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Soria-Lara, J.A.; Bertolini, L.; te Brömmelstroet, M.

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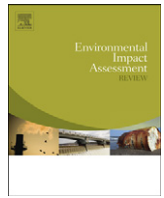
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Environmental impact assessment in urban transport planning: Exploring process-related barriers in Spanish practice



Julio A. Soria-Lara*, Luca Bertolini, Marco te Brömmelstroet

Amsterdam Institute for Social Science Research (AISSR), Nieuwe Achtergracht 166 1018 WV Amsterdam, The Netherlands

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ABSTRACT

The effectiveness of EIA for evaluating transport planning projects is increasingly being questioned by practitioners, institutions and scholars. The academic literature has traditionally focused more on solving content-related problems with EIA (i.e. the measurement of environmental effects) than on process-related issues (i.e. the role of EIA in the planning process and the interaction between key actors). Focusing only on technical improvements is not sufficient for rectifying the effectiveness problems of EIA. In order to address this knowledge gap, the paper explores how EIA is experienced in the Spanish planning context and offers in-depth insight into EIA process-related issues in the field of urban transport planning. From the multitude of involved actors, the research focuses on exploring the perceptions of the two main professional groups: EIA developers and transport planners. Through a web-based survey we assess the importance of process-related barriers to the effective use of EIA in urban transport planning. The analyses revealed process issues based fundamentally on unstructured stakeholders involvement and an inefficient public participation

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Introduction

The reduction of the negative environmental impacts of transport planning, seen as decisive for promoting sustainable development outcomes (Banister, 2005; Litman, 2009), requires their assessment. Integrated assessment methods have become a rapidly developing set of tools, usually focused on policy/program change or project implementation (Deakin et al., 2007; Gasparatos, 2010; Ness et al., 2007). A key one among these, an Environmental Impact Assessment (EIA) is a comprehensive evaluation of the likely effects of major projects that significantly alter the environment. It provides decision-makers with an indication of the likely environmental consequences of their selected policies (Jay et al., 2007). Firmly rooted in rational planning theory, this approach employs a technical evaluation to provide a strong basis for decision-making (Fischer, 2003; Owens et al., 2004). Since the 1970s EIA has become increasingly more important in planning practice and has been introduced in national legislation worldwide (Cornero, 2010; European Commission, 2009).

Although widely used in many countries and planning contexts, the effectiveness of EIA for evaluating urban transport projects is contested (Fischer, 2001; Folkesson et al., 2013; Keshkamat et al., 2009; Zhou and Sheate, 2011). Next to content-related barriers (i.e. the technical measurement of environmental effects), process-related barriers (i.e. the role of EIA in the planning process and the interaction

between key actors) also play an important part in this discussion. The context of transport planning has seen dramatic changes in the last decades, in particular with the growing interaction between professional domains and stakeholders in decision-making (Bertolini, 2007; te Brömmelstroet & Bertolini 2011; Bertolini et al., 2008). As a result, more actors are involved in the EIA process, which limits the suitability of technical-rational instruments in the context of transport planning. The academic literature identifies a number of EIA issues that underlie this challenge: the perception that EIA is undervalued in decision-making (Hildén et al., 2004); the participating professional groups seem to focus heavily on securing a dominant position during the assessment process, which impedes the creation of constructive dialogue and transforms EIA into a non-transparent process (Richardson, 2005); stakeholders are not always structurally involved during the assessment, affecting the scope of the EIA (Soria-Lara, 2012); public participation is not addressed in a way that provides effective support to the experts (Lidskog and Soneryd, 2000); practitioners do not consider EIA's role during early decision-making phases, which drastically reduces its effectiveness (Thomson et al., 2013); there are significant differences between the more sophisticated assessment methods developed by researchers and the simpler methods often used by practitioners in daily practice (Lee, 2006); practitioners feel that the conclusions and suggestions of EIA are not sufficiently implemented into transport planning (Mayer et al., 2012; Tomlinson, 2011).

Despite the abovementioned process issues, academia has traditionally paid more attention to solving the EIA's content-related barriers and paid only limited attention to such process-related barriers. Nevertheless, it is unclear whether overcoming content barriers alone will be enough to

* Corresponding author.

E-mail addresses: j.a.sorialara@uva.nl (J.A. Soria-Lara), l.bertolini@uva.nl (L. Bertolini), M.C.G.teBrommelstroet@uva.nl (M. te Brömmelstroet).

improve the effectiveness of EIA in transport planning. Spain is a case in point. EIA became mandatory in the Spanish planning system in 1988 and has served as the main support tool for decision-makers in major transport projects ever since. Recently, its effectiveness is increasingly coming being questioned by scholars. The solutions that are frequently developed are mainly based on determining how to measure environmental impacts (Gómez-Orea, 2007; Loro et al., 2014); however, the abovementioned process barriers (lack of communication, trust, collaborative work, transparency, etc.) between key involved agents (EIA developers and transport planners) and other stakeholders have not been sufficiently explored as a part of the solutions.

This paper aims to gain more insight into the discussion on EIA effectiveness and offer in-depth knowledge about process issues by exploring the following central research question: Which are the main process-related barriers in EIA, according to practitioners, and are there significant differences in perception of the different professional groups? We explored these perceptions with a web-based survey with the two main involved professional groups, EIA developers and transport planners. The Spanish context provided the empirical focus.

In the next section, the recent academic insights on process-related EIA issues are discussed, paying special attention to the Spanish case. In Section 3 the research method is described, while Section 4 presents the main results of our research. The paper closes with several concluding remarks and recommendations for further inquiries.

Process-related barriers of supply analysis techniques

Significant changes have taken place in the context of transport planning during the last two decades. Instrumental rationality has come under strong attack (see Bertolini et al., 2008; Willson, 2001), resulting in the emergence of new communicative approaches, mainly based on effective facilitation of the interaction between different professional domains (see te Brömmelstroet & Bertolini, 2011; Beukers et al., 2014; Straatemeier, 2008). In this particular context, the study of process-related issues in transport planning is not exclusive to EIA; interesting examples associated with other supply analysis techniques can be also found in Cost–Benefit Analysis (CBA) and Planning Support Systems (PSS).

