Accessibility Instrument Survey

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Accessibility Instruments for Planning Practice

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Chapter 4. ACCESSIBILITY INSTRUMENTS SURVEY

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4.1 Introduction

This chapter presents the main results of the Accessibility Instrument Survey (AIS), collecting basic information on each of the accessibility instruments reviewed in this report (for more detail on these Instruments see Chapter 3). The aim of the survey was to enable quick, objective and comparable overviews of each of the reviewed accessibility instruments. The information collected will enable the categorization of accessibility instruments present in this research, aiming to be a reference for future categorization of accessibility instruments for planning practice. These categories will support the analysis of the coverage of accessibility instruments in this research, i.e., identify how representative this research is across different accessibility instrument types. In addition, these will be used to analyse the characteristics and concerns which most frequently underlie the development of accessibility instruments. Finally, the survey also collects developer's perceptions on the usefulness of their accessibility instruments in planning practice, enabling the first insight into the main research question of this COST Action, although limited to the developer's point of view.

In summary, the results of the survey will be used for four purposes:

- Development of an accessibility instrument sheet for each accessibility instrument summarizing its main characteristics (Appendix A);
- Identify the coverage of accessibility instrument types present in this research (Section 4.3.1) discussing the representativeness of this Action;
- Provide a glimpse on the characteristics and concerns which most frequently underlie the development of accessibility instruments (Section 4.3.2);
- Provide a first insight into the perceived usefulness of accessibility instruments in planning practice from the point of view of the developer (Section 4.3.2 and Section 4.3.3).

The next section provides an overview of the Survey describing the information collected. This section also describes the development process of this survey including data collection, dates and means. The results of the survey are analysed in the third section starting with a discussion on the coverage of accessibility instruments reviewed by this research (Section 4.3.1), identifying accessibility measure types which are represented and which are absent. This discussion is accompanied by the presentation of the main categories of accessibility instruments from the perspective of the end user. These categories try to summarize the main concerns planning practitioners are expected to have when searching for an accessibility instrument and is built upon some of the information collected by the survey. Following, the third section also presents a general analysis of the results (Section 4.3.2), focussing on the dominant characteristics of the accessibility instruments reviewed and on the developer's perception of the usefulness their instrument will have for end users. The section ends with a brief cross analysis of results (Section 4.3.3) trying to identify relationships between accessibility instrument characteristics and perceptions of usefulness by developers. The fourth and last section presents the main conclusions of this study.

4.2 The Accessibility Instrument Survey

The Accessibility Instrument Survey was conducted on the Action's website (http://www.accessibilityplanning.eu) with developers of accessibility instruments participating in this research being invited by e-mail with a direct link to the survey (which was not accessible otherwise or searchable on the web).

The development of the survey started in the beginning of 2011 with a general discussion meeting involving all research groups of this COST Action. The main issues of the survey were discussed in a general assembly, which was later subdivided into smaller groups to work on the particular questions in each group. This process enabled the development of an inclusive survey considering different perspectives and the backgrounds of accessibility instrument developers. The draft version of the survey was then further developed by a smaller team. The survey was available to be filled in by all participating accessibility instrument developers from mid-August to mid-September 2011.

A preliminary analysis of the results of the survey and of the comments left by the accessibility instrument developers revealed some minor corrections required for the survey. These corrections were developed following a general discussion meeting in Edinburgh in the fall of the same year with corrected questions sent out for a second round by the end of the year, concluding the data collection phase of the survey.

The final version of the survey (see Appendix B) holds 4 main groups of questions preceded by a preliminary group of questions providing general information on the developer of the accessibility instrument (such as, name, e-mail and institution) as well as the name of the accessibility instrument. The remaining questions are divided into four groups:

1. Planning Context.
2. Planning Goals.
3. Characteristics of the Instrument.
4. End-users and how they use the tool.

The first group of questions aimed to identify a number of baseline issues for the development of the accessibility instrument, namely, if there are political requirements for accessibility planning in the country/region of origin/activity of the developer, as well as, information on the geographical scale, the status of development of the instrument and the type of planning process for which the instrument is intended.

The second group of questions aimed to identify the main planning goals considered in the development of the instrument, or in other words, the planning goals the instruments are able to consider or provide an answer to. Within this group of questions, planning goals were divided into public stakeholder goals, private investor goals and personal/individual goals.

The third group of questions aimed to summarize the main operational characteristics of the accessibility instruments surveyed, including accessibility measures type (identifying if the measure follows traditional contour measures, gravity measures, utility

measures, etc.) and the components considered (from the 4 main components of Transport, Land use, Temporal and Individual components), the level of disaggregation with regard to spatial, socio-economic and temporal data and analysis, and the transport modes and opportunities considered. This group also includes questions evaluating the developer's perception on the ability of the instrument to replicate reality and on the speed of the tool.

Finally, the last group of questions aimed to evaluate the developer's perception on the usefulness of the accessibility instrument in planning practice and to understand the relationship with the potential end users. With regard to the developer's perception of usefulness, respondents are asked to rate how easy it is to use the instrument, the knowledge and skills required to use the instrument, the ability to provide understanding on the quality and experience of travel and the success of the instrument in its intended role in urban planning. Additional questions include issues on potential users, the role in connecting service users and accessibility providers and the role in urban planning. This group ends with questions on the main issues blocking implementation of the accessibility instrument.

With the exclusion of the rating questions, most questions allowed multiple responses. The large majority of questions allowed an answer of "Not applicable" or "Don't know yet" (in this case only for instruments marked as "in development" in question 1.3 identifying the status of development of the instrument).

4.3 Accessibility Instruments in TU1002

4.3.1. Coverage of Accessibility Instruments

The aim of this section is to present an overview of accessibility instruments and to show the coverage of the tools reviewed by this research, identifying which types and which application are represented or are absent and to provide a tool for urban and transport planning practitioners for choosing what they may need. In other words, this paragraph illustrates a "coverage analysis", showing how many instruments of each type have been proposed in the COST Action, through a clear and quick synopsis of the main characteristics of the different instruments.

The coverage analysis of accessibility tools has been developed starting from the point of view of the potential user and the instruments have been categorized starting from five basic questions planning practitioners may have when they have to choose the instrument that best fits their requirements: For each planning question a category and several classes have been defined as summarized in the following table.

