

National sustainable transport planning – concepts and practices



SUSTAIN

National Transport Planning – sustainability, institutions, tools.

Working Paper

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Udgivelsesdato: 16. september 2013

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Abstract:

Sustainability has become a significant ambition for transport planners and policy-makers around the world. However, a transition to sustainable transport is a challenging, long term process, which raises important questions concerning how national, planning processes could support the integration of sustainability. This is the topic of the research project SUSTAIN. Internationally, research on national transport planning is limited, and not well established as a coherent field of research.

This paper presents preliminary results within SUSTAIN. The aim of the paper is to discuss how to conceive and define the concept of 'national sustainable transport planning'. This is done via selected literature within this and associated areas. A definition is provided and it is suggested that three interlinked dimensions are of importance for transitions, thus a normative, an analytic and a governance dimension.

The definition of national sustainable transport planning is confronted with current national transport planning practices in Sweden and Norway, which are somewhat advanced and have long traditions of recurrent, comprehensive, cross modal planning processes and integrated documents. Nevertheless, it is found that the Swedish and Norwegian planning efforts do not qualify to the label of 'national *sustainable* transport planning.

Finally three research topics for future research in national sustainable transport planning are proposed, which all link to the above mentioned dimensions and their interlinkages.

1. Introduction

Sustainability has become a significant explicit ambition for transport planners and policy-makers around the world. In Denmark, for example, the first plan for sustainability in transport was published in 1990 (Trafikministeriet, 1990), and most recently the national government and Parliament reconfirmed their commitment in an infrastructure plan on “Sustainable Transport” (Regeringen, 2008) and a political agreement on a “Green Transport Policy” (Transportministeriet, 2009), where significant new goals and policies were announced. The European Commission has also promoted this agenda over more than two decades, most recently in their 2011 Transport White Paper on a “Roadmap to a Single European Transport Area” (European Commission, 2011).

Successful transition to sustainable transport raises important questions concerning how to organize strategic planning processes and how to apply knowledge tools in order to support the implementation of new policy goals and instruments for sustainability (Givoni & Banister, 2010). In Denmark, the effectiveness of the previous “ad hoc” approach to national transport planning has been questioned by e.g. the Danish Infrastructure Commission (Infrastrukturkommissionen, 2008), and some planning innovations are now being adopted such as a number of superior transport policy objectives or principles, more clearly defined staging of the planning process, more fixed planning cadences and the conduct of so-called ‘strategic analyses’ supported by an integrated national transport model to underpin decisions. These innovations emerge in a national context characterized by traditions for strong involvement of Danish politicians in infrastructure decision making and implementation (Cars et al., 2009), but also in a sector characterized by significant public management reforms that have included the disintegration of former public monopolies and the marketization of transport services (Hodge et al., 2010). This raises further questions on how the changing institutional frameworks in the transport sector influence the way new planning processes and tools for sustainability can connect to the existing national decision making context (Toleman & Rose, 2009), and how this again will influence actual sustainability performance of transport systems and policies.

Internationally, research on national, transport planning systems and processes is limited, and it is not established as a coherent field of research. Transport planning frameworks are found to vary across countries, but there is no widely recognized way to typologize such frameworks to help explain their significance for national, sustainable transport planning outcomes. The research area needs to be advanced through a combination of theory, empirical study and methodological experimentation.

This is the background for the recently started Danish research project, SUSTAIN, running from 2012 to 2016. The scientific objective of SUSTAIN is to help establish national sustainable transport planning as a coherent research topic across the social and technical sciences, while the societal objective is to promote future-oriented planning for a sustainable transport system in Denmark.

This paper is a product of preliminary results within SUSTAIN. The aim of the paper is to

discuss how to conceive and define the concept of national sustainable transport planning; how this corresponds to what is actually taking place in practice under such a heading; as well as some research questions that could be unfolded within the field. The methodology applied in the paper is a review of literature in order to substantiate each of the semantic elements in 'national sustainable transport planning' and to derive an integrated concept. Empirical research into actual national transport planning will be extended in subsequent steps of SUSTAIN. Apart from references to the Danish transport planning context two examples of transport planning in neighboring Norway and Sweden are explained and analyzed, since these two countries for a number of years have produced major, national transport plans, and in some regards have more advanced practices than Denmark. Taking point of departure in the stated understanding of national sustainable transport planning and the experiences from Sweden and Norway, some important questions for further research within the field are suggested.

After this introduction the paper proceeds with a section 2 which will define the term 'national transport planning' using theoretical notions. Section 3 enters into analyzing the integration of sustainability into national transport planning, while the large section 4 is devoted to focus on the experiences from Sweden and Norway. Finally, in section 5 three major research questions for research in national sustainable transport planning are posed.

2. National Transport Planning

In this section we develop a basic, normative understanding of 'national transport planning' by considering one by one each element in the term (planning, transport, national).

Multiple and different definitions of '*planning*' as such exist. At the most general level one can observe that planning as a deliberate activity has to do with the future. Furthermore, as a social or collective process (Alexander, 1986) planning in modern society typically faces complex situations and is therefore often seen to incorporate the use of analytic knowledge and science to identify the best solutions or interventions to key problems (Friedman, 1987: 38).