Like EIA, CBA is a widely used as an ex-ante tool to support decision-making on transport plans and projects. Together with methodological and content problems, related to for example cost estimates (Mouter et al., 2013), also process-related issues are noted. Mackie (2010) highlights that in the UK CBA effectiveness is reduced because planners feel it does not give always understandable and recognizable outputs. Discrepancies between planners and appraisers regarding how to integrate CBA results in decision-making is also a relevant issue in the Swedish context (Eliasson and Lundberg, 2010). Beukers et al. (2012, p.76) find two fundamental process issues during the implementation of CBA in the Netherlands: “the mistrust between plan owners and calculators towards each other and the plan or instrument which they represent and, furthermore, how this leads to a communication deficit and inferior cooperation”. In French transport projects, Damart and Roy (2009) also note a lack of transparency among experts, which directly impeded the effectiveness of CBA.

PSS are geoinformation tools developed to support specific spatial planning tasks (Vonk et al., 2005). They can be very useful in transport planning, for instance in supporting the development of strategies for an effective integration of land use and transport systems (Te Brömmelstroet and Bertolini, 2008). Similar to EIA, PSS can assess alternatives and support actions. Te Brömmelstroet (2010) demonstrates however that a common language between PSS developers and planners is still lacking and that this shortcoming is a substantive barrier for the effective implementation of PSS in transport planning practice. The persistent divide between PSS developers and planners can largely explain why most of the wide range of developed PSS do never make it past a prototype phase. Their characteristics are seen as too rigid, too

complex and in general unfit to the characteristics of the planning processes in which they are supposed to be used. As a result, and because planners with high expectations and hopes were often disappointed, many planning practitioners have developed a strong antagonistic attitude towards such PSS.

Many of the abovementioned process problems also seem to be present in the context of EIA implementation in Spanish transport planning. Arce and Gullón (2000) and Granero (2011) note several process-related barriers that hamper the effectiveness of the EIA during the initial goal-setting phase of the transport planning process in Spanish practice: the experts' perception of the EIA's role in decision-making; the need to foster stronger collaboration between EIA developers and transport planners in earlier phases; the lack of transparency and unrealistic EIA expectations. While the authors indicate that EIA developers and transport planners should act as entrepreneurs—addressing integrated objectives, advocating values and norms, reflecting those formulated in higher tier policies (Lee, 2006)—the current situation in Spanish practice frequently invites frustration and distrust between EIA developers and transport planners (Romero, 2012). Public institutions do not foster interaction among professional groups in EIA's earlier phases, and the practitioners end up working separately without constructive dialogue. In addition, Soria-Lara (2012) describes that the high EIA expectations seen in earlier phases are sharply reduced later on, due to the expectation that EIA outcomes will usually not be taken into consideration in decision-making.

Other process-related barriers are highlighted in the Spanish context during the intermediate generation and selection of alternative phase of transport planning. They are based in particular on the perception of assessment methods by practitioners, the importance they give to comparing alternatives in practice, the collaborative work between EIA developers and transport planners, including the level of EIA comprehension among the involved actors. Arce et al. (2010) highlight the existence of a significant gap between environmental assessment methods developed by academia and the simpler methods often used by Spanish practitioners. Simple matrices are the most commonly used method in practice, while quantitative and more robust assessment techniques are preferred by Spanish scholars (Miralles-Guasch and Domene, 2010; Miralles-Guasch and Martínez-Melo, 2013; Soria-Lara and Valenzuela-Montes, 2014b; Talavera-García et al., 2014).

Lastly, EIA effectiveness in Spain seems to be also dependent on certain process-related barriers that emerge during the final decision-making phase in transport planning. “Monitoring and frustration” seem to be the usual outcome. Mandated by the legal framework, EIA establishes a monitoring plan focused on measuring the performance of plans and projects. However, this monitoring plan is scarcely implemented in practice, and its impact on the transport plan or project is frequently limited, which fosters a feeling of frustration among experts (Lopez, 2012).

Research method

We sought to explore the main process-related problems that impede the effective use of EIA in Spanish transport planning practice, as identified by the main actors (EIA developers and transport planners) in a web-based survey. The survey was designed based on experiences from Spanish planning practice as well as already documented process-related issues from other transport supply analysis tools (e.g. CBA or PSS). In January 2014, using mailing lists from Spanish professional associations and institutions, approximately 700 people involved in EIA of urban transport planning were asked to participate in the survey by filling out an online form.

In total 181 respondents filled out the form. Thirteen respondents declared having no experience in transport planning EIA and were eliminated from the analysis. Fig. 1 shows the distribution of respondents according to their primary work domain: 77 EIA developers, 54 transport planners, 11 both work domains (respondents with a dual

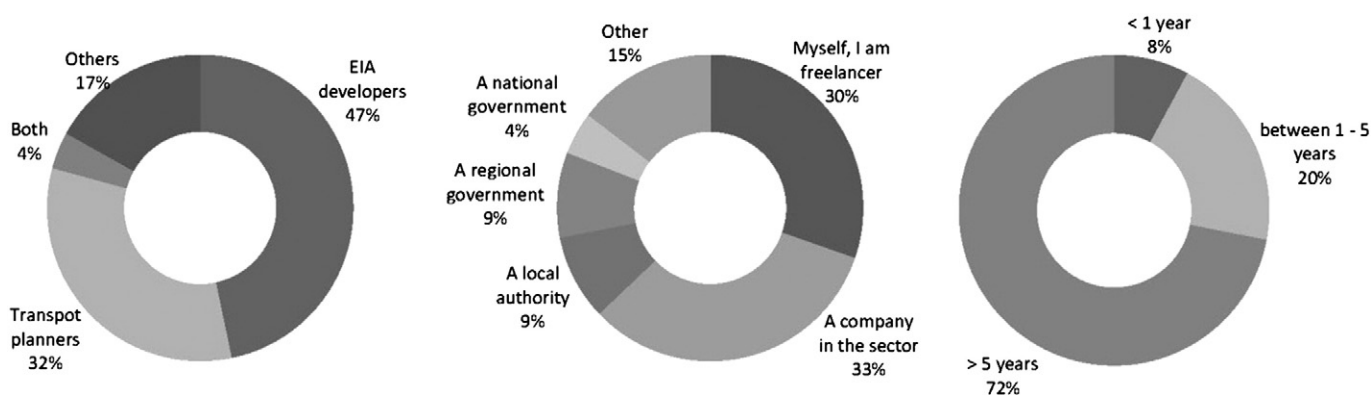


Fig. 1. (a) Work domain. (b) Work organization. (c) Level of experience.

