

Transformative capacity for climate mitigation in strategic transport planning – principles and practices in cross-sectoral collaboration

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Abstract

This article presents findings from a qualitative in-depth analysis of a four-year Swedish national policy initiative where six public agencies got the task to produce a strategic plan for a transformation towards a fossil-free transport sector. The specific aim of the article is to provide empirically grounded insights on principles and practices of importance for building transformative capacity in strategic, long term transport planning. In the analysis, we have applied the concepts stewarding, unlocking, transforming and orchestrating to explore and discuss transformative features of the policy initiative. Altogether, we found that several elements of transformative capacity were developed through the process. Of specific importance was the open and explorative approach to the task, and the ways in which the organizations involved challenged existing routines, perspectives and ways of working in conventional transport planning. New joint principles for assessment of policy measures for climate mitigation were developed, as well as ways to accommodate uncertainties. However, as the initiative was detached from more established planning settings, the question is whether the new principles and practices will lead to a more substantial transformation of the transport system.

Keywords: transport planning, climate mitigation, transformation, transformative capacity, path-dependency.

1. Introduction

Mainstream transport policy and planning during the postwar era has been rooted in a paradigm where the private car is seen as the main mode for individual mobility, and where forecasted traffic growth has typically been met by increased road capacity (Owens, 1995; Lyons & Marsden, 2019). This paradigm, which is often called the ‘conventional’ paradigm for transport planning, has in recent decades met criticism and opposition, as knowledge has increased about the transport sector’s massive contribution to the climate crisis and other environmental and social problems. This has led to a broad range of initiatives and measures seeking to transform the transport system to a more sustainable development path (e.g. European Commission, 2017). At the urban and regional level, there exists a rich flora of policies, plans and concrete measures aiming to support sustainable mobility and accessibility (Eltis, 2020).

Despite numerous initiatives to develop policy responses and planning initiatives for sustainable transport, automobility and its basic spatial, social and economic relations have continued to permeate a large share of transport planning (Banister, 2008; Isaksson et al., 2017; Hrelja, 2019). Previous literature identifies features within the practice of policy and planning that serve to maintain and reproduce the conventional approach. Common explanations are related to a lack of sharp targets for long term transport planning (Finnveden & Åkerman, 2014), a lack of relevant and productive planning tools (Curtis & Scheurer, 2010), a fragmented institutional context (Hull, 2008; Pettersson, 2014), parallel and conflicting goals and agendas (Pettersson, 2014; Isaksson et al., 2017), and an avoidance or incapability to deal with the essentially political choices that the

goals of a sustainable transport requires (Legacy, 2016; Isaksson, 2020). There is scarcer knowledge on possible paths of action for breaking the car-based mobility paradigm and to transform the transport system into a long-term sustainable trajectory. Previous research has identified several relevant concepts and ideas such as sustainable mobility, sustainable accessibility, and triple access planning to guide the development (Banister, 2008; Curtis, 2008; Lyons & Davidson, 2016), but less is known on *how* to integrate these into real-world planning situations. Recent research indicates a need for a transformation of planning practice to enable the accomplishment of climate objectives (Marsden & Reardon, 2017; Witzell, 2020), and point at the relevance of strategies for raising a new type of awareness, creating new consciousness, strategic reorientations or institutionalizing desired discursive shifts (Hrelja et al., 2013; 2015). However, empirical explorations of how this could be achieved are still limited.

This article seeks to contribute a richer understanding of ways in which conventional transport planning can be transformed. We set out to explore this by means of an in-depth analysis of a Swedish national policy initiative from 2016, when the Swedish Energy Agency was given the task to, in collaboration with five other national public agencies, produce a strategic plan for a transformation towards a fossil-free transport sector (Swedish Government 2015). In concrete terms, this would involve a 70 percent reduction of greenhouse gas emissions from the transport sector in 2030 (compared to the emission level 2010), and zero net emissions in 2045. These goals have been decided with broad political consensus in the national parliament but have been disputed when they have reached the policy-administrative level (Kågeson, 2019).

Theoretically, we take inspiration from emergent discussions in research on governance approaches for a deliberative sustainability transformation (O'Brien, 2012), with a specific focus on transformative capacity (Wolfram, 2016; Hölscher, 2019). Research on transformative capacity includes, among other things, a discussion about the need for new institutional and procedural approaches including social learning (Castán Broto et al., 2019).

The government commission to produce a strategic plan for a transformation towards a fossil-free transport sector is an interesting case, since it suggests a new approach to implement climate targets in transport policy and planning. It provides an up-to-date illustration of strategic transport planning in a context which is characterized by ambitious climate policy goals, on the one hand, and implementation challenges, on the other hand. Interestingly, in previous research, the commission has also been described as an example of (too) strong government control over public authorities who are supposed to work semi-independently from political power in the policy adaption process (Hansson, 2019; Hansson & Nerhagen, 2019). The complex and contested character of the commissions' task makes the initiative a relevant case to explore for providing insights about transformative capacity.

