

Quality Urban Pedestrian Networks - What Criteria Should be Used to Judge Such a Network in Terms of Access and Legibility for the Mobility Impaired?

Andrew Stuck

Abstract

Drawing on published research and guidance on developing local walking strategies, and on research carried out in the City of Salisbury, the paper sets out recommended criteria with which to determine a quality urban pedestrian network in terms of legibility and access for the mobility-impaired.

Improvements in the network are recommended, as are means by which pedestrian movements for all can be encouraged.

The paper explores who holds responsibility for the creation of such networks and recommends raising awareness, improving understanding of these stakeholders and of network users of how to create urban form that provides an enabling environment for pedestrian movement.

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As part of his work, he has been able to set up the Get Wiltshire Walking! Initiative which provides funding and advice to community initiatives promoting walking 'for a purpose', and for the establishment of local walking forums. In association with the local health authority, amongst other partners, local walking forums have been established in more than a dozen communities.

Involving local people as forum participants has brought several innovative walking initiatives to fruition, and has raised the profile of walking as sustainable transport amongst professionals, local authority officers and political members, and the public alike.

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Introduction

The overall aim of the research has been to derive criteria that should be fulfilled prior to defining a quality pedestrian network in terms of legibility and accessibility for the mobility impaired. With an increasing urban and ageing population, it is important to make our cities more pedestrian friendly, not only accessible to the able-bodied but convenient to everybody.

Awareness amongst local authority officers of the value of involving users in pedestrian survey work, and awareness amongst users of the differing constraints on the quality of the urban pedestrian environment, has been raised.

Three Origin/Destination routes were chosen on the basis that the destinations were major trip generators. In order to explore the legibility of the inner urban area of the City of Salisbury, residents were asked to provide directions to would be visitors who shared the same level of mobility-impairment as those giving directions. These three routes were then surveyed by four pedestrians, with differing levels of knowledge of Salisbury and of mobility-impairment.

Modifying an existing 'Comment form' used by clients of 'Shopmobility' in Salisbury, provided a means of gathering information about the current provision for access and for prioritising remedial engineering work. This survey also revealed misunderstandings about access provision amongst users, local authority officers, professionals and consultants alike. The research was limited in its scope as it gave specific consideration to the legibility and access of a pedestrian network and did not consider other aspects.

Access for the mobility-impaired has only recently been embodied in legislation under the 1995 Disability Discrimination Act (DDA) (HO 1995). The implications of the DDA on streets and public spaces will remain unclear, until tested in the courts. If defined as 'services', local authorities would be obliged to make all parks and streets accessible within the meaning of the DDA by 2004. Similarly, the European Human Rights Directive that becomes law in the UK in October 2000 may also reinforce the need to create barrier-free built environments and to provide access to urban spaces.

Mobility-impairment can be the result of not only the degree to which the environment is disabling but also the physical and mental impairment of the individual. A temporary muscle strain, pregnancy or the need to carry heavy shopping will make an individual's mobility impaired.

The *social model* of disability that is based on the premise that people with disabilities have human rights is becoming more prevalent. "The emphasis is shifted towards seeing

society's attitudes and thus the design of the built environment as disabling, and 'making' people disabled." (Swain et al. 1993 as adapted in Manley 1998)

For first time visitors or those less familiar with a part of the city, or those walking in wet weather or after dark, or in a hurry, or suffering temporary or long term sensory impairment, consistent legible, signage is vital.

Policy context – the setting of pedestrian movement

Transport and Land use policy

Advice to local authorities on setting targets for increased pedestrian movement is included in guidance on Local Transport Plans (DETR 1999a) and in *Encouraging Walking* (DETR 2000a), and as part the requirements of Best Value (HO 1999), whereby targets for reporting footway repairs or 'outage' of street lights are recommended.

Improvements to the pedestrian environment and better design are key aspects of the report of the Urban Task Force *Towards an Urban Renaissance* (Urban Task Force 1999). Similarly, *Our Healthier Nation* (DoH 1999), *New Directions in Speed Management* (DETR 2000b), and the Road Safety Strategy, *Tomorrow's Roads - safer for everyone* (DETR 2000c) all reinforce the desire to create pedestrian-friendly cities.

