Identifying the Accessibility Problems of Disadvantaged Groups & Generating Solutions

Application to the Barnsley Dearne Area of South Yorkshire

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1. Introduction

This report forms part of the output of Project B of the DISTILLATE consortium research, funded by EPSRC under the 'SUE' (Sustainable Urban Environments) research programme. Project B is concerned with developing a range of tools to assist in the process of transport/land use option generation, at both strategic and scheme levels, that either draw on existing knowledge (leading to 'inside-the-box' solutions) or use methods that encourage more innovative thinking (resulting in 'outside-the-box' solutions)¹.

The spreadsheet tool described in this report covers strategic level option generation, in the context of developing a sub-regional Accessibility Planning strategy. It recognises that the starting point of such an exercise is to obtain a detailed and comprehensive understanding of the kinds of practical problems experienced by various population groups living in different communities, so that appropriately targeted solutions can be developed. The tool then helps practitioners to develop solutions aimed at particular kinds of problem, by using a combination of 'inside-the-box' and 'outside-the-box' option generation methods.

The tool has been developed in conjunction with officers in South Yorkshire PTE and Barnsley Council, with funding to cover local meeting and survey costs from Yorkshire Forward and One Barnsley. The information contained in the tool, covering problem identification and potential inside-the-box option generation solutions has been derived from work with local residents in the Barnsley Dearne area (covering three ex-coalmining communities) and with the agencies that provide services for these communities, through a series of focus groups² and professional workshop sessions³.

Components of the tool were tested during a workshop with representatives of the delivery agencies for the Dearne (including education, health, housing, regeneration, policing and public transport) held in Barnsley in December 2007. This workshop also included a local councillor and two representatives of the local residents (a single mother and a retired lady)

¹ Jones, P. and Lucas, K. (2005) 'DISTILLATE, Project B: Option Generation - Literature Review'. December. DISTILLATE Working Paper, TSG, Westminster, December.

² Snell, C, and Jones, P. (2007) 'Accessibility problems in the Dearne: Experiences of some local residents and their suggestions for solutions. A case study for developing Accessibility Planning tools for problem identification and option generation. DISTILLATE Working Paper, CTS, UCL, December.

³ Jones, P. and Thoreau, R. (2008) 'Engaging with professional stakeholders in the Dearne Valley Area of South Yorkshire. Strategic problem identification and option generation: the case of Accessibility Planning.' DISTILLATE Working Paper, CTS, UCL, March.

2. Overview of the Tool

The Accessibility Planning problem identification/option generation tool has four main components, as illustrated in Figure 1.



Figure 1: The main components of the spreadsheet tool

The first component summarises details of the timing and location of provision of the particular service of interest. The second component considers the client groups for that service, and identifies the timing constraints that limit when they can take part in particular activities associated with that service, without having to make major changes to their daily schedules. The third component turns to the particular areas where prospective clients live, and looks at the kinds of accessibility problems that people might face, under five headings; those categories which will apply partly depend on where services are located in relation to clients' homes. Finally, the fourth component considers potential solutions to the problems that have been identified, both at general and very specific levels, using a mixture of inside-the-box and outside-the-box option generation techniques.

Each section of the tool is described and illustrated in turn, in the remainder of this report.

3. Service Provision

Figure 2 shows the main screen for the Service Provision spreadsheet. The user needs to provide details of the type of service that is being described (in this case, Hospital Outpatient services), where these services are provided in relation to people's homes, and the times of day that the services are provided on weekdays, Saturdays and Sundays.

What	Hospital O	Ne	xt Sheet		
	At Home	Home Service/Delivery	0		V
	Actionie	Telephone/ Internet	0	,	View
Where	In \/illages	Mobile Service	0		cation
where	in villages	Local Service	0	LC	Man
	In Wider Aree	Direct Public Transport Acc	ess o		Map
	in wider Area	Public Transport Access via	a Interchange 💿		
	Monday-Friday Add service Reset	6 AM 9 AM 12	РМ ЗРМ	6 PM	9 PM 12 AM
When	Saturclay Add service Reset	6 AM 9 AM 12	РМ ЗРМ	, , , , , , , , , , , , , , , , , , ,	9 PM 12 AM

Figure 2: The Service Provision sheet

The blue text box next to the "What" section allows a text description of the service to be entered. The radio buttons in the "Where" section lets the spreadsheet user indicate where and how the service is provided. In the example shown in Figure 2, the service is provided in the wider area and is delivered by the service user travelling to the service site by public transport, usually requiring an interchange (e.g. if the hospital is sited on a Greenfield site). The "When" section is where the spreadsheet user enters the hours of operation of the service, on Mondays to Fridays, Saturdays and Sundays. Clicking the "Add Service Details" button brings up the dialogue box shown in Figure 3.