1.1 Aim and research questions

With this paper we wish to contribute to the emerging research field of transformative capacity and how the concept can be understood and developed in policy and planning for sustainable transport. The aim is to provide empirically grounded insights on specific principles and practices for building transformative capacity in strategic, long term transport planning.

The analysis has been guided by the following research questions:

- Which were the overall features and characteristics of the government commission that generated opportunities for doing things differently?
- Which specific principles and practices were critical in the work for a climate target-oriented strategic planning approach?

2. Analytical framework

2.1 Institutionalized practice in transport planning

The study builds on critical studies on power relations and institutionalized practice permeating long-term strategic transport planning. Of specific relevance are previous studies on socio-technical and institutional path dependencies that serve to reproduce conventional transport planning, i.e. planning which is focused on car-based mobility and demand satisfaction (forecast based provision of new infrastructure), typically motivated by ambitions to shorten travel times and based upon cost-benefit analysis (CBA) (Owens, 1995; Owens & Cowell, 2002; Banister, 2008). Previous literature has given rich illustrations of how conventional transport planning has institutionalized certain methods, requirements and routines that prevent new perspectives such as de-carbonization, gender equality and climate targets to transform existing planning practice (Naess, 2006; Driscoll, 2014; Kronsell et al., 2016; Henriksson, 2019; Witzell, 2020). A specific focus in previous research is related to power structures such as discourses, norms, routines, and knowledge perspectives that influence planning practice (Richardson et al., 2010; Tennøy, 2010; Thoresson, 2011; Schwanen et al., 2011; Banister & Hickman, 2013; Pettersson, 2014; Imran & Pearce, 2015; Isaksson et al., 2017; Vigar, 2017; Hrelja, 2019; Witzell, 2020).

While several studies analyze and describe difficulties to change conventional transport planning approaches, we are specifically interested in how to, within an established institutional context, develop processes and ways of working that can ignite and support a sustainability transformation. Thus, while we draw lessons from critical studies on long-term strategic transport planning, we also want to contribute with insights on how to push towards a sustainable transformation. To do so, we make use of the analytical concept “transformative capacity”.

2.2 Transformative capacity

Insights on *transformative capacity* (TC) mainly come from climate governance literature but is also influenced by planning scholars who emphasize institutional and governance capacities (cf. Healey, 1997; Innes & Booher, 2003). The TC concept has been developed with the ambition to identify transformative action, often in an urban and local setting, that contributes to the capability of public and private actors to steer urban development towards sustainability (Wolfram et al., 2019). In this paper, we define TC as the ability to organize action and to “reconfigure and move towards a new and more sustainable state” (Wolfram, 2016, as cited in Castán Broto et al., 2019, p. 450). This also encompasses an ability to “actively disrupt and dismantle existing systems, and simultaneously create and build up viable alternatives” (Wolfram et al. 2019, p. 438). TC sheds light upon abilities, resources, capacities and practices that public organizations and authorities need to change if they want to spur transformation. Typically, communicative skills and the ability to collaborate with a variety of actors and stakeholders are highlighted, as well as systemic thinking, civic engagement, strategies to prioritize social learning and reflexive action, and the ability to link specific initiatives to wider political visions (Wolfram et al. 2019).

One strand of the TC literature focuses on TC as an evaluative framework that can enable self-reflection and learning (Wolfram, 2016; Castán Broto et al., 2019; Glaas et al., 2019). Some scholars have used the concept to investigate and explore urban processes (Hölscher, 2019; Hölscher et al., 2019; Torrens, 2019) and to critically investigate specific traits of urban transformation (Nordström & Wales, 2019). Attention has been drawn to how the development of TC always is highly contextual. The process oriented strain of the literature expresses an interest in agency, and how different actors “accomplish” transformative climate governance (Hölscher, 2019). Previous research has also explored how and by whom new types of capacities are produced and what types of conditions that are needed to develop TC (Nordström & Wales, 2019). Based on this, we see a potential of applying it to the transport planning context, which is currently facing pressure to transform.

Ontologically, the concept of TC builds on a constructivist understanding of institutions and change, according to which professional norms, practices and discursive conditions are important aspects of policy and planning (Hajer & Wagenaar, 2003, c.f. Hölscher et al., 2019). It is relational in the respect that capacity is not regarded as something that an individual actor can possess, but rather a result of interactions between a variety of actors in institutional settings that in turn are shaped and re-shaped depending on specific material and spatial conditions. The capacities are continuously developed and adapted through governmental action (Hölscher, 2019). This understanding of transformative capacities acknowledges that institutions have both enabling and constraining effects and are shapeable through work performed by actors that manage specific rules, knowledge and resources (Wolfram et al. 2019).

