



Considering landscape in strategic transport planning

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ABSTRACT

The implementation of transport infrastructure plans often has significant impacts on landscapes, especially where new roads and railroads are built. Key decisions regarding the building of new transport infrastructures are often made on a strategic level, where the long-term development of a region is determined, and before the infrastructure project actually begins. In this paper we build on previous advances in Strategic Environmental Assessment theory by linking the process-related issues of the integration of these assessments in general to landscape issues in particular; we use a multiple case study of Swedish transport planning.

Results of this study indicate that the particular planning processes we looked at failed to carry out strategic landscape assessments and integrate landscape assessments in the planning process. We conclude that this can be explained by the flawed procedure of assessing landscape, the unhelpful structuring of SEA reports and by process-related issues. The idea of applying a holistic understanding of landscape, in line with the ELC, was notably absent from the studied cases. The lack of consideration of landscape as a whole can be attributed to poor use of dissipated and fragmented knowledge about landscapes as well as weaknesses in the assessment procedure. Our results indicate that the traditions of EIA are still prevalent in the practice of SEA, despite the fact that SEA theory has moved away from EIA-based methodology to become a tool for integrating environmental concerns into decision-making and for paying close attention to strategic decision processes.

1. Introduction

The implementation of transport infrastructure plans often has significant impacts on landscapes in which new roads and railroads are built. The construction of roads and railroads affects the landscape directly by claiming land and indirectly by the inevitable emissions into air and water and by traffic noise. When new areas become accessible as a result of the construction of new roads, railroads and stations, they are likely to be developed in terms of new housing and industries. Transport infrastructures cause barriers in the landscape, both for the connectivity of flora and fauna, and with respect to cultural and historical structures. They may also create barriers preventing people from moving freely in the landscape. Transport structures also have a wide range of effects on ecological processes, resulting in both positive and negative impacts for biodiversity (Karlsson and Mörtberg, 2015).

Landscapes, in and around cities and in rural areas, are valued for economic, ecological, cultural and recreational reasons. Considering landscape development is a policy priority at different levels of spatial planning. Under the European Landscape Convention (ELC) (Council of Europe, 2000a) any impacts on landscapes require careful consideration. In Sweden, for example, the Swedish environmental quality objectives describe desirable qualities of both natural and urban landscapes. Consequently, an

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important objective in transport planning is to understand and manage landscape changes caused by the construction of transport structures.

Key decisions regarding the building of new roads and railroads are often made on a strategic level (which is where, of course, the long-term development of a region is determined) and before an infrastructure project actually begins. Strategic planning on the regional scale encompasses both cities and their surrounding green areas. It has been argued that municipalities are too small to manage strategic urban challenges, while conversely the national scale is too large to address place-specific physical, environmental, economic and social relationships appropriately (O'Sullivan et al., 2014). Small impacts on individual sites, caused by urbanization or infrastructure projects, can result in considerable cumulative impacts on the availability of natural spaces in a region, something which only becomes evident through environmental assessment on a regional level (Mörtberg et al., 2007; Balfors et al., 2005). Thus, there is a need for landscape assessments to be carried out in planning at strategic level and regional scale, in order to grasp fully the cumulative effects of multiple transport projects.

The reduction of negative environmental impacts of transport infrastructures is significant for supporting sustainable development outcomes (Soria-Lara et al., 2015). In strategic transport planning processes in Sweden, the Strategic Environmental Assessment (SEA) aims to “integrate environmental aspects into the plan or programme so as to promote sustainable development” (chapter 6, section 11 Environmental Code). Although widely used in many countries and transport planning contexts, several difficulties of integrating environmental impact assessments in transport planning have been discussed by academia (Folkesson et al., 2013; Zhou and Sheate, 2011; Fischer, 2001; Valve, 1999; Hildén et al., 2004). Next to content-related barriers (i.e. the assessment of environmental effects), process-related barriers (i.e. the integration of environmental assessments into the planning process and the interaction between key actors) play an important part in these discussions (Soria-Lara et al., 2015). Researchers contributing to SEA theory have developed measures to integrate environmental concerns into decision-making, paying close attention to strategic decision processes (Lobos and Partidario, 2014; Fundingsland Tetlow and Hanusch, 2012; Caratti et al., 2004).

In this paper we build on previous advances in SEA theory by using a multiple case study of Swedish transport planning to link the process-related issues of the integration of SEAs in general to landscape issues in particular. We also introduce a content focus to the case study, in which we investigate the content of planning documents with regard to the effects on landscape in relation to plan alternatives. By investigating both the process of planning and the content of planning documents we aim to build an understanding of both content-related and process-related barriers and the linkages between the two. We initiated this study with an idea that understanding the process of the studied cases could help to explain the outcome of planning, especially in respect of the content of planning documents. Likewise, we presupposed that studies of the content of planning documents could shed light on the process of planning.

An important aim of this study is to develop a detailed understanding of the handling of landscape issues within the planning of transport infrastructure at strategic level and thereby come to understand what important challenges and facilitators there might be for the consideration of landscape in this context. Thus, the two main research questions are: *What challenges and difficulties in considering landscape in transport infrastructure planning can be identified? What are some of the reasons for these difficulties?*

In the next section, the theoretical frameworks around the two main fields of research pertaining to the subject matter are discussed: landscape in transport planning and SEAs in transport planning. In Section 3 the research methods and materials are described. An overview of contextual conditions of the cases is presented in Section 4. Next, Section 5 presents the main results of planning document analyses, and Section 6 presents the main results of interview analyses. Document analyses and interview analyses are cross-analyzed in the discussion (Section 7) and additionally related to previous research. The paper closes with our conclusions.

2. Theoretical framework and previous research

In this section we first establish our understanding of the concept of landscape as used in this research project. The additional concept of the SEA, both the development of SEA theory and research investigating the integration of SEAs in transport planning practice, is central to the paper. Lobos and Partidario (2014) identify four key aspects in SEA theory advancement. These four key aspects are described here and related to case studies of SEA in the contexts of transport planning. Finally, in this section we report on previous studies of the consideration of landscape in transport planning.

2.1. Considering landscape in planning

We base our understanding of the concept of landscape on the definitions formulated by the ELC, which describes landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe, 2000a). The ELC considers landscape to include natural, rural, urban and peri-urban areas as well as land, inland water and marine areas. The ELC also states that landscapes that are considered outstanding, common or degraded are all of importance (Council of Europe, 2000a).

The *Explanatory Report* to the ELC reflects the idea that landscapes evolve through time, affected by both natural forces and human beings, and that the landscape components form a whole (Council of Europe, 2000b). An important notion in the understanding of landscape as a whole is the *site in context*, which implies that a landscape feature cannot be understood in isolation from its wider environment (Selman, 2006).

Researchers from different fields have characterized landscape in terms of a tripartite analysis (Stephenson, 2008). Piorr (2003), for example, suggests that the landscape should be analyzed on the basis of:

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