A classical model of planning is concerned with rational decision-making following a sequential order of steps from formulation of goals and objectives, to identification of alternative solutions, to evaluation of consequences, to subsequent decision on a course of actions (Leleur, 2008). Some authors hold, however, that planning can never become a fully routinized phenomenon because it deals with novel problems and may ultimately even serve transformational ambitions (Alexander, 1986; Friedman, 1987).

Thus, classical views on the characteristics of societal planning would hold it to be a deliberate, future-oriented, knowledge-based, collective, rationalistic and non-routinized activity aiming to prevent problems or fulfill goals by way of decisions of a potentially transformative character. The concept of *strategic* planning serves to connect the planning phenomenon to modern public management with an emphasis on implementation and performance in an institutional context (Bryson et al., 2010). In modern public policy, planning is thus associated with performance management philosophies and techniques (Christensen & Lægreid, 2002) that are oriented just as much towards scrutinizing outcomes of past efforts to inform the present planning, as aiming towards the future. A more comprehensive or cyclic time dimension is thus assumed in strategic compared to classical planning.

What does planning then mean in the context of *transport*? Transport refers to movement of freight and passengers from one location to another, while traffic is the physical manifestation of movement and flow of various means of transportation. Traffic flows are again dependent on the availability of supporting infrastructure and energy for propulsion. Planning of transport takes place at several levels, from the individual scheduling his or her activities in time and space, to companies demanding or providing a variety of transport services, to urban, regional and national governments with responsibility for developing and managing entire transport systems. Transport volumes and traffic flows are usually not considered as planning goals themselves, but phenomena to plan and provide for in order to fulfill mobility (e.g. Ciuffini, 1995), accessibility (e.g. Litman, 2012) or other wider socio-economic goals. National transport planning has traditionally had a strong focus on the (mostly public) infrastructure and less on the (mostly private) provision of transport services (OECD & ECMT, 2005), although this balance has been under change for a number of years. Transport planning can be single modal (e.g. a road plan) or covering two or more transport modes. Often transport planning has a strong spatial component, linking it to land use, physical infrastructure, and regional development agendas.

We now turn to what to understand more specifically by '*national* transport planning' 'National' in our context is defined as planning of relevance for the nation, that is, impacting on or interesting for large groups of inhabitants across the nation. This usually means that national transport planning is being conducted by a national government or having national government institutions in a key role¹. National transport planning can result in a comprehensive 'national transport plan' but can also involve for example planning or management of particular large, individual infrastructure projects, like a bridge serving a national function, or strategic policies to be adopted in certain parts of the nation and not others, such as congestion charging in the capital. The national focus does therefore far from exclude key roles also for local, regional or supranational authorities, but since most local (e.g. city, municipal) and regional (e.g. county) transport planning do not have national impact and relevance, this type of planning usually differs from national planning. National transport planning can also have strong involvement of private sector actors through partnerships or other modes of joint engagement.

To sum up, strategic national transport planning can be broadly considered as deliberate, knowledge-based and strategic endeavours to develop, manage, regulate and assess nationally significant transport systems and services.

3. ... including sustainability

Since the Brundtland Report 'Our Common Future' presented by the United Nation's World Commission on Environment and Development in 1987 (World Commission, 1987) 'sustainability' has gradually become an established element in politicians' and planners' discourse. Policy making at the European Union level has facilitated the integration of sustainability as a concern for national transport policy in European countries, through so far three generations of transport policy White Papers emphasizing sustainability as a goal, accompanied by an overarching general strategy for the integration of environmental concerns in sector policies such as transport (Lenschow, 2002). Ahead of this, Denmark was one of the first countries in the world to publish a specific national transport plan addressing the issue of sustainability, namely the so-called Transport Action Plan for Environment and Development in 1990 (Sørensen, 2003; Trafikministeriet, 1990). Interestingly, this has so far not materialized in a particularly elaborated strategic planning framework, however.

In the Brundtland Report sustainable development was defined as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission, 1987: 43), thus insisting on the link between long term impacts and present development. Sustainability further implies considerations of local impacts as well as global impacts, and a particular attention is paid to potentially irreversible impacts (Joumard & Nicolas, 2010). A common way to incorporate sustainability in policy making has become by way of reference to three pillars that need to be addressed and somehow brought in balance, namely an environmental, an economic and a social one (Joumard & Nicolas, 2010; Sustainable Development Solutions Network, 2013). Scholars have stressed that ambiguity and ambivalent goals characterize sustainability (Voß et al, 2007),

The three pillars are frequently adopted along with the Brundtland definition in national frameworks or strategies for sustainability in the transport sector (Gudmundsson, 2004; Meunier, 2012), but apart from that there is considerable variation among the approaches taken to embed sustainability in national transport planning and balance the dimensions. At a more practical level sustainable transport strategies for example put varying emphasis on efforts to *improve* the environmental, social, or economic performance of transport systems and technologies; to *shift* transport from cars and trucks to public transport, bicycles, rail and sea modes, and to *avoid* the need to travel altogether, e.g through high-density, mixed-use urban planning and development (Dalkmann & Branigan, 2007; EEA, 2010).