background) and 26 other professional sectors (with some transport planning EIA experience). About a third of the respondents worked as freelancers (51 respondents) and another third worked at a private company in the sector (52 respondents). The level of professional experience was more than 5 years for most (120 respondents), and only a few had less than 1 year (13 respondents).

The survey was structured in three blocks: (i) general statements; (ii) problems directly impeding EIA implementation; (iii) the perception of EIA in transport planning practice. Three types of questions were contained in the survey: statements, multiple-choice questions, open-ended questions. In addition to answering the survey questions, respondents were also required to provide specific professional information, such as region, type of company, job position and years of experience.

The main part of the survey consisted of 29 rated statements (some had also a multiple-choice portion) divided in three blocks. For each statement, respondents could select between: “strongly agree”, “agree”, “neutral”, “disagree” and “strongly disagree”. When applicable, the multiple-choice questions provided deeper insight into the reasons behind the rated statement. For each multiple-choice question, respondents could select among five possible options or write their particular view. In the rest of the survey, the respondents were asked to share in open-ended questions their opinions regarding the most important changes necessary for improving the effectiveness of EIA in transport planning.

The first draft of the survey was submitted to 10 Spanish practitioners (5 EIA developers and 5 transport planners) for comments and suggestions. Individual short interviews were conducted with the practitioners to assess whether the survey accurately captured the issues and barriers encountered in Spanish planning practice. They were also asked to indicate new questions and statements as well as to reflect on the survey’s technical aspects (readability, structure etc.). The results of the short interviews did not show significant differences between the views of the 5 EIA developers and the 5 transport planners. Both groups highlighted that the survey was well-structured, understandable and realistic. Some modifications were suggested for the statements that assess the perceptions of methods, and the majority of the practitioners thought that the survey should pay more attention to the impact of the constraints posed by the tight timeline of most EIA. The practitioners’ suggestions and opinions were incorporated into the final version of the survey (see Appendix A for the English translation of the survey, which was implemented in Spanish).

The survey responses were processed on several levels. First, the professional characteristics of the survey participants were explored. Second, the answers to the statements and multiple-choice questions were analyzed, to obtain more in-depth knowledge about the perception of process issues. The existence and intensity of process barriers was estimated by the percentage of respondents who agreed or disagreed with the statements. Third, an analysis based on a

Kruskal–Wallis one-way analysis of variance by ranks was conducted, to identify different perceptions among different types of practitioners.

Results

The perception of process-related barriers in EIA

The survey results were structured in three blocks: (i) general statements concerning EIA in Spanish transport planning; (ii) problems directly impeding the implementation of EIA; (iii) the perception of EIA in practice (see Figs. 2, 3 and 4). When not otherwise stated, below we considered an ‘agree’ or ‘strongly agree’ response as acknowledgement of the relevance of an issue.

The general statements (see Fig. 2) mainly dealt with the role of EIA in decision-making and sought to assess the level of participant satisfaction. The first two general statements assessed whether *EIA was insufficient for decision-making* and whether *EIA quality was sufficient*. A total of 10.5% of EIA developers and 8% of transport planners perceived that *EIA was insufficient for decision-making*, while the respondents with a dual background and the respondents from other sectors did not see it as a problem. However, the quality of EIA was the major hindrance identified by respondents in this part of the survey. In total, 38.4% of EIA developers, 36% of transport planners and 7.7% of respondents from other sectors agreed or strongly agreed that the EIA quality was not sufficient. General comments from the open-ended questions showed that the majority of practitioners who declared that EIA quality was not sufficient also thought that EIA was too generic and that better adaptation to transport planning issues was needed.

The third statement from this part directly explored the respondents’ perceptions of *EIA’s role in decision-making* (more structuring or more marginal). In total, 12.5% of EIA developers, 20% of transport planners and 8.6% of respondents from other sectors declared that EIA had a marginal role in decision-making. Curiously, the respondents with a dual background disagreed and declared that EIA had a structuring role in Spanish decision-making. Such results partially confirmed the findings of current academic literature that transport planners perceive EIA as a complementary tool, while EIA developers and practitioners with a dual background understood EIA as key for structuring and guiding decision-making.

The last two statements from this part of the survey covered *EIA implementation in decision-making*. In total, 20.8% of EIA developers, 12% of transport planners and 7.6% of respondents from other sectors agreed in identifying as a problem that EIA was implemented too early in decision-making. Only 4.2% of EIA developers and 8% of transport planners perceived as a problem that *EIA was implemented too late in decision-making*. For respondents with a dual background the timing of EIA implementation in decision-making was not highlighted as a barrier.

