Edited by
Marco te Brömmelstroet, Cecília Silva and Luca Bertolini

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Marco te Brömmelstroet
Amsterdam Institute for Social Science Research
University of Amsterdam
Plantage Muidergracht 14
1018TV Amsterdam

Cecília Silva
Research Centre for Territory, Transports and Environment (CITTA)
Faculty of Engineering of Oporto University
Rua Dr Roberto Frias s/n
4200-465 Porto

Luca Bertolini
Amsterdam Institute for Social Science Research
University of Amsterdam
Plantage Muidergracht 14
1018TV Amsterdam

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Chapter 5 CONCLUSIONS AND DISCUSSION

Marco te Brömmelstroet, Carey Curtis, Anders Larsson & Dimitris Milakis

5.1 Conclusions

This report started by identifying the potential of accessibility instruments to support planning practices and by discussing the implementation gap that limits this potential. We set up an experiential research design to investigate the usability of current accessibility instruments and to gain insights into the types of interventions that can improve usability. The research question was defined as follows:

> *How usable are accessibility instruments in supporting urban planning practices across Europe, and how can their usability be improved?*

Building on the pragmatic paradigm of research in planning (coined realistic evaluation), we attempted to answer this question through multiple experiential case studies in which a wide variety of instruments were used and tested in simulated real-life planning practices. Through discussions within the COST Action TU1002 partners, we developed a standardised approach for the workshops central to these case studies and the questionnaires on the usability of the instruments.

In total, 17 workshop-based case studies were performed across Europe and Australia; also one interview-based study from Norway was added. The case studies fed into this report with rich accounts of each individual workshop, local planning context and instrument usability characteristics (Chapter 3). Next to these reports, a number of indicators were collected and analysed, in order to help the team interpret the underlying patterns (Chapter 4). Below, we will draw conclusions based on these empirical findings and divide them between those on the experiences of the planning processes in the workshop and on the perceived usability of the accessibility instruments.

Participant definitions of accessibility and their prior experience with using accessibility instruments

The findings seem to indicate that the reactions to the accessibility instrument are influenced by (1) how the practitioners define accessibility, and (2) by their prior experience of using accessibility instruments and transport models. It seems that prior experience with an accessibility instrument makes it easier to use another instrument, due to the acquired baseline understanding of the concepts.

In our analysis we found that the most frequently proposed definition of accessibility was 'the ease of getting to a place'; however, the fact that a very wide range of definitions was suggested indicates that there is still a need for the development of a shared language.

A final thought that arose from this analysis is that the types of planning being undertaken by participants as well as the extent to which their respective organisations see accessibility seems to matter as a core part of their policy direction are important. Both aspects seem to influence the participant's ability to grasp accessibility as a concept and, therefore, are integral to their assessment of usability.

Defining a planning problem—the richness of approaches to accessibility

All 17 workshops focused on existing planning problems in their local contexts, which can be broadly divided into the following types (although some instruments cross this typology):

1) Accessibility to/from specific amenities or infrastructure projects;
2) General accessibility indicators/levels for areas;
3) Network-based accessibility and connectedness (none or only a limited land use component).

Typical examples of the first category are Munich, Turin, Madrid and Gothenburg; there the instrument was used to answer a specific planning question (for example, in the Munich case the interest was to accommodate increased housing demand and its distribution in relation to accessibility). In the second category (e.g., Adelaide, Rome and Lisbon) accessibility measures and indicators were used as part of a more comprehensive planning process in the respective area. In this group the planning interrogations focused on strategies to achieve sustainable urban development. The last set of cases (e.g., Volos, Limassol, Ljubljana and Izmir) took infrastructure-based measures of accessibility as a point of departure (for example, in Izmir alternative transport options for future mobility needs were assessed).

In response to this diversity of planning problems, different approaches were taken—ranging from interactive live scenario testing (via a combination of computer and pre-printed maps) to only printed maps and pre-defined planning problems. This span is related to the different technological configurations of the specific tool regarding real-time capabilities as well as to the data requirements and the means for manipulating and inputting new data in response to questions arising from the group.

Perceived quality of the workshop process

The participants had, in general, a very positive reaction to the process (for example, mentioning that the workshop gave useful results; satisfactory sessions; correct assumptions and group solution; useful insights with regard to the processes, the opinions of the other participants and the possibilities that their organisation has in 'steering' the problem). The moderator seemed to

have a central role in supporting the successful exchange of information. Finely honed skills and abilities are required to manage the process well and meet the Action's goals while, at the same time, following the participant discussions and offering solutions if the discussion takes an unexpected turn. Clearly, managing such an interactive and discursive process requires attentiveness and responsiveness, combined with an open mind to new possibilities.