Table 4.1 Categories of how the Accessibility Instruments inform planning goals

Practitioners' planning question	Category	Class
What is the geographical scale? (question 1.1 of the survey)	Geographical scale	Supra-national
		National
		Supra-municipal
		Municipal
		Neighbourhood
		Street
What is the planning goal? (question 2.1 of the survey)	Planning goal	How to decide on the loc ation of residences /activities / services?
		How to manage, encoura ge or reduce the use of a particular transport mode(s)?
		How to stimulate economic development?
		How to ensure economic equity?
		How to ensure social equity and/or cohesion?
		How to ensure reductions of emission/energy use?
What kind of support are you looking for? (question 3.1 of the survey)	Decision support task	Passive decision support tool
		Active decision support tool
		Cooperative decision sup port tool
		Used in the ex-post evalu ation of the decision impact
What will you need support on? (question 4.7 of the survey)	Role in urban planning	to create new insights
		to justify decisions/ positi ons already taken
		to support strategy/ optio n generation
		to support strategy/ optio

Practitioners' planning question	Category	Class
		n selection
What are the transport modes you want to consider? (question 3.8 of the survey)	Transport mode	Any mode
		Walking
		Bicycle
		Public Transport
		Car
		Truck
What are the trip purposes you want to consider? (question 3.9 of the survey)	Trip purpose	No purpose / not applica ble
		All purposes (aggregate measure)
		Work
		Leisure
		Healthcare
		Shopping

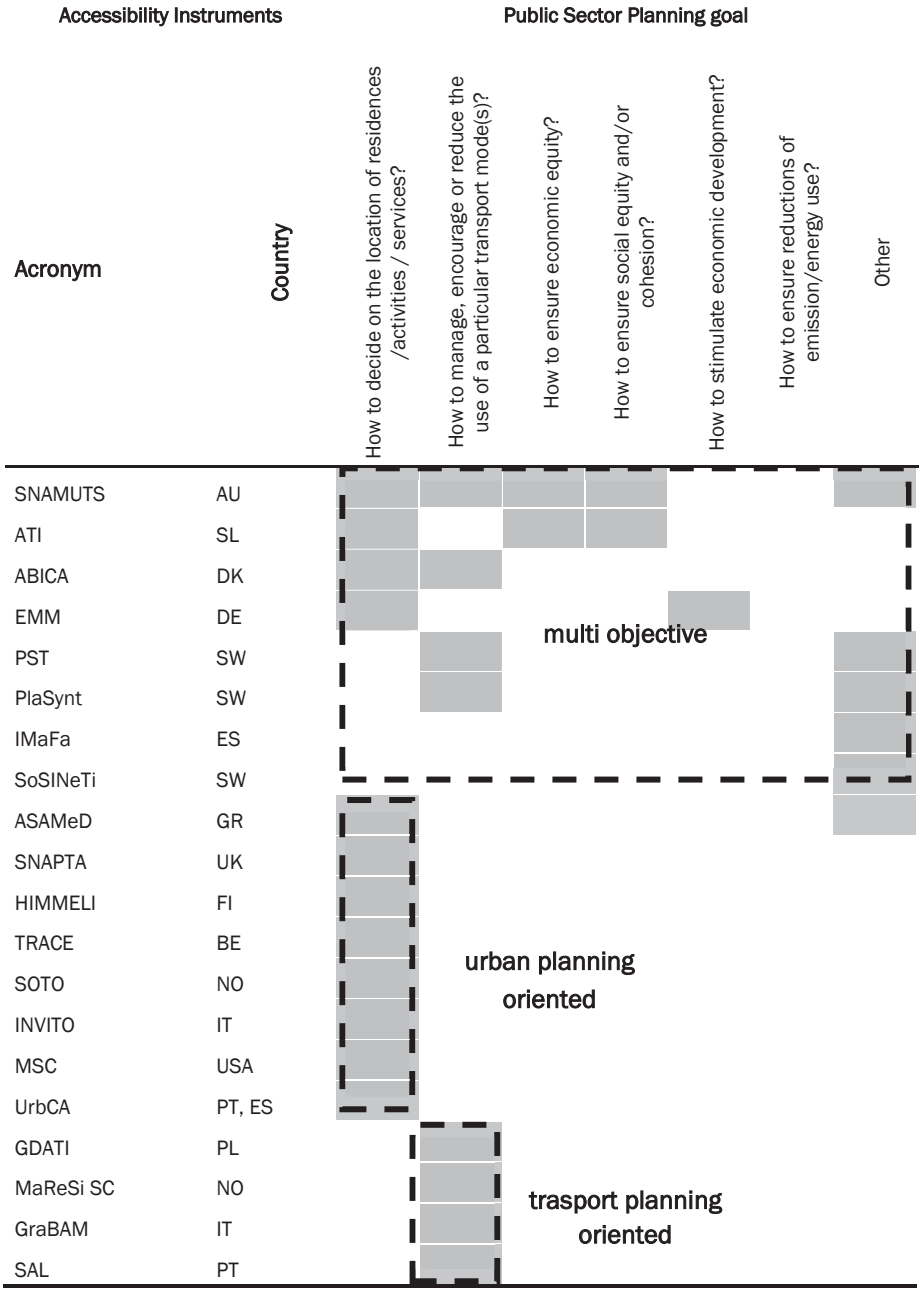
In order to show the coverage of the accessibility instrument, the following tables (from Table 4.2 to Table 4.7) demonstrate how the tools presented in this research can be used and in which circumstances, according to the different services provided by the instruments. From the coverage analysis some clusters of accessibility instruments were defined according to the categories used.

The accessibility instruments presented in this research cover all the geographic scales from the supra-national scale to the street level, but only *IMaFa* and *RIN* can be used at the supranational scale; *IMaFa*, *GDATI*, *TRACE* and *RIN* can be applied at the national scale. Only *IMaFa*, *PlaSynt*, *ASAMeD* and *MoSC* consider the street level. Almost all of the instruments have been developed for the use at the supra-municipal scale and around 3/4 for the municipal scale. On the other hand, the instruments for applications at the macro or micro scale are less numerous. Most of the instruments, as showed in Table 4.2, can be used also for applications at two or more geographic scales.

Table 4.2 Coverage of each Accessibility Instrument according to the geographical scale

Accessibility instrument		Geographic scale					
Acronym	Country	supra_national	national	supra-municipal	municipal	neighbourhood	street
IMafA	ES						
RIN	DE						
TRACE	BE						
PlaSynt	SE						
MoSC	USA						
GDATI	PL						
SAL	PT						
InViTo	IT						
EMM	DE						
SNAMUTS	AU						
SOTO	NO						
ABICA	DK						
UrbCA	PT						
HIMMELI	FI						
GraBAM	IT						
JAD	NL						
SNAPTA	UK						
ATI	SL						
SoSINeTi	SW						
ASAMeD	UK						
PST	SE						
MaReSi SC	NO						

Table 4.3 Coverage of the Accessibility Instruments according to the planning goals



According to the planning goals (see Table 4.3), nine accessibility tools proposed in this research have a multi objective structure. The other tools are mainly aimed at deciding on the location of residences /activities / services (urban planning oriented) or at managing, encouraging or reducing the use of a particular transport mode (transport planning oriented). One instrument (*EMM*) has the objective of stimulating economic development. The economic and social equity goals are covered by two instruments (*SNAMUTS* and *ATI*). None of the accessibility tools has any particular relevant aim to reduce emissions/energy use. Several instruments have also identified other specific objectives besides of the once available, which nevertheless could be settled within the existing list of general objectives and concerns (focussing on particular transport, land use, social or economic objectives).

The tools that are "transport planning oriented", aiming to manage, encourage or reduce the use of a particular transport mode, can be divided into different categories according to the particular transport mode they are oriented towards. Two instruments (*SAL* and *ABICA*) have the goal of managing all the transport modes. *GraBAM* has the aim of reducing car use and encouraging public transport, while *PST* has the objective of managing car, bicycle and walking modes. *PlaSynt* and *MaReSi SC* focus on car use and *SNAMUTS* and *GDATI* have the aim of managing public transport modes (see Table 4.4).

