The Design of Streets with Older People in Mind

DSOPM004

This I'DGO design guidance relates to pedestrian crossings. It is part of The Design of Streets with Older People in Mind; a toolkit for those who plan, design and maintain the public realm. It can be used as an aid to assessing the 'walkability' of local neighbourhoods, particularly with regards to pedestrian safety and comfort. Based on the views of over 1,600 pedestrians, street audits and key sources of existing UK guidance, it includes advice on providing accessible crossing amenities that send out a consistent message to all users and flags the importance of raising awareness among pedestrians as to how crossings work and why.

Pedestrian Crossings

Design Guide 004

Being outdoors enhances the physical, social and emotional wellbeing of older people.
I'd go outdoors if I could: wouldn't you?

I'DGO design guides are based on evidence from the Inclusive Design for Getting Outdoors (I'DGO) research project. They have been cited by the World Health Organization as being of global importance in planning, designing and maintaining Age-Friendly Cities and by the UK Department for Transport. The research was undertaken by the SURFACE Inclusive Design Research Centre at the University of Salford. Details of context, findings and methodology are provided within, with recommendations on the reverse.

Pedestrian Crossings

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Existing UK Guidance

Crossings provide non-motorised traffic with passage across a carriageway. Used by pedestrians, cyclists and equestrians, they are a requirement of Part 2 of the Traffic Management Act (2004). There are several crossing types for pedestrians, both formal and informal. Formal crossings offer a designated route across a busy road, often with signalised control of approaching vehicles, and informal crossings indicate where it is considered safest to cross a quieter route, providing enabling features (such as dropped kerbs) for pedestrians.

The responsibility for the provision of pedestrian crossings rests with local authorities. To assist them in assessing the need for a crossing, and whether to make it formal or informal, the Department for Transport published *Local Transport Note 1/95 The Assessment of Pedestrian Crossings in 1995* (and again in 2003). The document describes how to assess a site and crossing options for it, taking into account how many, and what type of, vehicles and pedestrians typically use it, at what time of day, at what speed etc. *Local Transport Note 2/95*, published by the Department in the same year (and again in 2005), offers detailed advice on planning, designing and installing 'at-grade' facilities, i.e. crossings at road level, not bridges or underpasses.

In the Local Transport Notes on crossings, there is consideration given to vulnerable pedestrians, including older people and people with disabilities. For a useful summary of the guidance most relevant to these users – including recommendations for dropped kerbs, tactile paving, and audible and tactile signals – see *Inclusive Mobility* (DfT, 2005) and Factsheet 5.5 of the *Code of Practice on Access and Mobility* (**www.accesscode.info**). Published in 2006, the *Puffin Crossings Good Practice Guide* (Department for Transport and the County Surveyors' Society) provides guidance on the most recent type of signalised crossing to be introduced to the UK.

As urban spaces become more congested, specific guidance has emerged related to pedestrian comfort on footways and at crossing points, for example, *Pedestrian Comfort Guidance for London* published, for the first time, by Transport for London in 2010.

"Pedestrian crossings play an important role in encouraging walking & cycling."

- Puffin Crossings Good Practice Guide (Department for Transport and the County Surveyors' Society, 2006)

Formal pedestrian road crossings

There are various types of formal pedestrian road crossing in the UK:

Zebra crossings do not force traffic to stop by means of a red light but, in the UK, they do give pedestrians permanent right of way. When used in the right context (low, slow traffic flow), they involve the minimum delay for both pedestrians and motorists. Level access, either by dropped kerb or raised road crossing, must be provided. The remaining types of formal road crossing in the UK are signalised. The Department for Transport recommends (*in LTN 1/95*) that signalised crossings are used "where there is normally a greater than average proportion of elderly or disabled pedestrians", as well as where traffic flow is fast, heavy etc. In each case, level access, either by dropped kerb or raised road crossing, must be provided.

The most common types of signalised pedestrian crossing are:

Pelican. These provide the means for pedestrians to stop the traffic by way of a push button on a Pedestrian Demand Unit (PDU). Traffic lights control the traffic; red and green men indicate to pedestrians whether it is safe to cross. A flashing green man indicates that a pedestrian should not start to cross and, where provided, a tactile cone rotates under the push button unit when the green man is lit.

Puffin. Introduced in the UK in 2006, these are 'smarter' than Pelicans in that pedestrian activity is monitored by infra-red detectors to allow users additional time to cross, where required. There is no flashing green man and the red and green men are displayed on the nearside of the crossing. Where provided, a tactile cone rotates under the push button unit when the green man is lit. Detailed guidance for these crossings is provided in the *Puffin Crossings Good Practice Guide* (DfT, CSS, 2006).

