capacity, for safety-reasons.

This means that the local environment objectives related to local noise, air pollution, barriers, urban development potential and through-traffic in housing areas are attended to by the municipal authorities, while the objectives related to improvements of the transport-system per se are ensured by the NPRA. Oslo emphasises to not increase traffic volumes in Oslo in their hearing comments.

There is a strong political push and will from Bærum for arriving at a plan that can improve the local environment, and soon. The NPRA are clear that they need to uphold the

requirements related to that the road is a national road. There are worries among those co-operating in Oslo-package 3 that this project will take even more of the total budget. There are also worries from several authorities and others with respect to the expected growth in traffic and GHG emissions related to the road capacity increase.

B.5.4.1.2 Whether reducing road traffic volumes is perceived as an important objective

From the documents and the interviews it does not seem as anybody focus on or emphasise the objectives related to reduction of GHG emissions (or traffic volumes – which is not directly expressed as an objective) as a prioritised objective.

Regarding changes of modal shares, these are calculated in the system analyses, but no discussions are carried out regarding what it would take to increase the public transport shares or reduce the car traffic shares. This means that the model analyses are approached with a ‘predict and provide’ attitude rather than a ‘predict and prevent’ (Owens 1995).

When asked whether reducing GHG emissions or traffic volumes is an important objective in their organisation, the interviewee from the strategy department of NPRA finds that environment and climate is very central in the discussions in their department, maybe too much sometimes. They have high ambitions, and see it as necessary and important to deal with this problem. The interviewee in the project department explains that this is an objective, and they want to contribute to achieving it, but that it is hard to deal with this at project level. When they address how to develop E 18 in order to improve the local environment and to make the transport-system work, they try to minimise the traffic growth and GHG emissions, but there is not very much they can do. In this project this is not the most important objective.

The interviewees at the planning authorities in Bærum explained that reduction of GHG emissions is something they aim at achieving. They want to contribute by reducing car dependency, traffic volumes and GHG emissions through planning. They emphasise that reduction of traffic volumes and car use have many other positive effects than reduction of GHG emissions. In this case, however, improvement of the local environment and the potential for developments in nodal points are more in focus. The traffic-increasing effects or increased road capacity is not a topic for discussions.

The interviewee at the County Council administration refers to stated and overall climate objectives, and finds that according to those statements, climate and reduction of GHG emissions are important. In this case, the politicians have focused on arriving at a road project they can agree on, and increased traffic volumes and GHG emissions have not been in focus. Since the political signals were so clear on what they find relevant, the administration cannot bring in other alternatives, at least not in this phase. In the formal hearings they focused on costs, which are understood as relevant.

B.5.4.1.3 How they understand the objective ‘reducing traffic volumes’

In the documents, and in the interviews, ‘reducing urban road traffic volumes’ is understood in several ways.

The model results in the system analysis refer to changes of number of trips by car, developments (in per cent) of total traffic volumes (vkm), and changes of public transport shares in the region. There are also figures regarding these entities for Asker and Bærum, and changes of traffic loads on the road system in the corridor. When discussing climate

(NPRA 2009a: chapter 10), growth in total vkm in Oslo and Akershus for the different alternatives are applied. This is the same measure as applied in this dissertation when discussing traffic volumes and GHG emissions.

It is explained that in order to achieve the objectives regarding reduction of GHG emissions in Oslo, the traffic volumes need to be stabilised at the present level, and then one hope that technology-developments will do the rest of the job. None of the alternatives will contribute to or ensure that the zero-growth will be achieved.

The interviewees wanted me to define precisely whether I talk about total traffic volumes, car traffic shares, or the traffic load on the road in question, and which geographical level I referred to. This indicates that they are quite aware that 'reducing traffic volumes' can be understood in different ways. They also expressed that when discussing GHG emissions, it is total traffic volumes in the region (vkm) which matter.

B.5.4.1.4 Whether reducing road traffic volumes and GHG emissions are understood as realistic objectives

The analyses from the NPRA demonstrate that no matter what they do, the traffic volumes and the GHG emissions will continue to grow (NPRA 2009a, 2011). The message is that if the aim is to reduce traffic volumes and GHG emissions, this cannot be affected by how this project is developed. Instead, it needs to be dealt with in other ways (road pricing is the main solution from NPRA).

In the interviews, the main understanding is that to actually reduce traffic volumes in the region hardly can be understood as realistic, mainly because of an expected strong population growth in Oslo and the region. The agreed objective is to freeze the total traffic volumes on the present level, and most interviewees express that this will be hard. They are not sure if it is achievable.

Several do, however, express that it is realistic to reduce the traffic volumes in the sense that changes of land use and transport-systems cause changes of travel behaviour. One points at the large differences in travel behaviour between different cities, as well as between different areas in Oslo, as an indication that it matters how land use and transport-systems are developed. Hence, it is clearly *possible* to reduce the traffic volumes by changing the modal split and the travel lengths.

Regarding the political reality, at least one interviewee finds that the politicians will be forced by reality, by the situation that will occur, to accept high enough prices in the toll ring to keep the traffic volumes down.

B.5.4.1.5 Conflicting objectives

When defining the situation and the alternative solutions as it has been done here, there are conflicting objectives.

The local authorities focus on local environment, and want tunnels. NPRA find that this requires large capacity increase, which cause and allow growth in urban road traffic volumes. Hence, the objectives regarding improvement of the local environment and the objective regarding reduction of traffic volumes are conflicting.

The NPRA's main focus is on the objectives related to that 'the road have to work' for all users. This require, according to them, at least some increase of road capacity in addition to

access control and road pricing. The increase of road capacity will cause and allow growth in traffic volumes. Hence, there is a conflict between the objectives regarding to 'make the road work' and 'reducing traffic volumes and GHG emissions'.

Since a traffic-reducing alternative is not developed, this is a case with conflicts of objectives. According to the expert knowledge in question, traffic volumes can be reduced by developing land use and transport-systems according to the agreed recommendations. A traffic-reducing alternative would not be in conflict with the local environment objectives or with the objectives concerning the quality of the transport for all users. Constructing new road capacity would be contra-productive, because it would cause and allow growth in urban road traffic volumes. In this understanding, the conflicts of objectives would be between increasing the road capacity on one side and local environment and traffic problems on the other.

B.5.4.2 Knowledge

B.5.4.2.1 Whether the actors possess or know of the expert knowledge in question

A simplified version of the main ideas and contents of the expert knowledge in question are described in the system analysis report. It is expressed, in all the documents referred here and in most of the interviews, that in order to improve the conditions in the E 18 corridor with respect to the listed objectives, a number of other measures than road building need to be implemented. This is also necessary in order to maintain the improvements that may be achieved by building the road.

The measures or variables that are discussed are land use development, parking, pricing of car traffic (road pricing), improving public transport, improving conditions for walking and for bicycling, and access control to the motorway.

When discussing climate, it is explained in the system analysis that it is expected that new technology will deliver reduction of GHG emissions, but not enough to ensuring that the climate objectives in the municipalities and the region are achieved. In order to achieve that, the mentioned measures for reducing or delimiting total road traffic volumes need to be implemented.

By reading the system analysis, it hence seems as the strategy department in the NPRA possess the expert knowledge in question. This is confirmed in the interview.

When discussing the expert knowledge in question with the project leader for E 18, he expresses that coordinated land use and transport planning is not his main field, but that he has been working close to this knowledge for many years. He discusses all the relevant mechanisms and measures. He also includes the long term and reciprocal interrelations between road capacity improvements, land use developments, travel behaviour and traffic volumes. Hence, he demonstrates that the project organisation possess the expert knowledge in question as well (through him).

The planners at the planning authorities in Bærum claim that this is not their expert field, and that they are not quite sure who possess this expert knowledge in their organisation. The project leader for the municipal plan agrees that he possesses this knowledge, but maybe on a more shallow level, and mainly the land use side of the expert knowledge. They relate to the ABC-principles for land use development in order to reduce traffic volumes.

The interviewee at the County Council possesses the expert knowledge and has worked in this field for years. The interviewees in Oslo, who has been involved in these discussions for two decades, relate to another understanding. This includes among others that increased road capacity is not an important cause for growth in traffic volumes.

The project leader for E 18 at NPRA did, however, comment that there may be disagreements regarding the strength of the traffic-increasing effects of increasing road capacity, and the importance of this mechanism compared to other mechanisms (economic development, population growth etc.). He referred to the transport model analyses, which show very small variations in traffic volumes in the region with different capacity on the main road. He did not mention the large variations in the corridor, demonstrating the effects of the road capacity on its users.

Except from one interviewee, all agree that increased road capacity cause growth in road traffic volumes, and that reduced road capacity will cause reduction of traffic volumes (most were worried about the negative effects of the latter, and none seem to be familiar with research in this field, such as Cairns et al. (1998)).

All interviewed planners are experienced. They are educated as engineers, architects or geographers. None of the interviewees are educated land use and transport planners (most are either land use planners or transport planners), or specialised in this field, but some have been working in this field for years. None are well read in coordinated land use and transport planning, since no-one know of any literature references in this field.

B.5.4.2.2 How the actors perceive this knowledge

The interviewees were asked how they perceive this expert knowledge, especially the understanding that increased road capacity causes and allows growth in urban road traffic volumes.

Their understandings can be summarised as follows: there are many and different factors and mechanisms involved, and the knowledge regarding these could probably be improved. Nobody mention concrete shortcomings or the like of the expert knowledge.

Some do, however, find that it is probably not lack of knowledge that cause lack of focus on traffic volumes or lack of traffic-reducing alternatives. This is rather because of the many and different objectives and interests in the area.

B.5.4.2.3 Which methods for analyses that are applied or supported

The method applied in this plan-making process is transport model analyses. In Oslo and Akershus they apply what is termed the Emma/Fredrik model, which is developed over years. Fredrik is first applied to generate the total transport volumes, and to distribute them on the different modes of transport, based on socio-economic data and data for the different alternatives (land use, car-ownership, parking conditions etc.). Emma is fed with data regarding the road transport-system and the public transport-system, before the transport volumes from Fredrik are distributed on the transport networks in Emma by the Emma programme.

Based on the results from these calculations, different analyses on different geographical levels are conducted. The system analysis report presents figures and illustrations regarding changes of number of trips by car, changes (in per cent) of total traffic volumes (vkm), and changes of public transport shares in the region and in Asker and Bærum. There are also

figure and illustrations regarding changes of traffic loads on the road system in the west corridor.

All the interviewees expressed unasked that they know that the transport models are inaccurate and uncertain. Some also mention that important variables, such as land use development, are kept exogenous in the models, and that the models are relatively insensitive to a number of the measures that are assumed to affect traffic volumes.

The general understanding is, anyhow, that the model analyses are important and necessary in these kinds of plan-making processes and that one are better off with them than without them. Further, there is an underlying doubt regarding whether it actually are the models that are in-sensitive, or if it maybe is the expert knowledge in question and the like that is wrong.

None of the interviewees, except from those from NPRA had been involved in the model analyses. Nobody had heard about discussions of the model, the analyses or the interpretation of the results.

One interviewee suggested that the transport models may take too much of the resources in the plan-making processes. It is anyhow necessary to do professional reasoning, based on the knowledge the planners have about how the city work and how it is affected by changes in land use and transport-systems. The large model analyses could maybe be replaced by such kinds of analyses, and only supported by quantitative analyses, in a simpler version. At current it is requisite to apply transport model analyses in planning of NPRA projects.

B.5.4.2.4 How the knowledge and the findings are presented

The main document for discussing these kinds of questions is the system analysis (NPRA 2009a). The expert knowledge in question (or something quite similar) is presented over several pages, and in a good and informative way. The alternatives or concepts that are analysed are described in a short, but good and transparent way. So are the objectives, and hence the arguments why the effects on certain variables are analysed. It is said, but not problematized, that certain important variables such as land use development does not vary in the alternatives.

Lack of accounting for input and mechanisms – black box

It is not clear from the report which mechanisms that have been included in the transport model, or with which strengths. For instance, it is not explained how one has arrived at different public transport shares. It is not clear if they have calculated or defined the modal shares outside the models and, if so, on the basis of which knowledge. Alternatively, the modal shares could have been calculated by the model, but this would require input of mechanisms affecting the modal shares, and these are not accounted for. The same shortcomings regard descriptions of all the mechanisms included in the model.

It is hence impossible to actually evaluate or judge whether one finds the analyses likely, realistic or trustworthy. There are no references in the system analysis to other documents or the like where such information can be found. This makes the transport model analysis a black box in this plan-making process.

Since there are quite large uncertainties and disagreements regarding how certain changes of land use or transport-systems affect traffic volumes in certain contexts, this strongly

undermines the validity of the analysis. This is not meant to indicate that NPRA consciously aim at hiding input data, assumption or uncertainties.

The presentation focuses on the lack of effect of road capacity on traffic volumes

The findings are presented as text, figures and illustrations, in a good way. It is, however, confusing that the text to a large degree refers to differences between alternatives on the regional level – including all of Oslo and Akershus. This may give the impression that the differences of the alternatives do not affect travel behaviour and traffic volumes substantially. When looking at the corridor-discussions, however, it is obvious that it does.

For instance, when discussing total traffic volumes, it matters whether one present the figures for the whole region or for the corridor, as illustrated below.