Table 4.4 Coverage of the Accessibility Instruments according to the planning goals – transport modes

Accessibility Instruments		Public Planning goal – transport modes (How to manage, encourage or reduce the use of a particular transport mode(s)?)			
Acronym	Country	Car	Public Transport	Bicycle	Walking
SAL	PT	■	■	■	■
ABICA	DK	■	■	■	■
GraBAM	IT	■	■		
PlaSynt	SW	■		■	■
PST	SW	■			
MaReSi SC	NO	■			
SNAMUTS	AU		■		
GDATI	PO		■		

As regards the decision support task, the accessibility tools can be categorized according to their mission in the planning process: a passive decision support tool (aids the process of decision making, but cannot bring out explicit decision suggestions or solutions), an active decision support tool (can bring out such decision suggestions or solutions), a cooperative decision support tool (allows the decision maker or advisor to modify, complete, or refine the decision suggestions provided by the system, before sending them back to the system for validation) or a tool used in the ex-post evaluation of the decision impact.

The accessibility instruments cover all the different decision support tasks, with a significant (nearly half of the instruments) prevalence of strategic planning support tools (see Table 4.5). We can find two passive decision support tools; three active decision support tools; four cooperative decision support tools; three can be used in the ex-post evaluation of the decision impact. Finally, one instrument is used in many different parts of the planning, appraisal and project delivery process.

Table 4.5 Coverage of the Accessibility Instruments according to the decision support task

Accessibility Instruments		Decision support task					
Acronym	Country	Passive decision support tool	Active decision support tool	Cooperative decision support tool	Used in the ex-post evaluation of the decision impact	Strategic planning support tool	Other
PST	SW						
SAL	PT						
MaReSi SC	NO						
GraBAM	IT						
RIN	DE						
GDATI	PO						
TRACE	BE						
MSC	USA						
UrbCA	PT, ES						
SNAPTA	UK						
ASAMeD	UK;NL;SE;BRA;CH;SA;JA						
SoSINeTi	SW						
PlaSynt	SE						
EMM	DE						
HIMMELI	FI						
SNAMUTS	AU						
SOTO	NO						
IMaFa	ES						
ATI	SL						
JAD	NL						
INVITO	IT						
ABICA	DK						
ACCALC	UK;EC;Global						

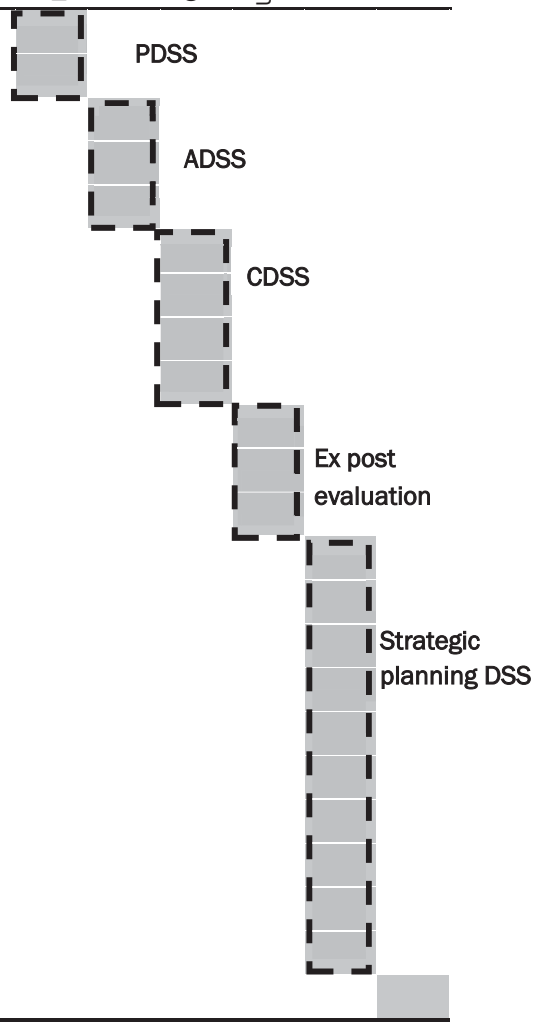
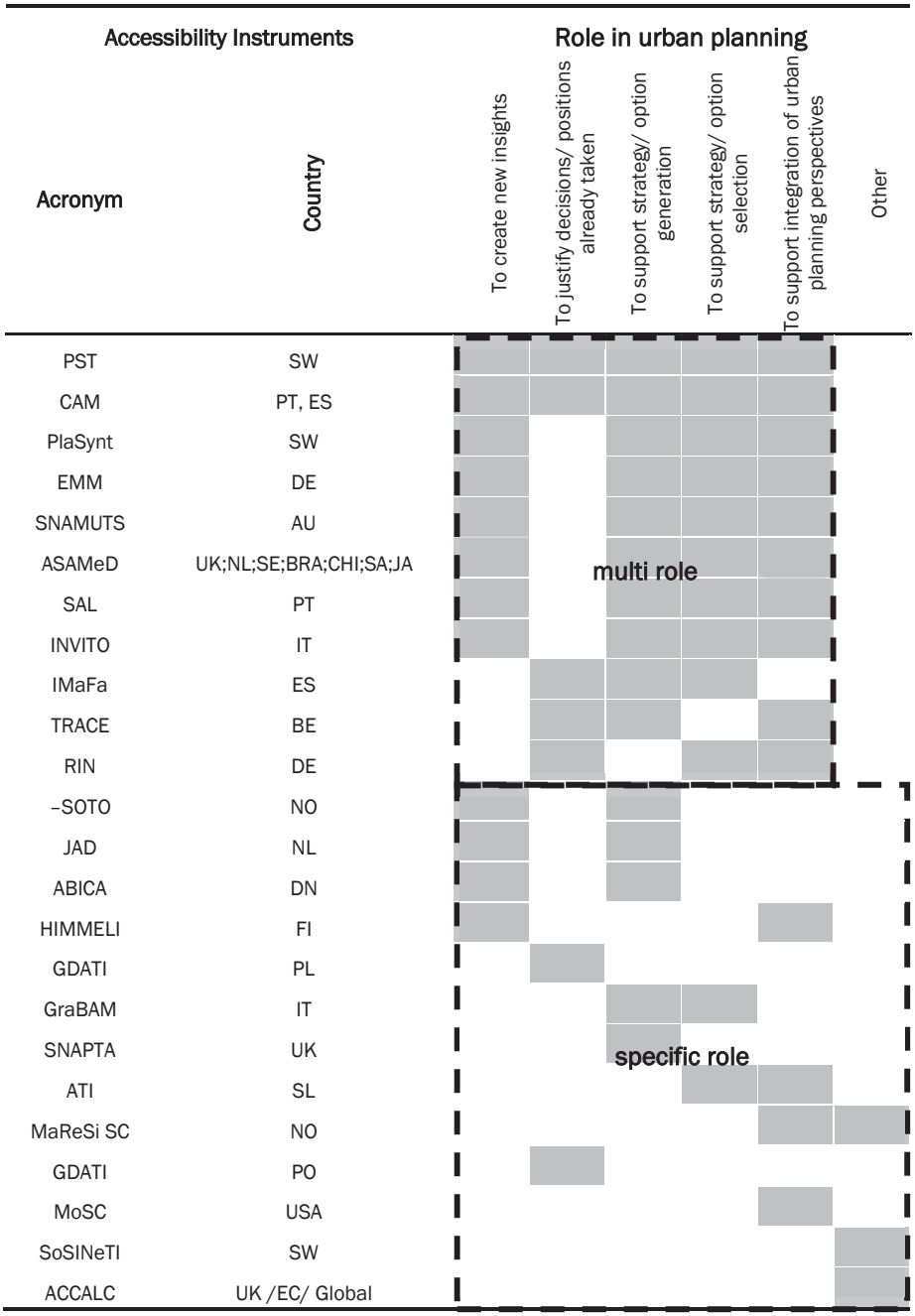


Table 4.6 Coverage of the Accessibility Instruments according to the instrument's role in urban planning



The accessibility instruments have different (intended) roles in the urban planning process: they can be used to create new insights, to justify decisions/ positions already taken, to support strategy/ option generation, to support strategy/ option selection, to support integration of urban planning perspectives. According to this categorization, two tools (*PST* and *UrbCA)* have all the above mentioned functions.