A	Add Service Details	
	Enter the start and end times for the service.	=
_	Start time 00:00 End time 00:00	M
	Add Service Cancel	

Figure 3: The "Add Service Details" dialogue box

The start and end times of the service that have been specified are then shown on the service time display, in blue. Discontinuous services (e.g. to represent morning and evening surgery hours) can be entered by using the "Add Service Details" dialogue box more than once. The "Reset" button removes all service timing details for that day of the week.

Clicking the button marked "View Location Map" takes the user to the type of map shown in Figure 4. This part of the spreadsheet allows the user to view the spatial distribution of the particular service that they are describing – in this case, hospital locations in the sub-region surrounding the Dearne Valley. The "Previous sheet" button returns the user to the initial "Service Provision" sheet (as shown in Figure 2).



Figure 4: The "Location Map" sheet showing the distribution of service provision

4. User Constraints

The second spreadsheet sets out information about the various temporal constraints typically faced by different service client groups, and relates this to information about service hours entered in the first sheet (Figure 2), to identify times of day when users could access the service without major inconvenience – taking into account public transport timings.

Figure 5 shows the layout of the main "User Constraints" sheet. The "Service" label and the weekday distribution of "Service hours" are automatically carried forward from the previous sheet.



Figure 5: The "User Constraints" sheet

The blue box in the "Type of Person" section allows a text description of the specific client user group to be entered. Up to six client user groups, with their associated constraints, can currently be defined. Clicking on the down arrow below the blue box allows the user to select a different service client group, as shown in Figure 6.

Type of Person	Lone parents with dependent children					
	Select new user group	Lone parents with dependent children				
Service	Hospital Outpa	Lone parents with dependent children 65 years and older Life limiting long term illness Group 4 Name				
Previous Sheet		Group 5 Name Group 6 Name				



Clicking the "View Distribution Map" button takes the user to a distribution map that relates in some way to the currently selected service client user group. For example, Figure 7 shows the map that is displayed when the "View Distribution Map" button is clicked when the client group "Lone parents with dependent children" is selected.



Figure 7: Map showing the distribution of the relevant client group

Adding Constraints

Two types of timing constraints can be added for a particular client user group, one relating to the "Personal Constraints" section and the other to the "Child/Adult Care Constraints" section.

Figure 8 shows the "Add Constraint Details" dialogue box. This box allows the spreadsheet user to add one constraint at a time to either the "Personal Constraints" or the "Child/Adult Care Constraints" sections. Each constraint must be given a start and an end time. It is also necessary to indicate whether the constraint is a complete **barrier**, something that would prevent the service client

group from accessing the service altogether, or a partial **obstacle**, something that makes it difficult (but not impossible) for the service client user to make use of the service. There are eight user definable constraint types for both types of timing constraint, which are distinguished by colour. Discontinuous constraints that only apply at specific times of day can be added by using the "Add Constraint Details" dialogue box more than once. Particular entries can be cancelled by clicking on the appropriate button.

dependent children Add Constraint Details	
1. Enter the start and end times for the constrain Start time 00:00 End time 00:00	t.
2. Is the constraint a total barrier, or a partial obstacle that can be overcome?	-
— Total Barrier Partial Obstacle ○	-
3. Enter a name for the constraint below.	
Category 1 Part time work Category 2 Volunteer work	=
C Category 4	
C Category 6	
C Category 8	
Add Constraint Cancel	

Figure 8: The *Add Constraint Details* dialog box

The times of application of the constraints are shown on the timeline alongside the relevant box, as shown in Figure 5. Those constraints that have been defined as complete Barriers are indicated by full height bars, and constraints that are defined as Obstacles are indicated by half height bars on the timeline, as shown in Figure 9.