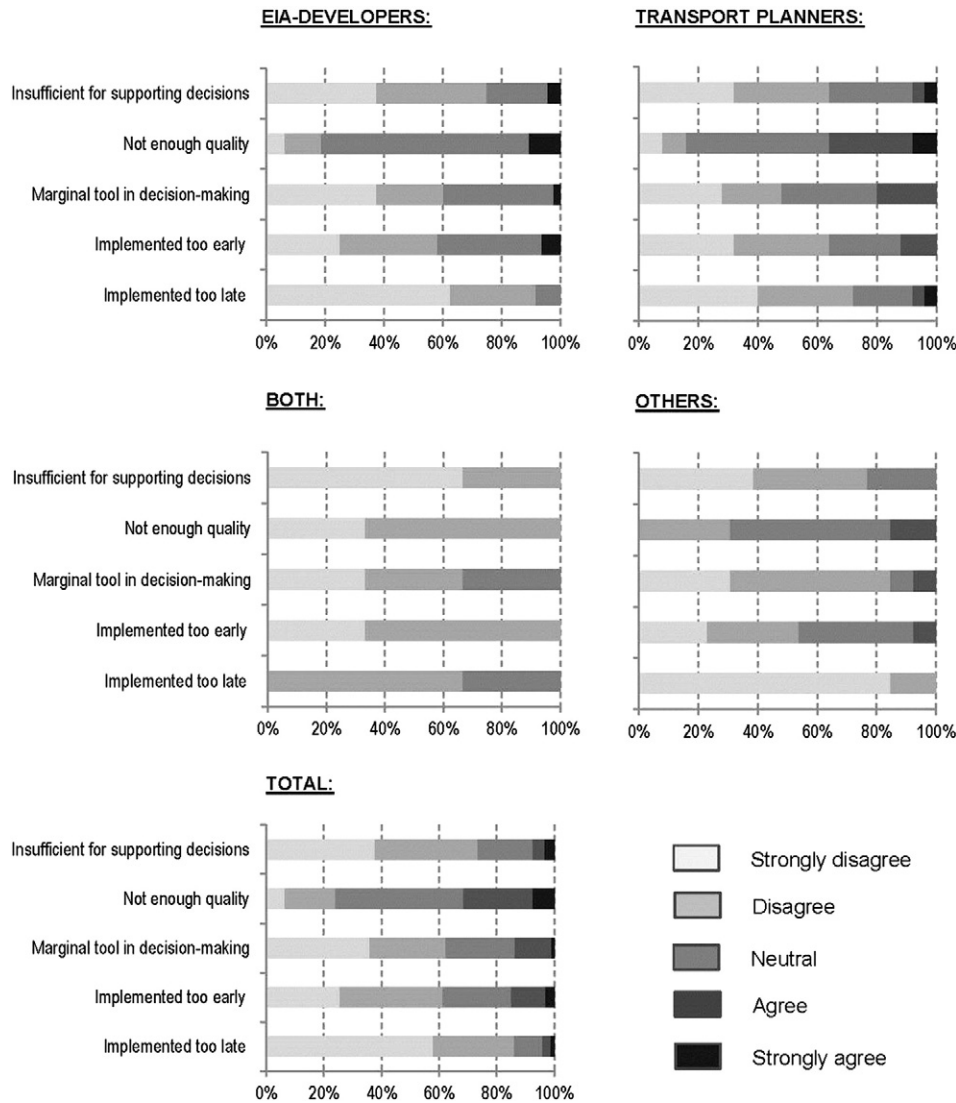


Fig. 2. The perception of process-related barriers of EIA in Spanish transport planning: General statements.

During the second part of the survey, practitioners were asked to identify process barriers that directly impede the implementation of EIA in transport planning (see Fig. 3). The results showed that EIA developers, transport planners and other respondents agreed in perceiving a higher number of potential barriers than practitioners with a dual background. The evidence demonstrated that this dual professional role as EIA developer and transport planner seemed to impede the identification of problems, which were clearly signaled by the other respondents. Also, a dual background probably makes it easier for these persons to effectively bridge the professional gap; thus, they encounter fewer barriers in their daily work (both interesting topics for further research).

Among the 14 potential barriers that the respondents rated during the second part of the survey (see Fig. 3), two were identified as major problems: *limited cooperation between public and private sectors*, and *limited stakeholder involvement*. More than 60% of respondents from each professional group felt that the limited cooperation between public and private sectors was strongly impeding the EIA effectiveness. In the words of one respondent, expressed in the open-ended question section, “many problems are found when public information about plans and projects must be consulted; the process for asking such information is frequently too long and not structured”. Limited stakeholder involvement was another key problem signaled by respondents. A vast majority—85.4% of EIA developers and 75.9% of

respondents from other sectors as well as more than 60% of transport planners and respondents with a dual background—saw this issue as one of the major barriers during EIA implementation. According to the academic literature (Fischer, 2003; Lee, 2006), effective stakeholder involvement is crucial for defining the scope and extent of EIA; it determines the impacts to be assessed, the system boundaries to be undertaken, the potential mitigating and enhancing measures for project alternatives as well as the recommended assessment methods. Given that the “scoping phase” is the first methodological step of EIA, limited stakeholder involvement can have a strong negative influence on the rest of the process.

The potential barriers presented to practitioners were related to the interaction between professional groups during EIA. Approximately a third of the respondents perceived process problems in this cluster of statements. More than 35% of respondents from each professional group declared that *EIA was not user friendly*, which particularly impacts professionals who do not have an environmental studies background. As one respondent stated, “working with easier methods, adapted to alternative designs in transport planning would improve the understanding level between EIA developers and transport planners”. Related to the previous findings from the literature (e.g. te Brömmelstroet, 2010), 35.6% of respondents perceived that *EIA was not interactive enough*, and 29.1% saw it as *not transparent*. In fact, 32% of EIA developers indicated during the open-ended questions that