PlaSynt, EMM, SNAMUTS, ASAMeD, SAL and *InViTo* can be used to create new insights, strategy/ option generation, strategy/ option selection and integration of urban planning perspectives. *SOTO*, *JAD* and *ABICA* have the function of creating new insights and of supporting strategy / option generation.

In general, it is fair to say that around half of the accessibility instruments have a multi-role in urban planning, focussing most of the different urban planning roles for which planning support systems generally developed. The other half has more specific roles, concentrating on one of two of these roles at a time. Within these instruments, the roles of creating new insight, supporting strategy/ option generation and to supporting integration of urban planning perspectives are most frequently found.

Table 4.7 Coverage of the Accessibility Instruments according to the transport modes used in the instrument

Accessibility Instruments		Transport modes used in the instruments						
Acronym	Country	Any mode	Car	Public Transport	Walking	Bicycle	Other	Not applicable
PST	SW	■					■	
MaReSi SC	NO	■					■	
ACCALC	UK /EC/ Global	■						
EMM	DE		■	■	■	■		
SAL	PT		■	■	■	■		
RIN	DE		■	■	■	■		
JAD	NL		■	■		■		
ABICA	DK		■	■		■		
HIMMELI	FI		■					
UrbCA	PT, ES		■					
INVITO	IT		■		■			
GraBAM	IT		■	■				
IMaFa	ES			■	■			
SNAPTA	UK			■				
SNAMUTS	AU			■				
GDATI	PO			■				
SOTO	NO			■				
SoSINeTi	SW			■				
PlaSynt	SW				■	■		
ASAMeD	UK;NL;SE;BRA;CHI;SA;JA				■	■		
MoSC	USA				■			
TRACE	BE							■

Multi modal

Car

Car + sm

Sustainable mobility

Accessibility instruments use different transport modes and in most cases combinations of them. All main transport modes are covered by the accessibility instruments researched in this Action, although analysis on accessibility by public transport, have more instruments to choose from. Instruments, such as, *PST*, *MaReSi SC* and *ACCALC* can use any mode, while *EMM*, *SAL* and *RIN* consider accessibility by the major transport mode groups (car, public transport, bicycle and walking). Most instruments consider more than one transport mode. Instruments dedicated exclusively to one particular transport mode can be found for car accessibility (HIMMELI and UrbCA) and for public transport (SNPTA, SNAMUTS, GDATI, SOTO and SoSINeTi).

According to the trip purposes/ opportunities used in the instruments, the majority of the instruments make use of all purposes (work, leisure, healthcare, shopping, education). Some of these use aggregate measure and thus are unable to specify the accessibility to particular activities while others may consider accessibility to any particular activity type. From the remaining instruments some focus on work and shopping activities can be inferred.

Table 4.8 Coverage of the Accessibility Instruments according to the trip purpose

Accessibility Instruments		Trip purposes / opportunities used in the instrument						
Acronym	Country	Any purpose (disaggregate) or All purposes (aggregate measure)	Work	Leisure	Healthcare	Shopping	Education	Other
SNAPTA	UK	■						
PST	SW	■						
PlaSynt	SW	■						
SNAMUTS	AU	■						
SOTO	NO	■						
SAL	PT	■	Multi purpose					
MoSC	USA	■						
RIN	DE	■						
UrbCA	PT, ES	■						
EMM	DE	■						
IMaFa	ES		■	■	■	■		
ABICA	DK		■	■		■		
GraBAM	IT		■	Systematic trips			■	
HIMMELI	FI					■		
TRACE	BE					Shopping		
MaReSi SC	NO					■		
JAD	NL							■
ACCALC	UK /EC/ Global							■

All the characteristics of each instrument have been summarized in Appendix 2 in order to clearly show the characteristics and coverage of each instrument presented in the research and their specific differences.

4.3.2. Planning Context and Usability of Accessibility Instruments

This section covers what the survey has told us about the planning context in which the accessibility instruments are designed to be used, the planning goals the instruments can address, the characteristics of the instruments, and developers' perceptions of how useful their instruments are for end users.

Planning Context

In three of the countries sampled (UK, Norway and Germany) there is a policy requirement to assess accessibility in urban planning and/ or transport planning (See Figure 4.1). Whilst in Sweden, Belgium, Spain, Greece and Denmark it is advised to use an accessibility instrument in either urban planning or transportation planning. Undertaking an accessibility assessment does not appear to be a requirement, at least in the context of Finland, Australia, Poland, Italy, Portugal, Slovenia, and the Netherlands.

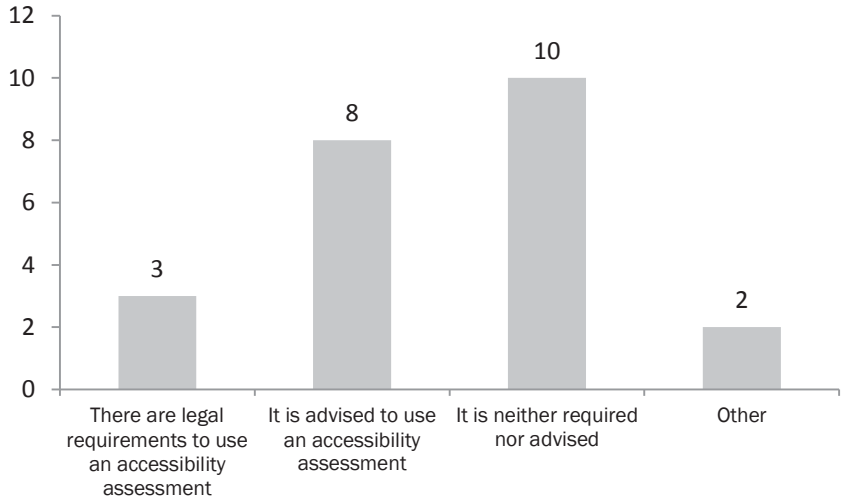


Figure 4.1 Policy requirements to undertake an accessibility analysis

Twelve of the instruments have been already used in either urban/ transport or health service planning. Five of these tools are also used in research by the tool developer. The remaining instruments are research tools which have either been developed or are in the process of development.

All the instruments are designed to be used by spatial or urban planners. In four cases these users were the only ones perceived to be potential users. Eighteen (78%) are also relevant for transport planners. Just over half (52%) of tool initiators also feel that their instruments would be appropriate for other tool initiators/ developers or researchers to use too.