Monday to Friday						Туре
Personal Constraints	Full height bar			Half height bar		Part time work Volunteer work
Add Constraint Delete	6AM 9AM	12 PM	ЗРМ	6РМ 9РМ	12 AM	

Figure 9: Full height and half height bars representing Barriers and Obstacles, respectively

Once added, individual constraints can then be deleted by using the "Delete Selected" button, as shown in Figure 10. Any constraint category, or combination of constraint categories, can subsequently be deleted by adding a tick mark next to the category name and then clicking the "Delete Selected" button.

Delete C	onstraint			
			Select All	
	Category 1	Part time work		
	Category 2	Volunteer work		
	Category 3			
	Category 4			
	Category 5			
	Category 6			
	Category 7			
	Category 8			
	Delete	e Selected	Cancel	

Figure 10: The "Delete Constraint" dialogue box

Note that, once Personal or Child/Adult Care constraints have been added, these are automatically deducted from the Service Hours for the specified service, to show the "Available Time", before any additional transport restrictions are taken into account – as shown in Figure 5.

Adding transport timing constraints

Unless the service is directly provided in clients' homes, time has to be allowed to travel form/to home to access the service. If this journey is made by a private mode of transport, then only the travel time has to be deducted from the "Available Time", but where public transport is being used (bus or train), the timetable imposes additional constraints.

Clicking the "Add Details" button in the "Transport Timings" section allows the spreadsheet user to add details about the timings/travel durations of public transport services to and from the location of the service being accessed. Figure 11 shows the "Add Transport Details" dialogue box. As can be seen, a distinction is made between transport timings from home to access the required service and those for the journey from the service back home.

Add Transport Details						
1. Is this a journey to or from the service?						
= Journey to	service					
📃 🖓 Journey fro	m service					
2. Enter the start	and end times below.					
Start time 00:00	End time 00:00					
=						
	Add Details Cancel					
<u>[</u>	Journey from service to home					

Figure 11: The *Add Transport Details* dialog box

If the spreadsheet user tries to add a journey that conflicts with a constraint that has already been entered, then the "Potential Conflict" dialogue box appears, as

shown in Figure 12. The spreadsheet user can then decide whether or not to continue adding the journey.



Figure 12: The "Potential Conflict" dialogue box

Once details of transport timings have been added, again the spreadsheet takes into account the other existing kinds of constraints in relation to the service opening hours, and shows the "Activity Time" when the client group could attend the service site without any major inconvenience – as shown in Figure 5.

Clicking the "Delete..." button in the "Transport Timings" section opens the "Delete journeys to or from service" dialogue box, as illustrated in Figure 13. To remove the journeys to or the journeys from the service, the spreadsheet user adds a check mark next to either "Journey to service" or "Journey from service", or both, and then clicks the "Delete Selected" button.





5. Access Problems by Area

Figure 14 shows the main Access Problems sheet. This sheet allows the user to identify and store potential access issues for a local area, by either selecting from an existing list of problems (here derived from the resident focus groups and the professional workshops), or by adding their own. Again, the Service type is carried forward from the first spreadsheet (Figure 5). The blue box in the "Area" section allows the user to add a text description for the local area; in the Dearne Valley case study areas were individual villages, as shown in the example of Bolton in Figure 14. Access issues can be stored for up to six areas, which can be selected by using the drop down box below the blue box.

Area	Bolton				View	Accessibili	v Map
Select different area Bolton							
Service	Hospital C	Outpatient	s				
						Start Genera	ting New Options
Previous Sheet	At Home	In Villages	Wide Direct Access by Public Transport	er Area Access via Interchange by Public Transport		or view sugg for each pro clicking on th	ested solutions blem category, by ne arrows below
nformation, Quality and Availability	,				Lack of Awa	areness of Services s Issue Clear Lis	t Suggested Solutions
Valking and Street Environment					Pavements	not suitable for bugg	ies and wheelchairs (too n
Cost of Transport					Lack of earl	ly morning availability	of concessions
					Add Acces	s Issue Clear Lis tes	t Suggested Solutions
Public Transport					Add Acces	s Issue Clear Lis	t Suggested Solutions
nterchanges					Lack of info	rmation about depart	ure points and timings
					Add Acces	s Issue Clear Lis	t Suggested Solutions

Figure 14: The Access Problems sheet

Clicking the "View Accessibility Map" button will link to an appropriate accessibility map that relates to the currently selected area (see Figure 15).