Land use planning is paramount, as without facilities in close proximity there is little likelihood of encouraging walking as the preferred travel choice. There has been a shift in government guidance towards promoting less dispersed development signalled by the publication of Planning Policy Guidance (PPG) Note 13 *Transport* published in 1994 and currently under revision (DoE 1994 & DETR 1999b).

PPG Note 1 (DoE 1997) includes the recommendation that everyone including the mobility-impaired have safe and obstacle-free access. Priority of the needs of pedestrians over the movement of vehicles is emphasised in PPG Note 3 *Housing* (DETR 2000d). PPG Note 6 *Town Centres and Retail Development* includes pedestrian flow and accessibility as indicators in assessing the health of town centres (DoE 1996).

Movement strategies, that provide for walking, cycling and public transport, are seen as key starting points in designing accessible neighbourhoods in the companion guide to Design Bulletin 32 (DB 32). DB32 has been the principal guidance on street layout for new development in the UK since the early 1990s. (DETR 1998b & DoE/DoT 1992).

Other policies

Pedestrians have too often been seen as vulnerable road users. Walking is still seen by many only from a safety/security or recreational walking perspective, and is still rarely being proactively encouraged as a mode of transport in its own right.

In the Government White Paper *A New Deal for Transport: Better for Everyone*, walking is recognised as playing an important role. "We are all pedestrians, even if we own a car. But all too often the things that make walking a more pleasant experience have not been given the proper attention, as can be seen in the way road space and

priority is so often biased against pedestrians. Too often pedestrians are treated like trespassers in their own towns.” (DETR, 1998a, Paragraph 3.1).

People with different types of disability will require different access arrangements. The best intentions can lead to some conflict between users. Where street enhancements have used traditional paving and cobbled areas in parts of Salisbury, conflicts have emerged between wheel chair users and those striving to retain a specific urban form.

As pedestrians can move in close proximity with one another, a relatively narrow footway can accommodate a considerable flow of pedestrians. Determining quality of a pedestrian route requires more than a mere measure of capacity, the concept of the level of service provided needs to be assessed (IHT 2000: 54).

Clearly of concern to many mobility-impaired users is the location of street furniture, retailers' *A-boards*, café chairs and tables, and other obstructions, both temporary and permanent, usually described as *clutter*. English Heritage recommends that "nothing should be placed in the street unless it is unavoidable." (English Heritage 2000: X)

Legibility

Residents were asked to give directions for specific routes, as if to a person new to Salisbury. It was hoped that they would identify features that they felt helped to clarify routes through the town. It is this ability of humans to synthesise all the information around them, their perceptions and memories of a place or a route they may have taken, and grouping them into an understandable pattern, with which Lynch defined the concept of *legibility* (Lynch 1960: 3).

“The solution to the problem of providing information and identity isn’t always a sign or a map. After all, people often navigate their way around a city by landmarks, pubs, roundabouts and petrol stations as well as official sites, or sometimes just by the ‘feel’ of a neighbourhood.” (Bristol City Council 1999: 13)

Involving users in the pedestrian networks

Recruiting pedestrians for ‘walking audits’ can raise awareness of the pedestrian environment amongst local authority officers and residents. (Pedestrians' Association 2000).

Local authorities have frequently sought to consult local people about the pedestrian environment, carrying out surveys to determine the number of people arriving or leaving specific destinations. Little has been conducted from a proactive stance to try to encourage more people to undertake more journeys on foot.

Commercial enterprises record *footfall*. Studies have sought to identify which locations will attract the greatest number of customers, a substantial number who may arrive on foot. Research includes how pedestrians link shops together in their *mind’s eye* and what the effects of distance are, and how *entry point* into a shopping location influences subsequent pedestrian flow and route choice. (Brown 1992, Carley 1996)

Survey Methods

For three routes in Salisbury, residents were asked to give directions as if to visitors with a similar level of mobility impairment to themselves. Four surveyors were invited to walk each of these routes giving a commentary and photographing positive and negative attributes along the route. An existing method of reporting comments from clients of *Shopmobility* was modified and a survey was conducted across the city.

Residents' Directions

Encouraging Walking (DETR 2000a) puts considerable emphasis on the proximity of routes to transport interchanges and key destinations (although not specifically defining the latter). Residents were asked to provide directions from three different points, each of them a potential arrival point in Salisbury: the railway station, the bus station and the central car park.

