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Publication date:
2017

Document Version
Peer reviewed version

[Link back to DTU Orbit](#)

Citation (APA):
Leleur, S. (2017). *Green Decision Making: Sustainable Transport and Systemic Planning (SP)*. Abstract from 61st Annual Meeting of ISSS, Vienna, Austria.

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Papernumber: 3031

Green Decision Making: Sustainable Transport and Systemic Planning (SP)

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The generic framework for planning and decision support set out in this paper is the outcome of the research work carried out in recent years in the international research project SUSTAIN concerning national sustainable transport planning. In the paper focus is on sustainable transport and infrastructure assessment and on the methodology and process of systemic planning (SP).

SP theory development has interchanged with practical application and testing of the SP approach in a large number of cases. The word systemic in SP indicates that complex planning problems and provision of decision support in today's strategic planning needs a focus on what may be addressed as systemic insights in balance with more conventional, systematically-based findings where causal linkages can be modelled and made use of. In practice this means that SP is based on a study-specific combination of hard (quantitative) and soft (qualitative) operations research (OR) methods; especially the latter have a function as regards knowledge generation that relates to obtaining systemic insights. Furthermore, SP applies a process that drives group-based learning forward. The group should be formed with the different stakeholder interests as regards the outcome represented by different group members. The process is guided by a facilitator and is assisted by an analyst, with the analyst providing ongoing, interactive modelling. This collective (man/machine) learning aims to lead to a final decision (or decision recommendation) about the best alternative or course of action for the actual strategic planning problem. The flexibility of SP makes it adaptable to different problem types.

The paper is disposed as follows: After the Introduction about green decision making, Section 2 presents five SP-perspectives, where each perspective is grounded in a particular research approach that serves a particular function in the SP framework. The following Section 3 describes the SP modelling toolbox consisting of 2 x 7 soft and hard OR methods. Based on the previous sections, Section 4 describes the 'SP-wheel', which is the process-driver behind an iterative group-based learning cycle, intended to provide decision support for the actual decision making. The SP-wheel consists of 8 steps which produce knowledge that is intended to accumulate as final decision support. In the following Section 5 findings from a number of conducted case studies are applied to illuminate various aspects of the individual steps in the SP-wheel. A final Section 6 presents findings and perspective.

A more comprehensive treatment of the SP framework presented in the paper and the ideas behind the framework is available as a free E-book download from the author's ResearchGate page: https://www.researchgate.net/profile/Steen_Leleur *GREEN DECISION MAKING – How Systemic Planning can support Strategic Decision Making for Sustainable Transport Development*, Tech. Univ. of Denmark, Department of Management Engineering, April 2017.

Keywords: systemic approach, sustainability, planning, decision support, generic methodology