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Equip the warrior instead of manning the equipment

Land use and transport planning support in the Netherlands

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Abstract: This paper assesses the embedding of land use and transport instruments—Planning Support Systems (PSS), models and tools—in Dutch planning practice, in order to shed light on how planning practitioners perceive these instruments and to ascertain the reasons and manner of their (lack of) utilization. These insights provide much-needed input to improve support instruments for integrated land use and transport planning, particularly during early planning phases and on the regional level. The research adds to the emerging literature on PSS. It builds on general insights into bottlenecks that block the use of PSS in practice, and employs a user-oriented approach to gain more insight into how users perceive these bottlenecks and how they relate to specific land use and transport PSS. Much of the existing research geared toward improving these instruments has a technical focus on adjusting the intrinsic workings of the instruments themselves. However, the way in which they are embedded in planning practice has remained largely ignored and poorly understood. Based on data from a web-based survey administered to land use and transport practitioners in the spring of 2007, this paper describes how LUT instruments are embedded in planning practice and how they are perceived by the planning actors in land use and transport planning. The findings suggest that a technical focus is insufficient to improve the implementation of these instruments. The key bottlenecks, identified by the survey, actually are centered on “softer issues,” such as lack of transparency and poor connections to the planning process. The closing analysis and discussion offer some potential remedies for these shortcomings.

Keywords: Planning Support Systems; Land use and transport planning; Models; Planning practice; User orientation

1 Integrating land use and transport planning

Better integration of transport and land use planning is crucial for achieving more sustainable mobility patterns in urban areas, as strongly supported by academics (e.g. Banister 2005; Bertolini *et al.* 2005; Cervero 1998; Meyer and Miller 2001), transportation professionals (e.g. Transportation Research Board 2004), governments (e.g. ECMT 2002) and business (e.g. WBCSD 2001, 2004). In the Netherlands, this is mirrored in recent Dutch national policy documents stressing the need for integration, including “Nota Ruimte” (Ministerie van VROM 2004) and “Nota Mobiliteit” (Ministerie van Verkeer en Waterstaat 2005).

Nevertheless, effectively integrated land use and transport (LUT) planning processes are often absent in planning practice (Banister 2005; Stead *et al.* 2004; Transportation Research

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Board 2004), which in turn produces suboptimal or even conflicting plans, ideas, and concepts. Although there are some positive signs, real LUT integration in the Netherlands is still far away, as discussed in *Expertcommissie Netwerkanalyses* (2006); Heerema and Linssen (2006); both reports emphasize the importance (and the current lack) of integration in the early phases of the planning process and of addressing issues on the regional level.

Several barriers seem to explain this lack of integration. These may be roughly divided into institutional/procedural discrepancies (i.e. separate planning institutions, formal processes, financial arrangements, etc.) and substantive differences (i.e. different planning objects, information etc.) (Curtis and James 2004; Hull 2008; Hull and Tricker 2006; Lautso *et al.* 2004; Vleugel 2000; Webster *et al.* 1988). As far as substantive barriers are concerned, general insights and suggestions for improvement have produced a host of indicators and instruments that attempt to provide expert LUT knowledge aimed at bridging the divide between the two planning domains; these are often based on transportation models (Ben-Elia *et al.* 2003; Emberger *et al.* 2006; Geurs *et al.* 2006; Schoemakers and van der Hoorn 2004; Waddell 2002; Wegener and Fürst 1999).

However, few of these instruments are used to support integral LUT planning in daily planning practice. Some LUT instruments have been successfully implemented to identify and extrapolate trends, assess strategies, and prioritize land use and/or transport projects; however, they do not address early planning phases, which are more open and “wicked” (Rittel and Weber 1984). These phases (e.g. visioning, generating strategies, and developing strategies) are very dynamic because a wide range of options is still open for discussion and a broad spectrum of potential participants may be involved. The resulting unstructured and diverging information needs greatly complicate the potential role of supporting instruments. However, these planning phases are crucial for effective LUT integration; framing common problems and solution spaces in a particular way limits the potential options available later in the process (see Schön 1983).

The lack of effective LUT instruments for these crucial planning phases produces several key questions: why are existing instruments not used/usable in these planning phases? What context-specific demands for information support are important? How can the fit of (existing) land use and transport instruments with current planning practices be improved? This paper will discuss the outcomes of exploratory research into the embedding of existing LUT instruments in day-to-day planning operation in the Netherlands.