The bus operator with the majority of services and that manages the bus station in Salisbury, has recently introduced a fleet of wheel chair accessible buses. To make access to buses easier and where space and traffic management allows, the local authority have installed raised kerbs and 'build-outs' at bus stops.

Access to trains by wheel chair users requires prior booking, so that ramps can be made available to ease access. Consequently, it is more likely that wheel chair users will arrive by car, than by bus, and by bus rather than by train. In reality, mobility-impaired individuals who qualify for an orange parking badge will park much nearer their destinations, than at these three arrival points.

The three routes to be surveyed were:

- From the railway station to the central Post Office in Castle Street
- From the central car park to the Market Square
- From the bus station, in Endless Street to the College in Southampton Road

Destinations were chosen on the grounds that they were likely to be popular with residents and visitors alike. Tourist destinations were deliberately not chosen as it was felt that such *destinations* might have benefited from better signage or accessibility.

Origin / Destination route surveys

To determine how legible the urban area was to pedestrian users, it was necessary to ask pedestrians to find their own way between points, and not offer them a prescribed route.

Two mobility-impaired and two able-bodied survey volunteers were recruited. It had been hoped to recruit more mobility-impaired surveyors, for example adults with children in pushchairs, but it was only possible at the time to recruit wheel chair users. One able bodied and one wheel chair user were residents of Salisbury, while the others were chosen precisely because they were first time visitors.

Mobility-impaired pedestrian surveyors started from the same point as able-bodied users so that comparisons could be made between their commentaries. Each surveyor was provided with an audio tape recorder and was armed with a camera with which to photograph items or views on their journey that they felt either made a positive or

negative contribution to their experience. Such photographs were useful for pin pointing detailed aspects in discussions with surveyors and others. The audio recordings were transcribed. Any recurring or major themes were summarised in a table.

Maps of the routes taken, the summaries and photographs were brought together for a meeting of the Salisbury Walking Forum (SWF), to which officers from the local authority were invited to discuss the analysis, and to provide a critique of the checklists.

Audit by Shopmobility clients

Shopmobility clients (pavement vehicle users) were asked to mark the routes they took and record specific problems or opportunities they encountered. All clients have some mobility impairment, and the majority were elderly. By providing their Shopmobility membership number the researcher was able to ascertain whether participants were regular or first time visitors. Their choice of pavement vehicle gave an indication of their level of mobility impairment. This avoided embarrassment they might feel over questions about their level of impairment.

What the surveys revealed

Comparing the Residents' directions, those provided by the mobility-impaired residents are more detailed, and also recommend longer routes.

For the Origin/Destination surveys, the intention was to compare resident with visitor and able-bodied with mobility-impaired. Both residents were women. The mobility-impaired female resident used a powered wheel chair. The mobility-impaired visitor was a fit and strong male paraplegic who used a manual wheel chair. It is important to recognise that wheel chair users are not a homogenous group, each of them will have different abilities and will find the environment disabling in different ways.

Surveys took place in day light on dry summer days. Owing to the timing of this research it was impractical for surveys to be undertaken after dark. Hence, the surveyors were asked to envisage what they might have felt had it been after dark. This wasn't entirely satisfactory and further after dark surveys are recommended.

Clearly there are advantages to those familiar with an area. There was a clear difference between residents and visitors in confidence and journey duration for each route. Comparing the survey routes taken, all are of similar lengths, with the exception of the resident wheel chair user taking longer routes so as to avoid awkward drop-kerbs at crossings, an underpass and some uneven paving. It is apparent from her route commentaries that she suffers considerable discomfort travelling over many surfaces that the visiting mobility-impaired surveyor found adequate.

For able-bodied users, the City of Salisbury presents few physical problems that cannot be overcome. Residents find it a fairly easy city to traverse. However, there appears to be shortcomings in signage across the town, not least that much is inconsistent, and the College appears not to be sign posted at all! Visiting surveyors, found it quite difficult to grasp which routes to follow. Landmarks and familiar shops included in the Residents' Directions were rarely mentioned in the survey commentaries.