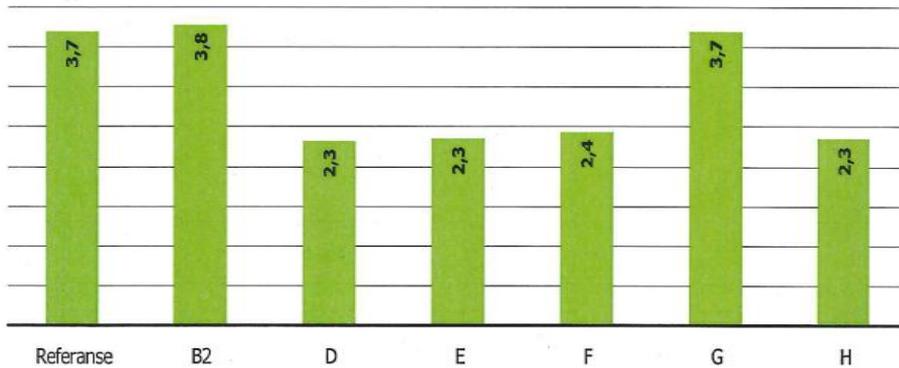


Figure B.13: Growth in vkm in Oslo and Akershus from 2009 to 2025, if different alternatives are realized (million vkm per workday), facsimile from NPRA (2009a:91).

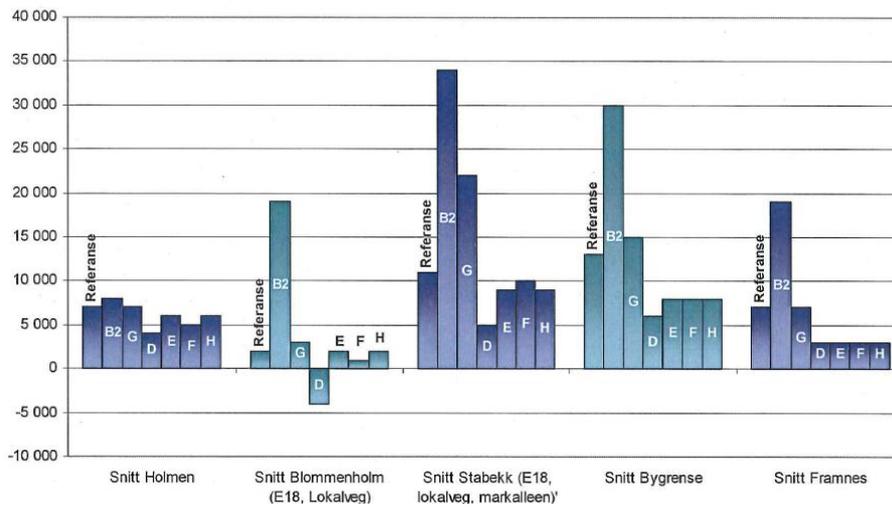


Figure B.14: Change in total traffic load for selected cross-sections in the E 18 corridor if different alternatives are implemented, vehicles/workday, facsimile from NPRA (2009a:88).

The system analysis report explains that the model seems to be sensitive only to road pricing, and not to any of the other variables. It is expressed several times that none of the alternatives can provide for instance the GHG emissions objectives, but without emphasizing the differences between the alternatives.

When comparing the alternative with eight lanes with the alternative with six lanes and road pricing, there are clear differences with respect to developments of traffic volumes, as demonstrated in the figures below. While implementing the alternative with eight to ten

lanes will cause and allow that the traffic volumes increase more and the problem get worse than in the reference alternative, the six lane alternative will contribute to reduce the growth in traffic volumes and help taking the development in the right direction. This is not very well communicated.



Figure B.15: The figure at left shows the differences in traffic loads between '2025 Reference' and the eight lane alternative without pricing, while the figure at right shows the difference between 'Reference 2025' at the most restrictive alternative. Red means increased traffic loads, green reduced, and the width of the line illustrates the dimensions of the changes, facsimile from NPRA (2009a:86-87).

The selection report discusses mainly different road designs, but refers also to consequences for traffic development and the traffic situation. It says that the traffic growth will be 30 % with the reference alternative, as well as with the six lane and the eight to ten lane alternatives. There will be more congestion in the alternative with less road capacity. It is warned that the capacity in the largest alternative will be filled up unless other measures are implemented in order to keep the growth in road traffic volumes down.

By reading the selection report, it is hence easy to come to the understanding that it does not matter with respect to traffic volumes in the corridor whether the road has more or less capacity. According to the system analysis report this is a faulty understanding. Hence, the selection report is not very transparent with respect to understanding the consequences of choosing an alternative with higher or lower capacity with respect to traffic volumes and GHG emissions.

Whether the effects of road construction and other measures on traffic volumes should be discussed in a regional or in a more local context will be discussed later. This regards among others the geographical area for measuring changes in road traffic, as discussed in chapter four.

B.5.4.2.5 Clashes of expert knowledge?

Nobody brings in alternative or more knowledge with respect to effects of the different alternatives on traffic volumes and GHG emissions, at least not in a form or with a strength that call for serious reflections from the NPRA in the reports or from Bærum as planning authorities.

In their comments, among others NSB question whether the real potential of changing modal shares towards more public transport are displayed in the model analyses (all comments can be found in Municipality of Bærum 2010b). The public transport administration company, Ruter, question whether increasing road capacity is counter-

productive with respect to the defined objectives, and whether the funds should rather be applied on improving public transport services.

Several commentators call for analyses of the effects of other measures than building new road capacity, such as access control and various improvements of the public transport-system. The County Governor's office calls, with reference to the climate objectives, for a discussion of how the GHG emissions can be reduced. They call for analyses of how the various measures can affect the traffic volumes, and for seeing these measures in relation to the road alternatives, as the road alternatives are developed.

Several commentators are not satisfied with the alternatives that have been presented, since they do not contribute to achieving several of the important objectives. None of the commentators do, however, call for changes in ways and with strengths that actually force Municipality of Bærum or the NPRA to try to develop a traffic-reducing alternative.

This means that there are no real clashes of knowledge in this case, since nobody promotes alternative knowledge with force. It is, however, a clear discrepancy between the understandings and the knowledge that is displayed here and the expert knowledge in question. The NPRA frame the problem differently than the expert knowledge in question, and hence develop road alternatives first and plan on analysing mitigating measures later on.

B.5.4.3 Power

B.5.4.3.1 Which direct and agenda-setting powers the actors have and exert

The initiators (NPRA) exerted their powers to initiate the project by starting the work with the system analysis. One may say that they were required to do so, since there were strong calls for this in the Oslo package 3 discussions, agreements and documents.

In the system analysis, the NPRA exerted their powers as initiators to include other approaches and measures than road building, and to warn that road building alone cannot solve the problems in the corridor and the region. Despite clear political signals that only an alternative with increased capacity and long tunnel stretches would be accepted, the NPRA exerted their power as initiators to keep and develop other alternatives and to discuss other measures. They arrived at four alternatives that were different concepts for development of the transport-systems in the transport corridor rather than a one-sided discussion of tunnel-lengths.

Two alternatives with different capacity were kept throughout the planning programme and the selection report, but as the process went on, the focus was more on the alternative with most capacity. According to the project leader, the plan-making in the area-plan process now regards tunnel-lengths and whether ten or eight car-lanes are enough. The six lane alternative has been ousted.

The planning authorities have followed the initial phases of the process, and are the formal authorities for the planning programme, but they do not seem to have much room for exerting powers here. This is mainly because the politicians are strongly involved.

It seems as the municipal politicians and the bureaucrats close to the politicians have had more to say in the initial phase of the process than the planning authorities. Strong and clear political signals have been sent regarding what is important for Bærum. That is first and foremost reduction of local environmental problems by building tunnels.

According to the interviewees, the political and administrative authorities in Bærum have exerted their powers as municipality and 'host for the road' as well as the political body that adopt the plan or not. They signalled what would be acceptable for them throughout the process. This is why the planning programme states that "The concept with no expansion of E 18 for car traffic, with only expansion by one public transport lane, is understood as unrealistic and will not be further analysed or discussed" (NPRA 2009a:7).

In the minutes from the meeting where Bærum municipality accepts the planning programme, two alternatives are accepted for further analyses, but they comment that "Bærum municipality will, under no circumstances, accept an alternative that involves expansion of the existing E 18 without tunnels" (Municipality of Bærum 2010:1). This means in reality that only one of the discussed alternatives is realistic. This is a strong exertion of power.

Further, in a later meeting discussing the selection report, the interviewees at the planning authorities as well as in NPRA tell that municipal politicians from all parties strongly called for more tunnels, and making clear that they would accept nothing else. In their comments to the selection report, the Executive committee for the municipal Council are very clear that only alternatives with long tunnels are acceptable (Municipality of Bærum 2011). All other alternatives should be abandoned. The tone and the message are strong and powerful signals from Bærum that the local environment should be prioritised.

The conclusion from the interviewees are quite similar: Since the local politicians, and eventually the regional politicians, had stated so clearly what they would and would not accept, it was in reality impossible for the planners in NPRA and in Bærum to call for other alternatives in order to reduce GHG emissions.

The County Governor's office and the County Council, as well as other authorities with right to comment on the plans, did exert their powers to point at the traffic-increasing and GHG emissions increasing effects of the suggested alternatives. Further, they applied their powers to call for analyses of other measures. They did, however, not call for this with strength, or in ways which actually could force NPRA and Bærum to obey. Neither did they apply their powers to call for an alternative that may contribute to achieving the objectives that are stated in municipal, regional and local plans and policy-documents with respect to traffic volumes and GHG emissions. Nobody sketched or developed a proposal themselves which could be an input to the plan-making process.

The powers discussed above may be termed either agenda-setting or direct powers, but I see them mainly as agenda-setting. It has caused that the two alternatives that will be presented have eight to ten lanes, and either much or very much tunnels. No alternatives that restrict the traffic will be presented. There will, however, need to be conducted an impact assessment, which will show increased traffic volumes and GHG emissions, and very high costs. At that point, the different actors may use their direct powers. What will happen then is an interesting question.

B.5.4.3.2 Structural powers in this case

I have not come around to do thorough thinking or analyses about the structural powers in this case either. When reflecting over what it is that makes the planners involved accept that only traffic-increasing alternatives are proposed, some issues may seem to be relevant.

The initiators/developers, the NPRA, explain that if they not aim at making the transport quality of the road good, they are not doing their job. They try to combine this with other important aims and objectives, but this is their main concern. This may be understood as a structural power that contributes to shape what one think is 'right' and 'good', and which seems to be in conflict with the objective 'reducing urban road traffic volumes'.

The municipal planning authorities as well as the planner at the County Council's office are clear on that even if they would and were able to present a traffic-reducing alternative, they could not do so in this situation (unless, I guess, that it also fulfilled all the requirements from the politicians). That is because the municipal politicians strongly have declared that they will only accept an alternative with long tunnels, which according to the NPRA cannot be combined with reduced or stabilised capacity on the road.

The ways the politicians act demonstrates that they find that the local environment for their inhabitants living along the road is more important than most other concerns, among increased road traffic volumes in the region as well as increased GHG emissions.

Another underlying understanding seems to me to be that the planners doubt if making a traffic-reducing planning alternative that can be acceptable and adopted is possible.

B.5.4.4 Objectives, knowledge and powers in this case

In the table below, the objectives, knowledge and powers of the main actors are listed with reference to the discussions and definitions in the dissertation chapter six.

Table B 9: Relevant properties of the objectives, knowledge and powers of the planners interacting in the plan-making processes in the case studies.

	Planners working for:	Developer/ initiator	Planning authorities	Important hearing instances	Local decision- makers
Objective s	Main objective	That the transport-system works satisfactory, especially for the business traffic	That local environmental problems are reduced, tunnels	That they are not negatively affected, that an agreement is reached	Agree on a road development alternative, that local environmental problems are reduced
	Is reducing traffic volumes important?	No, not really	No, not really	No, not really	No
	How they understand this objective	As actually reducing	As actually reducing	As actually reducing	-
	Other relevant objectives	That local environmental problems are reduced, tunnels	That the road system works satisfactory, especially for the business traffic	-	-
	Possess or know of expert knowledge in question	Yes	To a certain degree	Yes, some	Don't know
	How they perceive this expert knowledge	OK	OK	OK	-
	Main references	None	None	None	-
	What are their main expert knowledge	Coordinated land use and transport planning Transport planning	Zoning planning Land use planning Road planning	Diverse Coordinated land use and transport planning	-

	Alternatives they propose and/or support	Enough capacity, pricing, access regulation	Road in tunnel	Alternatives that are not too resource demanding	Road in tunnel
	Methods they apply and/or support	Transport models Professional reasoning	Agree on transport models	Do not call for alternatives to transport model	-
	Causal interrelations they include and/or support	Increased road capacity cause and/or allow increased traffic, and most of the other mechanisms	Increased road capacity cause increased traffic, and most of the other mechanisms	Increased road capacity cause increased traffic, and most of the other mechanisms (not all)	Tunnel cause reduced local noise and pollution
	Types of outputs	Quantitative traffic figures and that which can be developed from that	Quantitative traffic figures and that which can be developed from that	Quantitative traffic figures and that which can be developed from that	-
	How they relate to uncertainties	They know they are there	Not sure	They know they are there(some)	-
Powers	1. dimension - direct; win or lose in direct battle	Suggest the alternatives, select method, do the analyses, present the findings	State – on behalf of the politicians - that they will not accept certain alternatives	State that the costs cannot be too high	State – through all channels - that only alternatives with long tunnels will be accepted
	2. dimension – agenda setting; what it is about	Suggest the alternatives, select method, do the analyses, present the findings	Delimit the alternatives to only the capacity increasing ones, do not develop alternative measures	Choose <i>not</i> to bring in focus on GHG emissions and traffic volumes Do not present an alternative File no formal complaints	State – through all channels - that only alternatives with long tunnels will be accepted
	3. dimension – structural; what one thinks is ‘right’ or obvious	Assume that the road system needs to work for the business traffic	When politicians have decided, the professional must be silent	When politicians have decided, the professional must be silent	See local environment problems as more important than the global environment in this case

B.5.5 Whether, how and by whom the objective or knowledge was ousted

B.5.5.1 The objective was introduced but ousted as unrealistic and as less important

In the system analysis, reduction of GHG emissions was stated as one of eight effect-objectives. The objectives were developed with basis in relevant overall plans and policy-documents, as well as laws and regulations, arriving at effect-objectives with indicators, which in turn were translated to requirements. The objectives were not ranked or weighted, and one may hence assume that they were seen as equally important.