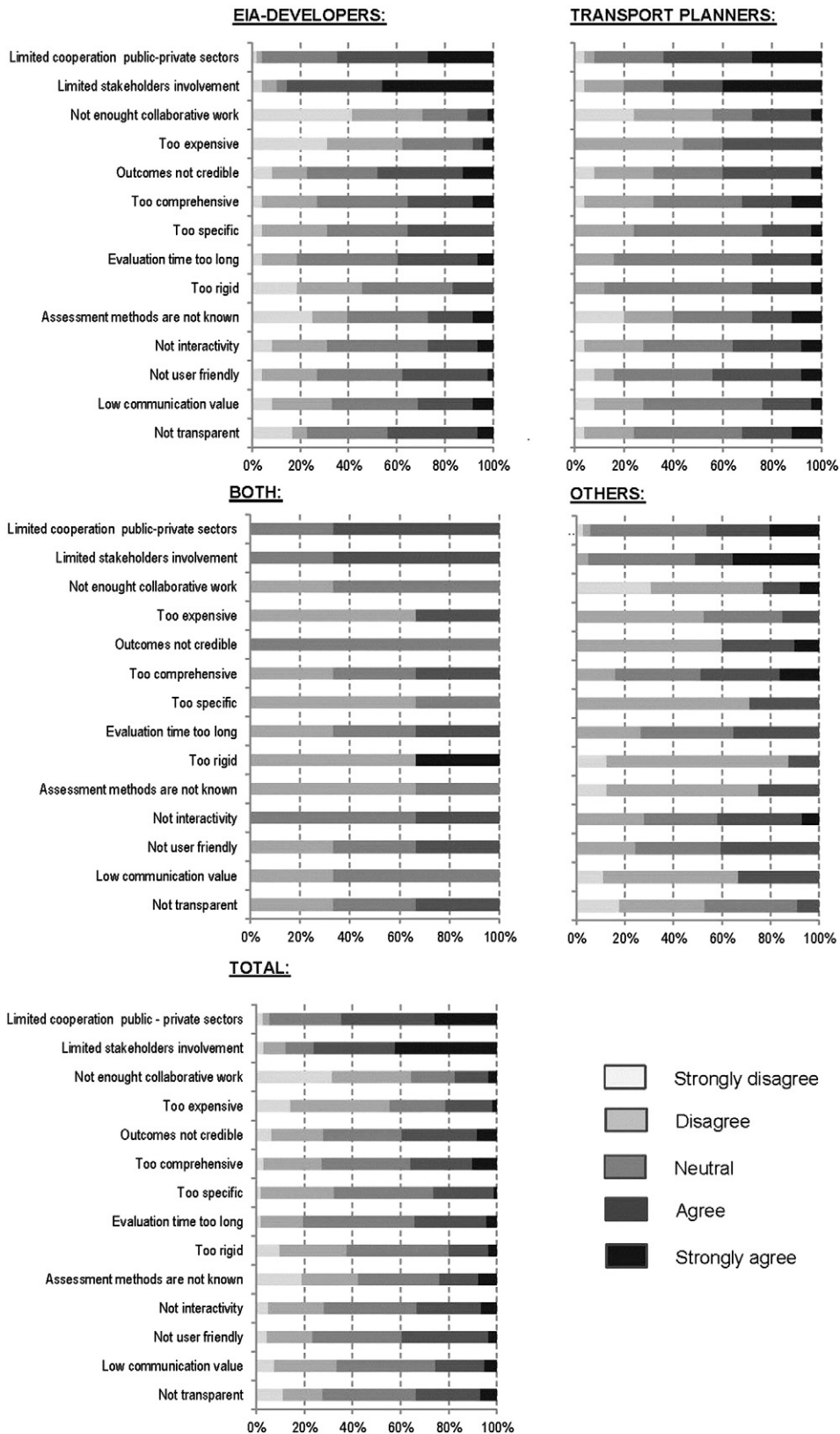


Fig. 3. The perception of process-related barriers of EIA in Spanish transport planning: Barriers blocking the implementation.

“they have difficulties to know all the characteristics of project alternatives during the evaluation and only the planned alternative by the power establishments contains in-depth details”.

The last cluster of statements in this part of the survey assessed whether respondents perceived problems related to EIA outcomes and

methods (see Fig. 4). The major problem perceived was that *EIA outcomes did not seem to be credible*, with 40% of transport planners and 30.7% of respondents from other sectors identifying this aspect as the biggest problem. In the opinion of one transport planner, “EIA outcomes are not credible because the project alternatives have been