Looking out for clues of how to get to her destination, the able-bodied visitor makes several mentions of signposting, not all of it she finds helpful. She is concerned about the width of the footway, and how this either protects her from traffic or makes traffic intrusive. She enjoys describing the shops and the more *peaceful* pedestrianised areas. It is the number of crossings that she has to make that concerns her:

"At first Salisbury strikes me as being a very funny place, it's got parts that are really beautiful, especially along by where the river is, but it seems that the traffic just seems to take over the whole place. So there are lots of crossings you've got to make, lots of zebra crossing, lots of traffic lights. Traffic really is monopolising it."

For the visiting mobility-impaired surveyor, signage and surface are of concern, as are obstructions, like A-boards, which narrow the footway, or inconsiderate parking that curtails his access. On reflection, he says, "I didn't record some of the problems I encountered as in my experience they were not exceptional. There are so many things wrong that I just have to put up with them. They become the norm."

He points out that the signage for the disabled car parking bays is not visible when you enter the car park. He is irritated by the double wait at linked traffic lights, remarking that such a wait in rain would be far from pleasurable. It is important to remember that wheel chair users rarely have the ability to use an umbrella on their journeys.

Crossings feature prominently in his commentary. Vehicle access driveways, inconsistent matching of drop-kerbs across roads, lack of controlled junctions, steep ramps at the underpass, shattered glass in the tunnel, lack of appropriate signage and the indignity of a barrier at the end of the churchyard (make his journeys a nightmare).

For the resident mobility-impaired surveyor, her summary table reveals much greater concern about the width, condition and access, via drop-kerbs, of the footway, and less about the crossings or signage. She praised a drop-kerb crossing and wonders why there can't be more consistency across the City.

She took a much longer route to get to the College. She later revealed her unease over using underpasses, as she found them not only claustrophobic but also intimidating. She isn't alone. All the surveyors expressed anxiety about using the underpass and of the routes to and from it.

In avoiding the underpass, she had to endure a number of obstacles and uneven surfaces. Sloping pavements and the unmatched pairs of drop-kerbs also meant further detours. To add insult, once she reached the College, she found the pedestrian access has two steps that meant a further detour!

The resident able-bodied surveyor makes no mention of the clutter along Catherine Street that is remarked upon by others. She does remark about the narrow width of the footways and the pleasure she has of getting away from the traffic on the pedestrianised Queen Street and on less trafficked streets on the way to the underpass. She makes light of the crossing at the end of Endless Street, which the two visiting surveyors criticise.

A clear call came from the Shopmobility survey, that a broad process of education of all users, including Shopmobility clients, was needed.

Shopkeepers need to be alerted that goods collection by customers and dustbins can obstruct access for the mobility-impaired; and that *A-boards*, chairs and goods displayed outside their stores narrowed footways or reduced access. Car and lorry drivers need to understand why drop-kerbs are installed, and why obstructing them with their vehicle is inconvenient. Shopmobility clients need to appreciate the desire of conservationists trying to retain features in a historic city.

Clearly, drop-kerbs were seen as a vital aspect for improved access but it was also clear that where they had been provided, insufficient care had been taken to make sure that the approaches and actual setting of the kerbs was consistent. Some had been installed at points where the footway was too narrow for a reasonable slope to be incorporated. Clients, when waiting at crossings, had to counter the camber by parking their pavement vehicle at right angles to the drop-kerb, making manoeuvring to cross the road difficult.

There appeared no rhyme or reason as to why there was a drop-kerb on one side of a junction but not on the other. Uneven drop-kerb pavers, slightly raised manhole covers and other utility service equipment was all reported. Longitudinal U-shaped drainage gullies came in for considerable criticism. These proved to be barriers to some clients, and to others contributed to extremely painful journeys.

Slopes in the footway caused Shopmobility clients to feel they were being tipped into the road. The need for wider footways in the more popular shopping streets was identified, with the suggestion that some of the footways were so narrow that Shopmobility clients had to queue up to take turns to pass at the wider points.

At controlled crossings it was felt that the phasing was insufficient for the pedestrian to complete the crossing, and that they were intimidated by car drivers eager to drive on. The indiscriminate use of *A-boards* by retailers advertising their wares, and the lack of enforcement for their removal was frequently commented on.

For many, tasks such as daily shopping became endurance tests. The survey results were a dramatic illustration that there was still much to be done to improve the accessibility in the city and in raising awareness and in improving understanding amongst local authority officers, contractors and the general public.

Characteristics of a quality urban pedestrian network

The results of the surveys and the following checklist of criteria were discussed at a meeting of the Salisbury Walking Forum, to which local authority officers, some Shopmobility clients and the surveyors had been invited.