This research builds upon previous research that examined the infrequent and weak utilization of Planning Support Systems (PSS) (see Batty 2003; Bishop 1998; Couclelis 1989; Geertman and Stillwell 2003; Harris and Batty 1993; Innes and Simpson 1993; Klosterman and Landis 1988; Sheppard *et al.* 1999; Sieber 2000; Uran and Janssen 2003; Vonk *et al.* 2005). It identifies specific bottlenecks for LUT instruments, through a web-based survey of planning practitioners (the end users). The aims are to deepen our understanding of a specific branch of PSS (with a focus on embedding them in planning practice) and to more directly explore directions for improvement. Also, this analysis started from a more PSS user-oriented perspective than most of the above-mentioned publications, with two groups of potential users (land use planners and transport planners) as starting points. Therefore, this paper offers more in-depth knowledge than the recent mainstream PSS literature. I will first briefly outline the general academic debate on the “implementation gap” of PSS, which provided the background for the survey developed for this paper. After presenting the survey method and the characteristics of

the respondents, the outcomes of the survey will be covered in greater detail. I will close with conclusions and suggested directions for improving PSS support for integrated LUT planning processes.

2 The implementation gap of general planning support instruments

2.1 Computer-aided planning: High and low tides

Since the first serious attempts at using computers to aid planning processes in the 1950s (Harris 1960), the academic field of computer-aided planning has seen several waves alternating between enthusiastic optimism about its potential and depressive critique (mainly due to the low implementation rates of the instruments).

In the 1960s, there was a growing effort to develop metropolitan land use models and transportation models, applying insights from several adjacent scientific fields (i.e. economics and regional science). At that time, planning was seen as a technical-rational process; the planning expert started from a set of policy goals and systematically evaluated all policy alternatives on their merits and consequences. It was believed that this process produced the optimal plan, which could be subsequently monitored and (if necessary) modified (Allmendinger 2002, p. 55). Computers were seen as very useful support tools, aiding the planner in the daunting task of assessing all possible alternatives from a wide range of indicators. The computer also offered the opportunity to incorporate more scientific knowledge into the planning process (Batty 1994; Klosterman 1997). During this period, some planners even saw computer-aided planning as “a revolutionary new potential that may impact or redefine the process of planning” (Harris 1968, p. 223).

Yet the many large-scale urban models (LSUMs) developed at the time (often with significant public funding) failed to be implemented in planning practice, drawing heavy criticism from the instrument-developing community (Brewer 1973; Danziger 1977; Greenberger *et al.* 1976; Lee 1973). In his seminal paper, Lee identified seven sins that seemed to cause the lack of implementation of the LSUMs, mostly concerning (lack of) data and calculation restrictions (Lee 1973, pp. 163–168). Many see his paper as heralding the start of the “dark ages” of the computer-aided planning field, when most of the funding for instrument-developing programs was canceled (Wegener 1994).

The 1980s witnessed a paradigm shift, due to the recognition that the technical-rational view of planning was no longer feasible in practice. First of all, this approach often resulted in planning disasters (Hall 1981); at the same time, planning practice was changing, becoming marked by increased complexity and uncertainty. Thus, planning became more focused on communicative and deliberative activities involving all relevant stakeholders. At first, these changes appeared to decrease the potential for computer instruments tremendously; however, advances in computer technology (especially the introduction of the desktop PC) rekindled interest in the role of computers in planning (Openshaw 1986). Instead of presenting objective scientific data, it was suggested that computer instruments should primarily facilitate communication between all stakeholders and support the process of making collective decisions (Sprague and Carlson 1982). This view was further strengthened in the 1990s with the introduction of Geographical Information Systems (GIS), a set of instruments designed to support the collection, analysis, and visualization of all kinds of geographical phenomena (Burrough

and McDonnell 1998; Stillwell *et al.* 1999). Such instruments could enhance the flow of information and knowledge between stakeholders in an open spatial planning process. Some scholars saw this renewed enthusiasm for computer-aided planning as a new revolution in planning processes, because “virtually anything a planner does can be done with a GIS” (Juhl 1994).

However, as Klosterman (1997) noted, “this always imminent revolution has yet to occur.” Although GIS instruments are used to increase efficiency and to facilitate routine planning tasks (i.e. the gathering, processing, and visualization of information), they are hardly used to support the more complex tasks unique to planning (i.e. forecasting, analysis, evaluation, and communication) (Couclelis 2005; Klosterman 2007; Lee 1994). Klosterman argues that the “soft side of technology” partially explains this shortcoming; the search for the appropriate role of technology in planning should not begin from a particular technology, but with a conception of a particular planning problem (Klosterman 1997, p. 46).

The most recent developments in the field of computer-aided planning are the so-called Planning Support Systems (PSS). As a relatively new concept, the term PSS has several interpretations in the literature, ranging from very narrow computer-centered definitions to much broader concepts related to information and planning. Here I use it broadly to refer to any kind of infrastructure which systematically introduces relevant (spatial) information to a specific process of related planning actions. In this view, PSS have both procedural and substantive components; the latter is sometimes (but not always) supported by computer technologies. Furthermore, PSS should accomplish several specific tasks: 1) to facilitate interaction among planners; 2) to contain structured and accessible information; 3) to facilitate social interaction, interpersonal communication, and debate (in order to address common concerns); and 4) to support a continuous and interactive process of constantly integrating new information (generated as analytical results) and thus redefining design issues (Klosterman 1997). Such PSS would contribute greatly to improving contemporary planning practice.