Hölscher (2019) has distinguished between different types of capacities needed to address transformation dynamics, including 1) *stewarding* (responding to uncertainties and risks through self-organization, monitoring and continuous learning), 2) *unlocking* (revealing, phasing-out and breaking down existing structures and path-dependencies), 3) *transforming* (creating and embedding novelties, anchoring novelties in context), and 4) *orchestrating* (strategic alignment, coordinating multi-actor processes to create synergies and avoid trade-offs) (Hölscher 2019, p.149, see also Wolfram et al. 2019, p. 440). We view these capacities as interrelated, often overlapping and mutually independent. We will make use of the capacities as analytical concepts for exploring transformative elements of the studied process.

3. Methods and materials

The study has been carried out based on a social constructionist research approach, with a focus on interactions, interpretations and communicative practices among actors involved in the policy and planning processes (Hajer & Versteeg, 2005). The study applies a qualitative methodology and builds on in-depth semi-structured interviews, complemented by policy documents (instructions and written reports) from the commission process. The documents initially shaped our understanding of the process, as they reflect what the process achieved, but also describe the working process and the methods applied. The documents were used as input to the interview guide and as objects of analysis.

Nine interviews with key persons in the commission's working group were conducted in 2019 and 2020 (see Table 1). The respondents were chosen because they had important roles to represent the participating authorities in the process. The interviews followed an interview guide that included questions about the organization and process in carrying out the commission, how the task was interpreted, what was achieved and why, and if any issues or procedures gave rise to conflicts and how these were dealt with. The interviews were recorded and transcribed verbatim. The interview material was analyzed through a content analysis approach (Patton, 2014). A first close reading identified utterances pointing at central principles and practices, as well as important decisions and key events. This reading identified themes for further analysis. The second close reading focused on coding these themes in line with the theoretical framing. The interviews and the documents were complemented with on-line material from a seminar with the director-generals of the authorities involved in the commission. Throughout the analysis, the focus has been on the process in the working group, not on individuals.

Studied documents included the commission to carry out the collaboration (Swedish Government, 2015), and key publications during the project time: an analysis of the current situation (SEA, 2016), the strategic plan for transformation (SEA, 2017a), a plan for monitoring and evaluation (SEA, 2017b), an overview of carried out 'effect chain' assessments (SEA, 2017c), a 'control station' report (SEA, 2020a) including appendix (SEA, 2020b), and a final report of the commission (SEA, 2020c), see also Figure 1 in Section 4.

In terms of generalization, we are striving for “analytical generalization” (Yin, 2009). This means that we aim to present the results and the context in which they emanate from as stringent as possible so that they can shed light on similar processes in other contexts (Larsson, 2009).

Table 1. *List of respondents.*

Respondent	Year
R1. Project manager, Swedish Energy Agency (SEA)	2019
R2. Project manager, SEA	2020
R3. Project manager, SEA	2019
R4. Economist, SEA	2020
R5. Contact person, Swedish Transport Administration	2019
R6. Contact person, Transport Analysis	2019
R7. Contact person, Swedish Environmental Protection Agency	2019
R8. Contact person, National Board of Housing, Building and Planning	2019
R9. Contact person, Swedish Transport Agency	2019

4. The government commission for a transformation to a fossil-free transport system

In 2016, the Ministry of Environment and Energy gave The Swedish Energy Agency (SEA) a briefly formulated four-year commission to coordinate a transformation of the transport sector to become fossil-free (Swedish Government 2015). According to the instruction, five additional public agencies with mandates related to the development of the transport system should assist in the work: The Swedish Transport Agency (STAg), The Swedish Transport Administration (STAdm), Transport Analysis (TA), The Swedish Environmental Protection Agency (EPA), and the National Board of Housing, Building and Planning (NBHBP). The task included carrying out dialogues with relevant actors, preparing a strategic plan, coordinating activities, and striving for synergies with other relevant processes. A plan for evaluation of economic costs and benefits of the work should also be prepared.

The brief government instruction suggested that the work could take international developments and previous public investigations as points of departure. Specifically, two reports were mentioned. First, an investigation which lay out possible development trajectories and measures to achieve reduced emissions and a fossil-free transport system (Swedish Government, 2013), and secondly, at the time a forthcoming report from the parliamentary Environmental objectives commission (Swedish Government, 2016) suggesting climate mitigation targets for the transport sector. The plan could, for example, suggest legislative changes, measures to be carried out by public agencies, and international policy advocacy.

The process of carrying out the commission can be sorted according to a few overarching phases which are reflected in key documents (see Figure 1). First, a joint analysis of the current situation of the transport system, focusing on obstacles to climate mitigation, was prepared. Subsequently, the main work of preparing a strategic plan for transformation was carried out, which came to include 31 agency commitments and 59 suggestions for policy and legislative changes directed to the government (SEA, 2020c). Examples of measures include suggestions to investigate a comprehensive transport sector taxation reform, measures aimed at strengthening information on

sustainable travel, revised agency planning guidance, political clarifications regarding transport developments within the boundaries of climate mitigation targets, etc. In parallel to the plan preparation, a plan for monitoring and evaluation of the climate mitigation transformation at large, as well as of measures in the plan, was prepared. Following the publication of the strategic plan, focus shifted towards implementation. During the last year, a ‘control station’ of the development in relation to climate mitigation was carried out. A final report was published shortly thereafter.