Most participants stated that they would use insights from the workshop in their daily planning practice and that they would communicate the session results in their organisations. These statements attest to the value they placed on the accessibility instruments and their relevance to planning questions.

The perception of communication and cohesion was generally high among the participants. This is likely related to the positive responses about the perception of consensus in terms of reaching a shared vision on the problems and the goals.

Despite the high level of agreement across all workshops regarding the usefulness of the accessibility tool, there were key difficulties in developing a shared professional language. This may have had a negative effect on the respondents' perception about the contribution of the session towards reaching a shared vision on the possible solutions.

Two groups of cities can be identified based on the perceived quality of the process. In the first group (Limassol, Volos, Lisbon, Madrid, Adelaide, Helsinki, Munich and Gothenburg) the participants stated that the session did indeed allow them to penetrate deeper into the problem, understand the views of their co-participants, develop shared language (only in the first four cities of the group), and finally reach a consensus about the possible strategies. As a result the participants in this group of cities expressed higher satisfaction levels with the session than the participants from the second group of cities (Turin, Breda and Krakow). There the participants appeared more concerned about the insights into the problem and into the opinions of their co-participants provided by the session. They were quite sceptical about the contribution of the session to the development of a shared language and consequently a shared vision on the possible solutions.

Male participants appeared to be more satisfied with the sessions than female participants. All age groups were very satisfied with the session. Urban planners strongly agreed that the session resulted in useful results with a higher percentage than transport planners (although both groups had a positive reaction about the session). Participants who work in the private sector were more enthusiastic about the outcomes of the session than their public sector counterparts.

Perceived usability of accessibility instruments

The participants had in general very positive views regarding the usability of the instruments for real-life planning problems; the relevance of the instruments to their profession; and the insights that the instruments offered into planning problems (but not so much into the land use–transportation relationship).

The instruments were found to be useful for generating and identifying problems in the urban structure, analysing them, selecting strategies and finally implement solutions.

A common response across the workshops was that participants found the visual map-based media to be a very useful tool for communicating accessibility and for laying a basis for discussion. This latter aspect provided a particularly useful way for bridging the professional discipline divide. Generally, it was demonstrated that planners prefer maps, while transport planners are more at ease when presented with quantitative outputs.

Two groups of barriers were identified concerning the potential use of the instruments in planning practice: first, the technical and resources barrier, and second, the political barrier. The participants expressed significant concerns about the low familiarity of their organisations with accessibility instruments and, therefore, felt that the instruments presented in the workshops would not be used. Moreover, a significant portion of participants believes that their organisations do not have the sufficient resources, either in terms of time and money or data and computational skills. These findings mirror those found by Curtis (2011). Also the instruments' high precision requirements are perceived as a factor that would increase the cost of using them in planning practice.

The participants in Adelaide, Limassol, Munich, Madrid and Helsinki were the most positive regarding the appropriateness of the instrument for analysing urban structure problems and supporting planning decisions. Additionally, the instruments used in the workshops in Adelaide, Helsinki, Munich and Gothenburg were seen as providing significant insight into planning problems.

In all cities, it was reported that the instruments seem to be less successful in giving insight into the land use–transportation relationship.

Regarding barriers for applying the instruments in planning practice, the participants in Limassol, Helsinki, Breda, Krakow and Ljubljana perceive the political constraints as most significant. Complexity is also an issue in the majority of cases, including Adelaide, Rome, Turin, Lisbon, Ljubljana and Breda. The level of familiarity of their organisations with accessibility modelling seems to be also a significant barrier, as reported in many workshops (Rome, Breda, Limassol, Madrid, Adelaide, Lisbon, Ljubljana and Munich).

Women tend to see more barriers on the technical level regarding, for example, the level of familiarity of their organisation with the accessibility instruments, while men tend to focus on the political constraints. The older the participants, the more barriers they tend to perceive.

Urban planners tend to perceive more barriers to using accessibility instruments in their daily planning practice than transport planners. These barriers include the technical skills and familiarity of their organisation with accessibility modelling and the political constraints. Urban planners are also less sure about the usefulness of the instruments in real-life planning problems and about the insights into planning problems that the instruments provided.