Twelve tool initiators thought a range of other users would be interested in their instrument besides urban and transport planners. Of the 3 retail location instruments, two mention retailers and two mention politicians. Politicians are mentioned by 6 other tool initiators in combination with citizens/ citizens and retailers/ and health, education, and retailers. 3 other tool initiators anticipate that either health and education, or health, education, retailers and citizens could be potential users.

Planning Goals

Thirteen of the instruments only address one of the public stakeholder planning goals as shown in

Table 4.3 above. 7 instruments address multiple goals (See Table 4.9), and in 4 cases no answer was given.

Table 4.9 Instruments that address multiple public stakeholder goals

Instrument	Public Stakeholder Goals Addressed
PST	How to manage, encourage or reduce the use of a particular transport mode(s)
	Traffic and urban planning in municipalities
PlaSynt	How to manage, encourage or reduce the use of a particular transport mode(s)
	The impact of planning/ development proposals on travel habits such as route choice and mode choice, the retail potential and the potential for public space to be used
EMM	How to decide on the location of residences/ activities/ services
	How to stimulate economic development
	How to ensure reductions of emissions/ energy use
SNAMUTS	How to decide on the location of residences/ activities/ services
	How to manage, encourage or reduce the use of a particular transport mode(s)
	How to ensure social equity and/ or cohesion
	How to ensure economic equity
	How to secure speed/ cost efficiency/ potential of a particular transport mode. How to manage urban growth/ transformation/ revitalization. How to enhance stakeholders' understanding of the link between land use and transport planning, and best practice in public transport network and service design.
ASAMeD	How to decide on the location of residences/ activities/ services
	How to improve cycling and pedestrian access; how to revitalize central areas; how to achieve social sustainability or cohesive communities; how to ensure access to basic services (health, education, welfare, food, shopping); how to increase the quality and experience of travel; how to create a low energy built environment.
ATI	How to decide on the location of residences/ activities/ services;
	How to ensure economic equity;
	How to ensure social equity and/ or cohesion.
ABICA	How to decide on the location of residences/ activities/ services
	How to manage, encourage or reduce the use of a particular transport mode(s)

PST, PlaSynt and *SNAMUTS* are research tools that are already used by urban or transport planners; *EMM* and *ASAMeD* are accessibility instruments used by researchers; and *ATI* and *ABICA* are instruments "in development".

Figure 4.2 Private investor concerns addressed by the instruments

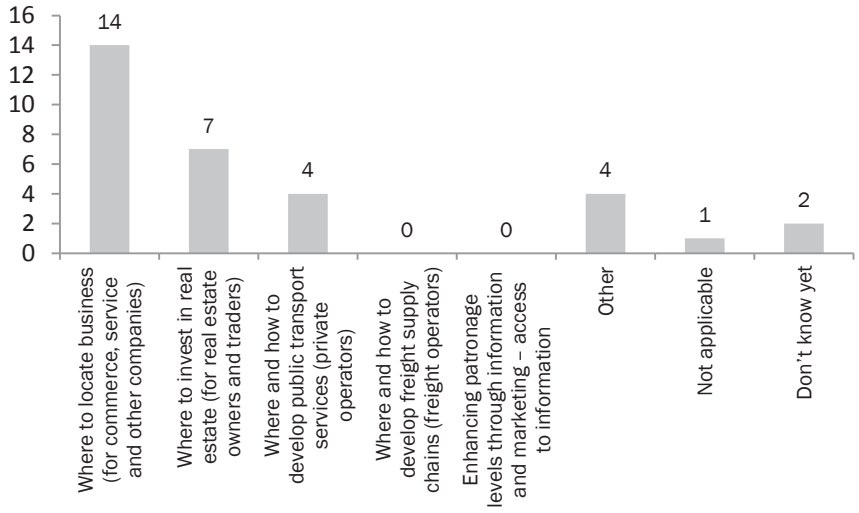


Figure 4.2 shows that nearly two-thirds (61%) of the instruments address private investors' concerns of where to locate their business. Thirteen of the instruments focus only on this and/or the issue of where to invest in real estate. *JAD* specifically addresses the private investors' goal of how to create places with high land values through transport investment.

PST and *ASAMeD* also address the public stakeholder concern of developing efficient transport services.

EMM, SNAMUTS, GDATI, and *InVio* provide information to private transport operators on where and how to develop public transport services. Except for *GDATI*, these instruments also address the issues of where to locate a business and/ or invest in real estate.

PlaSynt and *MaReSi SC* specifically focus on private sector retailers and public sector goals of managing transport. *PlaSynt* aims to identify the local market catchment area for retail and *MaReSi SC* answers the question of how large a shopping centre do we need in this location?

Figure 4.3 shows that 43% of instruments address the key issue for individuals of choosing where to live. Eight of the 10 instruments focus on this individual goal only; *EMM* also aims to support decisions on where to find the nearest activity, and *MaReSi SC* also supports decisions on where to find the nearest activity and choosing the best route to that activity.

SNAMUTS and *ASAMeD* address both how to choose the best route to a particular activity and how to choose the nearest activity. The latter specifically has the aim of "Choosing a neighbourhood/ housing area with a good choice of services available (health, education, etc), the quickest route to work, and how to get to the nearest opportunity". *TRACE* assesses how to choose the nearest retail activity.

Four instruments are able to help in the choice of the best route to a particular activity. *SNAMUTS* focuses on only district centres within the metropolitan area where there are spatial concentrations of two or more activities (employment, education, leisure, retail or health facilities). *SNAPTA* focuses on how to choose the best route to a destination by public transport and covers the activities of employment, education, leisure and health facilities. The two other instruments that enable choosing the best route to a particular activity are *MaReSi SC* and *ASAMeD.*

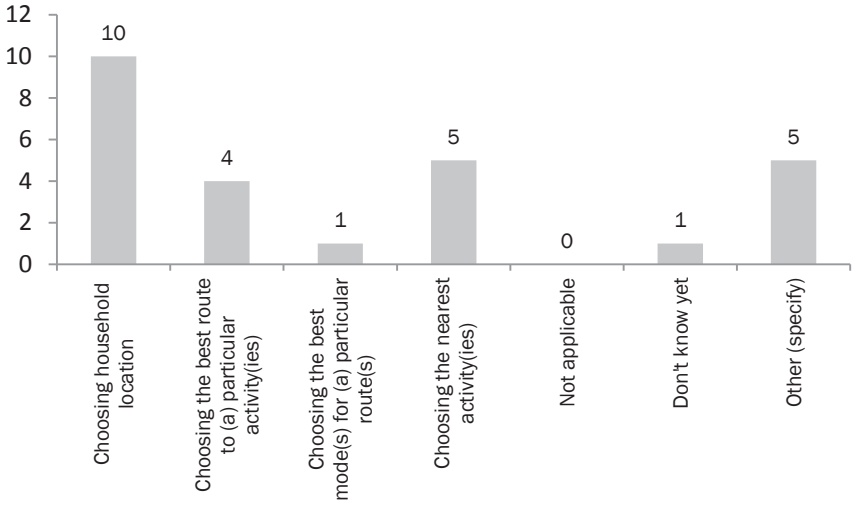


Figure 4.3 Individual goals addressed by the instruments

Accessibility Instrument Characteristics

Several questions sought information on the specific characteristics or the components of accessibility which the instruments focussed on. The transport modes and the trip purposes analysed have already been addressed in tables Table 4.7 and Table 4.8 above. This section focuses on the accessibility components, the accessibility measure traditions the instrument is attached to, how well instrument developers perceive their instrument represents reality, and what the perceived user experience is.