However, recent research shows that (yet again) several factors hinder these new planning support instruments from becoming integrated into daily planning practice (Couclelis 2005; Geertman 2006; Uran and Janssen 2003; Vonk *et al.* 2005). Some of the reasons for this “implementation gap” are grounded in planners’ negative perceptions of current PSS as inadequate, far too generic, complex, technology-oriented (rather than problem-oriented), too narrowly focused on strict technical rationality, and incompatible with the unpredictable and flexible nature of most planning tasks and planners’ information needs (Batty 2003; Bishop 1998; Couclelis 1989; Geertman and Stillwell 2003; Harris and Batty 1993; Innes and Simpson 1993; Klosterman and Landis 1988; Sheppard *et al.* 1999; Sieber 2000; Uran and Janssen 2003; Vonk 2006). In 1994, Douglas Lee argued in retrospect that his 1973 critique of LSUMs was still valid, as model developers had not changed their approach and were still striving for comprehensiveness and fighting to include as much complexity as possible. As a result, they failed to respond to the needs of the practitioners, who would rather have “redundant approximations than detailed models” (Lee 1994).

Recent scientific progress in land use-transport interaction models (Waddell 2002; Wegener and Fürst 1999), activity-based mobility modeling (Ettema and Timmermans 1997), and the modeling of agents (Macy and Willer 2002) confirms that there is still vibrant interest in model development. However, the utilization of these tools to support the integration of LUT into day-to-day planning practice remains rather limited.

2.2 Specific challenges for LUT PSS

The general lack of use of PSS has been extensively covered in recent studies. There is reason to believe that supporting LUT integration in the early phases of the planning process presents some unique opportunities and threats. First of all, LUT planning adds complexity: two separate systems (land use and transport) must be addressed, each with its own unique input variables, dynamics, and uncountable interrelations (not all of which are well understood). Consequently, as LUT PSS have to model all relevant interrelations, it is difficult for planners to interpret modeling outcomes and understand causal relationships; the seemingly random designation of some relationships as relevant produces uncertainty about these relationships that increases the complexity of the LUT PSS. Secondly, although there are generic LUT problems, most challenges are unique to specific geographical and temporal contexts (especially in dynamic urban regions). Finally, the information generated by LUT PSS has to be meaningful to planning actors from both land use and transportation planning domains; they come from two very different planning traditions with different education, skills, and planning paradigms. LUT PSS and their outputs have to be able to accommodate two very different mindsets, each with its own body of explicit and tacit knowledge (further elaborated in [Straate-meier and Bertolini 2008](#); [te Brömmelstroet and Schrijnen 2010](#); [Willson 2001](#)).

3 Exploring LUT planning support in practice: Methodology

3.1 Data collection

The primary goal of this study was to gain insight into the embedding of PSS in processes of LUT integration in planning practice. With this aim, a web survey was developed based on lessons from the PSS literature, experiences from planning practice, and interviews with planners and PSS developers.¹ In March 2007, a large number of Dutch land use and transport planning practitioners were contacted to assess their experience with LUT PSS in integrating land use and transport planning and their willingness to participate. In total, 450 people were approached directly via electronic mailing lists (provided by relevant consultants and knowledge networks) and calls for participation were posted on several appropriate websites and published in relevant newsletters.²

Although the survey was anonymous, respondents were required to specify their primary domain of work (transport or land use) and their position (end user or developer). The next part of the survey consisted of eleven general statements, referring to the current state of LUT PSS. For each statement, respondents could distinguish between: 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree'. The third part of the survey listed twelve possible bottlenecks, selected from existing PSS literature as possible explanations for the low implementation of existing LUT PSS. For each bottleneck, respondents had to judge its degree of importance by distinguishing between: 'very big problem', 'big problem', 'neutral', 'no problem' and 'no problem at all'. Additional bottlenecks could also be suggested by respondents in an open format.

¹ The web survey is available at <http://www.transport-planning.eu/websurvey.html> and <http://www.transport-planning.eu/websurvey2.html> (both in Dutch).

² <http://www.verkeerskunde.nl> (site for transport planners); <http://www.ruimte-mobiliteit.nl> (knowledge network for LUT integration); IKCRO newsletter (newsletter for land use planners).

The fourth part of the survey consisted of 21 open and closed questions; it focused on capturing in-depth insights regarding implementation challenges and potential improvements.

3.2 Data interpretation methods

For the general statements, the level of agreement was analyzed by calculating the average of the responses, where 'strongly agree' was coded as '2', 'agree' coded as '1' and so forth, with 'strongly disagree' coded as '-2'. Generating this average level of agreement for each group of respondents (based on their primary domain of work) made it possible to check for varied patterns. Also, the consistency of the outcomes within the groups was assessed by comparing frequency scores.

For each group of respondents, the perceived importance of the bottlenecks was analyzed by combining the frequency scores of the categories 'very big problem' and 'big problem'.