Figure 15: The Bus Accessibility Map for Bolton

Potential accessibility problems are grouped under five broad headings:

- 1. Information quality and availability
- 2. Walking and street environment
- 3. Cost of transport
- 4. Public transport
- 5. Interchanges

Only the accessibility categories that are relevant to where the service is provided are highlighted on the "Access Problems" sheet. This has been defined in the "Service Provision" sheet (see Figure 2), where the user has a range of options from 'At Home' to 'In Wider Area'. In Figure 2 the user indicated that Hospital Outpatients has been provided in a location requiring 'Public transport via interchange' and in this situation, all five accessibility problem groupings are potentially relevant.

Figure 16 shows how making different 'Where' selections on the "Service Provision" sheet affect the accessibility categories that are highlighted (and can be opened) on the "Access Problems" sheet.

Service Provision			Potential Access Problems							
Ι.				Area	Bolton	n				View Accessibility Map
	What	Hospital O	utpatients		Select d	ifferent are	a Betor		-	
	What			Service	Hos	pital Out	tpatient			
		At Home	Home Service/Delivery Telephone/ Internet	Present Dest	-	e Monee	it vPaper.	Prop Creat Activity by Autor Torroport	Area Areas and Material States	Start Generating New Options or view suggested solutions for each problem category, by dicting on the arrows below
	Where	In ∨illages	Mobile Service o Local Service o	Information, Qual and Availability	ity					Lack of Anarouses of Services
		In Wider Area	Public Transport Access o Public Transport Access via Interchange o	Walking and Street						Add Access lines Clear Lint Suggested Subtree
٤ t	Selectii he <i>Sei</i>	ng Home tvices she	e Service/Delivery on eet	Environment Cost of Transport Public Transport						
				Interchanges						
	Service P	rovision		Potential Access	Problems	5				
		00131011		Area	Bolton	n	100			View Accessibility Map
	What	Hospital O	utpatients	Service	Select d	ifferent are nital Out	a Betan		-	
		-		Service	1100					Start Generating New Options
		At Home	Home Service/Delivery o Telephone/ Internet o	Prevent Dest		(Hereine)	ia Villageo	High Crock Access by Autor Transport	Augusta August	or view suggested solutions for each problem category, by cicking on the arrows, below
	Where	In Villages	Mobile Service O Local Service O	Information, Qual and Availability	ity .		_			Lack of Assessment of Services
		In Wider Area	Public Transport Access o Public Transport Access via Interchange o	Walking and Stre	n i					Add Access lines Clear Line Supported Subport
				Environment						Add Access Issue Orear Lint: Ecospected Soldium
Ś	Selecti	ng Loca	al Service on the	Cost of Transpor	8					Lack of early rearring availability of concessions
•	Sorvica	s choot			-	-				Add Access Issue Crew List Separated Solutions
		53 311661		Public Transport						Add Access lines Clear Lin Supported Sectors
				Interchanges						

Figure 16: Effect of selecting different 'Where' options on the Service Provision sheet Clicking the "Add Access Issues" button for one of the (up to five) accessibility problem categories that is highlighted allows the spreadsheet user to review a list of pre-specified potential problems relevant to that category, and to add an access issue to that accessibility category that is relevant to that particular area.

Figure 17 shows the "Enter Access Problems "dialogue box. Each time the user clicks on an entry in the list, it is added to the box on the right hand side. In this way, the spreadsheet user can build up a complete set of problems relevant to people living in that particular area.



Figure 17: The "Enter Access Problems" dialogue box

Adding new problems

It is possible to edit this list to add additional types of problems under these five broad categories⁴. New problems are added on the "AccProbRef" sheet, as shown in Figure 18.