¹ In large, federal nations such the USA and Canada individual states conduct transport planning which in scope and features are similar to other countries' national transport planning,

National *sustainable* transport planning implies integrating sustainability in national transport planning. Thus, following up on the above presented considerations, ‘national *sustainable* transport planning’ could be described as *deliberate, knowledge-based, and strategic endeavours to integrate sustainability principles, criteria and goals in the development, management, regulation and assessment of nationally significant transport systems and services.*

It is not an easy task to accomplish transformation to sustainability practices. Cross-disciplinary sustainability research finds that transition towards sustainability is a process that must involve three interlinked dimensions: a normative, an analytic and a governance dimension (Becker et al., 1997, see also Voß et al., 2007). The generic meaning of each dimension as well as their possible translation into a national transport planning context appears from the table below.

Transition towards sustainability – three dimensions		
Dimensions	Generic meaning	Implications in a national transport planning context
Normative dimension	The fundamental ethical principles and value-orientations of sustainability.	What sustainable transport is, what the three pillars (environmental, economic, social) imply in transport and which goals to pursue.
Analytic dimension	Determine whether an action is sustainable or not.	Knowledge on consequences for sustainability of interventions, e.g. infrastructure and transport service projects and plans.
Governance dimension	The system of governance that should promote and implement changes towards sustainability through policies, programs and plans	Organisational forms in the transport sector (e.g. public, private, partnerships), the set-up of key government institutions, as well as transport planning and implementation procedures which promote integration of sustainability.

Table 1. Transition towards sustainability – three dimensions. Inspiration from Becker et al., 1997.

It is hard to imagine endeavours qualifying for the label national *sustainable* transport planning, which do not address these dimensions in the planning process. Highlighting these dimensions however also pave the way for scrutinizing the interlinkages between them.

Thus, one dimension is hardly meaningful without the other. From a classic planning perspective, the dimensions could be interpreted as stages in rational decision-making (formulation of sustainability goals; evaluation of consequences; and subsequent decision by way of an appropriate governance system). However, as stated above strategic planning should be seen as a recurrent, time cyclic process (Bryson et al., 2010). This implies that the dimensions are interdependent, and in a longer time frame they all impact on one another. Thus, political processes (and the population’s experiences) as well as new knowledge provided might contribute to adjust values and goals, and interpretations of sustainable transport, sustainability pillars and principles. Similarly, instruction and feedback from policymakers might contribute to calibration, development or application of new analytic

tools. And finally, the values and goals will impact on policy making indirectly (via incorporation in knowledge production), but also directly as inspiration and guidance in policy making. The dimensions and their interlinkages are illustrated in figure 1 below.

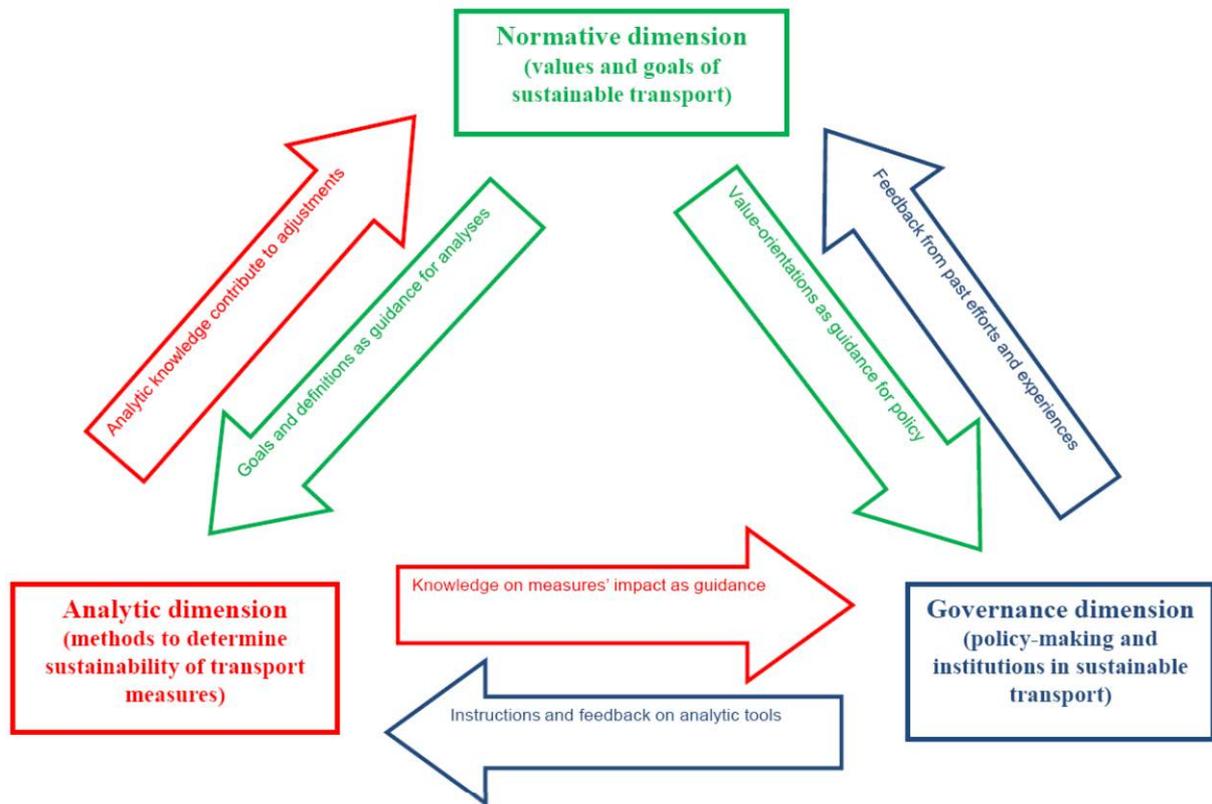


Figure 1. National sustainable transport planning – dimensions and interlinkages.