During the system analysis report, total traffic volumes and GHG emissions are among the objectives the alternatives are assessed in relation to. In the discussions of the effects on environment and safety, it is emphasised that the amount of GHG emissions are directly

related to the total traffic volumes. It is explained that the analyses show that the traffic volumes in the region will continue to increase no matter which of the alternatives that are chosen. It is not mentioned that some of the alternatives cause substantially less traffic growth in *the corridor* than the reference alternative. Hence, it is concluded, “none of the concepts can meet the target set for reduction of GHG emissions in the region” (NPRA 2009a:91).

It is said that the concepts with more road building and capacity and without road pricing facilitate a stronger growth in traffic volumes and GHG emissions (the less capacity strong alternative with road pricing has 30 % less growth in the region Oslo and Akershus than the more capacity strong alternatives without road pricing), and that this difference will increase if perceiving this in a longer time perspective than 2025.

What is actually promoted here is that no matter how the road is dimensioned and designed, the traffic volumes and the GHG emissions will continue to grow. If the aim is to reduce traffic volumes and GHG emissions, this cannot be affected by how this project is developed, at least not the size of the road. Instead, it needs to be dealt with in other ways (road pricing is the main solution from NPRA). This understanding is strengthened in the interviews, where all but one of the interviewees explain that the traffic will continue to grow no matter what we do. Hence, to not increase the road capacity will cause chaos and increased local traffic problems. Instead, one needs to apply parking restrictions and road pricing in order to keep the traffic and the GHG emissions down.

Whether this is right or not cannot be told from the analyses conducted here, since nobody has developed an alternative which aim at reducing traffic volumes and GHG emissions.

The interviewees also express that other objectives are more important, as discussed above. The main objective for the municipal authorities is to improve the local environment. The most important objectives for NPRA are to ‘ensure sufficient transport quality for all users’, especially for business traffic, through traffic and public transport, and to ensure safety. Since local environment improvements require tunnels (according to Bærum), and tunnels require capacity (according to NPRA), a capacity-strong road is required. Since these considerations and priorities are very important for the politicians, they cannot be questioned, according to the interviews.

The objective ‘reducing traffic volumes’ and ‘reducing GHG emissions’ are hence ousted in two different but reinforcing ways. They are ousted by the understanding that it is unrealistic to think that they can be helped or achieved by decisions made in this case, and hence we can disregard them and focus on other objectives. Further, they are ousted by other objectives that they are considered mutually exclusive to.

The main message is: reduction of traffic volumes and GHG emissions need to be dealt with somewhere else by somebody else. This seems to be the understanding of the following plan-making process, which concentrates on developing a road design which everybody can agree on and which does not cost too much (we have passed NOK 10 billion a while ago). It is emphasised that traffic-reducing measures will be discussed later on, in the impact assessments and in the public hearing of the area plan, and that this is necessary in order to avoid strong increase in road traffic volumes.

B.5.5.2 The expert knowledge was introduced, but ousted by other knowledge

B.5.5.2.1 System analysis

The process discussed here, and which was initiated by the 2009-analysis, started out with a broad description of the problem, definition of objectives, and a simplified description of many of the different measures that are possible and necessary to apply in order to reduce traffic volumes (NPRA 2009a). Eight alternatives were developed and analysed. In the alternatives, the variables road capacity, road pricing, bicycle infrastructure and parking prices varies. Further, no alternative was developed which aimed at reducing transport demand and traffic volumes as far as possible with the help of the listed measures and/or other measures.

The land use development is defined and made exogenous in the alternative generation and analyses. This means that the land use development does not vary with any of the variables in the model. No matter how the roads are developed, how well the public transport-systems are developed or where the traffic loads increase or decrease, the land use development will be exactly the same. This is obviously not realistic, and it causes large faults and inaccuracies in the models. It is explained that this is done because the municipal plans are found to steer the land use in accordance with the ABC-principle. It is suggested that this means that the land use development is steered optimally and in traffic-reducing directions (which it in reality is not). Hence, there is no need for discuss other land use alternatives. This understanding is confirmed in the interviews.

The eight alternatives are briefly evaluated, and two alternatives are excluded, mainly because of overlaps. This is followed by a quantitative model-analysis. It is found that the model is sensitive mainly to road pricing. It is concluded that the model is “not suitable for measuring effects of measures like access control, improvements for walking or bicycling, or for public transport (except for measures that reduce travel time or costs)” (NPRA 2009a:78). This means that most of the expert knowledge in question already is disregarded.

Model analyses are however conducted for how the six alternatives affect the defined effect-objectives. Consequences for transport and effects on environment and safety are discussed.

The report concludes with recommendations for further planning. Based on the transport analyses, it is claimed that it has been demonstrated that none of the six alternatives result in achievements of the defined objectives. None of the alternatives cause substantial reduction of congestions, and the concepts that include increased road capacity without restrictions on the road traffic seem to counter the objectives.

There is a lot that speaks for developing the alternatives that combine improvements of the public transport services and the conditions of for walking and bicycling, restrictions on car traffic and moderate increase of the road capacity. The capacity increasing alternatives have advantages too, especially with respect to the potential for differentiating the road system, and if combined with restrictions on the car traffic (pricing, access control). It is recommended to continue working with four different alternatives, whereof two that include a substantial increase of road capacity.

It is concluded that “the system analysis underpins the necessity of assessing different alternative road systems within comprehensive concepts also in the further work with the municipal area plan. This is because the effects of a given road system will vary substantially

with the quality of the rest of the transport-system, land use and restrictions on car use. It is important to consider the effects of road alternatives and concepts in a longer perspective than 2025” (NPRA 2009a:99). This is a strong call for applying the expert knowledge in question in the concrete plan-making process.

B.5.5.2.2 Planning programme

In the planning programme, the four concepts were reduced to two main principles. The alternative without road building, and which caused less increase in road traffic volumes, was excluded because it was “understood as so unrealistic that there is no need for further analyses of an alternative like that” (NPRA 2009b:7). Hence, two principles are discussed: Expansion of existing E 18 to six car-lanes and two public transport lanes, and; construction of new E 18 with eight car-lanes and two public transport lanes. That means a bigger E 18 or a new and even bigger E 18, both with good conditions for the bus traffic.

It is defined that the project is delimited to regard the two road systems alternatives in the E 18 corridor, including public transport lanes and bicycle-tracks directly related to this project. Other measures are not considered in this phase, but will be dealt with later on.

Further, it is clarified that transport analyses and a cost-benefit analysis will be the main methods in the plan-making process. Two different transport models are mentioned. By the help of these, the calculations done in the system analysis (NPRA 2009a) will be checked, and new calculations carried out. It should also be conducted more detailed calculations in order to look closer at effects of public transport prioritisation and use of access control. It will also be conducted “a comprehensive transport analysis with focus on all transport modes. The situation in rush will be addressed and calculated. It will be conducted analyses of effects of traffic regulations, pricing and parking restrictions, as well as traffic regulations on the local roads and use of information technology” (NPRA 2009b:25).

The socio-economic consequences shall be calculated by applying the defined methods in NPRAs handbook. The variables that should be included are benefits for the travellers, the transport-users and operators, traffic accidents, noise and local pollution, GHG-emissions (vkm as indicator), budget and tax costs, remaining value, investment costs and running and maintenance. It is required that the results are presented as the ratio between benefits and costs.

Regarding consequences that cannot be priced or quantified in the same way, a number of variables are mentioned. These are public transport, conditions for bicycling, urban and rural landscapes, local environment and outdoor life⁶⁰, nature, land and water, cultural monuments, natural resources, local land use and urban development, regional development, risks and vulnerability.

When describing how to deal with GHG emissions, it is referred to the analysis from 2009, demonstrating that all the alternatives cause growth in road traffic volumes. It is not expressed that this is considered as an indication that they need to consider other alternatives. It is summarised that “It shall be conducted calculations of GHG emissions for both principles” (NPRA 2009b:26). Neither is it mentioned that there are large differences in absolute number of vkm between the alternatives.

⁶⁰ 'Nærmiljø og friluftsliv' in Norwegian.

When reading the planning programme, there is no doubt that we now have switched focus from 'what should we do in order to solve the traffic and environment problems in the west corridor' to 'what are the consequences of building either of these road expansions'.

The comments in the public hearing of the planning programme is summarised in the case documents presented for the politicians in Bærum before they accept the planning programme (Municipality of Bærum 2010b). Comments from the County Governor's office, Municipality of Oslo, the national train company NSB, the public transport administration company Ruter, and Friends of the Earth Norway regard doubts about whether the planning programme covers the targets defined for Oslo package 3. It is only the Friends of the Earth who states clearly that the road capacity should not be increased, but several comment that road building will not solve the problem.

None of the commentators with power ask explicitly for inclusion of an alternative that does not include increase of road capacity. Hence, there is no need for NPRA and Bærum to develop an alternative like that. The chief officer answers, to the comment from Ruter that alternatives which do not include expansion of the capacity for ordinary car traffic "will not be part of the municipal area plan" (Municipality of Bærum 2010:11).

The chief officer considered the comments to the planning programme as expressions of opinions and as specifications, rather than expressions of shortcomings of the planning programme, and recommended the Municipal Council to adopt the planning programme without changes. This is what they did, and they added that "Bærum municipality will not, under any circumstances, accept an alternative that involves full expansion of E 18 without tunnels" (Municipality of Bærum 2010:5).

B.5.5.2.3 Selection report

In order to increase the efficiency of the planning process, the NPRA initiated analyses in order to select those alternatives that perform better with respect to the defined objectives (NPRA 2011). Only these alternatives would be further analysed. The ultimate situation would be to start directly on the zoning plan proposal for the highest prioritised section or parcel. The analyses and report is conducted by consultants, headed by the company Dr. ing. A. Aas-Jakobsen AS as the main consultants. The report is, however, a NPRA-report.

In the introduction, it is said that a comprehensive strategy that also includes traffic-reducing means is necessary, but that the analyses reported only includes infrastructure measures for cars, bus and bicycle. The analyses regard mainly how much of the road that could and should be built as tunnel, which tunnels that should be prioritised, and the costs and benefits of building the different parcels as tunnel. They arrive at five different combinations of road in tunnel and road not in tunnel. There are no discussions in this analysis with respect to whether increase of road capacity is desirable or whether it has negative effects and consequences.

In the objective analysis, the effect-objectives, indicators and requirements from the NPRA (2009a) report are applied. The transport analyses show that the increase of traffic in all alternatives is about 30 % in the Oslo and Akershus region. It is found that all alternatives facilitate increased use of alternative modes of transport to car, since public transport lanes and bicycle lanes are included in all alternatives. Modal shares are not discussed or specified. It is explained that even if there are some differences between the alternatives with respect to traffic volumes and congestion, the new capacity will be consumed by the growth in

traffic volumes in all alternatives. Other measures than road constructions are necessary in order to reduce congestions.

The costs for the different alternatives are estimated to between NOK 7,4 billion and NOK 10,2 billion. Two alternatives are recommended included in the further planning process, one with six car lanes and almost without tunnels and one with eight to ten car lanes and more tunnels. There are no further analyses of which other measures that are necessary in order to keep traffic down, not to mention to reduce traffic volumes and GHG emissions in accordance with the objectives stated by Akershus County, Municipality of Oslo and Municipality of Bærum, as well as in the National Transport Plan.

The report was presented for a limited public hearing. The responsible authorities are, in their comments, still concerned about the growth in traffic volumes and GHG emissions, the lack of plans for traffic-reducing measures, and the estimated costs (that were much higher than estimated when deciding the Oslo package 3). None does, however, call for other alternatives. Several actors call again for analyses and plans for the 'other measures' that need to be implemented in order to hinder the growth in urban road traffic volumes.

B.5.5.2.4 Plan-making for the municipal area plan

As this is written, the plan-making process is on-going. The NPRA and the planning authorities in Bærum work intensively on developing road alternatives that can be accepted by both of them. The less expansive alternatives have been abandoned. The discussions regard tunnel shares and whether ten lanes are necessary or if eight can be enough. Ten lanes means four lanes on top of the tunnels, in addition to the bus lanes, causing six lane roads that are not much of an improvement of the local environment compared to the present situation.

In interview, the representatives from NPRA and Bærum both explain that there are no discussions at this point regarding the consequences of the increased road capacity on traffic volumes. Further, they do not discuss other measures that can contribute to restrict or reduce traffic volumes. They have to use all their time and capacity on developing the road alternatives. Later on, new traffic analyses will be conducted, and then they will discuss traffic-reducing measures as well. This indicates that they do not think that those measures will affect the dimensioning or design of the road.

At this stage in the plan-making process the expert knowledge is not important or applied. Rather, it has been ousted. It may be applied later on when discussing the consequences of selecting either of the proposed alternatives, or when assessing the proposal in the public hearing.

This understanding was confirmed in interviews. The most central representatives for NPRA and Bærum in this phase both expressed, when discussing the quality of the expert knowledge in question, that this knowledge was not particularly important in the plan-making they are doing right now.

B.5.5.3 The problem is framed as a road building project

When discussing how and why a plan is made which will propose two variations of traffic-increasing road projects, an answer may be that the project has been framed as a road building project.

B.5.5.3.1 Transport planning instead of land use and transport planning

NPRA do the plan-making, and it seems that the planners at NPRA are more focused on, familiar with and knowledgeable with respect to transport planning than with coordinated land use and transport planning. Even though they emphasise that other measures than road building need to be implemented in order to achieve the defined objectives, they explain several times that they first need to discuss the road, and then traffic-reducing measures. This is what De Jongh (1988) terms as to include only certain mechanisms. A land use and transport planner would have chosen a different approach, especially if aiming at developing a traffic-reducing alternative.

Both NPRA planners also emphasise that the road transport quality needs to be predictable and stable and that increase of road capacity can contribute to this because it contributes to balance the capacity in the system better. A land use and transport planner aiming at reducing traffic volumes and GHG emissions would at least consider whether *reducing* the capacity in other parts of the road system could contribute to achieving this balance.