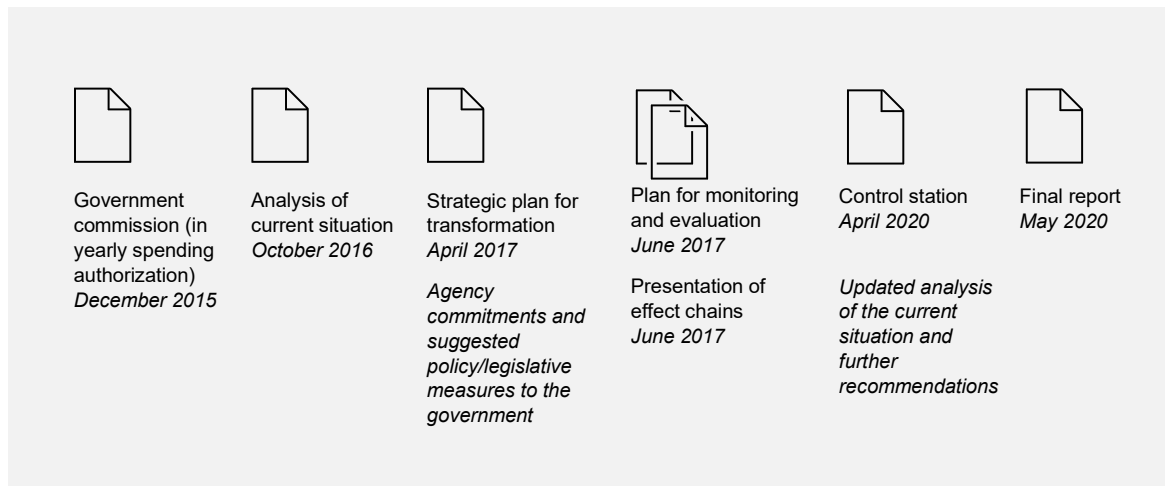


Figure 1. *The process, chronologically arranged according to main documents produced.*

The choice to initiate the commission should be seen in the light of how Swedish public administration is organized. In Sweden, the government offices are relatively small and in practice a substantial part of the executive power is carried out by public agencies. The task of the public agencies is to operate “in accordance with the guidelines received from the Government in instructions, appropriation directions and other government decisions” (ESV, 2020), but they should also act semi-independently, and use their own expertise to make the interpretations and decisions needed to make political decisions operative (ESV, 2020; Öberg & Wockelberg, 2020). The Swedish government regularly gives the agencies specific assignments to analyze potential new policy pathways by initiating a commission or committee of inquiry, just like they did in this case (ESV, 2020).

5. Results

The framing of the commission, and the result of the work, include several transformative elements; for instance, the way in which the involved agencies came to deliberate on obstacles to transformation, and agree on common principles to guide transformation, and what characterizes relevant assessments in light of the specific aim to contribute to climate mitigation. The following analysis uses the concepts *stewarding*, *unlocking*, *transforming* and *orchestrating* as an analytical framework to identify and discuss the more specific content of the transformative capacity that was developed through this process.

5.1 Stewarding through co-ownership of an open and flexible initiative

In TC theory, stewarding is defined as responding to uncertainties and risks through self-organization, monitoring and continuous learning (Hölscher, 2019). In this case, the commission from the government was important in providing conditions for self-organization. It was assigned by the Energy and Environmental Ministry to the SEA. This positioned the commission at a distance from the formalized, ‘conventional’ national transport planning carried out by the STAdm under the Ministry of Enterprise and Innovation, and which is known for its strict and standardized planning practice centered around conventional travel demand forecasting and cost-

benefit analysis (Kloo et al., 2019; Witzell, 2020). The formulation of the commission also provided room to self-organize the task. Interviewees recall how they interpreted it as if the ministry wanted the work to be done, but not set the details for how to do it. Early discussions were characterized by open, mutual interpretations of how to define the task (R9; R7). The open character was perceived as providing the SEA much room to shape the process (R1). A participant recalls that they “could think wide and free” (R7), and that:

the instruction was vague enough to not set limitations. But it was interpreted positively – the project leadership did not set any restrictions or narrow scope. (R7, c.f. R6; R9).

From the outset, the SEA further emphasized that although they had been handed the formal commission, they aimed at enabling a joint ownership for the process and its outcomes among the involved agencies, by which the work should be carried out together in close collaboration. A project manager within the SEA express that establishing an organization and process providing room to discuss and deliberate on issues was a major part of the commission (R1). The principle of joint ownership and mutual dialogue was also manifest by the steering group which consisted of the agencies’ general directors. Several respondents reflect upon the general directors’ close involvement, not only in approving and signing the strategic plan and the final ‘control station’ report, but also by being involved in specific formulations in the documents (R2, c.f. R1; R9).