On this background a second - more abstract but for research more operational - definition of 'national sustainable transport planning' could be provided. Hence, 'national sustainable transport planning' could be understood as the integration of sustainability in the normative, analytic and governance dimensions of national transport planning and securing the interlinkage of these dimensions closely to one another.

In the following we will apply national transport planning practices in Sweden and Norway as examples to illustrate how this operational definition could be applied in empirical research into recurrent, comprehensive and knowledge-informed, cross modal planning processes and integrated policy documents.

4. Sweden and Norway as examples

Sweden and Norway are countries with explicit and easily identifiable national transport planning practices that are in accordance with the definition we provided in section 2. Both countries have for a number of years prepared what they also themselves term 'national transport plans' with several generations of plans now completed and extensively documented. As will appear below, in both countries' transport planning documents references to sustainability are made.

The latest generation of Swedish and Norwegian national transport plans has assumed a specified planning horizon of 12, respectively 10 years. The Swedish plans are renewed every four or six years, while the Norwegian plans are renewed every four years. Both plans cover the entire country with a view to ensure a comprehensive regional balance. The two national transport plans include a set of strategic transport objectives to be fulfilled, and an accompanying procedure to verify to what extent they are achieved. The core of the plans consists of the measures that are adopted. The clearly dominant component in terms of cost as well as analytic and deliberative efforts in the plans adopted so far has been transport infrastructure provision with comparably far less attention paid to other policy instruments. In both countries earlier rounds of national transport plans were made for each mode separately, whereas now all modes are addressed, with prioritization across modes being a planning priority.

Some of the key features of these plans as regards sustainability will be highlighted here, and summarized in table 2 below. Point of departure for the review of the Norwegian plan is a newly published national transport plan (Samferdselsdepartementet, 2013), while in the Swedish case, we analyze two interlinked plans: a new so-called principle- and framework plan (Näringsdepartementet, 2012b) that is followed by an action plan (Trafikverket, 2013), which however was not ready when this paper was prepared. Instead, we look at the previous action plan from 2009 (Banverket et al, 2009a). In this review we start with the normative dimension and continue with the analytic and strategic dimensions. The actual implementation of the plans is not an element in this review.

4.1 The normative dimension

As regards the normative dimension, none of the plans explicitly include considerations as to what sustainable transport means, even though the notion is applied a few times in the Norwegian plan (Samferdselsdepartementet, 2013) and several times in the Swedish plan (Näringsdepartementet, 2012b). However, both plans include some considerations about sustainability in general. In the Swedish plan it is stressed that the development of the transport system cannot take place in isolation but must be seen as an integrated part of and tailored to economic, environmental and social claims of long-term sustainable development, thus, mentioning all three pillars of sustainability. In particular climate change is emphasized as a major challenge (Näringsdepartementet, 2012b, p. 22). The Norwegian plan refers to the national strategy for sustainable development and states that such a development should build on principles of fair distribution, international solidarity, the precautionary principle, the polluter pays principle, cost efficiency and the principle of common responsibility (Finansdepartementet, 2007, ch. 7; Samferdselsdepartementet, 2013, p. 209). None of the plans specify any intended balance, priority or linkages between sustainability pillars or

principles. In the transport planning documents only limited space is spent on these considerations.

Sustainability is further reflected more or less explicitly via policy objectives. In Sweden the superior objective of transport policy is to “ensure economically efficient and long-term sustainable provision of transport for the public and industry throughout Sweden”. There are two sub-objectives, a functionality objective focusing on accessibility and a protection objective focusing on safety, environment and health (Näringsdepartementet, 2012b, p. 10 - our translation). The dual superior objective seems to suggest a stronger emphasis on the economic pillar compared to the other two, whereas the sub objectives indicate a more equal balance. In the Norwegian national transport plan the superior objective is stated as “to offer an efficient, accessible, safe and environmentally friendly transport system that covers societal needs for transport and advances regional development” (Samferdselsdepartementet, 2013, p. 71 - our translation). Beneath the superior objective, the Norwegian plan states four main objectives, on mobility, safety, environmental protection, and accessibility for disabled people, and a further number of stage-goals (Samferdselsdepartementet, 2013: 71-72). Again all sustainability pillars are represented without any strict specification of the intended balance.

Summing up on the normative dimension, none of the plans attempt to define what sustainable transport is. But in both countries the plans include formulations about principles or pillars of sustainability. The Swedish superior objective explicitly includes sustainability, which the Norwegian does not. The sub-objectives in the Swedish plan as well as the main objectives in the Norwegian plan represent all three sustainability pillars.

4.2 The analytic dimension

When now turning into the analytic dimension, we will examine how effects of the measures included in the plans are considered.