The open questions were mainly used to interpret the other results and to provide in-depth justification of problems and possible solutions.

3.3 Exploration of survey participants

A total of 124 people responded and filled in the first three parts of the survey (a response rate of 28%): 62 from land use planning, 60 from transport planning, and two who did not specify their primary work domain. The vast majority (over three-quarters) were LUT PSS users, while developers made up a smaller part (31 respondents). Twenty-four of the respondents (primarily PSS developers) specifically declared that their activities fit in multiple boxes.

A total of 107 respondents filled in the fourth part (open questions); the twelve who declared that they had no prior LUT integration experience were excluded from further analysis. Of the remaining 95, four had LUT experience from a PSS development perspective, 25 had experience from a land use planning perspective, and 66 were involved in LUT integration from a transport perspective. The employment of these respondents (mostly civil servants on the sub-national level) is shown in the upper pie chart in Figure 1. The role they played in LUT integration is visualized in the lower chart (multiple answers were possible). Project leaders (38%) formed the most prominent group, followed by project members (30%). The respondents represented all (geographical and organizational) layers of land use and transport planning, with different levels of experience in LUT integration processes.

3.4 Validity of outcomes

Because little insight into the embedding of LUT PSS is currently available, the main aim of the survey was to identify directions and patterns of bottlenecks and solutions, not to scientifically assess the implementation-blocking mechanism. Listing the twelve bottlenecks provided a useful format for the respondents to select common problems, and stimulated them in thinking and adding additional ones. Only a very limited number of additional bottlenecks were proposed, leading me to conclude that the original twelve cover the most pertinent barriers.

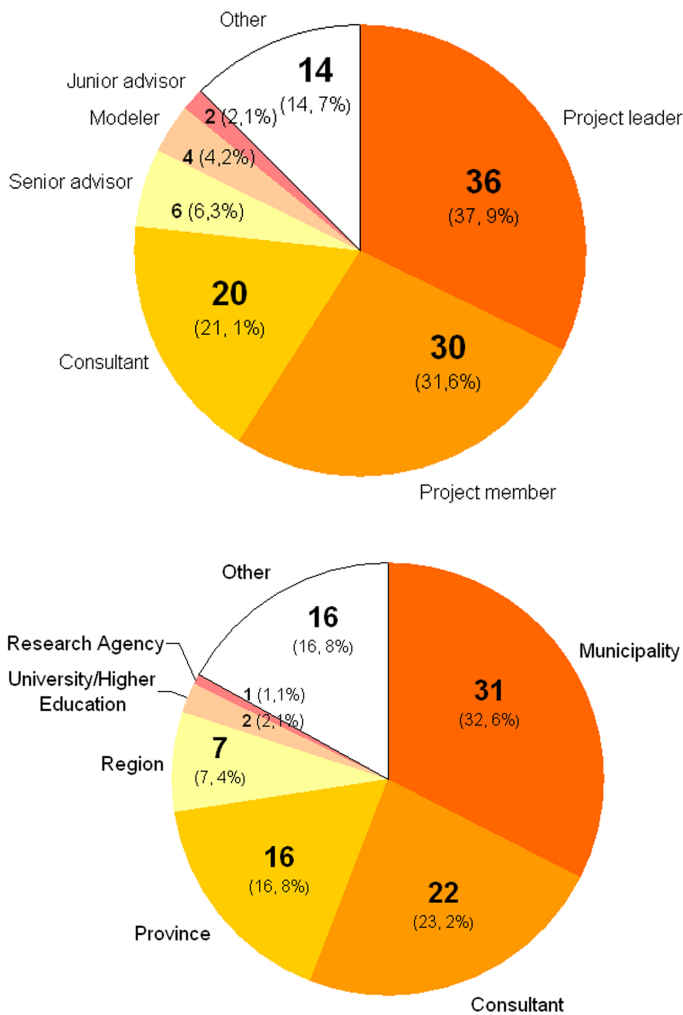


Figure 1: Work organization of respondents ($N = 95$) of fourth part of survey (upper) and their role in LUTR integration (lower).

4 How are LUT PSS perceived in planning practice?

4.1 General statements concerning LUT PSS

The three categories of general statements included: 1) implementation of LUT in the planning process; 2) phases of LUT planning that are insufficiently supported by PSS; and 3) general statements. Figure 2 illustrates the level of agreement with the statements. In order to show similarities and differences between responses from the two domains, results are plotted separately for the overall average (black), the land use respondents (orange), and the transport respondents (green).