Initially, some participants expressed a will to ground the strategic plan in a long-term backcasting scenario, to establish a development trajectory which credibly would achieve the climate mitigation targets. Time constraints of the process, in combination with a general will to reach an increased level of concretion, resulted in agreement on a more pragmatic, action-oriented approach focused on implementation within a shorter time perspective (R1; R2; R6; video-presentation):

We felt that one can’t keep on calculating and calculating and investigating eternally. We experienced that many measures had been on the table for ten years, in various investigations. Now action was needed. And we *know* that those measures are needed. So now we get together – the agencies – and jointly state that we must do these things, which have emanated from various processes, from various investigations. (R6)

While there was an initial discussion on which target level for mitigation of climate emissions to strive for, the parliamentary Environmental Objectives Commission (Swedish Government, 2016) presented their final report which included clearly specified targets half a year into the work. According to several respondents, the politically suggested mitigation target was important for the proceeding of the process since it solved ongoing discussions, which otherwise could have been difficult to reconcile. As noted by a participant, the opinions on how to *reach* the target differed, but at least they agreed on which target to approach (R5). While the overarching question of which target to work towards was settled, also the continued process was characterized by extensive discussions:

I recall that, generally, there were discussions on how we should work, what we should suggest, how we should calculate. (R2)

From a TC perspective, the openly formulated yet clearly targeted commission, the processual ambitions of establishing co-ownership and providing room for deliberation, and the pragmatic approach to getting things done, all reflect characteristics of self-organizing and room for continuous learning in relation to the climate challenge.

5.2 Unlocking the conventional approach

Unlocking is about revealing, breaking down and phasing out existing structures (Hölscher, 2019). During the process, there were several such elements - especially in the early phases of the work, when the project group started to develop their joint approach to the task, and which laid a foundation for subsequent activities.

5.2.1 Analyzing the current situation and obstacles to transformation

A first example of unlocking regards the way in which the agencies approached the task as it continued into a more operative stage. The agencies carried out a joint analysis of the current state of the transport system in relation to climate mitigation, focusing on obstacles for transformation, an overview of agency mandates and ongoing strategic work.

Identified obstacles in current transport planning involved the car as a norm, cheap fossil fuels and subsidies of car travel, lack of funding of measures aimed at sustainable travel, long lead-times related to a transformation, ambiguous policy objectives, and the way in which infrastructure planning tend to assume continued traffic growth. A respondent described that the analysis led to a joint consideration of external dependencies and uncertainties which would have to be considered in the subsequent strategic plan and its implementation:

We discussed that precisely *due* to the uncertain surrounding world, it is important to work with all three ‘legs’ [of vehicles, fuels and ‘transport efficiency’]; we need to work on several frontiers. And we also generally discussed that changes in the surrounding world may make certain measures obsolete. Consequently, we included a continuous external analysis [as part of the commission], to be able to adjust the direction. (R6)

Initially, there were diverging opinions on whether yet another analysis of the current situation was needed. With hindsight, however, respondents acknowledge that the analysis contributed to shape a common understanding that eventually proved important for the continued process:

The analysis of the current situation lay, very much, the foundation for it becoming such a good collaboration. All agencies presented what had been done previously. And everyone tried to understand each other’s situation, and how one had worked with the issues before. It was very useful, because then suddenly we *had* a common background and platform for the continued work. ... We came to agree on where we stand today and in which direction we aim. That increased the understanding for each other’s limitations, what one *can* do and what one lacks mandate to do. (R8)

5.2.2 Agreeing on general principles for transformation

Following the analysis of the current situation, during the preparation of the strategic plan, the agencies came to formulate general principles for what should characterize transformation, as well as for the design and assessment of concrete climate mitigation measures (see Table 2). The general principles were stated to contribute to the establishment of common attitudes in handling opportunities, obstacles and challenges related to the task (SEA, 2017a).

The principles acknowledge the need to work with a broad set of measures aiming at improved vehicle efficiency, fossil-free fuels, and ‘transport efficiency’, where the latter is defined as shifting towards more energy-efficient modes of travel, as well as more efficient, shortened or avoided trips and transports (SEA, 2017a, p. 5). ‘Transport efficiency’ was an important concept as it addressed the need for decreased travel – a need which is not acknowledged in conventional national transport planning (Witzell, 2020). It was expressed that the vast scale, the limited time available, and risks related to the transformation, requires a broad set of measures (SEA, 2017a).

Respondents express how these principles were important in setting a common ground for the subsequent preparation of the strategic plan. One respondent describes how they, through the discussions, arrived at principles for the transformation which everyone agreed on. Through these principles, it became clearer how different measures, with greater or smaller impact on climate emissions – could fit into the strategic plan (R2).