In both countries the expected effects of the national plans with regard to the stated environmental and other objectives are assessed using a range of indicators and appraisal methods. Thus, both the Swedish and the Norwegian plan comprise ex post information on the past performance as regard the country’s transport policy objectives. In the Swedish principle- and framework plan an ex post-examination is provided for the superior objective as well as the two sub-objectives (Näringsdepartementet, 2012b, p. 68 ff). The new, Norwegian national transport plan similarly includes an evaluation of the stage goals in the current plan (Samferdselsdepartementet, 2013, p. 30ff). In both cases the information comprises a mixture of qualitative and quantitative wordings. As in the Norwegian plan e.g. stating qualitatively that ‘train services are now more reliable’, while other information is strictly quantitative, e.g. the number of serious injuries and fatalities in road traffic (Samferdselsdepartementet, 2013, p. 31). In both countries’ planning documents references

are made to the annual budget propositions including a more thorough evaluation of the past achievements as regards the transport policy objectives (Näringsdepartementet, 2012a; Samferdselsdepartementet, 2012). In the Swedish case this scrutiny again is based on an annual monitoring report from the national Transport Analysis agency (e.g. Trafikanalys, 2013).

In the planning documents, however, ex post information on previous results take up much less space than ex ante assessments of the new plan. Taking the Swedish Action Plan from 2009 as an example (Banverket et al., 2009a), one observes that it includes a part focusing on effects of the plan as well as schemes in an annex dealing with effects of individual projects one by one. Other contemporary publications also cover effects of the plan (e.g. Banverket et al, 2009b). The plan is considered to be economically efficient, though app. ¾ of the projects, which the government has chosen in advance, reduce the cost-benefit rate considerably. As regards the sub objectives the results varies across different issues, e.g. from a very small reduction in climate gas contributions to a minor increase in people affected by traffic noise (Banverket et al, 2009b, p. 51+53). As regards the new plan in Norway, a cost benefit analysis of road and rail investments is offered as well as analyses concerning each main objective and the attached stage goals. Interestingly, the cost benefit analysis shows that the investments in road and rail all in all are not profitable (Samferdselsdepartementet, 2013, p. 74). As in Sweden, the effects of the plan are expected in some cases to contribute to achievement of stage objectives and in other instances not.

To sum up concerning the analytic dimension, both countries apply a wide range of knowledge sources (in the shape of indicators and other information) to ex post examination of past efforts in transport planning as well as to ex ante scrutinizing of new plans. In the Swedish plan the individual infrastructure projects (above a certain size) are being evaluated in the plan with a number of indicators, which is also the case for mayor projects in the Norwegian plan. The Norwegian plan further includes coherent analyses of consequences of investments within eight different transport corridors (Samferdselsdepartementet, 2013, p. 239ff). In none of the plans overall conclusions are provided neither regarding the superior transport policy objectives or sub objectives. The transport policy objectives and goals imply that applied knowledge represent all sustainability pillars. However, no effort is made to consider a project's or an action's overall consequences for sustainability or sustainable transport, though it is stated regarding the Swedish plan that success on economic efficiency and the sub objectives would indicate contributions to long-term sustainability (Banverket et al., 2009b, p. 24).

4.3 The governance dimension

The Swedish principle- and framework plan is made by the Ministry of Enterprise, Energy and Communications, and approved by the Parliament, while the subsequent action plan is made by the Swedish Transport Administration, a state agency with the core task to build, operate and maintain public roads and railways. In the previous planning round four different state agencies cooperated on the action plan, but this now has been changed because some agencies have been merged. The action plan needs approval by the Government. The

Norwegian national transport plan is published by the Ministry of Transport and Communications. However, the state agencies in the field, thus the National Road Administration, the Norwegian National Rail Administration and the Norwegian Coastal administration² as well as the state-owned limited company, Avinor, which is responsible for the Norwegian airport network, are the main actors in the preparations. The National Road Administration is in a leading position (Samferdselsdepartementet, 2013, p. 33). The plan will be subject to scrutiny and adoption in Parliament, and it will afterwards be followed by individual action programs by each of the state transport agencies. In both the Swedish and Norwegian planning processes extensive hearings are taking place.

National transport planning in both countries can be characterized as (mostly) transport infrastructure plans, however set in a context of related policies regarding transport, technological development, taxation, traffic safety, environment, land use planning, administration policy and other issues. Thus, the overall purpose of the plans is planning and allocation of transport infrastructure investments: the amount of funding for investments; the distribution of the investments across regions and modes; and the procurement of funding. This said, it should be acknowledged that the Norwegian plan also include policy on e.g. economic incentives, accessibility for disabled, as well as other non-infrastructure measures regarding traffic safety, freight transport, public transport, and environmental protection. The prime focus on infrastructure is a limitation for sustainability achievements, since the previously mentioned strategies of avoid and improve – and to some extent also shift - cannot be dealt with effectively with infrastructure measures. The focus on infrastructure also is a limitation for obtaining of objectives and goals affirmed in the plans themselves. Thus, the Norwegian government itself acknowledges in the new plan that obtaining of objectives and goals require that other actors outside the government apparatus, outside the transport sector and outside Norway contribute with endeavours and measures, e.g. development of technology (Samferdselsdepartementet, 2013, p. 84).

The focus on infrastructure implies that a considerable amount of funding is needed for implementation of the national transport plans. The greatest share is state funding, but in Sweden also municipal and regional authorities, the EU, companies, user fees, and congestion charging are expected to contribute to funding of the plan (Näringsdepartementet, 2012b, p. 45ff), and in Norway road tolls contribute with a considerable share of the funding. In Norway, the public limited company, Avinor, contributes with its own funding to implementation of the plan (Samferdselsdepartementet, 2013, p. 106). In both countries the state funding expected to be applied is not allocated by the national transport plans, but require inclusion during the planning period in annual state budgets.

