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### Making planning support systems matter : improving the use of planning support systems for integrated land use and transport strategy-making

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# Summary





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## SUMMARY

The essence of spatial strategy-making is the link that it establishes between, on the one hand, the knowledge about the urban context and on the other intervening actions, plans and strategies. The specifics (the *how*) of linking knowledge and action in current spatial strategy-making processes has been the object of much academic debate (Healey, 2007, chapter 8). Both in theory and practice, the debate revolves around what constitutes right, relevant or rigorous knowledge and who has the power to make this distinction. In response to theoretical, political and practical flaws of the classical approach of technical rationality (with professional/systematised/expert knowledge at its centre), there is a growing emphasis in planning research on various communicative and collaborative approaches. These aim to include other, more contextualised and personal types of knowledge from all the involved actors. Despite important differences, most of these approaches share the idea that planning should be first and foremost a social process of 'reasoning together', based on communicative rationality. Nevertheless, the question remains: *how* to integrate local and experiential types of knowledge with the more traditional, professional types of knowledge? Both the importance and the difficulties of this question are recognised in the academic literature on communicative planning and on the so-called Planning Support Systems (PSS). Current PSS (as instruments designed to provide this integration of knowledge) face structural implementation difficulties. Planners see them as far too generic, complex, technology oriented (rather than problem oriented), narrowly focused on strict technical rationality and incompatible with the unpredictable/flexible nature of most planning tasks and information needs. The fundamental problem of these instruments is their overwhelming focus on (computer) technological tools for producing systematised, scientifically rigorous knowledge. Far too little attention is paid to embedding the output in the planning context and connecting it with local and experiential knowledge. First, this technology biased focus fails to consider the different meanings that each planning actor attaches to the technical facts and outcomes. Second, it fails to take into account the rapidly changing context in which spatial strategy-making takes place.

Within spatial strategy-making, one of the central challenges is to integrate different planning domains. These are strongly interrelated but often have developed strict sectoral pillars of legislation, financial arrangements, institutions and education. It is a widely held notion that better integration of the land use and transport planning domains is a crucial prerequisite for designing sustainable spatial strategies. Such a sustainable strategy would foster opportunities for the inhabitants and businesses to take part in relevant social and economic activities which require mobility, while at the same time reducing the negative effects of this mobility. However, the professional sectoral languages developed throughout their careers equip the professionals with different the types of indicators and different modes of thinking. This makes shared spatial strategy-making difficult and sometimes even conflict prone. Land use and transport planners not only use different indicators and models, but also perceive differently the urban environment, its problems, and strategy-making. There have been significant academic and professional efforts to develop concepts, tools and instruments to support the integration of land use and transport

planning processes. However, recent studies show that this information and these 'state of the art' instruments are hardly used to support LUT integration in planning practice. Especially in the early phases of planning, there is still a significant deficiency of relevant integral information and tools.

The importance of integrated land use and transport strategy-making and the cumbersome relationship between knowledge and action in such processes stimulated the formulation of the following central research question:

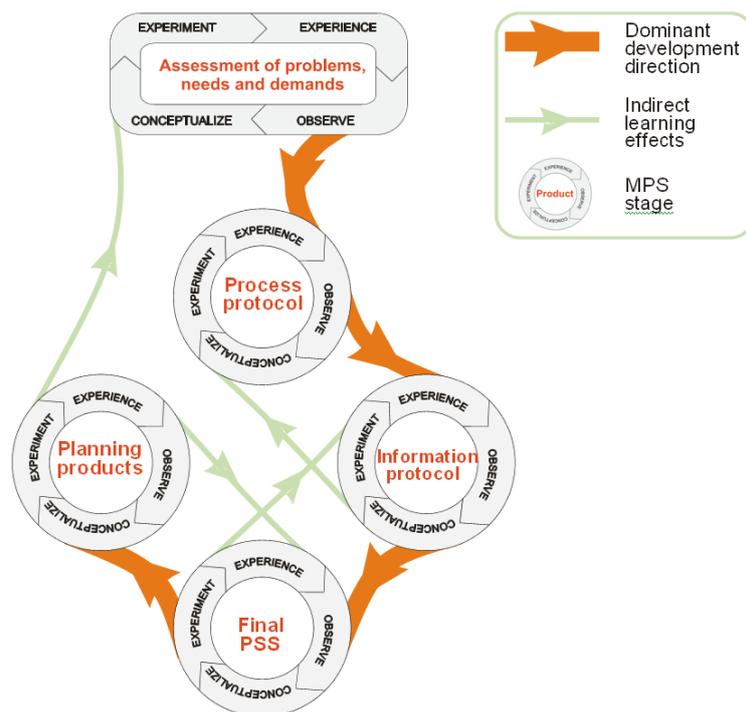
*How to improve the use of Planning Support Systems that aim to support integrated land use and transport strategy-making?*