We also see that NPRA first and foremost include and relate to measures that are related to transport planning. This regards the infrastructure for cars, public transport and bicycles, but also road pricing, access control and to some extent parking pricing. Other measures are mentioned, but not applied in analysis etc. Several commentators have called for integrated analyses, but this has been disregarded by the NPRA and the authorities in Bærum. It is said, in documents and in interviews, that other measures will be considered as soon as the road design is in place. This will be considered in the impact assessment and in the public hearing of the area plan.

The planners from NPRA seem to be quite convinced that road pricing can and will be the better measure in order to reduce or restrict the traffic volumes. This may be the case. Pricing of travelling by car can, however, only affect those journeys that can be skipped, or changed with respect to time, destination or transport mode. The price also needs to be high enough to keep traffic down. This is, as both NPRA planners emphasised, not politically eatable at present. The same goes for access control, which is understood as a good measure for separating through-traffic and business traffic from the 'driving to job'-traffic.

The focus on road building as the main measure to solve the problem is demonstrated in the choice of variable in the concepts in the system analysis, the planning programme and the selection report. The alternatives are analysed with respect to the defined objectives, and it is found that the objectives will not be achieved, but they do not discuss or analyse whether other measures could contribute to achieving the objective.

This may be expected, since the main duty of the NPRA is to plan, build and maintain the national road system. In this case, there is also a strong push to come up with alternatives that work – fast. This could explain why they turn to the measure they are in control of, which is road building.

B.5.5.3.2 Transport models as main method

Further, NPRA apply transport model analyses as their main tool. As demonstrated in this case, as well as by several authors, the transport models are not a good tool when discussing reduction of traffic volumes and GHG emissions (see e.g. Tennøy 2004 for a literature review, discussions and references). The models are, according to the documents and the interviews, in-sensitive to all other measures than road pricing when defining traffic

volumes. Hence, most other measures are excluded from the analyses. As the case usually is, land use is kept exogenous in the model. The output of the model is traffic figures for the different alternatives, and congestion levels with different road capacities.

No other analyses are conducted. This means that, in reality, no other measures than road pricing and road capacity are evaluated. Since these transport model analyses are applied in all projects where NPRA are involved, one may understand that it affects how the NPRA planners frame the problem, the possible solutions, and the ways in which they should be discussed. This may be an explanation how and why NPRA do not come up with a traffic-reducing alternative.

This problem is worsened by the fact that the results of the analyses are presented as precise, certain and objective knowledge, and without warnings regarding the many and severe shortcomings of the models when discussing these issues. This may cause not very knowledgeable readers to believe that the results from the transport analyses to a high degree represent reality, and that it demonstrates that a future with reduced traffic volumes is practically impossible. If more knowledgeable readers would check the data, equations and assumptions in the models and the analyses, they could not do so, since this is not accounted for in the reports.

In interviews, all planners express that they know that the models have shortcomings. Still, several of them explain that the discrepancy between the model results and the expert knowledge regarding mechanisms and effects could just as well be caused by faults in the expert knowledge as in the models. In this case, the plan-making process was quickly stripped down to measures that are relevant in the models. When that is done, the expert knowledge in question is of no help.

This is an example of how transport model analyses crowd out other approaches to analyse the problem and discuss alternative solutions. The transport planners use transport models to estimate future traffic loads, and discuss future road systems with respect to these traffic loads. Alternatively, the discussions could have revolved around which changes of land use and transport-systems, as well as other measures that could contribute to reduce transport demand and car traffic shares.

Since the transport models, the input data, the assumed mechanisms and the strength of these are not presented in the reports, no-one can critically consider whether the output of the transport analyses are reasonable, valid or just. Nobody else have the resources to make alternative transport model analyses. Hence, the analyses and the results are dependent on the knowledge and the framing of those involved in designing the models, running the analyses and interpreting the results.

Another point is that the energy, capacity and funding for plan-making is used for activities related to the transport models, rather than on discussions, analyses etc. related to developing other solutions that consider a broader scope of measures.

B.5.5.3.3 Framing affects the results

If the case is defined as an infrastructure construction project, if other measures are not included in the discussions, and if the method applied is not sensitive to other measures than road pricing and road capacity, the plan-making process can in reality only produce one solution: road building and road pricing.

B.5.6 How did the actors act when producing a traffic-increasing plan

The actions of the main actors can be summarised by applying the framework defined in chapter 6.6 in the main report:

- The initiators initiated the process by conducting an analysis of different concepts which were supposed to help solve the traffic and environment problems in the west corridor
- The initiators chose to not present an actual traffic-reducing alternative, and to apply a tool which is in-sensitive to almost all traffic-reducing measure
- Their analysis demonstrated that none of the concepts met the defined objectives
- Some commentators responded by pointing out conflicts with objectives in overall plans, but none called for a traffic-reducing alternative or for other methods to be applied
- The planning authorities did not point out conflicts with respect to traffic volumes and GHG emissions, or call for plans that meet this objectives, but rather for plans that meet requirements for improving the *local* environment
- In the planning programme, the initiators and the planning authorities chose to include two traffic-increasing road alternatives whereof only the most capacity strong was seen as realistic. No other measures are discussed.
- The initiators produced a selection report, discussing mainly road development designs (tunnels) with increased capacity
- Some commentators responded by pointing out conflicts with objectives in overall plans, while others did not, but none called for alternatives that contribute to reduce traffic volumes
- The municipal politicians signalled clearly that only an alternative with long tunnels, and hence high capacity, is acceptable
- In the on-going plan-making process, the initiators and the planning authorities discuss only the largest road alternative, with different tunnel lengths, and may consider traffic-reducing measures later on

B.5.7 Explaining how and why a traffic-increasing plan was made

B.5.7.1 How and why this ended up as a traffic-increasing plan

B.5.7.1.1 What is necessary in order for traffic-reducing plan to be made?

When aiming at explaining how and why this traffic-increasing plan is made, and after having described the structure of the problem and the relevant conditions, it is helpful to ask the retroductive question: what is necessary in order for a traffic-reducing plan to be made instead of a traffic-increasing plan?

The main answers to that would, according to previous discussions in this dissertation, be that reducing traffic volumes would have to be defined as a prioritised objective. Further, knowledge needs to exist that demonstrates that the traffic-increasing plan is a traffic-increasing plan, and somebody needs to point that out. Knowledge also needs to exist regarding how land use and transport-systems can be developed in order to achieve reduced traffic volumes, and a transport reducing alternative needs to be produced. The traffic-increasing alternative would have to be rejected, and the traffic-reducing alternative would have to be adopted.

In this case, reducing traffic volumes and GHG emissions were defined as objectives. They were, however, ousted as un-realistic and by competing objectives in the plan-making process. Other objectives were prioritised in the process. Reducing traffic volumes and GHG

emissions are still stated objectives, and several commentators emphasise them in their comments. Traffic-increasing alternatives have been developed and assessed as traffic-increasing. It is clear for everybody that they cause, or at least allow, growth in traffic volumes.

What is lacking, however, is an alternative that aims at reducing transport demand and traffic volumes with the help of accessible measures. Since this alternative is not developed, it cannot be assessed, compared with other alternatives or chosen. The question is hence why this alternative has not been developed. There are several reasons why this is the case.

B.5.7.1.2 Strong signals from local politicians

The politicians in Bærum (who eventually would be the ones that adopt the zoning plan allowing the road to be built) have made it crystal clear that they will not accept an alternative without long tunnel stretches. Combined with the safety requirements from the NPRA, this means that increased road capacity is necessary. All interviewees explained that when the politicians have been this clear, they can in reality not oppose this and propose other alternatives.

B.5.7.1.3 NPRA frame the problem as a road building project

One reason may be that NPRA seem to frame the problem as an infrastructure building project, as discussed above. The alternatives they discuss vary mainly with respect road capacity and design (tunnels) and road pricing. The transport models are insensitive to almost all other measures than road pricing. Traffic-reducing measures will only be considered after the road capacity and design has been defined, in the impact assessment and public hearing of the area plan. This means that traffic-reducing measures will only be considered as mitigating measures, and not as part of the solution.

If the case is defined as an infrastructure construction project and measures are not included in the discussions, and if the method applied is not sensitive to other measures than road pricing and road capacity, the plan-making process can in reality only produce one solution - road building combined with road pricing.

B.5.7.1.4 Nobody called for a traffic-reducing alternative

One may expect that NPRA arrive at a plan for road building and road pricing. In order for a traffic-reducing alternative to be produced, somebody else would need to require or produce this alternative. If a good alternative actually was produced, this could have changed the discussion and the plan-making process in more traffic-reducing directions. In this case, nobody put power behind their calls for a traffic-reducing alternative, considerations of other measures before concluding on road designs, or application of other methods, and nobody produced an alternative plan.

This may be because nobody with deep and comprehensive knowledge in this field was involved and could call for and make probable that this is a real alternative, that nobody has the resources to do so, that it is nobody's duty to do so, or because nobody involved believe that a traffic-reducing alternative actually can exist. It may also be because of the understanding that a road construction alternative is what the politicians want.

It would take a strong, knowledgeable and convincing voice to persuade the other actors to actually try to develop a traffic-reducing alternative. This voice was not present in this debate. Hence, a traffic-reducing alternative was never introduced, and only traffic-increasing alternatives were developed.

B.5.7.1.5 The objective and the expert knowledge is ousted

Since the NPRA frame the problem as a road building project, and since nobody else can or will call for a framing focusing on reduction of traffic volumes and GHG emissions and on applying the expert knowledge in question in order to achieve this, the objective and the expert knowledge is ousted.

These are the main mechanisms through which the causal powers work in this case. The objectives in focus are to improve the local environment and to make the road system work for all users. The knowledge that is applied is transport planning, including a limited set of measures and transport model analyses with large and well known shortcomings. It is hard to see how one may arrive at a traffic-reducing plan, or how a traffic-increasing plan can be stopped, in this situation.

B.5.7.1.6 The same story over again?

When comparing the plan-making process that is studied here with the two previous processes that were discussed before, a pattern appears. The processes start out with a broad description of the problem, definition of objectives, and a broad description of the many different measures that are possible and necessary in order to achieve the objectives. At a certain point this is reduced to two or a few road alternatives that are analysed with respect to few variables with the help of transport model analyses. These alternatives have been quite similar. The outcome has been assessments of which of two road expansion alternatives that are better.

Since the consequences of expanding the road are large and negative, and cannot be accepted due to overall policies, objectives and plans, this alternative may not be acceptable. Hence, the plan-making process may need to start all over again. This has been the case in the previous two attempts.

B.5.7.2 Explanation

The main cause why a plan is initiated is that especially the NPRA (owners of the road) and Bærum municipality (which inhabitants suffer from local environment problems and congestions) find that they have a traffic and environment problem that they want to and need to solve.

Because of the conditions, the mechanisms 'ousting the objective' and 'ousting the expert knowledge in question' were activated. These conditions regards among others: that the NPRA were in charge of the plan-making process; that NPRA framed the problem as a road construction problem; that transport models were applied as the only method; that there were no planner(s) present who would and/or could and/or was responsible for bringing forward a traffic-reducing and otherwise acceptable alternative; that nobody called – with force - for a traffic-reducing alternative; that the municipal politicians strongly require tunnels, and; that NPRA and Bærum gave higher priority to other objectives than to reduce traffic volumes and GHG emissions.

This contributed to that reducing traffic volumes and GHG emissions are not the main objectives, but rather objectives that seem to be in conflict with these. Only a limited selection of traffic-reducing measures is considered.

Hence, a traffic-reducing alternative was never proposed, discussed, analysed, assessed or compared with the other alternatives, and a traffic-reducing alternative will not be

presented. The traffic-increasing alternatives were not challenged and stopped. This means that the decision-makers cannot select a planning proposal for a traffic-reducing development of E 18 in the west corridor. The politicians will eventually either have to adopt a strongly traffic-increasing plan, or to reject the proposals. If the latter is the case, the process will need to start over again.

B.5.8 Relevance of the preliminary explanations

B.5.8.1 Explanations related to the expert knowledge in question

This has to do with properties of the expert knowledge in question. Even though a simplified version of this expert knowledge to a certain extent is described in the system analysis report, it is not really applied in the plan-making process. This is caused – among others – by entities of the expert knowledge itself.

This probably has to do with the lack of empirical documentation of the existence and strengths of the effects of certain changes of land use and transport-systems on each other, travel behaviour and traffic volumes. This makes it harder to apply the expert knowledge in question directly and develop a trustworthy and traffic-reducing alternative.

It probably has to do with lack of defined, described and well discussed methods for applying the expert knowledge in analyses leading towards answers and recommendations. Further, it probably has to do with lack of comprehensive presentations of this expert knowledge, which also is accessible and actually usable in plan-making processes – especially when the problems are large, long term and complex, as they are here. This leaves the scene open for the transport model analyses, even though it is well known that they are not good tools for these kinds of tasks.

It probably also has to do with the fact that the expert knowledge in question do not aim at producing quantitative average data. Hence, it is hard as well as un-wanted to produce quantitative and precise predictions. The more qualitative and explanatory predictions seem to be harder to make and to understand, and hence they are not produced.

Finally, it probably has to do with that the knowledge – because of the reality – is complex, and that this expert knowledge is not willing to do the over-simplifications that are done in the transport models (and the reasons why is clearly demonstrated in this case). Since the transport planners and the transport models do this simplification, and come up with answers, they take lead in the discussions.

This means that the situation could be improved if the quality of the expert knowledge was improved, especially with respect to development and description of methods, accessibility to comprehensive description of the knowledge, as well as empirical knowledge. There seem, however, to be a pull towards the simpler quantitative methods discussing few measures, instead of the complex and qualitative methods discussing many and different measures and interrelations simultaneously. The shortcomings of these methods, and the consequences of applying them, need to be thoroughly discussed. NPRA could seriously consider whether requiring transport model analyses and cost benefit analyses of their projects is wise, or whether they rather should consider other methods and approaches.