Only 3 instruments (13%) take into account all the accessibility components of land use, transport, temporal and individual characteristics as shown in Figure 4.4. These are *PlaSynt, ATI*, and *RIN*. The remaining instruments (87%) take into account some of the components.

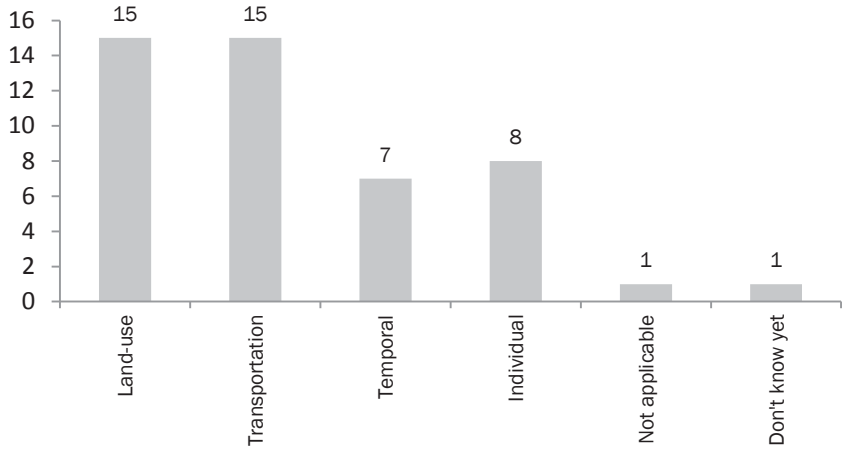


Figure 4.4 Accessibility components addressed by the instruments

There are four main accessibility measures that the instruments rely on. These are gravity-based measures, network measures, spatial separation measures and contour measures (See Figure 4.5). Ten instruments are attached to only one of these traditions; the other instruments use combinations of accessibility measures in their analysis. Table 4.9 shows a grouping of the instruments around the accessibility measure traditions.

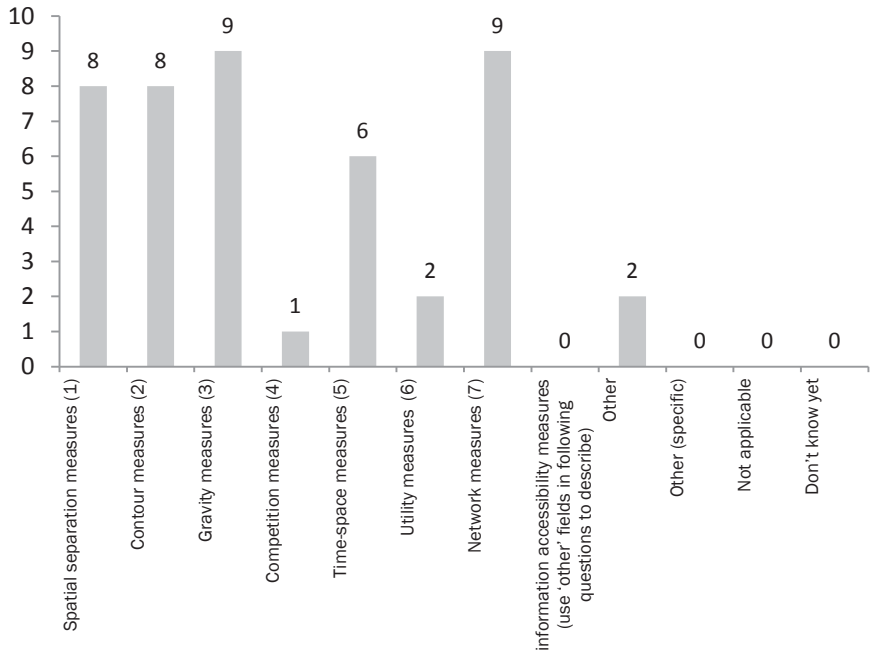


Figure 4.5 Accessibility measures used in the instruments

Table 4.10 Accessibility measures used in the instruments

Accessibility Instruments		Accessibility measure traditions								
Acronym	Country	Spatial separation	Contour	Gravity	Network	Time-space	Information	Utility	Competition	Other
SNAPTA	UK	■	■	■				■		
SNAMUTS	AU	■	■	■	■					
TRACE	BE	■	■			■				
IMaFa	ES	■	■		■					
ASAMeD	UK;NL;SE;BRA;CHI;SA;JA	■	■		■					
ATI	SL	■						■		
SOTO	NO	■	■							
SAL	PT	■	■							
MSC	USA	■			■		■			
GDATI	PO	■			■					
PST	SW				■					
PlaSynt	SW				■					
RIN	DE				■					
MRSC	NO			■		■			■	
EMM	DE		■	■						
HIMMELI	FI			■	■					
JAD	NL		■	■						
ABICA	DK			■		■				
GraBAM	IT			■						
UrbCA	PT, ES			■						
INVITO	IT					■				
SoSINeTi	SW					■				
ACCALC	UK /EC/ Global									■

Spatial separation/ contour measures

Network measures

Gravity-based measures

Few of the instruments have been designed to evaluate the quality and experience of travel. Tool developers were asked to rate their instruments on this attribute on a scale of 1-7, with 7 being the highest rating The mean and median scores in Table 4.11 show that the sample accessibility instruments are relatively weak in their ability to demonstrate understanding of the quality and experience of travel.

Table 4.11 Developer's perception on a number of issues influencing usability of Accessibility Instruments

Theme	Question	Min.	Max	Mean	Median
Usability of tool in understanding the quality and experience of travel	Social evaluation	1	7	4	4.5
	Environmental evaluation	1	7	3.9	4
	Safety and security evaluation	1	7	2.5	2
	Physical skills evaluation	1	6	2.4	1
Quality, accuracy and speed of the instrument	Quality of data	3	7	5.6	6
	Quality of calculations	3	7	5.6	5
	Accuracy of the model	3	7	5.2	5
	Speed of the tool	1	7	3.9	4
Knowledge and Skill levels required by practitioners	Modelling and computational skills	1	7	4.5	4
	Spatial awareness skills	2	7	4.6	5
	Understanding policy context	1	6	3.7	4
Tool Initiators Evaluation of the Ease of Using Accessibility Instruments	Ease of collecting data	2	7	4.2	4
	Ease to play	1	7	3.8	3
	Transparency	3	7	5.4	5
	Flexibility	3	7	5.4	6
	Understandable output	4	7	5.3	5
	Visual representation	2	7	5.5	6

A number of questions explored how 'easy to use' the instruments would be for practitioners, Table 4.11 above shows the four categories of questions with each question rated by tool developers on a scale of 1-7, with 7 being the highest rating.. The first category focused on the quality and experience of travel. The table shows that the mean and median scores are the lowest ratings given overall for this suite of questions, with tool developers being more confident that their instrument would be able to provide evaluation of the social aspects of accessibility.

Tool developers were asked to rate the quality of the data and the calculations as well as the accuracy of the model and the speed of the instrument's calculations. Tool developers gave slightly higher ratings for the quality of data and the quality of calculations than the accuracy and the speed of the instrument. The best performing instruments on these representations of reality were both gravity-based accessibility measures.