² The Norwegian Coastal Administration is formally subordinate to the Ministry of Fisheries and Coastal Affairs.

In both countries, the plan enters into a system of management by objectives and results. Thus, the continuous evaluations of goal achievement in the annual state budget propositions provide possibilities for adjustments during the planning period if political objectives are not met. And as explained above, by each planning round ex post information on goal achievement is provided, which makes it possible to adjust goals or measures in the subsequent plan. Management by objectives and results is applied throughout the state apparatus (Sørensen & Gudmundsson, 2010).

In summary, it seems that strong planning and implementation set-ups exist in both countries with political commitment and stakeholder influence. Stable state funding is provided for implementation of the plans with additional funding raised from alternative sources, and a system of management by objectives and results provides for implementation and for possibilities of continuous follow-up on achievements. However, many conditions for achievement of transport policy objectives and goals is outside the auspices of the government and transport authorities, and the (prime) focus in the plans on infrastructure is a limitation for the contribution of national transport planning to obtaining the policy objectives and goals and even more for sustainability achievements.

4.4 National *sustainable* transport planning?

Core features of the Swedish and Norwegian national transport plans are provided in the table below.

	Sweden	Norway
Normative dimension		
Considerations on sustainability	Economic, environmental, and social pillars of sustainability mentioned, without specifying balance between the pillars.	Referring to various sustainability principles, without specifying balance between them.
Policy objectives	Superior objective is “to ensure economically efficient and long-term sustainable provision of transport for the public and industry throughout Sweden”.	Superior objective is “to offer an efficient, accessible, safe and environmentally friendly transport system that covers societal needs for transport and advances regional development”.
	Two sub objectives, a functionality objective and an protection objective.	Four main objectives on mobility, safety, environmental protection and accessibility for disabled people.
Analytic dimension		
Indicators and other information	Information and indicators are provided on the superior objective and the sub objectives. Ex post information appears in connection to annual state budgets and an annual report from Trafikanalys. Both ex post and ex ante information are provided in the principle- and framework plan, and more ex ante also on individual projects will be provided in the action plan	Information and indicators are provided organized after stage goals for the plan period. Ex post information appears in the annual state budgets. Ex ante and ex post information is provided on the entire plan, eight transport corridors and mayor individual investments.
Governance dimension		
Institutional connection	The principle and framework plan: Ministry of Enterprise, Energy and Communications. The action plan: Swedish Transport Administration.	National transport plan is published by Ministry of Transport and Communications, but the main actors in preparation are the state transport agencies and the state-owned company, Avinor.
Width in measures	Focus on transport infrastructure: planning, distribution, funding,	Focus on transport infrastructure but also other measures are included.
Funding	State funding and funding from municipal and regional authorities, the EU, companies, and via user fees, and congestion charging,	State funding and funding via road tolls.

Table 2. Important features of Swedish and Norwegian national transport planning.

Limited space is spent on formulations of sustainability in the plans, its pillars (Sweden) or its principles (Norway), and with no intention of balancing or priority. The Swedish plan includes sustainability in the superior transport objective, thus talking about “long-term sustainable transport”, but without defining this term. Both countries’ sub goals (Sweden) and main goals (Norway) represent all three sustainability pillars, which is also the case for the ex post and ex ante indicators and other information applied in connection to the plans or budget documents applied in the implementation process. In none of the countries, however, are any efforts made to consider the individual actions, nor the entire plan’s consequences for sustainability. The institutional set-up in both countries seems to provide for a strong planning and implementation set-up, but the scope of planning focusing (mostly) on transport infrastructure provide a limitation for sustainability achievements. Sustainability is not a core issue for any of the national transport plans in Sweden and Norway, and as we understand ‘national sustainable transport planning’ in this paper, the Swedish and Norwegian planning efforts do not qualify as such.

5. Questions for research in national sustainable transport planning

Adopting the idea that transitions towards national sustainable transport planning presuppose processes that must involve a normative, an analytic and a governance dimension the figure 1 above as well as the experiences from Sweden and Norway can provide a basis for several relevant questions for future research in the field. We here will address only three topics, which we formulate by applying academic literature reviewing the Swedish and Norwegian experiences in national transport planning. The topics are relevant for the Danish research project in national sustainable transport planning, SUSTAIN.

The *first research topic is about the use and influence of objectives and goals* in national transport planning, thus the linkage between the normative and governance dimensions of national sustainable transport planning (see figure 2 beside). Objectives are stated in the Swedish and Norwegian plans – and even in the recent Danish plan and political agreement. In several countries, the application of objectives in politics and planning have increased in many policy fields through the last decades due to increasing utilization of systems of management by objectives and results (Ejler et al.,2009). When it comes to national transport planning, in particular the Norwegian experiences have been researched, however not the most recent planning rounds, and the research is not extensive.