As Figure 2 shows, the respondents found that LUT PSS are implemented too late rather than too early in the planning process. However, both statements showed a relatively low score (-0,27 and +0,14) indicating a lack of consensus within each group. There was a stronger positive score for the statement that LUT PSS are “implemented too far removed from the polit-

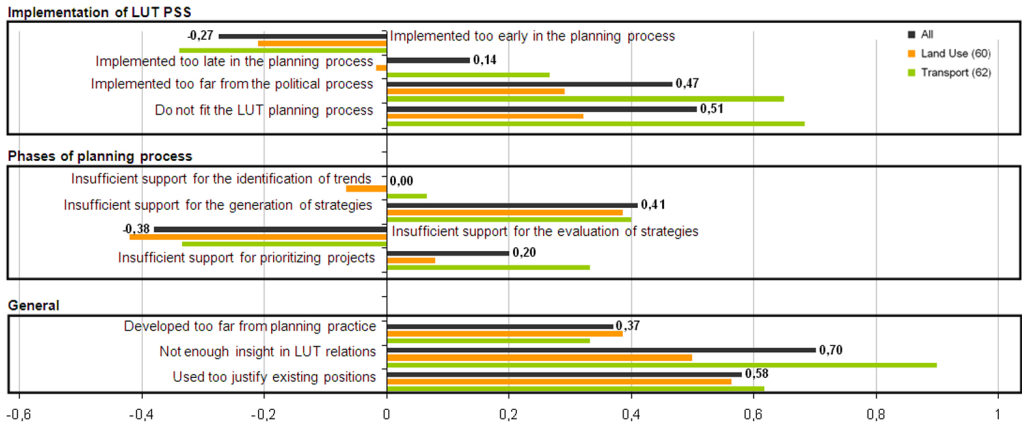


Figure 2: Average level of agreement on statements about implementation of LUT PSS, phases of the planning process and general use: from -2 (strongly disagree) to +2 (strongly agree).

ical process” and that “they do not fit the LUT planning process”. Transport respondents had stronger opinions about both statements.

The responses to the four statements about the support of the different typical phases of the LUT planning process show that LUT PSS do not sufficiently support the generation of new strategies; on the other hand, both planning domains agree that LUT PSS does adequately support the evaluation of strategies. Respondents also report that, the evaluation of LUT projects seems insufficiently supported, although there is a less agreement between the domains on this issue.

The final three general statements show a relatively high level of agreement in both planning domains. This confirms the widely held view of LUT PSS weaknesses as: developed too far from planning practice, not providing enough insight in crucial LUT relationships, and (in the words of one respondent) being used as “weapons in fact-fighting battles instead of for joint fact-finding.”

Overall, there are no large discrepancies between land use and transport respondents or between PSS users and developers. In general, the results show that the respondents are dissatisfied with currently available PSS and with how they are used and developed. This widely held view is succinctly summarized in the words of one land use respondent who would rather see “a provisional instrument that is simple to use and shows useful images than the current sophisticated black boxes.”

4.2 Bottlenecks blocking implementation

In order to gauge the importance of each bottleneck, the respondents were asked to select the most pertinent blockages for LUT PSS, as presented in Figure 3.

Again, a remarkable consensus among professionals from both domains emerged. Four bottlenecks were seen by over half of the respondents as blocking the use of LUT PSS. However, additional analysis showed that PSS developers saw the top four as far less problematic, but graded the bottleneck “instruments are not known” as most important (with 52 percent).

Almost two-thirds of the respondents (and three-quarters of transport respondents) found lack of transparency to be a major PSS implementation problem. Apparently, currently avail-

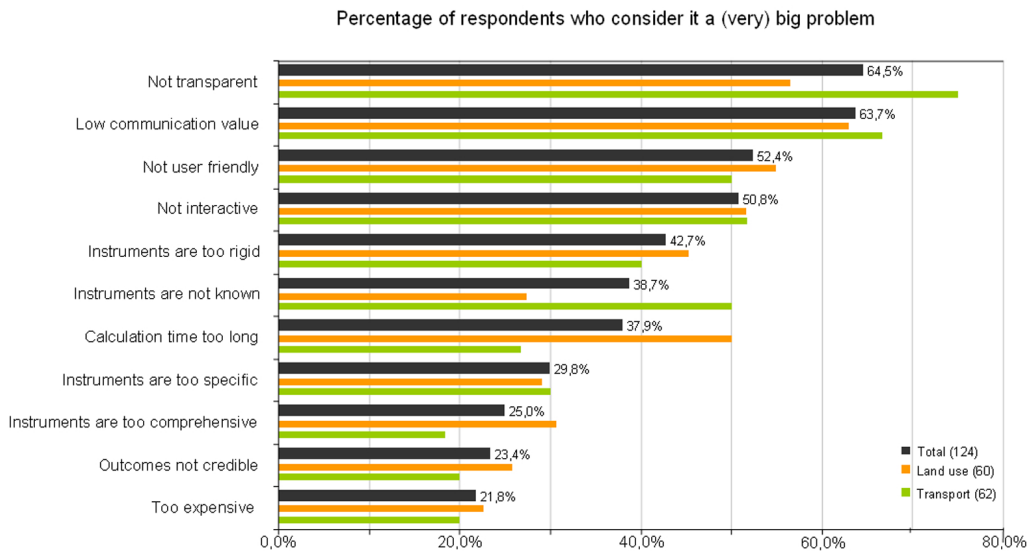


Figure 3: Potential bottlenecks for LUTR instruments and their perceived importance (percentage of respondents who consider it a big problem).