Tool developers rated the prior knowledge and skills required from practitioners to be able to use their instrument. Modelling and computational, and spatial awareness, skills were seen as more necessary than knowledge and understanding of the policy context

The visual representation of accessibility instruments for end users and the flexibility of the instrument in terms of the ease of changing parameters and variables are both highly rated in this sample. In both cases the median score shows that the distribution is influenced by a few low scoring instruments. Tool initiators also consider their instruments have a high level of transparency in terms of the main causal assumptions and that the output is understandable. Problems arise more from the ease of playing with the instrument and the ease of collecting the necessary data, both of which have lower ratings.

Two of the instruments described as 'in use' by practitioners received higher scores on the usability of instruments, as did many of the instruments classified as 'in development'. This suggests that engagement with practitioners does lead to positive refinement of the instruments and also that the more recent tool developers are starting to address the usability of their instruments.

Institutional barriers to using Accessibility Instruments

This last section looks at some of the known barriers to using accessibility instruments. Tool developers identified a number of institutional issues that block the effective use of accessibility instruments in their country. Data availability is the most problematic issue identified, followed by separate institutions for urban and transport planning and formal government processes. The different objectives of organisations and the political commitment to implement accessibility instruments are also seen as problematic.

Table 4.12 Barriers to the use of Accessibility Instruments

Barrier	No. of responses	% of sample
Separate urban and transport planning institutions	9	39%
Formal processes	7	30%
Financial arrangements	2	9%
Data availability	11	48%
Different planning objectives and/ or assumptions	6	26%
Staff technical skills	4	17%
Political commitment	6	26%
Other	5	22%

Four respondents were not aware of any institutional issues that might create a barrier to the use of accessibility instruments. Two respondents mentioned only barriers which were not included in the question. Seven respondents identified three or more barriers. Several respondents identified additional barriers.

Table 4.13 Institutional and other issues that might block the effective use of accessibility instruments

Instrument	Barriers
SNAPTA	Resources including time available to planning agencies to engage in such deliberation; Sometimes - timely and consistent data availability
TRACE	Data availability, tool in development
SAL	The instrument considers several activities (any you want but this does not mean it does so in an aggregate manner)
MaReSi SC	Black-boxing and competing analyses (non-transparent, non-understandable, incomprehensible assumption etc) from the initiators' consultants
ACCALC	Most money in transport planning is linked to the delivery of a project not to the analysis of problems for users so there will always be relatively more analysis to make the case for than to understand the accessibility needs of people
IMaFa	Not easy to elaborate and high cost instrument
SoSiNeTi	Long term data, post evaluation data

4.3.3. Cross-analysis

In this cross-analysis questions from three survey sections – *Planning Context* (Q 1.1-1.4), *Planning Goals* (Q 2.1-2.3), and *Characteristics of the Instrument* (Q 3.1-3.12) – were tested against evaluative answers of *End-users and how they use the tool* (Q 4.1-4.9).

It was clear from the very beginning, that the survey composed as the first stage of the Action will contain inconsistencies in terminology and it became clear in the analysis of the survey that the respondents from different backgrounds bring natural uncertainties, fluctuation and mismatch to their answers. Therefore at this stage it is not feasible to try a comprehensive cross analysis, but instead to seek to find some preliminary main characteristics of the instruments.

A systematic check was made for clusters of answers in each question according to the most obviously recognised components and mapped against Qs 4.2, 4.4 and 4.5. For each class the mean values of the answers have been calculated and histogram have been defined, in order to understand if any relation exists between the Accessibility Instruments and the usage potential of the tool. For most of the analyses no significant relations have been found.

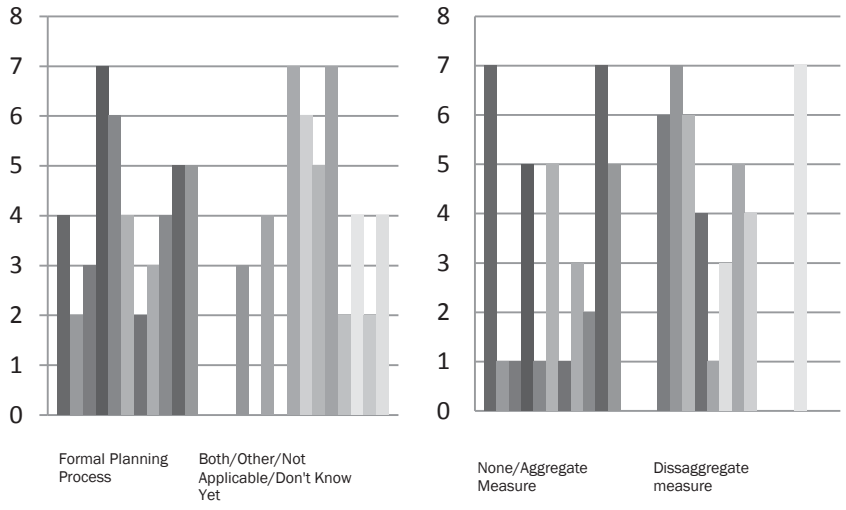


Figure 4.6 Cross-analysis of selected questions

Typical histograms of cross analyses in Figure 4.6 above show the variation in answers that make further explanation using cluster analysis difficult. So far the best candidate for providing a common explanatory factor for the end-use characteristics was found from the group of questions concerning the aggregation/disaggregation level of data (Q3.4-3.6).

Some tentative results can be seen through a single analysis. Questions in section 3.4 required respondents to identify the level(s) of spatial aggregation in their instrument. Detailed sub questions were divided in four and included aggregation by area units (administrative unit level), local level spatial enclaves (plot level), networks (street segment level) and social grouping (individual group level). Of these the last three contain a description of disaggregated spatial entities in models, which might give a hint of the complexity of the operation procedure. This was used as a clustering principle that is easily recognized. Five instruments [13] are based solely on aggregated data and four instruments [14] use only a single type of disaggregated data. The remaining twelve instruments [15] were ones containing multiple disaggregate data sources.

[13] SoSINeTi, ABICA, GraBAM, SOTO, SNAMUTS

[14] MoSC, ATI, IMaFa, SNAPTA

[15] UrbCA, RIN, IN.VI.TO, JAD, SAL, ASAMeD, MaReSi SC, TRACE, GDATI, HIMMELI, PST; PlaSynt

Table 4.14 Grouping by spatial aggregation and the difference between three instrument groups

3.4 Identify the level(s) of spatial aggregation of data used in the instrument.	. Ease of collecting data	ease to play with instrument	transparency of main causal assumptions	flexibility of instrument (ease of changing parameters and variables)	understandable output	visually representation	Please rate the knowledge and skills required to use the tool in terms of: modellingcomputational skills	spatial awareness skills	understanding policy context	usability in environmental evaluation	usability in safety and security evaluation	usability for physical skills evaluation
	Q 4.2						**Q 4.4**			**Q 4.5**		
	A	**B**	**C**	**D**	**E**	**F**	**A**	**B**	**C**	**B**	**C**	**D**
Only aggregate data (N=6); MEAN	2,333	2,333	3,667	3,833	3,667	2,833	3,000	2,667	1,500	1,500	0,833	1,000
One disaggregate source (N=4); MEAN	4,750	2,750	5,500	5,500	5,750	6,500	5,250	4,000	2,000	4,000	3,500	2,750
Multiple disaggregate data source (N=12); MEAN	4,308	4,154	5,308	5,308	5,154	5,538	4,231	4,923	4,308	4,077	2,154	2,154
Difference: row1 | row2	-2,417	-0,417	-1,833	-1,667	-2,083	-3,667	-2,250	-1,333	-0,500	-2,500	-2,667	-1,750
Difference: row1 | row3	-1,974	-1,821	-1,641	-1,474	-1,487	-2,705	-1,231	-2,256	-2,808	-2,577	-1,321	-1,154
Difference: row2 | row3	0,442	-1,404	0,192	0,192	0,596	0,962	1,019	-0,923	-2,308	-0,077	1,346	0,596

Although it is obvious that the visual representation benefits from detailed data collection in the same way as the applicability of the instrument for social-economic evaluation is correlated with the level of the socioeconomic disaggregation of the data, it appears that it also has the effect of wider usage and operation of the instrument. Even though the sample sizes are small and the objectivity of respondents can be further debated, it is probably not too much to say that the level of aggregation/disaggregation divides instruments into two major categories that also have very different usage potentials.