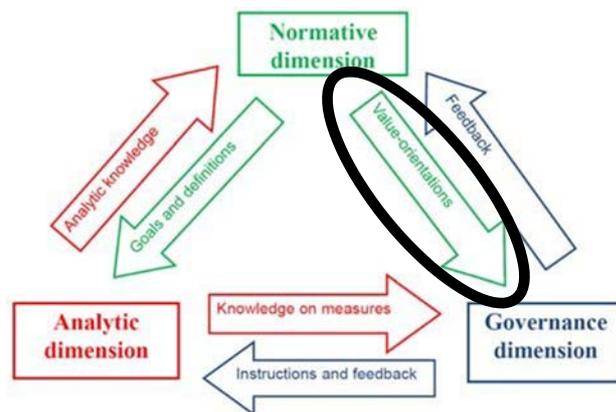


Figure 2. Focus of the first research topic: value-orientations as guidance for policy

In both countries observations from research seems to be that most MPs find it difficult to attach an appropriate role for transport policy objectives in the political processes. Nevertheless, they simultaneously stress that such objectives have to be included in the plans, probably because objectives – in an era of management systems - contribute to legitimize the transport policy as well as the national transport planning process, and thus play a symbolic role (Ravlum & Sørensen, 2005; Sager & Sørensen, 2011). Since it is difficult in the political process to define unambiguous, stable, operational and consistent objectives, their potential as a steering mechanism is limited, and the management systems in both countries have been characterized rather as a steering philosophy than a steering technique (Sørensen & Gudmundsson, 2010). However, policy documents from the last two rounds of Norwegian national transport planning have endorsed and emphasized (Samferdselsdepartementet, 2009, 2013) management by objectives as an important steering philosophy and new instruments have been adopted, which could indicate political ambition and willingness to adhere to objectives and goals and apply these as a steering technique.

In comparison to the above, it appears that the transport policy objectives have a more pronounced role and effect in bureaucracy. This at least seems to be the case in Sweden, which has been subject to analyses (Sørensen & Gudmundsson, 2010). In Norway, some traffic safety objectives suggested for the Norwegian National Road Administration were criticized for lack of connection with the jurisdiction of the Road Administration, and some objectives referred to outcome that even the Norwegian government could hardly influence (Elvik, 2008).

Thus, more research is needed to specify under which conditions objectives and goals could be applied and be influential in the political and bureaucratic processes of national sustainable transport planning. How they should in that case be formulated and featured to have a proper role, e.g. in correspondence with the jurisdiction of the accountable unit? It further is relevant to research into other (alternative) ways of internalizing sustainability principles and values in policy-making and implementation of national transport planning.

The *second research topic* regards the use and influence in national transport planning of knowledge provided on impacts of investments and other interventions suggested in the plans, thus the interlinkage between the analytic and governance dimensions (see figure 3 beside).

The use of knowledge in decision-making for many years have been a topic in social science (e.g. March, 1994), and thus also Swedish and

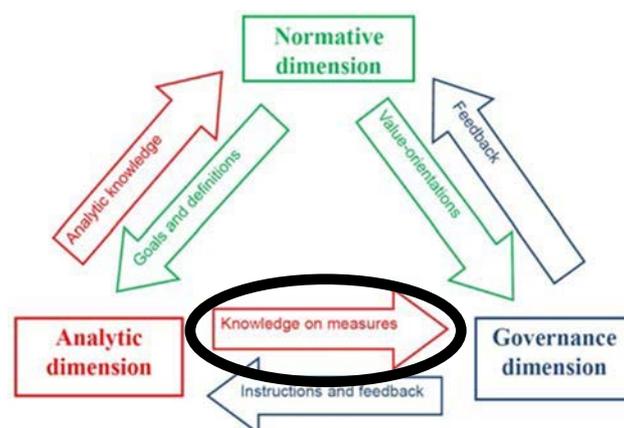


Figure 3. Focus of the second research topic: knowledge of measures' impacts as guidance for policy

Norwegian national transport planning have been subject to analyses. In particular the use and influence of benefit-cost ratios and in particular ex ante indicators (and less ex post) have been studied. It thus appears from analyses of Swedish national transport planning that appraisal of effects and in particular the benefit-cost ratios were instrumental in choosing among these investment projects that were not in advance determined by the government. The benefit-cost ratio impacts as a screening tool to avoid projects with negative net benefits and later on as a sorting mechanism to determine the order of priority among the projects (Eliasson & Lundberg, 2012; Sørensen & Gudmundsson, 2010).

In contrary, the influence of ex ante appraisal information seems limited in the political processes in Sweden, where the investments selected directly by politicians, do not show any connection between high benefit-cost ratio and selection of investments (Eliasson & Lundberg, 2012). In Norway, research into the MP's decision-making has stated the same observation for cost benefit analyses as well as for other appraisal information. Thus, researchers have found that the politicians' information processing is highly biased and designed to confirm what they already claim to know (Sager & Ravlum, 2005; Sager & Sørensen, 2011), implying that benefit-cost calculations do not "alter a single priority neither in the National Transport Plan nor in the annual budgets" as a Norwegian MP is quoted for stating (Sager & Sørensen, 2011, p. 227). However, other research into Norwegian planning suggests that the politicians do use an Impact Assessment sheet of all the projects, but choose only a few of the impacts when deciding which projects to include in their investment portfolios. In addition, the most variables determining the politicians' decisions are among those included in a traditional cost benefit analyses. However, the politicians take them into account in non-monetary units and partially rather than via the composite benefit-cost ratio (Odeck, 2010).