The surveys revealed a need for a more consistent and coherent policy regarding: the installation of drop-kerbs, the enforcement of *A-board clutter* control, traffic signal phasing to increase the time available for pedestrians, and in signing to key trip generating destinations.

Although there may be several drop-kerbs across a pedestrian network, many of them can still create obstacles to access. The detailing of such kerbs needs to be overseen, and sufficient room should be made so that severe slopes can be avoided. Cambers and

slopes need to be levelled out as much as possible and situations in which the balance of mobility-impaired users is compromised should not be allowed.

Drop-kerbs are installed by three different functions of the local authority as well as by private contractors. Although there are guidelines, there appeared to be no standard design drawings available to designers or contractors. Problems for users of drop-kerbs have probably been caused by ignorance (rather than negligence) of installation contractors. The maintenance of existing works, for example, uneven paving and inappropriate drainage gullies, need not only to be reported and surveyed swiftly, but repaired promptly and deadlines for such work should be enforced.

A consistent policy concerning *A-boards* and shop displays should be evident. Awareness of the problems that such *clutter* creates must be impressed upon all retailers, through a regular set of procedures. Footways in historical streets are always likely to be narrow unless the proportion of space devoted to vehicular traffic is reduced and given over to the pedestrian. *Clutter* diminishes footway width still further. Enforcement against pavement parking should also be a high priority.

Phasing of traffic signals and controlled crossings should be reviewed in the light of mobility-impaired pedestrians. Sufficient room needs to be made available on either side of crossings, so pavement vehicles are able to manoeuvre conveniently and safely.

Pedestrian access to and around key trip generating destinations should be improved. Key routes for pedestrians to such destinations should be designated and access provision for pedestrians prioritised. These routes could be enhanced so as to become well-known paths, adding to the legibility of the pedestrian network. Pedestrian signage and orientation guides, at a level appropriate for the mobility-impaired to read should be erected on such routes and at key arrival points, for example, the bus station and stops, the rail station and from central car parks.

There should a coherent access strategy that is continually being updated. It should include soft targets for example, awareness raising amongst local authority officers and contractors concerning the needs of the mobility-impaired; and hard targets, for example on consistent design standards for drop-kerbs, pavement repair and signalling.

This list of criteria is of course limited by the focus of the research, which was restricted to access and legibility. An access strategy will also need to address other issues including those of personal security, lighting, traffic intrusion, as well as aspects to accommodate those with sensory impairments.

It was suggested that a matrix should be drawn up to include who was responsible for each of the problems identified in the surveys and that this should be displayed at the Shopmobility unit. A training day could be organised for representatives of each of the organisations responsible to share experiences with Shopmobility clients.

Conclusions & recommendations

The research generated a wealth of information and created a momentum amongst mobility-impaired users in the City of Salisbury, to raise awareness about their needs amongst the general public, local authority officers, professionals and contractors alike.

It has highlighted shortcomings in the way in which the local authorities make their constituents aware of pedestrian network improvements. Shortcomings have also been revealed in the information provision, and signage of key trip generating destinations.

Local authorities should be asked:

Are key walking routes identified on orientation maps and in leaflets?

Are key destinations identified and signed in terms of access e.g. residential homes, retirement flats, schools, nurseries and play area (orientation maps on the routes to and at key destinations would be useful too)? Is access prioritised around origins e.g. the bus or rail station? What distances are pedestrians expected to travel to key facilities compared to cars? Is there a minimum limit for footway widths and a target for the number of at grade level crossings to be installed? Are there set minimum limits for the width and height of drop-kerbs and the sloped approaches to them? Are areas of steep slope and cross fall camber identified in the pedestrian network and is there a programme in place to prioritise levelling them? What procedures are in place to forewarn mobility-impaired users of existing dangerous slopes? Is there a standard design guide for the installation of access facilities? Prior to installation is there an opportunity for access and drainage facilities to be tested by mobility-impaired users? Is there a target set for a reduction of clutter? Is there a policy for licensing the outdoor seating for cafes and restaurants? Is there a clear and coherent policy on restricting A boards and what procedures are in place to enforce such restrictions? Is there a policy on disabled parking and how does it relate to provisions in surrounding towns and across the region? What procedures are there in place to enforce inconsiderate parking e.g. across drop-kerbs? Are traffic signals and controlled crossings programmed to offer pedestrian priority? Is there a programme of raising awareness amongst the public, contractors and professionals? How is awareness to be raised amongst users? Is there a regular programme of training professionals working on these aspects?