В	С	D	E	F	
<information, and="" availability="" quality=""></information,>	<walking and="" environment="" street=""></walking>	<cost of="" transport=""></cost>	<public transport=""></public>	<interchanges></interchanges>	
Lack of Awareness of Services	Pavements not suitable for buggies and	Lack of early morning availability of conc	Limited routes	Lack of information	
Lack of Information about Public Transport	Cars drive too quickly on residential str	Can't use pass on different operators on	Low frequency	Uncertainty about n	
Poor Social Support Networks	Unsafe crossing places at junctions	Need to buy additional ticket when interc	Limited/uncertain access	Lack of comfortable	
Lack of Internet Access	Unsafe crossing places at bus stops/st	tations	Intimidation at stops/stat	ions and on vehicles	
Lack of Availability of NHS dentists	Personal security concerns – poor light	ting	Lack of evening services		
Poor Quality of Service	Personal security concerns – groups h	anging around	Unreliability		
Limited Availability of Local Fresh Food					
New Problem					

Figure 18: Sheet for adding a new problem

New problems can be added in columns B-F, under the appropriate category of accessibility problem. Once it has been added onto this sheet, the access problem will appear in the relevant drop down list on the "Access Problems" Sheet, and on the relevant sheet for solutions (*Acc1Inf, Acc2Walk, Acc3Cost, Acc4PT* or *Acc5Int*).

⁴ Although in doing so, these additions will not then link automatically to a set of pre-specified suggested solutions. These also need to be added (see Section 7).

6. Generating solutions: 'inside-the-box'

Once all the relevant access problems have been entered for a particular area, the spreadsheet user can choose to view a list of suggested solutions, or to start generating their own novel solutions (see Section 7).

The suggested solutions are linked to the individual problems that are listed for each of five accessibility problem areas. Like the problems themselves, they have been derived from a combination of the suggestions made by local residents in the focus groups and by the professionals in the workshops, as well as from previous knowledge.

Clicking the "Suggested Solutions" button on the "Access Problems" sheet will display the problem-specific solutions, as illustrated in Figure 19 below.

Walking and Street Environment	<u> </u>
Problem 2: Cars drive too quickly on residential streets	Return to Access Problems
Introduce physical speed reduction measures: speed humps, chicanes	Start Generating New Options
Use of regulations: 20 mph speed limits, give way at junctions, park on alternate sides of street	
Enforcement of speed limits	
Problem 4: Unsafe crossing places at bus stops/stations	
Provide informal crossing facilities: refuges, speed tables	
Provide zebra, pelican or puffin crossings	
Resite bus stops to safer locations	
Problem 5: Personal security concerns – poor lighting	
Improve lighting levels and colour	
Remove potential hiding places and improve sight lines	
Problem 6: Personal security concerns – groups hanging around	
Provide community wardens	
Improve leisure facilities for young people	
School sessions, to encourage more responsible behaviour	

Figure 19: Suggested solutions for four of the specific access issues relating to Walking and Street Environment

Here, under the general category of 'Walking and Street Environment', the user has selected four of the six pre-specified problems: number 2 on the list (Cars drive too quickly on residential streets), number 4 (unsafe crossing places at bus stops/stations), number 5 (Personal security concerns – poor lighting) and number 6 (Personal security concerns – groups hanging about). In each case, two or three kinds of solution are suggested for possible implementation in that area.

Once the spreadsheet user has decided which of these solutions to consider for that area, he/she can then return to the Access Problems sheet (Figure 14) to consider the other relevant accessibility problem categories, by clicking on the yellow "Return to Access Problems" button. As previously noted, separate problems and solutions can be identified for up to six areas.

Adding new predefined solutions

Additional solutions are added to the following sheets:

- 'Acc1Inf' for solutions relating to 'Information, quality and availability'
- 'Acc2Walk' for solutions relating to 'Walking and street environment'
- 'Acc3Cost' for solutions relating to 'Cost of transport'
- *Acc4PT*' for solutions relating to 'Public transport'
- *Acc5Int*' for solutions relating to 'Interchanges'

Figure 20 shows an example of one of the solution sheets (*Acc1Inf*). Solutions are added in the row that relates to the specific problem.