able LUT PSS do not clearly define assumptions and calculation methods; this echoes one of the fundamental problems of computer-aided planning, already recognized in Douglas Lee's "Requiem" (1973). Land use respondents ranked low communication value (i.e. LUT PSS that are not understandable to planners, stakeholders, and politicians) as the biggest problem, with this bottleneck scoring almost equally to "lack of transparency". All four of these key problems can be described as "soft" problems, clearly indicating that the biggest problem of LUT PSS lies in the fact that they are very difficult for non-developers to use.

Apparently, the technical issues are not considered a major hindrance for implementing LUT PSS. The "too comprehensive" and "too specific" bottlenecks scored low, as did price and calculation time. However, these problems are not negligible; half of the land use respondents saw them as a bottleneck and the lowest ranking bottleneck was seen as a problem by almost 22 percent of all respondents. As previously identified by Vonk (2006), these findings confirm the importance of the "instrument quality" category of bottlenecks. However, it is not so much the technological qualities, but rather the adaptation of the tool to the planners' demands (user friendliness, transparency, flexibility) that seems important for LUT PSS. This holds especially true in combination with the lack of PSS support during the phase of generating strategies. In other phases (e.g. evaluating strategies), more technical issues might be considered more important.

4.3 Understanding the embedding of LUT PSS in planning practice

The above results support the finding documented in the academic PSS literature, that planning actors are not satisfied with currently available PSS. Also in line with the academic literature, the reasons given in this survey focus on "soft" elements of PSS instead of on the systems' technological characteristics. To better understand this perception of LUT PSS and to find concrete directions for improvement, the last part of the survey contained mainly (semi-)open questions.

This last part of the survey was completed by 95 respondents, all of whom had prior experience with PSS in LUT integration projects. Almost half of them (42%) considered their integration project a success: “it was the first time that there was genuine interaction between the two domains”; “there was readiness to listen to each other”; “it was possible to dispute sacred cows”; and “it led to more acceptable solutions [than separated planning]”. Yet the respondents who considered it unsuccessful (30%) often mentioned the PSS as one of the main reasons: “the assumptions in land use and transport models did not match” and “too rigid [PSS] to easily calculate alternatives”.

Conflicting interests between the land use and transport actors are the main barrier to successful LUT integration, with “lack of a common language” in second place, followed by “lack of political commitment”. Although these findings suggest that a strong institutional barrier exists, they also confirm the potential importance of, and need for, the development of useful LUT PSS.

The second set of questions concerned the use of PSS outputs. Respondents stated that the outputs of LUT PSS often are used as input at the start of LUT workshops, to evaluate existing and new strategies or to provide background information for discussions. Although three-quarters of the respondents stated that PSS outputs created new insights, only 26 percent found that they created a common language. The weak points deemed responsible for this lack of performance were the one-sided transport orientation of the PSS and the complexity of their output (which made it difficult to use for generating strategies).

The respondents were asked how the output of LUT PSS should be used to better support the phases of generating new strategies and developing strategies (Figure 4). About 85 percent of the land use respondents suggested that LUT information should be used to “create new insights” and almost 70 percent that the information should be “easy to play with”. The most frequent uses of LUT PSS—visualizing the current situation and providing background information—were rated at the bottom of the list of important characteristics, especially by transport respondents.

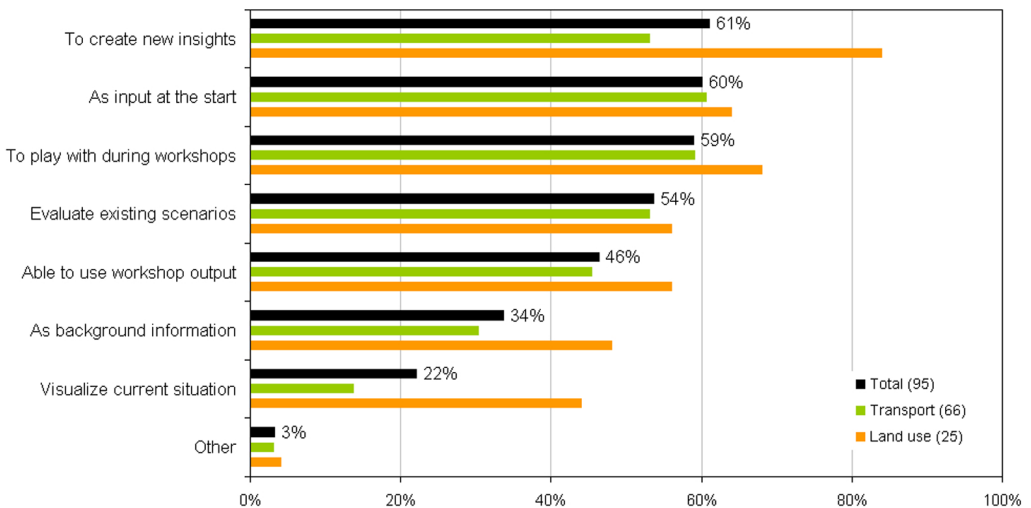


Figure 4: How LUT information should be used to improve support (percentage of respondents).