Potential for improvement of accessibility instruments

Only one instrument (from the Torino workshop) could process scenarios in real-time. It offered users the opportunity to change infrastructure networks and directly recalculate the accessibility effects. A majority of the other teams concluded that real-time capabilities were the most-demanded feature missing in their instruments. Some instruments were able to perform scenarios in real-time, but teams decided to use printed maps in order to avoid any potential technical problems that would be detrimental to the rest of the workshop.

One further aspect mentioned by most teams is the positive influence of geographical maps in the presentation of accessibility and other data. The output of an accessibility analysis in the form of numbers, tables and graphs is often complex and requires a high degree of expert knowledge. Maps provide an overview that invites a much wider group of users to take part in the discussion. The ability to use maps to simplify the presentation of large amounts of spatial data is one key feature. Another, more indirect dimension, is the fact that maps puts the planning problem in its real-world place so to say. Planners can recognise places and relate accessibility to other planning questions from their everyday work.

Several teams commented on the usefulness of high-resolution geographical data. The ability to model the area in question in detail facilitates the usability in terms of 'being closer to reality'. Most instruments used administrative areas as the basis for visualisation. Some used a grid system while others relied on the infrastructure network level of visualisation. Although geographical detail was seen as a positive feature, there are potential methodological problems to aggregate such data into more general accessibility indicators.

One last point mentioned by many teams is the risk of information overflow. Accessibility instruments have the ability to be easily translated in printed maps, as experienced in many workshops where, accordingly, the organisers

had prepared a large number of them. However, in most cases only a few of the maps were eventually used in the exercise, because participants could not absorb more than five to six different maps in a single session.

5.2 Reflections on the methodology

The four-step process model was helpful in explaining to the participants the actions that were going to take place and their sequence. However, the case comparison made it clear that very few workshops were able to use the four-step model without alterations. In most cases workshop sessions had to be shifted or compressed due to the participants' tight schedules. In a few exceptional cases the organisers themselves defined the planning problems and even proposed solutions in order to complete the workshop.

Several cases reported problems with involving all participants in the discussion and/or spending extra time on technical discussion and explanation. This can be related to the need for a basic level of knowledge about accessibility instruments and the concept of accessibility—all participants shared at least a minimum level of understanding. Most workshops held a pre-meeting session in order to provide basic information to the participants; however, based on the reflections from the cases, it looks as if this stage needs careful attention, especially with participants from different planning specialisations (transport planners and urban planners).

A comparison of the cases shows that the focus on one specific planning problem makes the workshop process easier and clearer for the participants. From a methodological point of view, we recommend spending sufficient time on the formulation of a limited number of accessibility-relevant problems.

Most importantly, and even if we take into consideration all of the potential shortcomings listed above, the workshops show that the accessibility instruments can contribute to the development of a common language and proved to be a very good platform for cross-sectorial discussion about planning problems. Particularly due to its integration capabilities, the methodology has a clear potential for application in real-life planning contexts.

5.3 Discussion

As indicated in the introductory section of this report, accessibility planning by its very nature brings together a focus on both urban land use planning and on transport planning. Clearly this integrated focus requires interaction between at least two profession groups—transport planners and urban planners. Although both groups work to service the city's plans and projects, they tend to work

separately, i.e. at best cooperating with each other rather than collaborating (Curtis and James 2004). Each specialisation has its own unique professional training, skill set and ideology. The difference can be seen in their use (or lack of use) of transport models and accessibility instruments as well as in their diverse definitions of accessibility. An interesting finding is that urban planners are less convinced than transport planners about the usefulness of the instruments in real-life planning problems and the insights they gained during the sessions. In part this difference may relate to the barriers they perceive to using accessibility instruments (see below), but arguably, it may also be due to the fact that urban planners typically are already used to thinking about the city from a strategic accessibility perspective. The fact that urban planners questioned the usefulness of the accessibility instruments must be unpacked further. The reasons are likely quite diverse (e.g. perhaps accessibility is not yet a policy focus of their organisation). The fact that the cases analysed here are quite diverse and context specific compounds this limitation even further.