B.5.8.2 Explanations related to the planners and how they relate to the expert knowledge

When a traffic-reducing alternative is not produced and presented in the plan-making process, this also has to do with properties of the planners, and how they relate to what is good knowledge and how it can be applied.

First, none of the involved planners are scholarly trained land use and transport planners, and none were well read in the topic land use and transport planning and development for reduced urban road traffic volumes. This may indicate that none of them possess deep and thorough understanding of how these systems work and how land use and transport-systems need to be developed in order to contribute to reduction of urban road traffic volumes.

It also has to do with how the planners involved relate to planning analyses and use of planning knowledge. Even though most agree on weaknesses, shortcomings and faults of the transport model analyses, they do agree that they are useful and should be applied. They easily allow the transport analyses to oust all other measures, and they do only rarely refer to the expert knowledge in question as the plan-making process has started for real. Instead, the plan-making programme states that the further analyses will be based on transport model analyses and cost-benefit analyses, and regard only two alternatives which are different only with respect to road capacity.

Nobody stands up for the expert knowledge in question. This has to do with properties of the planners as well as properties of how the planners relate to the expert knowledge in question.

B.5.8.3 Explanations related to the plan-making processes

That a traffic-reducing alternative is not produced also has to do with the plan-making process and how it proceeds.

As we have seen, NPRA and the municipality both promote and protect their main objectives. As the plan-making proceeds here, reducing traffic volumes is in practice a competing objective to those objectives. Reducing traffic volumes with the help of the measures recommended by the expert knowledge in question would among others require to reduce, or at least not to increase, the road capacity. As the situation is presented by the responsible planners, improving the local environment requires tunnels, and according to NPRA this requires increased road capacity. NPRA emphasise in the documents as well as in the interviews that they will and do include traffic-reducing measures, and that a comprehensive approach is necessary in order to achieve the defined objectives. This is not followed up.

Since nobody can, will and do apply the expert knowledge in question in order to produce a relevant alternative that apply the expert knowledge in order and cause reduction of traffic volumes, this alternative is never presented in the plan-making process. Further, nobody seems to feel that they are responsible for requiring an alternative like that from NPRA. NPRA themselves express in interview that their job is to plan a road system that contributes to achieving the defined objectives, and that they also expect others to implement other measures (land use, public transport services, road pricing) that can contribute to keep the traffic down. That is, however, not their duty. Hence, nobody calls for this alternative, and nobody feels that it is their responsibility to develop it.

It is also explained that only the infrastructure measures can be discussed in the area plan process. This is not necessarily the case. Land use developments, parking norms, access control and other measures can be discussed in area plans. One may hence say that the area plan process has been defined as to only consider the roads.

Those with most power in this process are the NPRA as initiators and Bærum municipality as planning authorities. The main power-problem in this case, as probably in many other cases, is that nobody with power is truly concerned with and responsible for reducing GHG emissions and to bring forward traffic-reducing alternatives.

B.5.9 Interviewees

Knut Gløersen, NPRA, project leader E 18, including i.e. the planning programme and the selection report

Anders Jordbakke, NPRA, project leader for the analysis of the future transport-system

Terje Hansen, planning authorities in Bærum, project leader for the municipal area plan

Kari Sagbakken, planning authorities in Bærum, involved in the system analysis

Njål Nore, Akershus County, case-handler for the case

Ivar Sørliie, Municipality of Oslo, Department for transport and environmental affairs

B.5.10 Interview guide

0. Background:

Professional background of respondents, and whether they are experts on coordinated land use and transport planning for reduced traffic volumes

1. This plan-making process specifically

- 1.1. Why does this plan-making process consider only capacity increasing roads that will cause growth in urban road traffic volumes?
- 1.2. Why was the potentially traffic-reducing alternative not included in the planning programme?
- 1.3. Did anyone/ did you submit traffic-reducing alternatives? Why are these alternatives not analysed in the same way as the capacity increasing road construction alternatives?
- 1.4. Has anyone brought in knowledge regarding coordinated land use and transport development for reduced traffic volumes? How has the expert knowledge been used, and how has this affected the alternatives, the planning and the plans?
- 1.5. What knowledge / arguments / considerations caused that the plan was made and approved?
- 1.6. When and how are they supposed to come up with the measures that are assumed to be implemented in order to hinder growth in road traffic volumes? Why cannot these measures be introduced *instead of* building new road capacity?
- 1.7. What happens next?

2. Objectives

- 2.1. Do you feel that the objective to 'reducing car traffic' is an objective or issues in this plan? Otherwise? In overall planning and policy documents?

- 2.2. Is this considered a realistic objective that can be achieved? Do you consider it this way?
- 2.3. Is the development of the road system moving in the right directions? The traffic volumes?

3. Knowledge

- 3.1. Do you feel that it is accepted knowledge that increasing road capacity cause and allow growth in road traffic volumes?
- 3.2. Is this well-known and common knowledge? Who does not know this/ disagree/ think it's insignificant?
- 3.3. What kind of knowledge base is commonly referred to? Is there literature or the like that you can refer to?
- 3.4. Which are good methods for analyses when applying the expert knowledge in question?
- 3.5. How is this knowledge used, and by whom? What data are collected, what questions are formulated, which strategies are drawn up, which consequences are considered, which alternatives are compared etc.?
- 3.6. Is our general knowledge regarding coordinated land use and transport planning for reduced car use and GHG emissions good enough? Theoretical, methodological, accessibility?
- 3.7. Are there competing knowledge that outperforms this? What, how and by whom

How and why planners make plans which, if implemented, cause growth in traffic volumes

Appendix C: Questionnaire applied in the survey

This is the original questionnaire, and it is hence written in Norwegian.

Norsk institutt for by- og regionforskning
Postboks 44 Blindern, 0313 Oslo
Tlf. 22 95 88 00
Kontaktperson: Aud Tennøy
aud.tennoy@nibr.no
Fagfolk



Spørreundersøkelse

Sett kun ett kryss per spørsmål dersom ikke annet er oppgitt.

Alle spørsmålene gjelder forhold i større norske byområder med press på transportsystemet, og vi ønsker at dere ser utviklingen i et mellomlangt og langt perspektiv (mer enn fem år).

1. Det byområdet jeg i hovedsak relaterer svarene mine til er...

¹ Oslo ² Bergen ³ Trondheim ⁴ Flere av disse ⁵ Ingen av disse

Virkemidler

2. Hvor effektive mener du virkemidlene listet under er, dersom man ønsker å redusere utslipp fra biltrafikken?

Kun ett kryss per linje.

	Ikke effektivt	Litt effektivt	Nokså effektivt	Meget effektivt	Svært effektivt	Vet ikke
	1	2	3	4	5	6
1. Å øke kapasiteten på hovedveinettet	<input type="checkbox"/>					
2. Å lokalisere nye boliger og arbeidsplasser slik at folk blir mindre avhengige av bil	<input type="checkbox"/>					
3. Å forbedre kollektivtilbudet	<input type="checkbox"/>					
4. Å forbedre forholdene for gang- og sykkeltrafikken	<input type="checkbox"/>					
5. Å gjøre det dyrere å kjøre personbil	<input type="checkbox"/>					
6. Å begrense kapasiteten på hovedveinettet	<input type="checkbox"/>					
7. Å gjøre det dyrere eller vanskeligere å parkere personbil	<input type="checkbox"/>					
8. Informasjon, holdningskampanjer og lignende	<input type="checkbox"/>					
9. Å kombinere flere av disse virkemidlene	<input type="checkbox"/>					

3. Hvor effektive mener du virkemidlene listet under er, dersom man ønsker å redusere køene/ bedre fremkommeligheten?

Kun ett kryss per linje.

	Ikke effektivt	Litt effektivt	Nokså effektivt	Meget effektivt	Svært effektivt	Vet ikke
	1	2	3	4	5	6
1. Å øke kapasiteten på hovedveinettet	<input type="checkbox"/>					
2. Å lokalisere nye boliger og arbeidsplasser slik at folk blir mindre avhengige av bil	<input type="checkbox"/>					
3. Å forbedre kollektivtilbudet	<input type="checkbox"/>					
4. Å forbedre forholdene for gang- og sykkeltrafikken	<input type="checkbox"/>					
5. Å gjøre det dyrere å kjøre personbil	<input type="checkbox"/>					
6. Å begrense kapasiteten på hovedveinettet	<input type="checkbox"/>					
7. Å gjøre det dyrere eller vanskeligere å parkere personbil	<input type="checkbox"/>					
8. Informasjon, holdningskampanjer og lignende	<input type="checkbox"/>					
9. Å kombinere flere av disse virkemidlene	<input type="checkbox"/>					

4. Dersom kapasiteten på hovedveinettet ikke bygges ut, i hvilken grad mener du at følgende vil skje?

Kun ett kryss per linje.

	Ingen grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Vet ikke
1. Køene og forsinkelsene vil øke inntil totalt trafikkaos oppstår	<input type="checkbox"/>					
2. Flere går over til kollektiv-, gang- og sykkeltrafikk	<input type="checkbox"/>					
3. Folk vil tilpasse seg situasjonen ved å reise mindre, på andre tider, til andre steder og lignende	<input type="checkbox"/>					
4. Folk og bedrifter vil flytte til andre steder i området, slik at de unngår køene	<input type="checkbox"/>					
5. Folk og bedrifter vil flytte ut av området	<input type="checkbox"/>					

5. I hvilken grad mener du det finnes konkurranseflater mellom biltrafikk og kollektivtrafikk?
 1 I svært liten grad 2 I liten grad 3 Til en viss grad 4 I stor grad 5 I svært stor grad 6 Vet ikke 17

6. Det er forskjellige syn på hvilken nytte ny kapasitet på hovedveinettet har i byer med køsituasjon og press på transportsystemet. I hvilken grad er du enig i påstandene under (bruk 5-års perspektiv)?

Kun ett kryss per linje.

	Ingen grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Vet ikke
1. Økt veikapasitet på hovedveinettet vil fjerne bilkøene	<input type="checkbox"/>					
2. Økt veikapasitet på hovedveinettet vil redusere forsinkelsene for biltrafikken	<input type="checkbox"/>					
3. Økt veikapasitet på hovedveinettet vil redusere biltrafikken på det lokale veinettet	<input type="checkbox"/>					
4. Økt veikapasitet gir liten nytte, ny biltrafikk vil fylle opp kapasiteten, og køene blir like lange som før	<input type="checkbox"/>					

7. I hvilken grad er din mening om virkemidler (som oppgitt i spørsmål 2-6) i overensstemmelse med oppfatninger i fagmiljøene på ditt felt (slik du oppfatter det)?

1 I svært liten grad 2 I liten grad 3 Til en viss grad 4 I stor grad 5 I svært stor grad 6 Vet ikke

8. Kan man påvirke biltrafikkens volum? Sett kun ett kryss.

1 Biltrafikken kan reduseres dersom de riktige virkemidlene settes inn
 2 *Veksten* i biltrafikken kan reduseres, men volumet vil fortsette å øke
 3 Biltrafikken vil fortsette å vokse i samme takt som nå, samme hva vi gjør
 4 Vet ikke

9. I hvilken grad opplever du at politikerne vegrer seg for å ta i bruk virkemidlene listet under i enkeltsaker?

Kun ett kryss per linje.

	Ingen grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Vet ikke
1. Å øke kapasiteten på hovedveinettet	<input type="checkbox"/>					
2. Å lokalisere nye boliger og arbeidsplasser slik at folk blir mindre avhengige av bil (nekte annen lokalisering)	<input type="checkbox"/>					
3. Å forbedre kollektivtilbudet	<input type="checkbox"/>					
4. Å forbedre forholdene for gang- og sykkeltrafikken	<input type="checkbox"/>					
5. Å gjøre det dyrere å kjøre personbil	<input type="checkbox"/>					
6. Å begrense kapasiteten på hovedveinettet	<input type="checkbox"/>					
7. Å gjøre det dyrere eller vanskeligere å parkere personbil	<input type="checkbox"/>					

Målsettinger

10. Bør det være en viktig politisk målsetting å redusere personbiltrafikken i byene i Norge?

1 Ja 2 Nei 3 Vet ikke

11. Hvor viktige mener du målsettingene under bør være for areal- og transportplanleggingen i større norske byer?

Kun ett kryss per linje.

	<i>Ikke viktig</i>	<i>Litt viktig</i>	<i>Nokså viktig</i>	<i>Meget viktig</i>	<i>Svært viktig</i>	<i>Vet ikke</i>
1. Bytransportens bidrag til utslipp av klimagasser må reduseres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
2. Lokal luftforurensing pga biltrafikk må reduseres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
3. Boligområder må skjermes mot biltrafikk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
4. Sentrumsområder må skjermes mot biltrafikk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
5. Barriere-effekter på grunn av biltrafikk må reduseres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
6. Fremkommeligheten for biltrafikken må bedres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
7. Den totale biltrafikken må reduseres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
8. Kollektivtilbudet må forbedres	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
9. Hovedtyngden av nye boliger og næringslokaler må lokaliseres sentralt eller ved kollektivknutepunkter	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

Institusjoner og makt

12. Hvor mye makt har de følgende gruppene i areal- og transportplanleggingen og -politikken?

Kun ett kryss per linje.

	<i>Ingen makt</i>	<i>Litt makt</i>	<i>En del makt</i>	<i>Mye makt</i>	<i>Svært mye makt</i>	<i>Vet ikke</i>
1. Tiltakshaver/ utbygger (også Vegvesenet og Jernbaneverket når de er tiltakshaver)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
2. Konsulenter/ uavhengige fagfolk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
3. Offentlige planmyndigheter	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
4. Offentlige vernemyndigheter	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
5. Lokale politikere (kommunale)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
6. Regionale og statlige politikere	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
7. Høringsinstanser	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
8. Publikum for øvrig	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

13. Hvem mener du bør få mer makt, og hvem bør få mindre makt, i areal- og transportplanleggingen?

Kun ett kryss per linje.