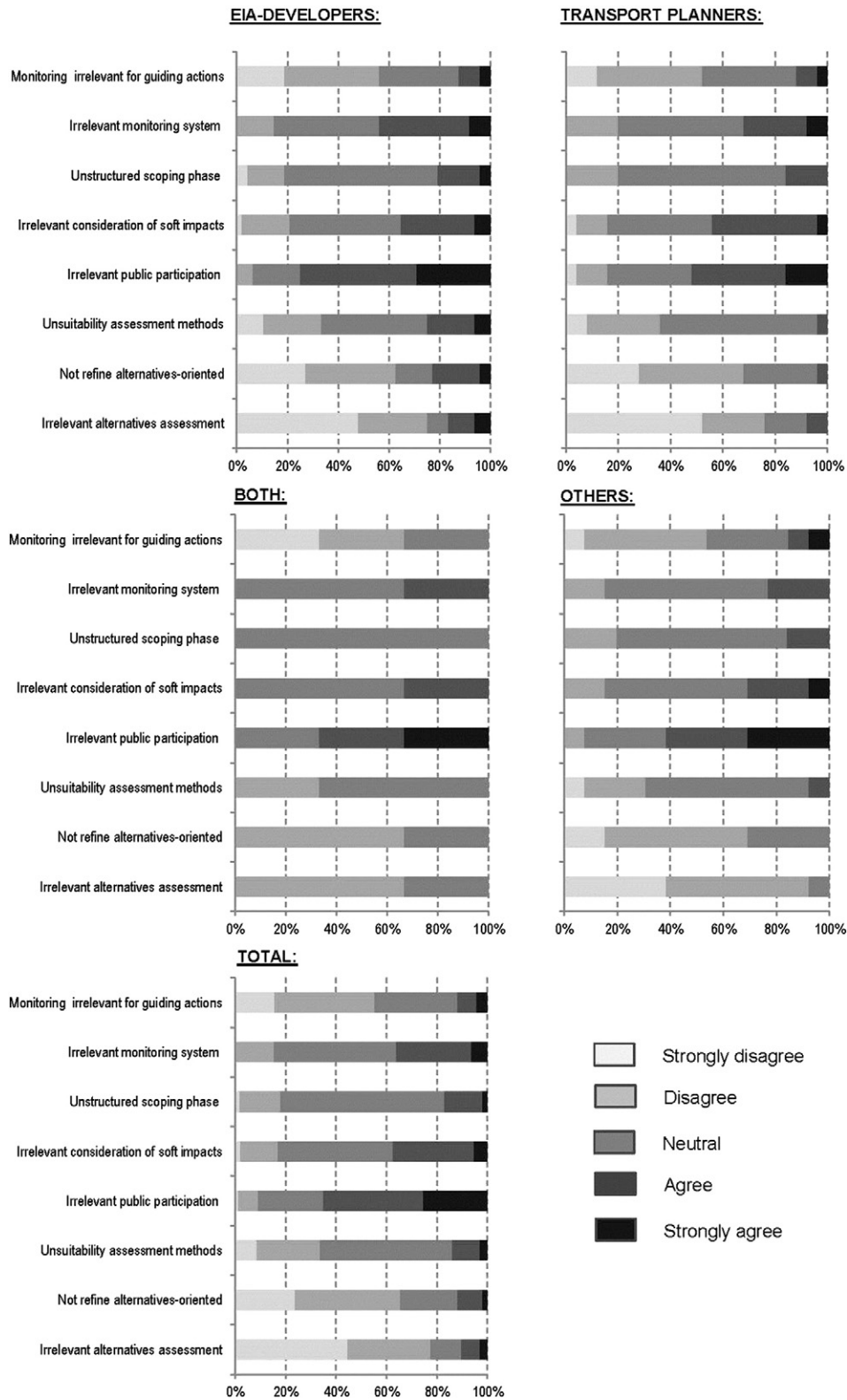


Fig. 4. The perception of process-related barriers of EIA in Spanish transport planning: EIA in practice.

selected before the EIA process, and EIA only certifies the decision previously made from power establishments”. However, several EIA developers felt that “EIA outcomes were not credible due to inadequate definition of the scope of EIA, with many relevant impacts not being assessed”.

During the last part of the survey, the respondents were asked to give their opinion about the perception of EIA in daily practice (Fig. 2). In this block, the *irrelevance of public participation during the EIA process* was unanimously highlighted as the major problem (75% of EIA developers, 66% of transport planners, 52% of respondents with a dual

background and 61.4% of respondents from other sectors). The majority of answers to the open-ended questions underlined the importance of effectively structuring and incorporating public participation into EIA. One practitioner shared that “incorporating the ‘social value’ of transport planning projects into the assessment process is crucial for achieving sustainability goals, because social issues are a relevant part of sustainability”. The second major problem, selected by 42.3% of respondents, was the *low consideration of soft impacts* during the EIA process (minor effects on air and water quality as well as public health). These were especially relevant for transport planners. In the open-ended questions, a transport planner indicated that “EIA is too much focused on negative impacts; soft or positive impacts are scarcely taken into consideration reducing the identification of opportunities and positive issues of the transport projects under evaluation”. The third main problem perceived in this part of the survey was *the irrelevant monitoring systems in EIA*. In this question, the opinion of EIA developers was particularly strong (43.7% of them considered it a problem), common views included that “monitoring systems are never considered by transport planners and decision-makers”, and that “monitoring systems are included in EIA because they are mandatory under Spanish legislation; however, such monitoring systems are frequently undervalued in daily practice”.

Differences between respondents' perceptions of process-related barriers

The differences between respondent responses were considered significant at the p-value of 0.05, using Kruskal–Wallis one-way analysis of variance by ranks (KW) (see Table 1). Three types of comparisons were made: (i) between work domains (EIA developers, transport planners, respondents with a dual background and respondents from other sectors); (ii) between type of employer (public, private and self-employment); (iii) between levels of experience (less than 1 year, 1 to 5 years and more than 5 years). In general terms, very few KW values were statistically significant at the 0.05 level, and a high level of agreement was found among the perceptions of participants.

The first comparison was made between work domains: EIA developers, transport planners, respondents with a dual background and respondents from other sectors. In only 3 of the 27 potential barriers did the KW results show significant differences (*EIA implementation is too late*; *EIA implementation is too rigid*; and *EIA implementation is too expensive*). It is especially relevant to highlight that transport planners and EIA developers shared in the open-ended questions that “many times EIA is implemented when all the decisions are made and its usefulness becomes nil”. On the other hand, respondents who work in both professional sectors did not perceive that *EIA implementation is too late* as a problem. The next significant difference was that *EIA was too rigid*. Respondents with a dual background declared that the “assessment methods frequently used in EIA (fundamental impact matrices) were too rigid when confronted with dynamic systems such as urban transportation”. Finally, the last disagreement among the work domains was that *EIA implementation is too expensive*, which can have an impact on its effectiveness. No opinions were obtained in the open-ended questions regarding this point.

The second comparison was conducted between different types of employer (public, private or self-employment). For 2 out of the 27 examined barriers KW showed differences at p-value 0.05: *Low communication value of EIA* and *The limited cooperation between public and private sectors*. The very few public sector workers who shared their views in the open-ended questions declared that “improving the communication value of EIA was crucial for improving its influence on final actions”. Regarding another disagreement, the *limited cooperation between public and private sectors*, both private sector workers and the self-employed commented that “requesting project information from public institutions is very problematic”.

The third and last comparison was conducted between participants with different experience levels (less than 1 year, 1 to 5 years and more than 5 years). For 2 out of the 27 barriers the KW test showed differences at the p-level of 0.05: *not user friendly* and *too comprehensive*. No relevant comments were provided in the open-ended questions related to the user-friendliness of EIA design. Nevertheless, respondents

Table 1
Kruskal–Wallis one-way analysis of variance by ranks (*p-value < 0.05).