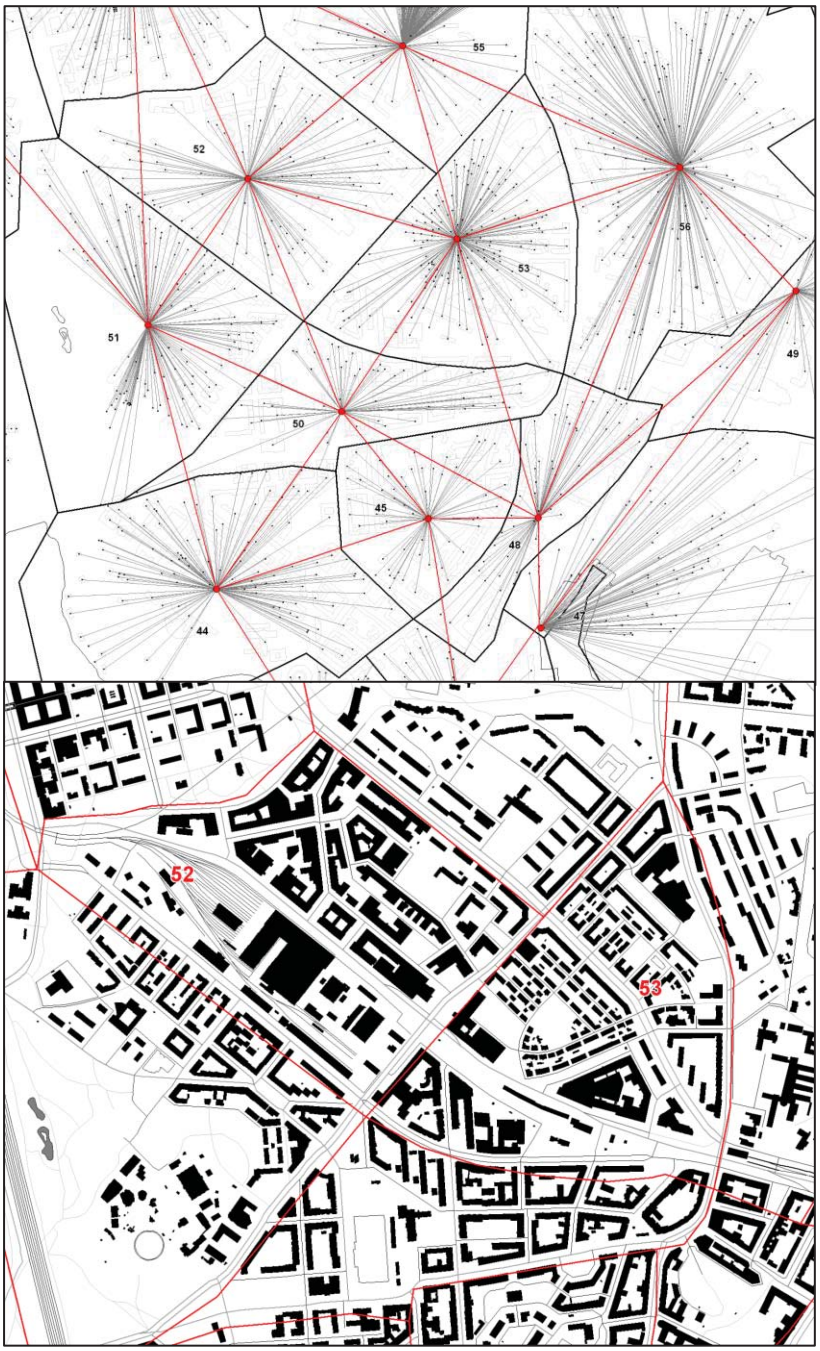


Figure 4.7 Images showing two extreme principles of accessibility instruments: zonal aggregation vs. detailed morphology

4.4 Conclusions

This conclusion summarises the main findings of the questionnaire survey and draws out some salient points that will be reflected on in Section 5 of this report.

We have heterogeneity evident in the accessibility instruments in this COST Action. This may reflect the diversity of the urban planning contexts across Europe and the different institutional contexts for urban planning such as the legal underpinnings, responsibilities and the spatial levels at which urban planning governance takes place. The instruments in this Action focus essentially on the needs of spatial/ urban planners (27%) and transport planners (24%) for data on accessibility.

In particular, the instruments are intended to support the following urban planning tasks:

1. The integration of urban planning perspectives (27%).
2. Strategy/ option generation (25%).
3. Strategy/ option selection (23%).
4. Create new insights (16%).
5. Justify decisions/ positions already taken (10%).

Few instruments are able to understand the quality and experience of travel.

An accessibility analysis is required in 3 EU member states for some aspects of urban and transport planning. The survey confirms that the instruments developed in these countries tend to have a higher level of transparency of the main causal assumptions, since they have been used by practitioner and other stakeholders. The visual representation of the findings is also more developed in these instruments. Where there is a legal requirement, the instruments focus more on aspects of a liveable, sustainable community/ settlement, than the other instruments.

The survey suggests that in another four member states it is advised to undertake accessibility assessments and in the remaining countries in this Action, it does not yet appear to be supported. Respondents drew attention to a number of barriers to using accessibility instruments in their country. These included data availability (mentioned by 48% of respondents), separate urban and transport planning institutions (39%), formal processes (30%), different planning objectives/ assumptions (26%), and political commitment (26%). Five respondents mentioned other barriers too.

Despite the diversity of instruments and their purposes, the Tables in this section have started to cluster and categorize the instruments based on the questionnaire responses. Clustering has been analyzed for the issues of geographic scale (Table 4.2), public sector planning goals (

Table 4.3), decision support task (Table 4.5), role in urban planning (Table 4.6), transport modes used in the instruments (Table 4.7), trip purposes (Table 4.8), and accessibility measure traditions (Table 4.10).

Tool developers were asked to rate how user-friendly their instruments were on a number of dimensions. Generally higher ratings were given for the quality of the data used, the quality of the instrument calculations, the visual representation of outputs and the flexibility of the instrument in terms of changing parameters. Lower ratings were generally given for the speed and accuracy of the instrument, the ease of playing with the instrument and the ease of collecting data by end –users. However, some instruments “in development” were given higher ratings on these aspects by their tool developers.

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