Table 2. *Agreed principles, summarized from the strategic plan (SEA 2017a, pp. 5-9).*

Principles for the transformation	Principles for specific measures
A transformation needs to consider increased 'transport efficiency', vehicle development, and fossil-free fuels	Measures should not counteract climate objectives
Sweden should take a role as international forerunner	Measures should follow the 'polluter pays' principle
The public sector should act as role model	Carbon taxation provides a foundation but needs to be complemented by a mix of measures
Collaboration among actors is required	Economic cost efficiency should be considered, as well as contributions to other societal objectives
A transformation can contribute also to other societal and environmental objectives	The transformation should continuously be monitored, evaluated, and adjusted accordingly
Accessibility rather than mobility should be in focus	Policy measures should be technologically neutral
Digitalization can contribute to a more efficient transport system	Measures should be combined in order to achieve mutually supportive and amplified effects
The transformation should consider and adapt to regional and local conditions	Social and geographical distribution effects should be considered

Altogether, the joint analysis of the current situation, the acknowledgment of uncertainty permeating the future, and the agreement on a set of principles for the transformation, outlined a direction beyond the 'conventional' approach to transport planning. The principle of attending to a broad set of measures, which acknowledges 'transport efficiency', appears as a central feature of unlocking. Taken together, they can be understood as a collective renegotiation of both what characterizes the current situation and how to approach the challenge.

5.3 Transforming by negotiating assessment approaches

According to previous literature, TC requires the creation of novelties and the provision of space, resources and networks for developing and testing new ideas, practices or policies (Hölscher, 2019).

5.3.1 Strict ideals but pragmatic heterogeneity in assessment, monitoring and evaluation

Throughout the process to develop a plan for monitoring and evaluating measures (SEA, 2017b), and in the preparations for the concluding 'control station' (SEA, 2020a; 2020b), references were made to an ideal of comprehensive economic assessment. According to this ideal, the marginal costs associated with each measure should be defined to allow comparisons vis-à-vis other measures, in order to find the most cost-efficient mitigation approach (SEA, 2017b; 2020a). Further methodological developments should, according to this view, make comparable economic appraisals possible (SEA, 2020a:29). Eventually, this ideal, which strongly influence conventional transport planning within the STAdm, was acknowledged as unattainable. Its overall relevance for climate mitigation was also problematized.

Published documents from the process reflect extensive deliberation over the relevance and applicability of conventional economic assessment. It was acknowledged that models are simplifications, and as such their applicability depends on their capacity to assess all relevant categories of measures (SEA, 2020b). It was stated that conventional transport economic appraisal is not designed to analyze broad societal transformations, that it is currently incapable of analyzing 'transport efficiency' measures, and that there is no obvious method for comprehensively analyzing effects against a wide array of societal objectives (SEA, 2017b; 2017c). Measures are often interrelated, reciprocally dependent, and thus difficult (or impossible)

to isolate. The actual effect depends on measures' subsequent detailed design (SEA, 2020b). Further, few marginal costs related to specific measures are currently available, wherefore measures can hardly be compared. The long-term marginal cost of the transformation in its entirety is also not known. Analyses should therefore rather be interpreted as indications or directions of consequences. Measures should be assessed when relevant, depending on the aim of the measure and size of its assumed effects (SEA, 2020a; 2020b).

5.3.2 Establishing qualitative 'impact chains'

When proceeding to sorting, assessing, and choosing measures to include in the strategic plan for the transformation to a fossil-free transport sector, it was initially not evident how to structure the work. Eventually, the SEA introduced an 'impact chain' method which had previously been applied in internal strategic work within the SEA (R1), and which was also recommended by the government for collaborative assessment of policy proposals (ESV, 2016). Respondents describe the 'impact chain' method as a structured approach which allowed to focus on the climate objective and established principles for transformation, while reflecting the heterogeneity and varying knowledge available on potential effects of measures. Potential measures were, through the 'impact chains', sorted according to their contribution to three overarching effects, which reflected the principle of working with a broad set of measures: increased transport efficiency, increased energy efficiency, and renewable fuels. Measures were prioritized based on assessments of their potential contribution to climate mitigation and the conditions for their implementation. Assessments were documented in a structured manner. They were mostly of a qualitative character, complemented by quantifications when available (SEA, 2017c).

5.3.3 Successive monitoring and evaluation of the development direction

In accordance with the acknowledged uncertainty and limited beforehand-knowledge on effects of several measures, recurring 'control stations' were suggested (SEA, 2017b) to monitor whether the development proceeds in the right direction, and to adapt measures accordingly (R1). A respondent from the SEA states:

There were discussions regarding what cost efficiency actually means – is it even possible to measure at this level, in dealing with such a great transformation? ... There are very large knowledge gaps. ... We therefore expressed that this should be done continuously, as it is not possible to fully answer questions like this beforehand. One has to continuously get updated on technological developments, political developments, and so on. (R4)

The 'control station' in 2020 provided a preliminary evaluation of the general direction of the transformation. It was based on an updated analysis of external factors and trends, indicators of climate emissions and other societal objectives, and a review of national climate mitigation scenarios. Measures in the strategic plan were evaluated based on available knowledge primarily from previous investigations, and seven measures which the government had not yet implemented were recommended for speedily implementation. The 'control station' provided a forward-looking discussion on how assessments of the transformation can further evolve. While a need for comparable economic appraisals was once again acknowledged, it also pointed at a need for a broader set of future scenarios against which measures, and the general development direction, could be assessed. A range of scenarios would make possible to illuminate expected impacts on wider environmental and social objectives that follows from different choices of transformation pathways (SEA, 2020a; 2020b).