More general research within knowledge utilization has provided *explanations* for use and influence or not of knowledge in decision-making (see e.g. Gudmundsson & Sørensen, 2012). Such literature could provide inspiration for research into the more specific criteria for knowledge use and influence in national transport planning in different institutional and cultural contexts. Research of this kind could contribute also to scientific development of existing analytic tools and appraisal methods or provision of new that possibly to a larger extent would offer a valuable contribution to politicians' (and bureaucrats') decision-making on national transport planning. A final research issue within this topic takes point of departure in the different roles that research and politics have. While researchers (and planners) will often aim for an instrumental rationality in decision making that provides the highest net gains to society, politicians are carriers of a political rationality and will always have other, legitimate matters to include in their considerations (Sager & Ravlum, 2005; Sørensen & Gudmundsson, 2010). This calls for modesty in researchers' and planners' ambitions, but might leave the sustainability agenda a bit amputated: How then to determine, whether individual measures and policy packages included in national transport plans are sustainable?

We now will turn to the *third and last research topic*, which is also the least researched in the academic literature on the national transport plans in Sweden and Norway. Thus, the issue of coordination of transport modes and policy instruments. This topic is an aspect of the governance dimension (see figure 4 beside).

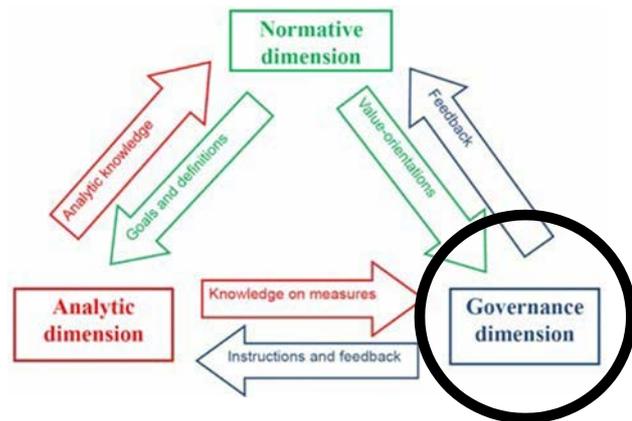


Figure 4. Focus of the third research topic: institutions in transport governance

Both Sweden and Norway have chosen different approaches to this topic as also appears in section 4.3 above. A couple of years ago the national road and rail administrations in Sweden were merged into the Swedish Transport Administration including responsibility for national transport planning of all four modes. Thus, in Sweden an intermodal organizational set-up has been established. However, the national transport plan is almost exclusively a transport infrastructure plan and only to a limited extent reaching out to other policy areas. On the contrary, the Norwegian organizational set-up for national transport planning is three state agencies (subordinate to two different ministries: Ministry of Transport and Communications; Ministry of Fisheries and Coastal Affairs) as well as a state-owned limited company. However, the Norwegian plan includes transport policy and transport related policy outside the scope of infrastructure.

Only Norwegian national transport planning has been researched from a coordinative point of view, mainly reviewing the first generation of modally integrated national transport plan and focusing on the inter-agency coordination necessary to provide a plan covering all modes. In the analysis it is found that the involved agencies operated under different steering models, and thus concessions had to be made to the market conditions some of the agencies were operating under, to the agencies' hierarchical and bureaucratic relations to their ministries and regional offices as well as to various requests for network co-operation made in national political guidelines. Competition between the road and rail agencies for resources and a withdrawal strategy of the aviation agency (now limited company, Avinor) contributed to the challenges in the planning process. On this background the authors conclude that coordination in national transport planning processes is costly and should be kept at an appropriate level giving net benefits, and it is stressed that the limited competitive interfaces between the transport modes in most markets might make (increased) coordination counterproductive (Sager & Ravlum, 2004). In later Norwegian planning rounds, the outcome

of the coordinative efforts have been criticized for insufficient integration (Sager & Sørensen, 2011)

National sustainable transport planning could call for integrated planning processes providing possibilities for strategic choices across modes and policy instruments (Banister, 2008) as is also the motive and ambition in Sweden and Norway. However, the analyses of the Norwegian efforts of coordination illustrate that such efforts come with a cost, and thus it is relevant to analyze pros & cons of national transport planning integrating all modes. The costs expectedly are even larger when policy areas outside the realm of transport are included, like taxation, technological development, land use planning, etc. The different organizational solutions in Sweden and Norway (merging of agencies are also seen in other countries) further raise the question if merging of modal agencies improve conditions and thus reduce the costs of coordination?

In summary: In the paper we have provided a normative definition of the concept of national sustainable transport planning taking point of departure in theoretical notions, and further suggested that the normative, analytic and governance dimensions should be addressed to qualify for this label. Via the Swedish and Norwegian examples we have explained important features of national transport planning in these countries, which include sustainability aspects but do not meet the criteria of national *sustainable* transport planning, which the authorities neither claim. The analyses illustrate usefulness of the operational definition of national sustainable transport planning, and they show that planning practice leaves room for improvement if the aim is national sustainable transport planning. Via research into the Swedish and Norwegian examples we further have posed three research topics which provide interesting questions to the planning efforts in the two Nordic countries but are even more crucial for the agenda of national sustainable transport planning. Research into such topics – which is among the objectives of the research project, SUSTAIN - can hopefully provide output that can assist Danish and other countries' efforts in obtaining a national transport planning system with significant features of sustainability.

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