The last part of the survey addressed the use of LUT PSS. Only 12 percent of respondents reported that PSS were used during workshops and an even lower percentage stated that the participants used them hands-on. Mostly, the consultants used the LUT PSS, often as back-office applications. However, 60 percent confirmed that PSS did play a supportive role in the projects, providing new insights into each others' choices, into coherent LUT relationships, and into the effects of the strategies selected.

Although both groups agreed on the measures needed to improve PSS usage, land use respondents additionally emphasized the need for improving usage in all phases of implementation. Figure 5 shows the suggestions given by participants for the desired characteristics of a useful LUT PSS.

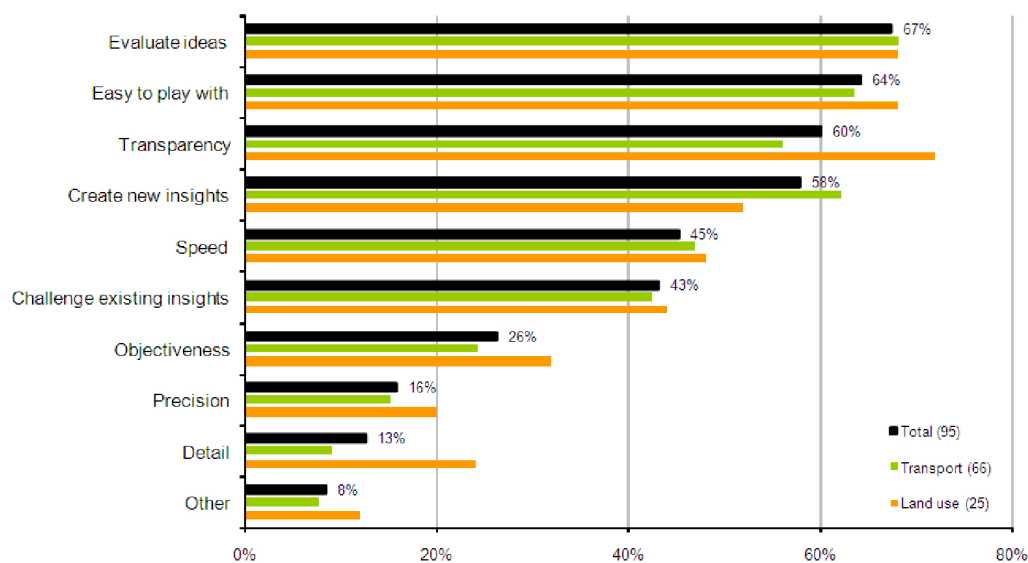


Figure 5: Importance of characteristics for LUT PSS in supporting the generation of LUT strategies (percentage of respondents that see each characteristic as important).

The PSS should be able to evaluate the participants' existing ideas and should allow the actors to play with strategies and thus learn about their effects. In other words, the LUT PSS should form a theoretical laboratory to support experimentation and learning-by-doing—a goal that can be achieved only with a transparent LUT PSS. Characteristics such as detail, objectivity, and speed are considered to be less important; therefore, it is apparent that the soft aspects of LUT PSS should be the focus of future improvement efforts.

5 Conclusions and discussion

5.1 Patterns and directions

This paper has reiterated the widespread consensus on the need to improve the integration of land use and transport planning (especially during early planning phases). However, despite this long-apparent need, a common LUT language is still lacking and this forms a substantive barrier. The implementation of recently developed PSS, aimed at overcoming this barrier, is either weak or nonexistent in daily planning. The results of the web-based survey presented

in this paper provide more insight into the challenge of using these specific LUT instruments in planning practice and discern clear patterns of user demands. This research builds upon the existing body of academic literature which deals with the unsatisfactory application of PSS. It seeks to: 1) deepen the understanding of specific PSS which successfully supported integrated LUT planning processes; 2) provide more user-oriented insights into attitudes towards PSS; and 3) explore avenues for improvement more directly.

In conclusion, current LUT PSS seem well suited for some planning tasks, such as calculating the effects of new and existing strategies and providing background information for discussions. However, PSS do have serious shortcomings as they do not provide enough new LUT insights; for example, they are used to justify positions that are already taken (i.e. “fact-fighting”), do not fit the planning process, and are not well linked to planning practice. Land use respondents feel stronger about this sentiment than their transport counterparts. Moreover, the output is often too transport-oriented and fails to provide a common LUT language to support the generation of strategies. In one word, the fundamental disconnect between PSS developers and their users is confirmed (already addressed in [Lee 1973](#)).