	<i>Mindre makt</i>	<i>Uendret makt</i>	<i>Mer makt</i>	<i>Vet ikke</i>
1. Tiltakshaver/ utbygger (også Vegvesenet og Jernbaneverket når de er tiltakshaver)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
2. Konsulenter/ uavhengige fagfolk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
3. Offentlige planmyndigheter	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
4. Offentlige vernemyndigheter	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
5. Lokale politikere (kommunale)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
6. Regionale og statlige politikere	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
7. Høringsinstanser	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
8. Publikum for øvrig	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

Om transportanalyser og deres rolle i planleggingen

14. Hvilken betydning mener du transportanalyser har for hvilke løsninger som velges i areal- og transportsaker?

Sett kryss ved den uttalelsen du er mest enig i.

- 1 Transportanalyser har liten betydning for hvilke løsninger som velges i areal- og transportsaker
- 2 Transportanalyser har noe betydning for hvilke løsninger som velges i mange areal- og transportsaker
- 3 Transportanalyser har stor betydning for hvilke løsninger som velges i enkelte areal- og transportsaker
- 4 Transportanalyser har ofte stor betydning for hvilke løsninger som velges i areal- og transportsaker
- 5 Vet ikke

15. Spiller det noen rolle for resultatene av transportanalysene hvem som gjennomfører dem? Sett kryss ved den uttalelsen du er mest enig i.

- ¹ Nei, gjennomføring av transportanalyser er et objektivt og vitenskapelig arbeid, resultatene vil bli de samme uansett hvem som gjennomfører analysene
- ² Noen vurderinger må gjøres av dem som gjennomfører transportanalysene, resultatene kan variere noe med hvem som gjennomfører analysene
- ³ Ja, det må foretas mange subjektive beslutninger, og resultatene blir derfor avhengige av kunnskap og holdninger hos dem som gjennomfører analysene
- ⁴ Jeg er ikke enig i noen av uttalelsene
- ⁵ Vet ikke

16. I hvilken grad mener du at overordna transportanalyser kan brukes til å vurdere effekten av transportreduserende virkemidler, som dem nedenfor.

Kun ett kryss per linje.

	Ingen grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Vet ikke
1. Transportreduserende arealutvikling	¹ <input type="checkbox"/>	² <input type="checkbox"/>	³ <input type="checkbox"/>	⁴ <input type="checkbox"/>	⁵ <input type="checkbox"/>	⁶ <input type="checkbox"/>
2. Driftsmessige forbedringer i kollektivtrafikken (frekvens, flatedekning, komfort...)	¹ <input type="checkbox"/>	² <input type="checkbox"/>	³ <input type="checkbox"/>	⁴ <input type="checkbox"/>	⁵ <input type="checkbox"/>	⁶ <input type="checkbox"/>
3. Begrensning av veikapasiteten/ kø på veinettet	¹ <input type="checkbox"/>	² <input type="checkbox"/>	³ <input type="checkbox"/>	⁴ <input type="checkbox"/>	⁵ <input type="checkbox"/>	⁶ <input type="checkbox"/>
4. Tilrettelegging for gang- og sykkeltrafikk	¹ <input type="checkbox"/>	² <input type="checkbox"/>	³ <input type="checkbox"/>	⁴ <input type="checkbox"/>	⁵ <input type="checkbox"/>	⁶ <input type="checkbox"/>

17. Hvor stor usikkerhet (avvik mellom beregnet trafikk og målt trafikk etter gjennomført tiltak) anser du som vanlig i transportanalyser?

- ¹ 0 -10 % ² 11 -30 % ³ 31 -50 % ⁴ 51 - 70 % ⁵ Mer enn 70 % ⁶ Vet ikke

Om prosessene rundt utarbeiding av transportanalyser (kun for dem som arbeider med transportanalyser/ kapasitetsberegninger, som konsulent eller tiltakshaver. Andre ka gå direkte til spørsmål 24)

18. Hvem har vanligvis størst innflytelse på hvilke alternativer som vurderes i transportanalyser? Sett kun ett kryss.

- ¹ Tiltakshaver
- ² Den som gjennomfører analysen
- ³ Det gjøres i samarbeid mellom tiltakshaver og den som gjennomfører analysen
- ⁴ Andre
- ⁵ Det varierer så mye at man ikke kan si noe generelt om dette

19. Hvem bestemmer vanligvis hvilke forutsetninger og data som legges inn i analysene (bilhold, parkeringsdekning, transportmiddelfordeling etc.)? Sett kun ett kryss.

- ¹ Tiltakshaver
- ² Den som gjennomfører analysen
- ³ Det gjøres i samarbeid mellom tiltakshaver og den som gjennomfører analysen
- ⁴ Andre
- ⁵ Det varierer så mye at man ikke kan si noe generelt om dette

20. Hvem utarbeider vanligvis anbefalingene som gjøres på grunn av transportanalysene? Sett kun ett kryss.

- ¹ Tiltakshaver
- ² Den som gjennomfører analysen
- ³ Det gjøres i samarbeid mellom tiltakshaver og den som gjennomfører analysen
- ⁴ Andre
- ⁵ Det varierer så mye at man ikke kan si noe generelt om dette

21. Hender det at det er faglig uenighet mellom oppdragsgiver (tiltakshaver) og den som gjennomfører transportanalysene? Sett kun ett kryss.

- ¹ Ja, det skjer ofte ² Ja, det hender ³ Nei, svært sjelden ⁴ Vet ikke

How and why planners make plans which, if implemented, cause growth in traffic volumes

Appendix D: How the objective and knowledge may be ousted in the plan-making process

D.1 Tasks in planning and decision-making

The understandings of planning have changed during the decades. Through the shifting discussions, however, some tasks seem to define planning and to be unavoidable in a practice defined as planning (Friedmann 1987). Based on among others Friedmann (*ibid*) and Banfield ([1959] 1973), the tasks involved in planning and decision-making may be listed as in the figure. These tasks are carried out in overall land use and transport planning as well as in zoning plan processes (at least they are supposed to be).

1. Situation analysis and problem definition
2. Formulation of goals and objectives
3. Identification and design of alternatives
4. Identification, prediction and assessments of impacts and consequences for each alternative (impact assessment)
5. Comparison of alternatives with respect to consequences in relation to desired objectives and other values
6. Recommendations (planning proposals)
7. Decision about action, based on knowledge produced through the preceding steps and other knowledge
8. Implementation of the decision through appropriate institutions
9. Feedback and post-auditing

Figure D. 1: The classic description of tasks involved in planning and decision-making (based on among others Banfield [1959] 1973 and Friedmann 1987).

Planning and decision-making processes will usually not follow a direct course of action from task number one to task number nine. Rather, they are iterative processes, more to be understood as continuous discussions regarding where we are going, what needs to be changed, where we want to go, how to get there and whether a proposed project contributes to take us there or not.

D.2 Situation analysis and problem definition

In task one, the present situation is described and interpreted, and what are to be understood as ‘problems’ which need to be dealt with are analysed and defined. In municipal plans, one describes the current situation and main developments regarding among others transport-systems and traffic (growth, delays, over-crowding) and environment, and may find that the situation is problematic.

In zoning plans, relevant parts of the existing situation are supposed to be described. This includes important and good qualities, as well as stress, which may be reinforced or relieved by the proposed project. This often regards different issues related to environment and transport. The situation analyses carried out by the public or private initiators will revolve around *their* specific situation, problems and needs, such as need for more office space.

Relevant context knowledge regarding the state and development of social, economic and ecological systems, as well as whether development trends go in directions which require action in order to change the present course, may come from a number of sources. These

could be science, inhabitants, businesses, political bodies, initiators of zoning plans, and others. The discussions may be affected by and include perceived problems of a region, city or local area, on-going political discussions, decisions in the EU or the UN, what is discussed in media etc.

Previous plans and analyses, as well as plans and analyses made at higher administrative levels, are important sources of information regarding states and problems. When zoning plans are initiated, this is normally a result of a situation analysis leading to a problem definition in a business, firm, a public sector agency, or others.

The process of describing the situation and defining which are the main problems are certainly a part of the plan-making process where participation from different parts of the society (depending among others of the kind of plan) is necessary, useful and (in the Norwegian context) required by the PBA.

Eventually, someone needs to decide what one actually includes in the situation analysis and defines as important problems, how this is to be measured and described, and how this is to be interpreted. This is normally done by the planners and/or policy advisers (working for different actors).

When analysing and interpreting the situation and defining what the problems are, the objectives and knowledge of those involved (working for different actors) inevitably affect which aspects of the situation they focus on, which aspects they find should be regarded as problems which need to be addressed, as well as how they measure and describe the problem. This regards what they are able to understand as problems, how they are able to measure and describe it, as well as whether understanding a certain aspect as 'a problem' and ensuring and describing it in a certain way improve the chances that *their* main objectives are achieved in the particular plan-making process.

One can hence expect that what comes to be *recognised as important problems* in a planning process will be shaped and defined in the discussions and struggles between actors with often fundamentally different objectives and knowledge. Overall societal needs may clash with the needs of proposers of zoning plans. Those which possess much power in a particular planning process will have the strongest opportunities to influence what is defined as important problems. National guidelines, strong political focus, understanding among the population that this is a problem, as well as other factors may contribute to defining which problems are more important.

Whether road traffic volumes are included in the description and analysis of 'the situation', and whether growing traffic volumes and GHG emissions come to be seen as 'a problem' hence depend on whether there are individuals involved in the analyses and discussions who bring this to the table. They also need to be knowledgeable about the topic and the ways in which this is a problem in order to be able to substantiate their claim. They also need to be able to persuade the other actors in the process that this is important.

If nobody brings these issues into the situation analysis and problem description, and/or if the ones doing it are not able to persuade the other actors that these should be considered important problems in absolute as well as relative terms, or it is downplayed or ousted by more powerful actors, increasing traffic volumes and GHG emissions from transport will not be recognised as an important problem.

D.3 Formulation of objectives

The discussions in task two, where objectives are formulated, regard what should be attempted changed, achieved, and/or not harmed by the development approved through the plan. Objectives can regard very different issues, such as to reduce GHG emissions, to increase or decrease economic growth, to reduce congestion on main roads, to build more kinder-gardens, to secure enough office space for one's business, to reduce urban road traffic volumes - and numerous others. Conflicting and competing objectives, as well as lack of agreement on making 'reducing urban road traffic volumes' a highly prioritised objective, on what it actually means, and whether it is achievable, may be important reasons why one not succeeded in reducing urban road traffic volumes.

The objectives are preferably formulated on the basis of what has been found to be important in the situation analysis and problem definition. Formulation of objectives will also be affected by what is understood to be practically and politically achievable. If new knowledge is developed regarding more acceptable ways of achieving an objective, this objective may be prioritised higher than previously. Different actors will have different opinions concerning which objectives should be prioritised, as well as how and with which clarity and strength they should be formulated, depending on their objectives and their knowledge. Those who possess most power in the particular planning process will influence the problem definition the most.

Ideally, in rational planning theory, decision-makers (politicians in this case) were supposed to provide clear and weighted goal-hierarchies, which the different alternatives of planning proposals (at overall as well as project level) could be assessed in relation to, in order to arrive at which alternative that maximises goal achievement. This way of understanding the role of objectives is abandoned by more modern planning theory. According to Banfield ([1959] 1973) this has never been understood as anything but a thought model, and there have probably never been public planning processes following this ideal. Public agencies need to reflect a number of incompatible interests in their end systems, resulting in complex systems of possibly conflicting objectives which may be hard (if possible) to achieve, he explained.

Remnants of rational planning theory are, however, visible in the hierarchical planning system, and not least in cost-benefit analyses and other analysis methods producing quantitative and aggregated indicators, often normalized and weighted within and/or across sectors, for comparison of planning alternatives (see e.g. Næss 2006a, Waeger et al. 2010).

A number of different kinds of objectives are brought into planning processes by numerous actors. These can be objectives at different levels, from societal objectives of reducing GHG emissions from transport to an initiator's objective of being allowed to implement her project. Plans and guidelines at higher administrative levels will provide a number of objectives (guidelines, requirements...) which need to be considered in the planning process. Sector plans, such as the National transport plan, will bring their own goal-hierarchies. The inhabitants (which also are the voters) will often have differing opinions regarding which are necessary and important objectives for societal planning. Public inquiries are required in early stages of planning processes in order to ensure that different prioritisations of objectives and formulations have been brought into the discussions. The definition and prioritisation of objectives may hence be understood as a collaborative process, influenced by many and different actors.

What come to be defined as the most prominent objectives, as well as how and with which clarity and strength the objectives are formulated, are however also influenced by the objectives, knowledge, and powers of the ones involved in the plan-making process. They will obviously aim at making their objectives and concerns prominent, and to oust objectives which conflict or compete with theirs. Objectives which can be legitimated by societal importance, contribution to equality or which are generally understood as just may have a better point of departure for being understood as important. Objectives supported by knowledge demonstrating that they are important (if not, bad things will happen), and/or that there are known way to solve them, may have a better chance to be made prominent. The same may be the case if an objective is supported by powerful actors (different kinds of power!). Objectives which cause problems may be down-played by powerful actors.

How objectives are formulated is important, since this strongly influences which alternative actions may be suggested in later stages. Objectives related to traffic volumes may be formulated as to achieve a more sustainable urban development or more sustainable transport, to reduce GHG emissions from road traffic, to reduce urban road traffic volumes, to reduce growth in traffic volumes, to increase the public transport's share of the transport, to increase the number of public transport passengers, to reduce congestion, to improve living conditions in the city and several others. All of these objectives can be meant as, and applied as, arguments for 'reducing urban road traffic volumes'. Several of them can, however, be achieved by the help of other measures which do not contribute to reduce urban road traffic volumes and which may even counter-act it, such as building capacity-increasing road tunnels in order to improve living conditions in the city.