Improving conditions for the mobility-impaired pedestrian user may not make a significant impact on the overall pattern of traffic congestion but it will go a long way in making our urban areas more convenient and pedestrian friendly, and it may only entail limited expense.

There has been a change in emphasis in government policy on transport and in land use planning. There is an increasing desire for local authorities to invest less in promoting journeys by car and more in promoting journeys on foot, by bicycle or by public transport. However, for the individual, visible changes in transport infrastructure provision are unlikely to materialise very fast, unless priority is given to that which creates greater accessibility for the pedestrian.

Access in the urban environment may yet be contested in the courts under Human Rights legislation or under the Disability Discrimination Act. In the mean time, it should be fairly easy (and inexpensive compared with the outlay for vehicular infrastructure) for improvements in the public realm to be made to accommodate more journeys on foot, and by so doing the creation of more accessible towns and cities. In so doing, there may be greater rewards still, with increasing numbers of people returning to our urban centres and 're-colonising the public realm' (Burgess 2000).

Acknowledgment

In writing this paper an attempt has been made to use language and terminology that is acceptable to people whose mobility is impaired and conveys respect for the whole person. Bearing in mind that the use of language alone can contribute to discriminatory behaviour, the paper attempts to convey positive rather than negative images. The author recognises the right for equal opportunity for all citizens and accepts the social model of disability (Swain et al. 1993), in which it is the environment that disables people, rather than people being 'disabled'. There is no intention to give offence to any person whose preference for non-disabling language varies from that used in this Paper. (With thanks to Manley 1998)

Bibliography & References

- Bristol City Council (1999) Bristol Legible City: You are here. Bristol City Council,
- Brown, S. (1992) *'Retail Location: A Micro-Scale Perspective'* Avebury, Aldershot
- Burgess, J (2000) pers. remark. 18 May 2000
- Carley, M. (1996) *'Sustainable Transport & Retail Vitality'* Research Paper No.2 with Transport 2000, Historic Burghs Association of Scotland., Edinburgh.
- DoE (1992) Residential roads & footpaths - layout considerations. HMSO, London.
- DoE (1994) Planning Policy Guidance 13 Transport HMSO, London.
- DoE (1996) Planning Policy Guidance 6 Town Centres & Retail Development HMSO, London..
- DoE (1997) Planning Policy Guidance 1 General Principles. HMSO, London.
- DETR (2000a) Encouraging walking: advice to local authorities. HMSO, London.
- DETR (2000b) New Directions in Speed Management HMSO, London.
- DETR (2000c) Tomorrow's Roads - safer for everyone HMSO, London.
- DETR (2000d) Planning Policy Guidance 3 Housing. HMSO, London.
- DETR (1999a) Guidelines for Local Transport Plan application. HMSO, London.
- DETR (1999b) Revision of Planning Policy Guidance Note 13: Transport - public consultation draft. HMSO, London
- DETR (1998a) A New Deal for Transport - Better for Everyone. HMSO, London.
- DETR (1998b) Places, Streets and Movement: HMSO, London.
- DoH (1999) Saving Lives: Our Healthier Nation. HMSO, London.
- English Heritage (2000) Streets for All. HMSO, London.
- Home Office (1999) Local Government Act. HMSO, London
- Home Office (1995) Disability Discrimination Act. HMSO, London
- IHT (2000) Guidelines for Providing for Journeys on Foot. IHT, London
- Lynch, K. (1960) Image of the City M.I.T Press, Boston.
- Manley, S. (1998) Creating Accessible Environments in Greed, C. & Roberts, M. (1998) *Introducing Urban Design: Interventions & Responses* pp.153-167
- Pedestrians' Association (2000) Aylesbury Walking Audit. Ped. Assoc. London.
- Swain, J., Finkelstein, V., French, S., & Oliver, M. (1993) (eds) *Disabling Barriers - Enabling Environments* Sage / Open University, London & Milton Keynes.
- Urban Task Force (1999) *Towards an Urban Renaissance.* HMSO, London.