Information, Quality and Availability							
Problems	Solution 1	Solution 2	Solution 3	Solution 4			
Lack of Awareness of Services	Lack of Awareness of Services - Test Solution 1	Lack of Awareness of Services - Test Solution 2	Lack of Awareness of Services - Test Solution 3	Lack of Awareness of Services - Test Solution 4			
Lack of Information about Public Transport	Lack of Information about Public Transport - Test Solution 1						
Poor Social Support Networks	Poor Social Support Networks - Test Solution 1	Poor Social Support Networks - Test Solution 2					
Lack of Internet Access	Lack of Internet Access - Test Solution 1	Lack of Internet Access - Test Solution 2	Lack of Internet Access - Test Solution 3				
Lack of Availability of NHS dentists	Lack of Availability of NHS dentists - Test Solution 1	Lack of Availability of NHS dentists - Test Solution 2					
Poor Quality of Service							
Limited Availability of Local Fresh Food	Limited Availability of Local Fresh Food - Test Solution 1						
New Problem							

Figure 20: Solution sheet for Information, quality and availability

N.B. New accessibility problems should not be added onto this sheet, only the solutions.

7. Generating solutions: 'outside-the-box'

Spreadsheet users are also encouraged to generate their own solutions, as well as relying on previous ideas and experience. There are two levels at which the user can trigger this process:

- (i) On the main "Access Problems" sheet (Figure 14), by clicking on the button "Start Generating New Options"; and
- (ii) On the individual Accessibility Problems sheets (see example in Figure 18), again by clicking on the "Start Generating New Options" button.

High-level generation of options

If the user starts at the higher level [case (i)], at the top of the main "Access Problems" sheet, they are first directed to a sheet which sets out a number of general ways in which an accessibility problem might be addressed by a service provider. This is illustrated in Figure 21. Here five broad solution strategies are set out, from Re-defining types of service provision, through to Relating better to other agencies, to address gaps in multi-agency service provision.

Previous sheet	Type of Solution					
	Redefine types of services provided Align more closely to customer need	Generate options				
	Relocate points of service delivery Become closer to customers/users	Generate options				
	Re-time patterns of service delivery Align with customer timing needs	Generate options				
	Refresh services To improve quality	Generate options				
	Relate with other agencies Joined-up', seamless service delivery, for better efficiency and effectiveness	Generate options				

Figure 21: High Level Strategies for Addressing Accessibility Problems

The user can click on any of the "Generate options" buttons and will be directed to a sheet that uses a well established 'out-of-the-box' method to encourage innovative thinking. This involves showing users randomised sets of three pictures, from which they are encouraged to think of how these concepts could provide a new way of viewing – and solving – a particular problem. An example

is shown in Figure 22. See Appendix 1 for a description of how to add to or replace the images that the spreadsheet draws on for the random selection.

Previous sheet	Generate New Selection	Export to a new workbook
In the second seco	Kance: Engage Ander Sconger Manage Ander Manage Ander Man	Sure: Image'Afte Tage: Royalty fee Tage: Royalty fee Tage: Royalty fee Tage: Royalty fee Tage: Royalty fee
Re-time	e patterns of service	delivery
ldea 2:		
Idea 3:		
Idea 4:		
Idea 5:		
ldea 6:		

Figure 22: Randomised images used to act as a stimulus to thinking about service retiming

In this example the spreadsheet user has clicked on the option generation button next to the 'Re-time patterns of service delivery' section, and has been shown pictures of a mouse trap, a snail and a fingerprint. This could stimulate thoughts, for example, about 'capturing' certain client groups at certain times that suit them, about allowing people more time to access services, or letting client groups 'stamp their own identity' on determining service operating hours.

If the user clicks on 'Generate New Selection' then another randomised triplet of pictures will appear. On the sheet there is room to record up to six ideas, before returning to the previous sheet (Figure 21) and either exploring another strategy (e.g. Refresh services), or returning to the main "Access Problems" spreadsheet (Figure 14) and looking at more specific kinds of problems and solutions.

These Random Images sheets can be exported and saved as a new worksheet by clicking the "Export to a new worksheet button" (shown at the top of Figure 22) and then using the Save As... command in Excel's File menu.

Option Generation at the Accessibility Problem Category Level

The spreadsheet user can also switch to the same type of 'out-of-the-box' option generation process at the more detailed level of dealing with a particular type of accessibility problem [case (ii)].

Here each of the sets of solution screens associated with a category of problems (e.g. Figure 19) has its 'Start Generating New Options' button. On clicking on this button, the spreadsheet user is directed to a similar type of sheet to that shown in Figure 22, but with the appropriately heading and its own set of three randomised pictures.