POTENTIAL BARRIERS		Work domains (KW p-value)	Professional sectors (KW p-value)	Level of experience (KW p-value)
General statements	Implemented too late in the planning process	0.018*	0.896	0.400
	Implemented too early in the planning process	0.647	0.702	0.724
	Marginal tool in decision-making	0.600	0.443	0.159
	Not enough quality	0.055	0.818	0.617
	Insufficient for supporting decisions	0.571	0.711	0.134
Problems blocking EIA implementation	Not transparent	0.209	0.177	0.884
	Low communication value	0.818	0.024*	0.805
	Not user friendly	0.838	0.587	0.027*
	Not interactivity	0.747	0.467	0.454
	Assessment methods are not known	0.916	0.544	0.171
	Too rigid	0.038*	0.111	0.889
	Evaluation time too long	0.898	0.959	0.322
	Too specific	0.445	0.890	0.276
	Too comprehensive	0.732	0.763	0.014*
	Outcomes not credible	0.559	0.184	0.604
	Too expensive	0.030*	0.383	0.397
	Not enough collaborative work	0.264	0.703	0.365
	Limited stakeholders involvement	0.448	0.590	0.310
	Limited cooperation between public and private sectors	0.756	0.033*	0.584
EIA in practice	Irrelevant alternatives assessment	0.682	0.613	0.121
	Not refine alternatives-oriented	0.809	0.866	0.646
	Unsuitability assessment methods	0.742	0.699	0.162
	Irrelevant public participation	0.297	0.472	0.292
	Irrelevant consideration of soft impacts	0.942	0.238	0.478
	Unstructured scoping phase	0.990	0.953	0.830
	Irrelevant monitoring system	0.668	0.870	0.175
Monitoring system irrelevant for guiding actions	0.828	0.572	0.918	

with less than 5 years of experience declared that “EIA should be less comprehensive and incorporate more sophisticated software and specific techniques to assess major transport projects”.

Conclusions and discussion

The paper sought to answer the following research questions: Which are the main process-related barriers in EIA, according to Spanish practitioners, and are there significant differences in perception between EIA developers and transport planners? The biggest problem shown was the unstructured involvement of stakeholders and inefficient public participation during the EIA process in Spanish transport planning. The second but relatively less relevant was the perception of a weak adaptation of EIA to issues specific to transport planning.

Regarding the biggest process-related challenges identified by the respondents, a shift in how EIA actors are involved in the assessment seems to be needed. Despite the existence of Spanish EIA legislation and institutional guidelines that regulate the involvement of stakeholders and the general public during the assessment, the respondents indicated that “many times EIA implementation is a set of disconnected steps where experts and stakeholders participate separately and feedbacks among them become nil”. This strongly affects the so-called scoping phase, the process of identifying the content and extent of the EIA. Frequently, it is completed in a relatively short period of time using existing information and consultations with stakeholders. Its main objective is to provide all relevant information on the impacts to be assessed, the system boundaries undertaken, the potential mitigating and enhancing measures for project alternatives, as well as the recommendations about assessment methods. Richardson (2005) offers guiding ideas for leading this potential change to reconsider issues such as dialogue, power and rationalities during the EIA process. Accordingly, Saarikoski (2000) reviewed useful problem-solving experiences in EIA based on collaborative learning processes, which can also provide effective guidance for articulating stakeholder involvement. Public participation is one of the central themes in EIA literature (Gluker et al., 2013). O’Faircheallaigh (2010) presents interesting ideas on how public participation can be useful for (i) obtaining public input into decisions, (ii) sharing decision-making with the public, and (iii) altering distribution of power and decision-making structures.

The second tier of identified problems centered around the adaptation of EIA process to transport planning issues. A common view echoed by the respondents is that “EIA developers and decision-makers should receive more training in transport planning issues”, and that “EIA should be more orientated towards transportation impacts”. Despite the extensive coverage of this issue in the international academic literature (Mayer et al., 2012; Tomlinson, 2011), no references could be found for the Spanish context. In addition, respondents clearly identified other EIA problems in transport planning, such as irrelevance of monitoring systems, insufficient quality of EIA, and too rigid or too comprehensive assessment methods. According to their opinions, “these problems affected EIA expectations” and fostered feelings of frustration among experts, which could emerge as a new barrier. Te Brömmelstroet (2010) also identified similar process problems in the context of the use of PSS in transport planning in The Netherlands. Te Brömmelstroet and Bertolini (2008) designed strategies geared at overcoming these challenges in the Dutch context, which can be useful to inspire new solutions for such EIA barriers in Spanish transport planning. Spanish authors also perceived that the simpler methods commonly employed use in practice were not effective in the transport planning field (Arce Ruíz et al., 2010; Soria-Lara and Valenzuela-Montes, 2014a). Despite the fact that the statements related to assessment methods were considered minor problems by the respondents, in the open-ended questions a large number of comments orientated towards discussing the need to use more sophisticated assessment methods in the case of transport planning. Finally, it is worth noting that the respondents’ views did not corroborate the conclusions of Soria-Lara (2012) and

Romero (2012), who identified that EIA was implemented too late in the decision-making process and that this could be a relevant process problem.

The paper also provides relevant contributions to methodology. Despite the indications of potential process-related barriers during EIA implementation in the field of transport planning (Hildén et al., 2004; Lee, 2006; Soria-Lara, 2012), such problems have not been extensively explored, especially not from the perception of the involved practitioners. In general, respondents had difficulty to perceive process-related problems when they were asked to reflect on general issues. This was particularly visible during the first and the third section of the survey. Nevertheless, they had no problems to identify process barriers when they were asked specific questions, as demonstrated in the second section of the survey. This outcome could be due to the predominant focus on contents-related problems in planning and the minor attention paid to process-related issues in both theory and practice. Actually, in the open-ended questions respondents tended to comment more on EIA’s methodological and technical problems than on process issues.

It is worth to conclude that both the methodological design of the paper and the identification of EIA process-related barriers in transport planning (according to the views of the principal involved actors) is an initial step for future research, which could focus on identifying and testing solutions for the indicated key problems in real-life practice.