5.3.4 Potentially transformative practices, but normative tensions prevail

Throughout the process, the ideal of comprehensive economic assessment was problematized. This paved the way for a more pragmatic approach to assessment by 'impact chains' and successive 'control stations'. This, further, provided increased room for provisional tacit expertise and judgment in assessments, in which broader professional knowledge beyond modelling and economics were acknowledged. Several respondents specifically point at the quality of having six

agencies assessing and supporting measures together, in light of the uncertain state of knowledge and the urgent need to act towards the climate objective (R1; R4; R6; R8; R9). In relation to this, the inter-agency agreement of the strategic plan was seen as a quality mark:

It is in fact a form of quality assurance that all agencies agreed. A sign that it is a relevant measure is that we are six agencies with different missions and backgrounds who can agree. (R6)

Still, it should be noted that while the pragmatic assessment practices allowed for a widened consideration of measures with uncertain effects, there were still conflicting standpoints between agencies regarding the relevance of specific measures. This can partly be explained by their differing and sometimes conflicting missions, mandates and instructions. Tensions evolved regarding how to formulate and interpret measures that could imply changes to ‘conventional’ transport planning and funding frameworks. Specifically, tension regarded whether objectives of environmental considerations should take precedence over objectives of travel-based accessibility in national transport planning, whether national co-funding of infrastructure and land-use development should be conditioned by their contribution to ‘transport efficiency’, and whether public transport and smaller infrastructure investments supporting ‘transport efficiency’ should get improved funding conditions. As one respondent stated: “regarding the other two ‘legs’ [of categories in the transformation] – vehicles and fuels – there were no similar discussions.” (R3)

In sum, the applied practices of ‘impact chains’, ‘control stations’ and the acknowledgement of broader professional knowledge and provisional expert judgment were novelties which, in line with the established principles of the process, allowed for consideration of wider development directions and measures.

5.4 Orchestrating by preparing a framework for a continuous process

According to Hölscher (2019), orchestrating includes coordinating multi-actor processes and shaping opportunity contexts. In the studied process, we identify such aspects in the way in which the collaboration was established and performed, and in the way in which the involved organizations planned for a continuous process ahead. The SEA’s efforts to establish an open atmosphere and a sense of joint ownership over the process and its results, reflect features of multi-actor coordination that shaped a new opportunity context, compared to conventional transport policy and planning. A central feature of the process regards its attention to transformation as a process characterized by continuous change, which requires an explorative and successively adaptive framework for policy and planning. The agencies also prepared for opportunity contexts and collaboration ahead by pointing at recurring ‘control stations’, at which the transformation in general as well as individual measures would be monitored, evaluated and adapted accordingly (SEA, 2017b; 2020a). In these activities, which we think of as “orchestrating ahead”, the agencies also acknowledged a need for further involvement and adaptation of assessment practices in relation to the expected changing character of the transformation. They pointed specifically at the value of assessing potential measures in relation to several future scenarios in order to secure that the transformation is in line with broader social and environmental needs (SEA, 2020a).

That six agencies jointly agreed on the outcomes was expressed to be a novel way of working (SEA, 2020c). A continuation of the collaboration was discussed with the ministry, and an evaluation of the processual aspects of the work was initiated in 2018. The general directors of the six agencies sent a letter recommending a continuation to the ministry in 2019, and have expressed a need for continued collaboration as the transformation towards zero emissions is considered to require changed ways of working and organizational learning among all involved agencies (SEA, 2020c). The commission was, though, eventually not extended by the government. Reasons therefore are not known. Still, several policy recommendations from the collaboration were included in the government’s Climate Action Plan (Swedish Government, 2019). The government further stated that a (new) strategic and action-oriented collaboration

between agencies will be commissioned. To summarize, while a forward-oriented framework for continuous monitoring, evaluation and further adaption of the transformation was prepared for, it has so far not led to any clear continued initiative.

6. Discussion and conclusions

The aim of this paper was to provide empirically grounded insights on specific principles and practices of influence for building transformative capacity in strategic, long term transport planning. To do so, we have carried out an in-depth analysis of a Swedish inter-agency government commission to co-ordinate a transformation of the transport sector in line with climate mitigation targets.

Altogether, we have found that the briefly outlined and open formulation and organization of the inter-agency commission provided a fruitful processual setting for building transformative capacity. By assigning the task to the SEA, the commission was led at a distance from the formalized, conventional national transport planning framework. Early in the work, the government suggested a sharp climate mitigation target, which helped to focus the work. The open character of the assignment meant that the SEA could establish a sense of joint ownership of the process and its outcomes. The inclusive, explorative and in this sense somewhat ‘messy’ character of the initial phase enabled for issues to be raised and jointly agreed. Furthermore, the organizations agreed to start the process by carrying out an initial analysis of the current situation, including a focus on existing obstacles to transformation. This contributed to the establishment of a shared understanding of the task and its conditions. Taken together, these processual elements, which reflect the capacities of stewarding and unlocking, provided favorable conditions for an open and potentially transformative-oriented way of working.

