

APPENDIX A - National Sustainable Transport Planning: an indicator framework for change

Context

This Ph.D. falls within the scope of the SUSTAIN project. The purpose of SUSTAIN is to develop research that will help provide a framework for National Sustainable Transport Planning (NSTP) in Denmark and potentially elsewhere. The SUSTAIN project addresses the following three topics:

- 1) Sustainability: How can the concept of sustainability be operationalised and transformed into strategic performance measures for national transport planning? (theme B)
- 2) Institutions: How can these types of knowledge about organisational forms and planning processes contribute to the achievement of such sustainability measures? (theme C)
- 3) Tools: How can these new types of knowledge be built into new model-based planning tools that can help advance the strategic planning in the desired sustainable direction? (theme D)

The ambition of the SUSTAIN project is to develop the scientific underpinnings for broad strategic and policy-oriented appeal and impact on promoting future sustainable transport.

Recognising the complexity and the inherent socio-technical features of this project SUSTAIN adopts a systems-oriented and interdisciplinary approach, which will draw both from social and technical sciences and focus on integration of the three core themes above.

This Ph.D. aims to address primarily the first topic.

Motivation

On the positive side, many transport departments and agencies around the world have started adopting the language of sustainability. Strategies and goals are being reframed through the prism of the three pillars, and indicator systems are being put in place to measure and benchmark sustainable development (Jeon and Amekudzi 2005; Zietsman et al. 2011).

Despite this – and despite progress on some individual indicators such as average emissions for new cars – the transport sector’s overall environmental footprint is systematically increasing, and it is expected to continue growing in the business-as-usual scenario (UNFCCC 2013; EEA 2012). Conclusions from these trends are clear: the construction and use of transportation infrastructure to meet growing demands worldwide has also brought growing negative economic, social and environmental impacts, leading to the conclusion that our current transportation system is unsustainable and continues to show little signs of abating (UNEP 2011; Banister 2008). Furthermore, the last decade of integrated transport plans – for example, from the UK or Germany - have yet to prove their capability to reverse these trends as economic imperatives have tended to supersede other considerations (Preston 2010; Schöller-Schwedes 2010).

Several countries including Denmark have adopted sustainability commitments and some planning approaches for use in national and/or urban transport planning. This project assumes that a general change toward a sustainable transport system will require strong support from national planning frameworks using indicators to assess, monitor, and evaluate performance (Zietsman and Ramani 2011; Pei et al. 2010; May,

Page, and Hull 2008; Jeon and Amekudzi 2005). The project will focus on key challenges associated with the effective development and use of indicators to promote sustainability in the transport area. The challenges can be grouped under conceptual, operational and utilization related ones (Gudmundsson 2003).

Conceptually, sustainability is not necessarily well represented in existing transport indicator frameworks (Joumard and Gudmundsson 2010). There is for example yet to come a consensus on the balancing between the various dimensions of sustainability, between the short and the long term, between basic needs and the materialistic notions of standards for the idea of quality of life, between growth and development being a cause of unsustainability or a mean towards sustainability, and, more fundamentally, between humanistic solidarity (in the form of intra- or inter-generational equity) and personal liberty (Verburg and Wiegel 2008; Gibson 2006; Langhelle 1999; Lele 1991; Brundtland 1987). Principles of sustainable such as those proposed by The Natural Step (Holmberg and Robèrt 2000; Broman, Holmberg, and Robèrt 2000), represent promising ways to provide stronger conceptual underpinnings.

Operationally, it is well recognized that indicator frameworks need to be adapted to the particular planning context to be effective (Marsden and Snell 2009), taking into account factors such as data availability, number of indicators that can be managed, aggregation into indices etc. The literature also offers interesting avenues for organizational change of the transportation sector through strategic planning that is sensitive to the various levels of maturity regarding sustainability (Barrella, Amekudzi, and Meyer 2012; Jeon, Amekudzi, and Guensler 2013).

As regards actual utilization of indicators, it has been observed that technical frameworks may not be sufficient to influence action (Gudmundsson and Sørensen 2012; Turnhout, Hisschemöller, and Eijsackers 2007; Innes 1998). For a desired change to diffuse and be more easily adopted, it must bring relative advantages and benefits that can be observed, be compatible with existing norms, and be easy to understand and experiment (Rogers 2003).

There is thus a need for research on the role of indicator frameworks in planning for transitions to a more sustainable transport system. The thesis will primarily address conceptual and operational challenges, while utilization related ones will be discussed at a more general level.

Objectives

The PhD objective is the elaboration of a framework that will facilitate the operationalisation of sustainability principles for the identification, assessment and selection of performance indicators for National Sustainable Transport Planning (NSTP). The framework will take into account the complexity involved in applying sustainability concepts to transport as well as the strengths and weaknesses of performance indicators as a linking mechanism between strategic goals, operational monitoring and utilization. The general research question of this Ph.D. will serve to address is:

How can sustainability be transformed from general normative orientations and principles to corresponding governing practices and actions towards change that genuinely support sustainable development of the transport sector at national level?

Contribution

Initially, a literature review of the *conceptualisation* of sustainability will be undertaken. This will mainly consider interpretations of sustainability in the form of sustainability strategies, sustainability assessment, and the use of sustainability principles such as The Natural Step (Broman, Holmberg, and Robèrt 2000; Holmberg and Robèrt 2000) as a basis for strategic planning and indicator frameworks. The review will explore some of the inherent conflicts in the definitions of sustainability and the difficulties in operationalising sustainability (such as reductionism (Gasparatos, El-Haram, and Horner 2008)). It will reflect on the possible consequences of choice of theories. The concepts found in the literature review will be put into perspective in relation to transport systems and will serve as a basis for later research.

Secondly, an analysis of existing sustainability indicator frameworks will be performed. This will serve to establish the current state-of-the-art in the *operationalisation* of strategic sustainable transport planning using indicator frameworks. The analysis will mainly draw from the latest research on the development of effective sustainable transport measurement frameworks (Barrella, Amekudzi, and Meyer 2012; Pei et al. 2010). Existing frameworks such as the U.S. Guidebook for Sustainability Performance Measurement for Transportation Agencies (Zietsman et al. 2011) and the EU indicators to assess sustainability of transport activities (Dobranskyte-Niskota, Perujo, and Pregl 2007) are considered cases of high relevance to determine the strengths and weaknesses of such frameworks. This research will serve to position the subsequent papers at the leading edge.

Thirdly, in order to set the above research into its Danish context, the current baseline for national transport planning and indicators in Denmark will be established. This will consist of gathering empirical data about current sustainability maturity levels (conceptualization), measurement (operationalization) and reporting practices (utilisation) in Denmark applicable to the transport sector. The focus will be on existing regional and municipality planning and transport indicators, with the aim of evaluating how these are linked and integrated together at national level. Part of the research will include a review of existing data sources for sustainable transport indicators. This step will also allow to identify potential case application for upcoming testing of an indicator framework.

Finally, a tentative indicator framework will be outlined and potential indicators will be identified. This work will be based on and feed into parallel SUSTAIN work (theme D) and contribute to the process for the selection of indicators eg. in the “Long List of criteria” (Jensen, Salling, and Leleur 2013). The research will take an iterative form, involving stakeholders identified in the previous step as well as SUSTAIN pre-defined user groups in focused workshops and/or semi-structured interviews. As part of the research, the elaboration of an index will be evaluated. The research will include testing of the framework with an evaluation of the results.

Literature

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