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Appendix A

Survey on process-related problems of EIA in urban transport planning¹

Professional details

1. The country in which you work:
2. In the case the country where you work is Spain, please indicate the region:
3. In my daily work, I am:
 - Environmental assessment-maker
 - Transport planner
 - Both
 - Neither, specify:
4. My employer is:
 - Myself, I am freelancer
 - A company in the sector
 - A local authority/municipality
 - A province
 - A regional government
 - A national government
 - Other, specify:
5. My experience in the sector is:
 - Less than 1 year
 - 1 to 5 years
 - More than 5 years

¹ This is an English translation of the Spanish original.

General statements

Through 5 statements we want to establish insights into general aspects of the EIA implementation. To do so, we kindly ask you to rate how much you agree with every statement. You can give a rate between 1 (very much disagree) and 5 (very much agree).

1. The EIA is relevant in earlier phases of the urban transport planning process:
Very much disagree: 1 2 3 4 5 :Very much agree
2. The EIA is relevant in later phases of the urban transport planning process:
Very much disagree: 1 2 3 4 5 :Very much agree
3. The EIA has a central role in the urban transport planning process:
Very much disagree: 1 2 3 4 5 :Very much agree
4. The EIA quality (process, outcomes, etc.) is enough in urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
5. EIA results permit to support decisions in urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree

Problems directly impeding the EIA implementation

Through 14 statements we want to establish insights into the potential bottlenecks blocking an efficient and effective use of the EIA in urban transport planning. To do so, we kindly ask you to rate how much you agree with every statement. You can give a rate between 1 (very much disagree) and 5 (very much agree).

6. The EIA process is transparent for all key people involved in urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
7. The outputs of EIA are understandable for all key people involved in urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
8. The EIA methods are user friendly:
Very much disagree: 1 2 3 4 5 :Very much agree
9. The EIA methods permit interaction among all key people involved in urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
10. Besides Impact Matrices, I know many others EIA methods for application in the field of urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
- 11.b. (*Subordinated, only if 3, 4 or 5*) The other EIA methods I know/use in urban transport planning are (you can select multiple options):
 - Environmental performance indicators/Indices
 - Forecasting and simulation impact scenarios
 - Cost-Benefit Analysis
 - Multi-Criteria Analysis
 - Life Cycle Analysis
 - Other, specify:
11. The EIA methods are not rigid:
Very much disagree: 1 2 3 4 5 :Very much agree
12. The duration of the EIA process is adequate for the assessment in the field of urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
13. The degree of detail of EIA outputs is adequate for the assessment in field of urban transport planning:
Very much disagree: 1 2 3 4 5 :Very much agree
14. The EIA methods used in the field of urban transport planning are sufficiently comprehensive
Very much disagree: 1 2 3 4 5 :Very much agree
15. The EIA outcomes are credible for all key people involved in urban transport planning:

Very much disagree: 1 2 3 4 5 :Very much agree

16. The EIA process is not expensive:

Very much disagree: 1 2 3 4 5 :Very much agree

17. The EIA process is a collaborative work among all key people involved in urban transport planning:

Very much disagree: 1 2 3 4 5 :Very much agree

18. During the EIA process stakeholders are sufficiently involved:

Very much disagree: 1 2 3 4 5 :Very much agree

19. During the EIA process the cooperation between the public and private sectors is effective:

Very much disagree: 1 2 3 4 5 :Very much agree

20. Do you have any more remarks about potential bottlenecks blocking an efficient and effective use of the EIA in urban transport planning?

EIA in urban transport planning practice

Through 8 statements and checkboxes questions we want to establish insights into the embedding of EIA in urban transport planning practice. To do so, we kindly ask you to rate how much you agree with every statement. You can give a rate between 1 (very much disagree) and 5 (very much agree).

21. During the EIA process, project alternatives assessment is relevant

Very much disagree: 1 2 3 4 5 :Very much agree

22. The outputs of project alternatives assessment permit to refine alternatives through corrective measures, rather than just ranking them:

Very much disagree: 1 2 3 4 5 :Very much agree

23. Traditional EA methods based on impact matrices are the most suitable to evaluate project alternatives in urban transport planning:

Very much disagree: 1 2 3 4 5 :Very much agree

24.b. (*Subordinated, only if 1 or 2*) In my opinion, the most suitable methods to evaluate project alternatives in urban transport planning are (you can select multiple options):

- Environmental performance indicators/Indices
- Forecasting and simulation impact scenarios
- Cost-Benefit Analysis
- Multi-Criteria Analysis
- Life Cycle Analysis
- Other, specify:

24 The opinion of the public is sufficiently taken into consideration during the assessment of alternatives:

Very much disagree: 1 2 3 4 5 :Very much agree

25. 'Soft' impacts are sufficiently considered during the EIA in field of the urban transport planning

Very much disagree: 1 2 3 4 5 :Very much agree

26. During the EIA there is an adequate method to fulfill the "scoping phase":

Very much disagree: 1 2 3 4 5 :Very much agree

27. Environmental monitoring systems are relevant during the implementation of projects:

Very much disagree: 1 2 3 4 5 :Very much agree

28. Environmental monitoring systems are important in guiding future actions of projects:

Very much disagree: 1 2 3 4 5 :Very much agree

29. Do you have any more remarks about the embedding of EIA in urban transport planning?

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Julio A. Soria-Lara. His research focuses on developing environmental assessment tools for application in urban transportation. Main publication topics include the implementation of Light Rail System in urban regions, planning evaluation, and environmental assessment during the planning process.

Luca Bertolini. His research and teaching focuses on the integration of transport and land use planning, on methods for supporting the option-generation phase of the planning process, on concepts for coping with uncertainty in planning, and on ways of enhancing theory-practice interaction. Main publication topics include planning for sustainable accessibility in urban regions, conceptualizing urbanism in the network society, and the application of evolutionary theories to planning.

Marco te Brömmelstroet. His research and teaching focuses on the use of PSSs to integrate transport and land use planning. Main publication topics include PSSs for sustainable transport planning, the CBA process in transport planning, and usability of accessibility instruments.