6.1 Principles and practices shaping transformative capacity

Through our work, we have identified specific shared principles that were important in the development of a more transformative-oriented trajectory than is commonly the case in national transport policy and planning. Of specific importance was the way in which the involved organizations started to address the uncertainty of future developments, and manage remaining knowledge gaps regarding the expected effects of suggested measures. The ways in which the process enabled explicit critical discussions regarding the relevance and applicability of ‘ideal’ comprehensive, conventional economic assessment, made it possible for the agencies to agree on new, shared principles in proceeding with their task. This resulted in a wide set of measures, including measures aimed at improved ‘transport efficiency’, assessing effects against broad societal objectives, and monitoring, evaluating, and adapting the strategic plan recurrently. By acknowledging the relevance of ‘transport efficiency’ measures, the scope of transport planning was widened by actively attending to possibilities of modal shift and decreased travel. These principles can be understood as a support for a processual approach to transformation, in which uncertainty, complexity and changing conditions are explicitly acknowledged and managed underway.

The establishment of new, shared principles provided an important foundation for the commissions’ work, which subsequently also influenced the practices involved in preparing and implementing the strategic plan. Uncertainty and knowledge gaps were addressed by practices which reflected the heterogeneous character of available knowledge and allowed for broader consideration of measures compared to ‘conventional’ transport forecasting, modelling and economic assessment. A structured assessment framework for successive monitoring and evaluation of the transformation was established, which acknowledged provisional, tacit expertise and judgment to complement available quantitative data. A plan for recurring ‘control stations’ was outlined, by which initial assessments focused on ‘impact chains’ would be continuously reassessed in the light of emerging knowledge. Besides conventional transport economics, recurring assessments would be carried out also against a set of indicators reflecting broad

societal objectives. Monitoring and evaluating impacts against a wide set of scenarios was also recommended.

The development of new principles and practices in this case illustrate how transformative capacity regards both introducing novelties and phasing out, or de-emphasizing, previously dominant perspectives and ways of working. For example, the practices of establishing ‘effect chains’ and carrying out recurring ‘control stations’, and the principal acknowledgment of wider forms of professional and expert knowledge, implied that the otherwise strong emphasis on comparable ‘marginal costs’ in conventional transport economics was de-emphasized.

An important take-away in relation to the theoretical conceptualization of transformative capacity is that the categories stewarding, unlocking, transforming and orchestrating are interrelated and partly overlapping. For example, the initial stewarding of the commission was critical in making it possible for the involved actors to discuss and eventually agree on novel ‘unlocking’ principles, which were subsequently important for developing elements of ‘transforming’. Principles and practices were reciprocally dependent, in the sense that the principles provided a shared direction and approach to transformation, while adapted practices operationalized them in ways which allowed consideration of a broader set of measures in line with the principles.

6.2 Looking forward: ambivalent politics and the risk of parallel policy-making

While we have seen clear elements of transformative capacity in the studied process, it should be noted that these capacities were clearly delimited to this specific commission. As stated in the empirical analysis, the involved organizations stressed the need for continued collaboration and organizational learning, and suggested an approach for ‘orchestrating ahead’ by establishing a framework for continuously monitoring and evaluating the transformation. So far however, the government has not acted decisively to extend the commission, even though they have acknowledged a need for further inter-agency collaboration to support transformation.

What initially and throughout the process was a beneficial condition for establishing transformative capacity in this case – i.e., the detachment from conventional transport planning – could therefore be seen as a disadvantage for sustaining and disseminating elements of transformative capacity. An authority like the SEA, that does not primarily work with strategic transport planning, or has the mandate to do so, might not be able to orchestrate the continued development. The initiative can thereby be seen as a process with some transformative *potential*, but it remains to be seen if the approach will influence a continued transformation in the broader governance of the transport system.

This raises the question of what impact the initiative will have on the overall national transport planning practices, in the end. A key insight from the literature is that transformation is dependent on a dismantling of existing systems, and the creation of viable alternatives (Wolfram et al. 2019). In this case, we conclude that conventional transport policy and planning is not challenged beyond the situated commission. Even though clear elements of transformative capacity were developed in this case, their potential to spur a more substantial transformation is dependent on to what extent they will influence the wider governance conditions and become institutionalized in the regular national transport planning framework. If not, there is a risk that the commission will end up as yet another layer or parallel process (Isaksson et al., 2017) which does not challenge the generally dominant, conventional approach to transport planning. An important takeaway from this study is therefore that sustaining and disseminating transformative capacity requires proactive attention and linkage to other processes and arenas in the wider governance landscape. This ought to be attended to in future planning initiatives aiming at establishing transformative capacity, as vital elements of enabling and orchestrating.

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