Eventually, someone do select and formulate the objectives that are made prominent in the plan-making. Planners are often involved in this work, but often in close dialogue with their employers. Even though it is the decision-makers or the developers respectively who decide how the objectives are formulated in the plans, the planners' abilities to bring in and discuss potential objectives, and how they can be formulated, may affect the selection and formulation of objectives substantially.

In order for 'reducing urban road traffic volumes' to be stated as an important objective, through clear and strong enough formulations, there need to be somebody involved in the plan-making process which think this is important, which promote it in knowledgeable and persuasive ways, and which 'win' in the sense that it is actually stated as a clear and strong objective and prioritised throughout the plan-making process. If not all these conditions are present, 'reducing urban road traffic volumes' will not be stated as an important, clear and strong objective or it may be down-played in the process.

It can, however, be politically impossible to state this objective this way. In such situations, other objectives which can be achieved by reducing urban road traffic volumes may be stated. These can later be used as arguments for carrying out traffic-reducing measures, such as reducing sprawl in order to reduce pressure and congestion on main roads.

D.4 Identification and design of alternatives

In the third task, the question regards which alternative actions that can (efficiently) contribute to achieve stated objectives. This is where the question 'what could we do in order to achieve...?' is supposed to be answered. Which alternatives are considered relevant and should be assessed will be affected by the kinds of strategies and measures the participants know and consider efficient and acceptable, and which they bring into the

planning discussions. This is strongly related to the individuals' knowledge, and to which objectives and concerns they understand as prominent.

Professionals with different expertise often disagree in discussions regarding which measures that can contribute to achieve stated objectives. They may be informed by different theories and research, experiences from former planning processes and implemented projects, but also by what is considered achievable and acceptable among politicians and the general public. Which alternatives are promoted by the different actors in the process will, however, also be affected by whether the alternatives contribute to achievement of their main objectives, whether it brings other benefits, and how it affects important concerns. The actors having and exerting most power may have stronger influence on what is understood to be relevant, acceptable, and efficient measures. A zero-alternative or do-nothing-alternative are normally included among the assessed alternatives.

Differences with respect to what is suggested as and/or supported as relevant alternatives also depend on how the actors perceive the objective. If the objective is understood as to reduce urban road traffic volumes, other alternative strategies and measures would be suggested than if it is understood as to increase the number of people travelling by public transport, to reduce congestion or to build a road.

Decision-makers, developers, the public and others may bring alternative strategies and measures into the plan-making processes, and they may have strong opinions about and influence on what are understood as relevant alternatives. If an alternative has negative effects on something which the neighbours, inhabitants, politicians or other find important, and mitigation measures are not available, this alternative may be considered not relevant for those reasons.

It is normally the planners who suggest and design alternatives. Planners with expertise in traffic-reducing development of land use and transport-systems may contribute in the discussions by suggesting strategies, changes, and measures which do contribute to reduce traffic volumes (whether this is a stated objective in the process or not). Professionals with other expertise may suggest other alternatives. If the objective is defined as to reduce congestion and delays on main roads, experts on traffic-reducing planning may suggest measures like improved public transport services, reduced parking capacity and change of land use development strategies towards densifications and car-independent locations of new activities. Other professionals with other backgrounds and types of knowledge may instead suggest to increase road capacity or to change land use development strategies towards sprawl in order to utilise the capacity on the roads, or to rely on economic measures.

In order for strategies, measures, and actions to be considered, which according to the expert knowledge in question will contribute to reduce urban road traffic volumes, someone needs to bring such alternatives into the process, to promote them and to win through. If not all of these conditions are present, alternatives contributing to reduce urban road traffic volumes will not be considered in the plan-making process, and can hence not be adopted.

D.5 Identification, prediction and assessments of impacts and consequences

The most important impacts and consequences of the major alternatives are supposed to be identified, predicted, and assessed. The aim is to identify impacts and consequences with respect to the most important objectives and to enable comparisons between alternatives.

'Impact' is often defined as the "identified change in the environment *with* a project or action, in comparison with the situation *without* that project or action" (Glasson et al. 1999:129-130). Consequences can be understood as the advantages and disadvantages a project or an action, and its effects or impacts, causes for society, nature, and environment (NPRA 1995).

Hence, this task is where general knowledge regarding causal interrelations, context knowledge and methodological knowledge are applied together in order to bring forward analyses and assessments regarding effects and consequences of a proposed project or action. This shall improve decision-makers' abilities to make decisions (choose an alternative) which contribute to achievement of their objectives. There are deep controversies among different disciplines and paradigms concerning how these tasks could and should be accomplished, as discussed in chapter six.

The objectives, knowledge and powers of the actors strongly influence what is identified as important impacts and included in the assessment, which knowledge is applied in order to predict the magnitude of these impacts, how their relative and absolute significance is defined, what is understood as the consequences of selecting and implementing a particular alternative, and how all this is presented for decision-makers.

D.5.1 Identification and selection of impacts to include in the assessment

This involves first to *identify which impacts or effects* caused by implementation of a certain strategy, project or action in a certain context that are most relevant and should be considered in the assessment (often termed scoping in the EIA literature, see e.g. Glasson et.al. 1999). The public hearings of planning programs have an important role in identifying which impacts should be included in the assessments. There will normally be more potentially relevant impacts than what is feasible to include in an assessment, and hence somebody needs to *select* which impacts to include in the assessments.

The objectives and knowledge of those involved in the plan-making will clearly affect which impacts they know of and find important, and hence which impacts are identified as potentially relevant, and selected. Their knowledge would for instance affect whether conflicts between the proposed project and objectives in existing plans and policies are detected. The actors may be less enthusiastic about impacts which they know will contribute to making the plan seem less in accordance with their objectives.

In case of disagreements, impacts affecting clearly stated and defined objectives may be selected, and issues with agreed knowledge regarding causalities may be selected over issues with more uncertainties. The power distribution will affect who among the actors are included in the discussions and who gets more opportunities to present their arguments regarding which impacts to include, and to be listened to. This will for instance affect whether the expected changes of total traffic volumes caused by implementation of the proposed project or action will be included in the assessment.

In order for increasing traffic volumes and GHG emissions to be assessed, somebody needs to introduce this into the impact assessments process and to ensure that it is included. The impact needs to be formulated clearly as relating to 'total traffic volumes' and not as something vague (sustainable urban development) or something else (increasing the number of people travelling by public transport). If either of these is not fulfilled, changes of total traffic volumes will not be included in the impact assessments.

D.5.2 Prediction of magnitudes

Second, the expected *magnitudes* of the impacts are predicted. The constellations of objectives, knowledge, and power of the actors in the specific planning process, together with what is common practice, will affect which knowledge is applied, and hence which outcomes that are produced. This part of the plan-making process is normally dominated by the professionals. Lay-people in this field will often not be able to understand, contribute to, or criticise the predictions.

There may be clear disagreements among the professional actors regarding the ontological understandings of causal interrelations, and hence how the magnitude of an impact could and should be predicted. This could among others involve: which causal interrelations that need to be included in the proposed 'model of the world'; how to describe these causal interrelations and their strengths in this specific context correctly, and; whether a proposed understanding of the world suits the particular problem (De Jongh 1988). There may be disagreements regarding which methods are suitable, relevant and reliable, regarding baseline data (description of the environmental baseline), input data and assumptions applied when doing the predictions, as well as which kinds of outputs the analyses should deliver, and more.

For instance, in a discussion between a residents' NGO in an inner city area of Oslo and the road authorities, the residents suggested to transform one lane of the main road into a bus lane, and move parts of the regional bus traffic from their local streets to the main road system. In their assessment of this proposal, the road authorities (their consultants) presented a transport analysis showing that this measure would create endless queues and congestions (Nilsen 2009). When examining the calculations, it was found that the calculations had been made on basis of a so called 'fixed matrix', where all traffic that previous is on the road, will remain on the road. The residents, as well as state-of-the-art knowledge in this field (see for instance Strand et al. 2009 or Cairns et al. 1998), claim that the traffic on the trunk road system will be reduced if the road capacity is reduced, and that a share of this traffic will be transferred to public transport, especially if public transport services are improved.

Disagreements of how to predict magnitudes of effects may also be due to differences regarding objectives. Actors which benefit from magnitude predictions showing high magnitudes will argue for methods highlighting such aspects, for applying assumptions which support this, and data at the higher end of the scale. Actors benefiting from arriving at lower magnitudes may do the opposite. Those with most power in the particular process have the strongest opportunities to affect which methods, data etc. that are applied, and hence which outputs are produced.

Professionals with different disciplinary backgrounds may have different training and knowledge regarding prediction of magnitudes (Tennøy 2004b, 2010), as more thoroughly discussed in chapter six. Planners possessing the expert knowledge in question here, regarding causal interrelations between development of land use, transport-systems, travel behaviour and traffic volumes, will probably insist on including more and other causal interrelations than transport planners or transport economists. The planners would probably rely on empirical data from contextually similar cases, apply professional reasoning (often included simple calculations) based on understandings of the causal interrelations regarding 'how the world works' as method. They would deliver answers in the form of explanations,

tendencies, and rankings. The outputs would normally be explanations regarding what will most likely happen if..., rankings of alternatives with respect to main objectives or alternative solutions.

Transport planners would normally simplify the model of the world into that which can be calculated, and calculate future transport volumes based on some kind of four-step-methodology (see e.g. Johannesen 1991)⁶¹ or more advanced models. The outputs are changes of traffic volumes, and total traffic load on different roads (per day and in rush hours), in five, ten or twenty years. These outputs are delivered in the form of precise (but uncertain) numbers of cars per day or car per hour (Flyvbjerg 2005, Tennøy et al. 2006). Such calculations can be input to the professional reasoning described above, especially in land use cases.

Transport economists would normally apply average elasticities in their calculations of how the project or action would change the travel behaviour and hence the traffic volumes, and deliver precise numbers for changes of traffic volumes. These figures will often be relatively non-contextual as well as highly uncertain.

The predicted changes of traffic volumes are, anyhow, used as input to predictions of the magnitudes of impacts with respect to among others GHG emissions, local health and environment factors, congestion, costs and more⁶². There may be similar disagreements regarding how to predict the magnitudes of these impacts as well (causal interrelations, choice of data, assumptions, methods etc.).

In order to be able to predict the magnitude of an impact, it is necessary to decide which part of the chain of causalities to predict⁶³, as well as which aspects of each impact that should be included in the assessment analysis. Regarding noise, for instance, one needs to decide whether it is indoor noise, outdoor noise, loss of silent areas or other aspects which should be predicted⁶⁴. One also needs to decide whether to predict and present separately *all* the most relevant aspects of for instance noise, to choose one aspect to *represent* the aspects of an impact (for instance 'change of outdoor noise' for noise impacts). These operations necessarily call for subjective choices. *Someone* needs to decide which issues to

⁶¹ The four step method normally involves to extrapolate the numbers of residences, work places, service facilities and other in defined zones, and to apply these together with empirical data regarding trip generation when calculating the number of trips starting and ending in each zone (Johannesen 1991). Further, in step two, origin/destination-matrixes showing traffic from each zone to each of the other zones are calculated based on extrapolation of known empirical data regarding traffic between zones, or on gravitation theory. In step three, the modal split is defined based on empirical data and context knowledge of the quality of the transport-systems (most common), or predicted with the help of more advanced methods. In step four, one calculate how much road traffic (and in theory public transport traffic, bicycle traffic and walking traffic) there will be in a given future on each of the main roads.

⁶² See Duncan (2008) for an interesting discussion regarding the consequences of different professional milieus applying others' prediction results as inputs to their predictions, without knowing the theoretical foundations, basic assumptions, types of uncertainties etc. included in methods those predictions.

⁶³ One chain of causalities could be: change of road capacity => increased road traffic => increased noise from traffic (source) => increased indoor noise & increased outdoor noise & loss of silent areas => loss of sleep =>reduced living qualities => reduced health => cost for society

⁶⁴ To defining what is impacts, effects, and consequences in cases regarding traffic and environment is not trivial, see e.g. Joumard and Gudmundsson (eds.) (2010) for a broader discussion.

include, and which aspects of these issues, and this will be affected by their objectives and their knowledge.

One may also choose to produce synthesized or composite indicators including *different* aspects of an indicator (indoor noise, outdoor noise etc.), different impacts within a problem field (noise, dust, water pollution etc. in a 'local environment' indicator), or even across fields and sectors (environmental, societal and economical consequences in 'sustainability' indicators). This is normally only done if quantitative methods are applied further on, in the comparison of alternatives.

D.5.3 Significance appraisal

In order to be able to produce synthesized indicators, one needs to decide what is more important or significant. This operation is often termed *significance appraisal*. Significance regards the importance for decision-making (Glasson et al. 1999); whether the impact will have important or significant impacts on the environment. By doing a significance appraisal regarding for instance noise, one would arrive at a weighting of the importance of the different aspects of noise such as indoor noise, outdoor noise and silent areas, stating for instance that indoor noise is twice as important as the other two. Likewise, the significance appraisal is the tool to define the relative importance of noise, dust etc. for local environment, and the relative importance of environment, society and economy for sustainability. The significance values (often termed weights in the actual analyses) are supposed to reflect the relative importance that society will grant to each aspect or impact (see Wathern 1990, Waeger et al. 2010).

In order to be able to make synthesised indicators, one needs to quantify the entities and to translate them into comparable entities (e.g. number of people affected, money values). This is often termed normalization (see e.g. Waeger at al 2010 for a further description).