In answering this central question, the research took a design-oriented approach. It takes the object of study as a *mutandum* or 'something to change'. The typical products of design sciences are *prescriptions* that are *tested* in practice and *grounded* in scientific knowledge. As a methodological framework, the experiential learning cycle was used, where the *observation of and reflection on concrete experience* leads to the *forming of abstract concepts*, which are then *tested in new situations*, eventually resulting in the adaptation of existing practices (i.e. *concrete experience*), starting a new loop.

The first research step explored the current implementation gap of PSS, which aim to support integrated land use and transport strategy-making. A literature review, semi-structured interviews and a web based survey were used to analyse the supply and demand side of this gap and to develop directions for improvement. General bottlenecks of PSS implementation found in literature were confirmed as hindrances to the specific set of PSS for land use and transport strategy-making. More specifically, planners found that these PSS do not provide enough new LUT insights, do not fit the planning process and are not well linked to planning practice. Especially for strategy making, the PSS lack transparency, have a low communication value, lack user friendliness and it is impossible to play with them. Instead, PSS should function as laboratories where planners can collectively experiment and take part in group learning about LUT relationships. In order to provide this support, the PSS should be easy 'to play with' and transparent on its assumptions. The current focus on improving the scientific rigor of the instruments seems contra productive in the face of these findings. Instead, or next to this, efforts should be concentrated on improving the fit with the context specifics of strategy-making processes and finding a balance between rigor and relevance. This balance needs to be sought together with the planner: a shift from 'developing for' to 'developing with'.

In the second step, a concept was developed that could support this shift: Mediated Planning Support (MPS). For this, an international literature review was carried out in the adjacent fields of knowledge management, process management, cognitive sciences, and system analysis. Central elements that were found as useful adaptations included a stepwise prototyping approach, a continuous exchange of the knowledge within instruments and the knowledge of the user, placing emphasis on the contextual nature of PSS and keeping the instrument 'as simple as possible, but

not simpler than necessary'. These findings were combined and translated into the specifics of PSS development. It is hypothesised that the resulting MPS approach (see figure below) addresses some of the fundamental bottlenecks recognised in the first research step. The transparency of the output and the assumptions of the (computer) models that are part of the PSS would improve. The PSS would become more flexible and attuned to the particular characteristics of specific planning process, increasing their compatibility with the existing planning tasks. Also, planners should gain a shared ownership of the process and information choices. PSS developers could learn how their model and output is used in 'wicked' planning processes and how this unpredictability can potentially influence the usefulness of their products.



This MPS approach was consequently applied in three cases of integrated land use and transport strategy-making. The cases tackled different, locally specific planning challenges ranging from fostering of economic growth (Amsterdam), to improving the potential of a train station (Breda) and developing regional public transport strategies (Eindhoven). Participatory observation of these cases together with workshop specific questionnaires produced learning effects between the three cases, allowing the team to make small adjustments to the MPS approach. One key insight was that especially the processes of externalisation and internalisation were crucial for bridging the implementation gap. If these processes are neglected, planners have difficulties using the PSS generated knowledge to support their strategy-making.

The fourth research step closed the experiential cycle with a reflection on the use of the MPS approach in the three cases of integrated land use and transport strategy-making. Here, the hypotheses grounded in the second research step were tested, through a survey which was sent to all the participants. Also, participatory observation and workshops questionnaires were used in this step. This analysis suggests that the MPS approach significantly improves the compatibility of a PSS

with the specific characteristics of strategy-making. It increased the planners' awareness and understanding of the PSS, enhanced transparency of its assumptions and outcome, and increased acceptance. However, the relationship with the usability of the PSS proved more complex than expected. It seems that improved transparency first creates a critical attitude of the planners towards the PSS, because they understand better what the PSS can and cannot do. If the facilitator and PSS developers can keep this critical attitude constructive the usability can increase. This is however a delicate situation.

The insights developed in these four research steps provide an answer the general research question. To improve the use of Planning Support Systems that aim to support integrated land use and transport strategy-making, iterative processes of knowledge exchange (especially externalisation and internalisation) should be employed. Also, existing PSS should be made context specific through stages of prototyping, during which the specific characteristics of different parts of the PSS are determined in close cooperation between PSS developers and planning professionals.