For example, part of the New Options screen for the accessibility problem category 'Information, Quality and Availability' is shown in Figure 23. This time the pictures depict a flower, a skyscraper, and a helicopter. Again, the ideas that are generated by the user can be exported to a new workbook.

8. Conclusions

The Accessibility Planning tools that are presently available to practitioners tend to focus mainly on the locational aspects of service provision, and do not consider the many other dimensions of accessibility problems⁵, such as temporal constraints, financial constraints or personal security concerns. In addition, existing tools do not directly contribute to the development of suitable solutions – other than by highlighting areas from which residential access is poor. The tool described here makes important contributions in both of these areas.

⁵ Jones, P. and Wixey, S. 'Measuring accessibility as experienced by different socially disadvantage groups'. End of project summary report to the EPSRC, July 2005.



Figure 23: Randomised images used to act as a stimulus to thinking about Information, Quality and Availability

First, the tool makes explicit a wide range of types of accessibility constraints, in addition to those directly relating to the spatial location of services. It sets out the detailed temporal constraints that can seriously limit a client group's access to services, and also considers various problems associated with information, costs of transport, poor pedestrian access, personal security, and other aspects of public transport services (e.g. limited capacity for buggies and wheelchairs, poor interchange facilities).

Second, it provides the user with detailed sets of known possible solutions, directly linked to the different types of problems that have been identified. It also affords users the opportunity to take part in out-of-the-box thinking, through the use of randomly generated triplets of carefully selected pictures.

Both the lists of problems and proposed solutions have been derived through the detailed involvement of people in the Dearne Valley area of South Yorkshire: local residents in a series of focus groups, and professionals in two interactive workshops. We would like to acknowledge the assistance of all those who contributed in this way to the knowledge embedded in this tool.

Appendix 1: Changing the pictures used in the 'outsidethe-box' option generation sequences

The pictures for the "Random Images" sheet used for the 'outside-the-box' option generation task (see Figures 22 and 23) are all held in a folder called "Images" which must be in the same directory as the main spreadsheet.

It is possible to replace any or all the images in this folder, or to add additional pictures. All the images in the folder should be sized so that the longest edge measures 800 pixels. The pictures currently used in the spreadsheet were resized with Picasa 2 using the "Export Picture to Folder" command under the File menu, as shown in Figure 24. Picasa 2 is a free image editing tool from Google available at http://picasa.google.com/download/.

The pictures must be renamed as "image(+number).jpg" (for example, image1.jpg, image2.jpg, etc.) before the spreadsheet will recognise them.

		23
M. AND	Export to Folder	
	Location of exported folder: E:\Peter Jones\DISTILLATE\Access Problems 5 Browse Name of exported folder:	
	Images Image Size Options:	
	Use Original Sze Resize to: BOD pixels Image Quality:	
	Automatic Preserves original image quality Export movies using: First Frame Full Movie (no resizing) 	
	CK Cancel Help	

Figure 24: The image resize dialog box in Picasa

Updated image details should be included on the "Image details" sheet, that is reproduced in Figure 25. There are spaces to record the original filename, the author, image source, basic usage details and a more detailed statement about the restrictions on the use of the image. The source, usage and restrictions fields are displayed along with the image.

If the number of images has changed this must be reflected under the "Number of Images" heading in column I of the "Image details" sheet. The spreadsheet generates three random numbers between 1 and the total number of images indicated. If there are more images than indicated, the choice will only be made from the number of images indicated; conversely, if there are fewer images than indicated, the spreadsheet may try and load an image which does not exist and this will crash the option generation code.

A	В	C	D	E	F	G	H	J	K	L.	M	N T
Image	4 Name	Original filename	Author	Source	Usage	Restrictions	Number of Images			1202		
1	image1 jpg			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free	100					
2	image2.jpg			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
3	image3 jpg			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
4	image4.jpg			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
5	image5.jpg			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
6	image6.ipg			Image"After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
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11	image11.jpd			Image*After	Royalty free	© 2003-2008 image*after and its licencees. Content is copyright-free						
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49	image49.jpc	1		image After	Royalty free	© 2005-2006 image after and its licencees. Content is copyright-free						

Figure 25: The "Image details" sheet