The findings highlight the LUT strategy-generating stage (where land use and transport planners are in dire need of good support) as the weakest link, due to several problems with currently available PSS: lack of transparency, low communication value, lack of user friendliness, and failure to support experimentation by users. This supports the identified findings of bottlenecks for general PSS and shows that PSS developers’ recent efforts to address these problems have not yet yielded results. The respondents’ low level of concern for the technical challenges flies in the face of current efforts and funding, which remain geared towards improving these technical aspects of LUT PSS (i.e. improving calculation time or outcome credibility by introducing complicated new modeling techniques).

LUT PSS seem too complex and too opaque to be useful in early phases of planning. The respondents saw a need to support the development of strategies and programs with improved information and LUT PSS support. PSS should function as laboratories where planners can collectively experiment and take part in group learning about LUT relationships. Building on this experience, they can subsequently generate grounded and tested LUT strategies. In order to provide this support, the PSS should be easy to “play with” and transparent in its assumptions. Researchers’ current focus on precision, detail, and objectivity is not very beneficial when planners generate strategies (although they are probably useful in other planning phases).

5.2 Discussion: From “developing for” to “developing with”

These results seem to necessitate a fundamental shift in thinking for both PSS developers and LUT planners. In order to increase the implementation success of PSS (with the aim of developing a common LUT language) the developers should not only focus on scientific rigor, PSS outcomes, detail, and comprehensiveness. Instead, they should try to find a balance between rigor and relevance. When developing their ultimate LUT PSS, the developers still seem to follow a technology and supply focus. They should not (only) develop scientifically state-of-the-art PSS, but also PSS which address context-specific user demands for support (state-of-practice). These demands differ over time, between groups of planners, and according to geographical area and scale (geographical and temporal). Again, Lee’s “Requiem” (1973) offers useful guiding principles for such a fundamental shift (Figure 6). LUT PSS developers should

not aim to follow (only) the dashed line, even though academic incentives support this focus. If PSS aim to support real planning practice, the top of the black line should be the goal, with a rigor-relevance balance to be found somewhere in-between. In my view, this should take place in close cooperation between PSS developer and potential user.

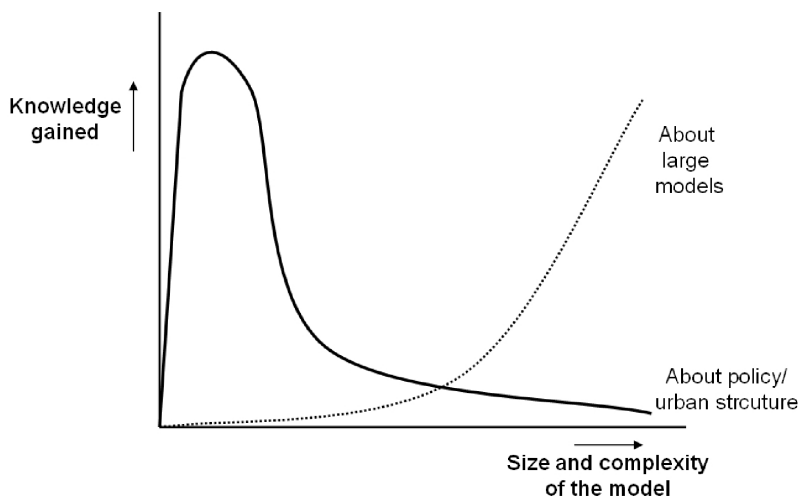


Figure 6: The dilemma of the different learning curves of PSS developers and users (from Lee 1973, p. 173).

One promising strategy is to create a structural dialog between PSS developers and potential users. This dialog would be centered on existing planning problems in day-to-day planning practice and would correspondingly produce a “learning by doing” dynamic. Around the planning problem, the PSS users and developers could cooperatively construct and use a PSS throughout the entire cycle (not only at the start and the end of a PSS development process), conceptualizing and testing it in iterative cycles. Such dialogs would allow PSS developers to understand that a generic PSS does not exist and to appreciate the fact that dialog with users should be an integral part of developing and using their PSS. Potential users would understand that these PSS are not always perfectly transparent and flexible to use; however, debate can increase the common understanding and build a useful common language (an idea also supported in Vonk and Geertman 2008). For LUT PSS, such a dialog is described in te Brömmelstroet and Bertolini (2008).

The shift in approach from “developing for” to “developing with” will increase mutual understanding between PSS developers and potential users. Such a shift will require more than “going through the motions” of a prototype run with users, after which developers develop a LUT PSS in isolation based on identified requirements. Rather, it implies a structural, continuous dialog throughout the relevant steps during the planning process, with PSS developers participating in all planning projects from the early phases of planning. This seems a promising way to create mutual understanding and thus useful, transparent, flexible, and appropriate planning support instruments. Finally, this would result in progress from the current situation where planners are simply “manning their equipment” toward a desirable condition where PSS “equip the warriors.”

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