The nature of the planning questions (i.e. the perceived purpose of the planning exercise) may be at the heart of the matter. In most cases the focus is on either individual land parcels within a city and their future function (urban planners) or on how to provide access to a central location (transport planners). However, strategic accessibility considerations–such as how to ensure that all residents gain adequate public transport, walking or cycling accessibility– are infrequently or rarely addressed by both professional groups. In the workshops there was considerable variation in the ability and speed with which the participants grasped the concept of accessibility in a practical way, i.e. how to apply it to particular planning questions. In Breda, for example, while the group could propose a long list of planning questions that needed answers, they faced difficulties in translating these into accessibility questions—a predicament overcome only once the facilitator (the accessibility tool developer) intervened and guided the participants. On the other hand, in the Adelaide workshop the participants were conversant with accessibility concepts, despite the fact that they reported little or no background in accessibility modelling. This outcome is due in part because their planning policies and strategies were written in such terms, and in part because they had prepared for the workshop by reading in detail about the application of the accessibility tool in other places.

It appears that the 'shared language' stumbling block is related to several factors: the professional training and experience of the individuals; the policy focus of the organisation; the complexity of the tool relative to the skill preference of the users; and the different preferences for types of accessibility outputs (again *relative* to skill preference).

5.4 Steps forward

For accessibility instrument developers

The feedback from the 17 cases demonstrated a clear need for developing interactive ways to enable planning practitioners to engage with visualised accessibility indicators. Although the participants were not unanimously supportive about the shared language offered, we expect that enhancing the instruments' capabilities to quickly test and manipulate planning interventions would greatly improve their usability. It would allow the instruments to go beyond providing only a passive view of an existing situation and to offer also a way to understand how existing accessibility scores can be changed (i.e. how response the urban system is on these indicators). The limited experiences with this approach have shown that through such play and shared testing of believes from different domains a remarkably higher sense of shared language and greater insight can emerge.

A further point is that it appears crucial that instrument developers keep on developing ways to explain accessibility indicators and mechanisms in lay terms, so that all the actors in the planning processes are able to understand and work with the tools.

A key aspect of map visualisation seems to be the map–user interrelation. In order to increase usability beyond pure technical and analytical improvements, instrument developers need to put more attention on maps as communication tools. From the COST Action cases a clear message seems to emerge: maps are invaluable, especially as platforms for discussion between different user groups.

The four-step process model that was developed as a guideline for all workshops placed the link between existing planning questions and the instrument square in the centre. Many participants and instrument developers saw this direct dialogue between user and developer as an important step forward. However, also some limitations in the ability of accessibility instruments to represent planning problems were observed. To increase the application potential, each developer needs to carefully assess what sorts of planning questions can be answered with the instrument and what added value the instrument can bring to the planning process. The collection provided in this report can serve as a portfolio of instruments, each covering a different aspect of planning problems.

For planning practitioners

The other side of the coin is that planning practitioners should actively engage with the logic of accessibility. The cases show that the accessibility language

offers important potential for assisting questions that link land use, transport and other domains. Current planning strategies should be adapted to reflect the new insights gained. The four-step process model offers a way for practitioners to actively engage with the instruments. By tinkering with the key assumptions and mechanisms of an instrument, they can adapt it to the needs of their specific context.

According to the findings from the case studies, many organisations are still far from integrating accessibility analysis as a mainstream methodology in their everyday work. However, COST Action teams have already taken a step forward by establishing a positive relationship between academia and practice through the workshops. It is essential to continue and develop this collaboration in order to strengthen the position of accessibility analysis in planning practice.

For accessibility scholars

This research conducted under this COST Action clearly is just the start of the efforts to bridge the gap between the broad range of accessibility instruments and their potential users.

One direction for future research is to keep conducting context-rich experimental case studies. By focusing on specific families of instruments (e.g. Space Syntax or gravity based ones) such research can be further refined and focused.

Another direction is to go deeper into the relations between the personal characteristics of potential users (their experiences, professional backgrounds, and attitudes towards the use of information) and the use and usability of accessibility instruments. The same can be done for relationships between different planning settings (public vs. private, strategic vs. operational, open vs. closed) as well as use and usability.

Another possible direction is to triangulate our research design, which can be pursued in two ways. One is to deepen our understanding by following one interaction with an accessibility instrument in much more depth: for instance, following, observing and interviewing individual users over a longer time period will certainly improve our understanding of how accessibility instruments can enhance their planning experience. Another way is to generalise the use and usability mechanisms beyond the different contexts (e.g., by setting up quasi-experiments that would isolate the mechanisms and control the context as much as possible). Validating the effects of these mechanisms in a quasi-experimental setting will add valuable academic rigour to the study of the role that accessibility instrument can play in supporting integrated planning.

5.5 References

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