There are numerous techniques and methods for doing significance appraisals (*ibid*). Even though considerable efforts have been made in order to arrive at objective methods for doing such appraisals, all normally require subjective considerations of some kinds⁶⁵. This means that which objectives and concerns that are understood as important by the professionals doing the appraisal, and which knowledge the involved actors have, inevitably will affect how the significance of an impact is appraised. Since this regards value questions regarding for instance whether a certain reduction in travel time for a certain number of people is more significant, important or valuable than saving a life per year or reducing a

⁶⁵ One can do sensitivity analyses regarding for instance the significance of a certain kind of pollution to a certain lake, and find that the pollution levels are close to threshold levels, and hence that further pollution will have major consequences. In another lake, where the same pollution will not cause the total pollution level to come close to the threshold levels, the same pollution will be less significant. This can be termed an objective appraisal of this particular pollution.

The significance of this lake being polluted and destroyed will, however, need to be weighed against the significance of choosing a different alternative, and this will often requires subjective considerations.

Regarding for instance the traffic noise level influence on human health, one can hardly claim that there are – or can be - objective ways of appraising for instance the relative importance of indoor noise, outdoor noise and silent areas. This turns far worse when appraising different kinds of changes of the local environment, and not least when appraising the significance for sustainability.

number of tons of GHG emissions, one could question the practice where professionals do the significance appraisal.

D.5.4 Assessments of consequences

When the impacts to assess have been scoped and selected, and the magnitude and significance of the impacts have been predicted and appraised, systematic assessments of positive and negative effects of each alternative can be conducted. In the assessment of consequences one asks which positive and negative consequences each alternative of a project will have with respect environment, society and economy, often translated to e.g. local noise, local environment, GHG emissions, sustainability, or other defined objectives or concerns.

The results of these analyses may be more or less quantitative, more or less aggregated and synthesized, and presented in different ways. Often, the results of the impact assessments are presented in a matrix showing vertically a number of variables (preferably linked to important objectives) which the project or action may cause changes in or of (traffic volumes, noise, pollution, retail structure, pressure on social infrastructure, economic development...), while each alternative has their own column for noting whether this is a positive or negative consequence, and its significance. The matrix is filled with results from the impact assessments regarding the consequences for variables X, Y, Z etc. if one selects alternative 1, 2, 3 etc.

	Alternative 1		Alternative 2		Alternative 3	
	Pos/neg	Significance	Pos/neg	Significance	Pos/neg	Significance
Variable X						
Variable Y						
Variable Z						

Figure D. 2: Results from impact assessments can be presented in matrixes, showing (here) the consequences of alternative 1 on variable X, and so forth.

Another way is to present a summary of the analyses and findings of the various analyses carried out (analyses of polluted grounds, traffic volumes and consequences with respect to noise, pollution, congestion and GHG emissions, effects on economic development in the area, effects on retail structure, social composition in an area, pressure on existing schools etc.) as a professional reasoning. The various alternatives are described. Their positive and negative consequences with respect to various issues (such as traffic volumes) are explored and discussed in ways which are supposed to clarify which the most important are, and whether these are disputed, in understandable and transparent ways. This way of presenting the findings from impact assessments is often found in zoning plan proposal presentations to the public and the decision-makers, at least in a Norwegian context.

How the analyses and their results are presented depend among others on who are doing the analyses, and their professional background, knowledge and objectives, as well as how these results are supposed to be used further on in comparisons between alternatives.

Different kinds of consequences, assessed at different levels and scales, with the help of different methods, and which deliver different kinds of outputs are included in the analyses. This means that *someone* needs to organise the assessments; how they are presented, whether they are normalized in ways which make the compatible, etc. Someone needs to tell the story about the different consequences, which are more important, to which degree

the different alternatives will contribute to positive and negative consequences, for whom etc.

How this is done will affect the understanding of which consequences the different alternatives have and if these consequences are significant, as well as whether the description is transparent and whether it is understandable for decision-makers which are supposed to make decisions on basis of it. Which objective are understood as prominent by those involved in doing this work, as well as which knowledge they have, will affect what they do and how, and hence which answers the assessment of consequences give. This is the case for consequences which can be quantified, as well as for those which cannot.

The assessment also includes whether and which mitigation measures are suggested, and how these are evaluated. Planners who aim to and have knowledge of how to reduce urban road traffic volumes may for instance put less emphasis on negative impacts on traffic-reducing changes or measures, and suggest mitigating measures in order to make traffic-reducing measures more efficient or more acceptable, rather than to dismiss them. Those who are more concerned with reducing delays on motorways, or to improve road safety, may view this differently.

D.5.5 The objectives, knowledge and power of the actors affect impact assessments

To assessing the consequences of different alternatives of a project or action hence requires that several individuals need to make subjective decisions regarding what to predict, how to predict, which relative and absolute importance or significance the different impact and aspects of impacts have and how to present and analyse the many consequences of the multiple alternatives in ways which allow for comparison of alternatives. This also includes which time perspective they choose to apply (10 years, 50 years, generations), which geographical scale is chosen (this site, the city, the region, the world), and whether one sees the impacts of this project in relation to impacts of other projects (so-called cumulative effects).

All these aspects are, as demonstrated above, affected by the objectives, knowledge, and powers of the actors carrying out the tasks involved in making impact assessments. How they carry them out will affect the results and outputs of the assessments, and these outputs are supposed to be presented for decision-makers in order to improve their abilities to make decisions which contribute to achieving their objectives.

In order for the alternatives to be assessed with respect to their traffic generating potential, somebody needs to bring this concern into the discussions, and to be able to make it become one of the variables that are assessed. Somebody needs to bring the expert knowledge in question into the discussions regarding which knowledge to apply, and to be able to make this knowledge become the applied knowledge. Somebody also needs to possess deep enough insight into this expert knowledge to be able to apply it correctly, and this work needs to be conducted with high quality. Further, the wider impacts regarding noise, GHG emissions, barriers etc. need to be recognised and assessed, and these changes need to be appraised. Finally, the presentations to the decision-makers need to show clearly the traffic generating effects of each alternative, and the consequences of choosing a more traffic generating alternatives need to be described in transparent and understandable ways. If any of these do not occur, increasing traffic volumes will not be part of the assessment, or it will not be assessed or presented rightly.

Planners who possess the expert knowledge in question, and which aim at contributing to reduce urban road traffic volumes, may affect the processes by contributing to identify changes of traffic volumes as an important impact which is included in the assessment, that analyses build on the more holistic knowledge of causal interrelations and iterative processes which allows for understanding this as a problem of organised complexity, that the input data and assumptions regarding future travel behaviour are reasonable, that the significance of impacts related to changes of traffic volume are not under-valued, that relevant mitigation measures are introduced, and that the analyses and description of the consequences of each project is done in honest, understandable and transparent ways.

D.6 Comparison of alternatives

In the fifth task, the alternatives are *compared* with respect to their positive and negative consequences, based on the impact assessments conducted in task four. The impact assessments result in numerous findings regarding different kinds of impacts and aspects of such impacts, their predicted magnitude, and significance. As one can understand, it can be hard to make comparisons of all these entities. This is why representative and aggregated indicators often are discussed, produced, and used in the impact assessments.

Comparison of alternatives can be done on the basis of: all predicted impacts; certain impacts selected to represent groups or kinds of impacts, aggregated impacts within the same issue (such as noise), or across issues at different levels (local environment, sustainability). In the latter case, one needs to apply aggregates of aggregates of aggregates etc.

Cost-benefit ratios and ecological footprints (Rees 1992) are highly aggregated indicators. In their extreme form, one indicator represents all consequences of each alternative. Hence, decision-makers are supposed to choose the alternative with the lowest cost-benefit ratio or the smallest ecological footprint. There are, however, a number of methods for comparison of different alternatives which require no or less normalisation, weighting, and aggregation, often termed multi criteria methods (see for instance Waeger et al. 2010).

Planners and other professionals will often disagree on which methods that are usable, valid and relevant for doing comparison of alternatives. Transport economists (and transport planners) will often apply cost benefit analyses (CBA), especially when comparing different road or rail alternatives⁶⁶. However, the values embedded in the methods for doing such analyses as well as other shortcomings of this method have been heavily criticised by numerous scientists, including many economists. This regards among others the discounting granting large benefits for the present population on behalf of the future population, and the normative ethics measuring 'the good' as utility (Howe 1990, Næss 2006a, Helm 2008, Waeger et al. 2010:215-223). These shortcomings are more visible when comparing substantially different alternatives, such as combinations of traffic-reducing land use developments, improvement of public transport services, construction of bicycle-infrastructure and reduction of road capacity, than when comparing for instance different road alternatives.

Planners often advocate methods which require less normalisation, weighting, and aggregation. Their methods for comparison may resemble the assessments of consequences

⁶⁶ This is mandatory for projects funded by the Public Roads Administration in Norway.

without quantification, as professional reasoning, as described above. This implies to discuss which are the main objectives and concerns, which main impacts (according to various analyses) the different alternatives have, the importance or significances of these impacts, and what one gain and lose by choosing each of the alternatives. Main arguments for choosing this method may be that it leaves the subjective value judgements to decision-makers rather than to professionals (or worse – to the methods), that the analyses and results are more transparent and understandable for decision-makers and others, and that such methods deliver less uncertain results (see e.g. Waeger et al. 2010: pages 192-203). On the other hand one may argue that this may be confusing or less understandable for decision-makers.

The objectives (values) and knowledge of those choosing how to compare the alternatives and doing the analyses, as well as the objectives (values) and knowledge embedded in the methods, will obviously affect which comparisons are done as well as how they are done and their outputs. These outputs are the recommendations to decision-makers. In some methods for comparison of alternatives, the consequences of increasing traffic volumes in near and especially in distant futures tend to be regarded less important (this is systematically so in CBA) due to the knowledge and methods applied.

Disagreements over which methods that are appropriate for doing such analyses cause heated debates among professionals from different disciplines (see e.g. Howe 1990, Flyvbjerg et al. 2002, Næss 2006a). Planners who focus on the objective ‘reducing urban road traffic volumes’ and which have knowledge of how this can be achieved, may contribute to making this aspect more important in the comparison of alternatives by affecting which methods for comparisons are chosen and how the consequences of increasing traffic volumes are treated.

D.7 Recommendations

In planning processes under the PBA, all that which is described above is supposed to be summarised in a document termed ‘planning proposal’. The planning proposal is first discussed with other public authorities, inhabitants, NGOs and others through public inquiries and hearings, in order to allow them to evaluate whether their interests, knowledge, values and objectives have been paid due respect. The planning authorities include a summary of these comments, as well as their own recommendations, and present the planning proposal to the decision-makers, in order for them to make the decision regarding whether to approve the plan or not. This goes for overall as well as operational plans. The document called ‘planning proposal’ is of high importance, since this often is the only documents decision-makers read before making their decisions.

The recommendations, and the analyses underpinning them, may be presented in different ways in the planning proposal. This regards among others what is emphasised and what is not in the document. It regards whether the recommendations are written in ways which allow decision-makers, other professionals, the public and others to understand what are the main issues, the main debates, and not least what the main reasons are for recommending one alternative instead of others. It also regards whether the recommendations are written in transparent ways, allowing the readers to understand the logical reasoning leading on to these specific recommendations, and it regards not least whether the recommendations are made in more and less biased or honest ways.

How the recommendations are presented will inevitably be affected by who is doing the job and their objectives (or values) and knowledge. The initiator/developer is often responsible for doing the analyses, and to write up the planning proposal including the analyses, in zoning plan processes. In other cases, the planning authorities write up the final document which is sent to the decision-makers. One can easily understand that a developer and a planning authority may view the underlying analyses and findings differently, and hence that the presentation of a zoning plan proposal and its consequences may look different if the public or private developer present it than if the planning authorities do.

The planners' recommendations are not expressed only in the final document presented for the decision-makers. Rather, the planners (working for different actors) pose their recommendations throughout the project. Different planners make different recommendations, based among others on which objectives they consider more prominent and their professional knowledge. These battles of many different and often conflicting recommendations regarding alternatives, methods etc. shape the planning process and its outcome.

D.8 Making the decision

Finally, the planning proposal is presented for the proper decision-making body. This will in Norway normally be the city or municipal Council for plans under the PBA. They decide whether to approve the proposal, to reject it or to ask for changes.

An approved overall municipal plan is (or is supposed to be) an important steering document for planning and development of land use and transport-systems. An approved zoning plan is a permission to carry out the proposed project (even if there is more paper work to be done before they actually can start digging in the ground).

D.9 Implementation of approved plans

In the eighth task, the decisions made are (supposed to be) implemented. Implementation of approved zoning plans will not be dealt with here.

D.10 Feedback and post-auditing

In the ninth task, feedback or post-audits, data about effects of implemented actions or changes are gathered and analysed. In EIA literature, post auditing is often described as to compare impacts predicted in the impact assessments with those that actually occur after implementation (Bisset and Tomlinson 1988, Dipper et al. 1998, Wood et al. 2000). The aim is to assess whether the measure, change, action or project had the effects and impacts which were predicted in the planning process. This feedback is necessary in order to improve our knowledge regarding effects of certain actions, changes and measures on certain variables (such as traffic volumes), and to test and enable improvement of the methods we apply to predict these effects. This is supposed to improve our understandings of the phenomenon as well as our prediction abilities.

Formal post-audits are often carried out by researchers. This is an important part of planning research, which contributes to development of planning theory and of methods. Feedback also provides more informal knowledge about what works and what does not to planning practitioners, politicians, the public and others.

How the effects of the implemented strategies, measures, changes, projects and actions on e.g. travel behaviour and traffic volumes are measured, analysed, interpreted and presented

may vary with the objectives and knowledge of those involved in doing this. Powerful actors (power in a wide sense) have more impact on how the efficiency of the measures are understood and presented than others.

Planners with expertise in causal interrelations between developments of land use, transport-systems, travel behaviour and traffic volumes may be able to understand and explain how and why traffic-reducing measures failed or delivered other results than predicted in other ways than professionals of other backgrounds, such as contextual explanations, as well as possible changes which may improve the performance of the objectives. Further, they may ensure that predictions of traffic volumes are among the issues that are audited.