On Pelican crossings, the green man is lit for: **four seconds** (for crossings up to 7.5m in length)**; up to seven seconds** (for crossings over 12.5m); **six to nine seconds** (if there is considerable use by pedestrians with disabilities). Puffin crossings with detectors enable people to cross in their own time.

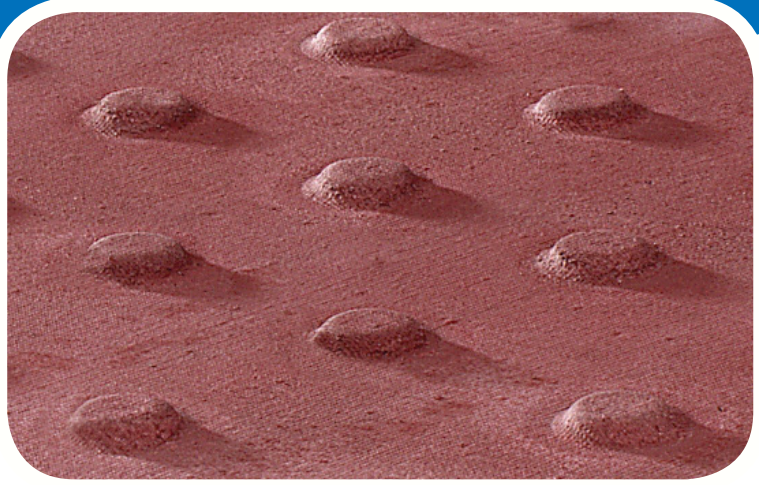
- Inclusive Mobility (DfT, 2005)

Toucan. These are shared crossings for pedestrians and cyclists. They function in the same way as Pelicans and Puffins, but are typically wider and have a green bicycle symbol in addition to the green man.

Pegasus. These are shared crossings for pedestrians and equestrians. They function in the same way as Pelicans and Puffins, but are typically wider, have an additional PDU (for mounted riders) and have a green horse symbol in addition to the green man.

Tactile Paving

Tactile paving indicates, through differences in the look and feel of underfoot surfaces, that pedestrians should expect a change in the street environment. The most definitive source of information on its use is *Guidance on the use of tactile paving surfaces* by the Department for Transport and the Scottish Executive (first published in 2005, revised in 2007). *Inclusive Mobility* states that "the appropriate tactile paving surfaces should be installed at all controlled and uncontrolled pedestrian crossings", that is, 'blister' paving (usually red or buff in colour). I'DGO has studied the use and experience of tactile paving by older pedestrians, publishing a separate design guide (DSOPM003) on our findings and recommendations.



Lighting and signals

Traffic Advisory Leaflet 4/91 provides guidance on audible and tactile signals at Pelican crossings. Published by the Department for Transport in 1991, it describes the devices which are approved by the Secretary of State for Transport for purchase and installation by local authorities, including the 'Bleep and Sweep' audible signal (four 'bleeps' followed by a longer rising tone) for staggered pedestrian crossings. Guidance on evaluating the lighting required at crossings is provided in *ILP Technical Report TR12: Lighting of Pedestrian Crossings* published by the Institute of Lighting Professionals in 2007. Updated from a 1997 document, it gives consideration to the "experiences gained from the recommendations of the original report, the advances in lighting technology and the requirements of BS EN 13201-2: 2003 and BS 5489-1: 2003".

The **Transport Advice Portal** is an excellent source of information on legislation, research and guidance related to pedestrian road crossings (and other aspects of the UK's road network). The portal is a paper-free technical library hosted by the Department for Transport and the Chartered Institution of Highways and Transportation. See **www.tap.iht.org**.

Informal pedestrian road crossings

LTN 1/95 states that "where there are sufficient crossing opportunities in the vehicle flow, most people are able to cross without the provision of a (formal) crossing". Informal crossings are measures put in place to make this easier. They are created using paving materials (sometimes with street furniture). They slow moving traffic, narrow the carriageway and shorten – or break up – the crossing time for pedestrians.

Typical informal crossing features include:

Pedestrian refuges – or 'islands' – which provide an area to stand in the centre of the carriageway between the two lines of traffic. *LTN 2/95* provides detailed guidance on their design, recommending, for example, "an absolute minimum" width of 1.2m.

Kerb build outs which extend the footway (pavement) out into the carriageway.

Raised crossing areas which comprise an elevated section of road, with the crossing raised to the height of the kerb.

Dropped kerbs which provide level access to the carriageway. *Inclusive Mobility* recommends that, on longer side roads and residential roads, dropped kerbs "should, where possible, be provided every 100 metres to avoid the need for wheelchair users to make lengthy detours to cross the road". With regards to the exact position, due consideration needs to be given to 'pedestrian desire lines' (where people want to cross) and 'inter-visibility' (where drivers and pedestrians can best see each other).
NB dropped kerbs must be provided at **all** formal crossings.

Other types of pedestrian road crossing

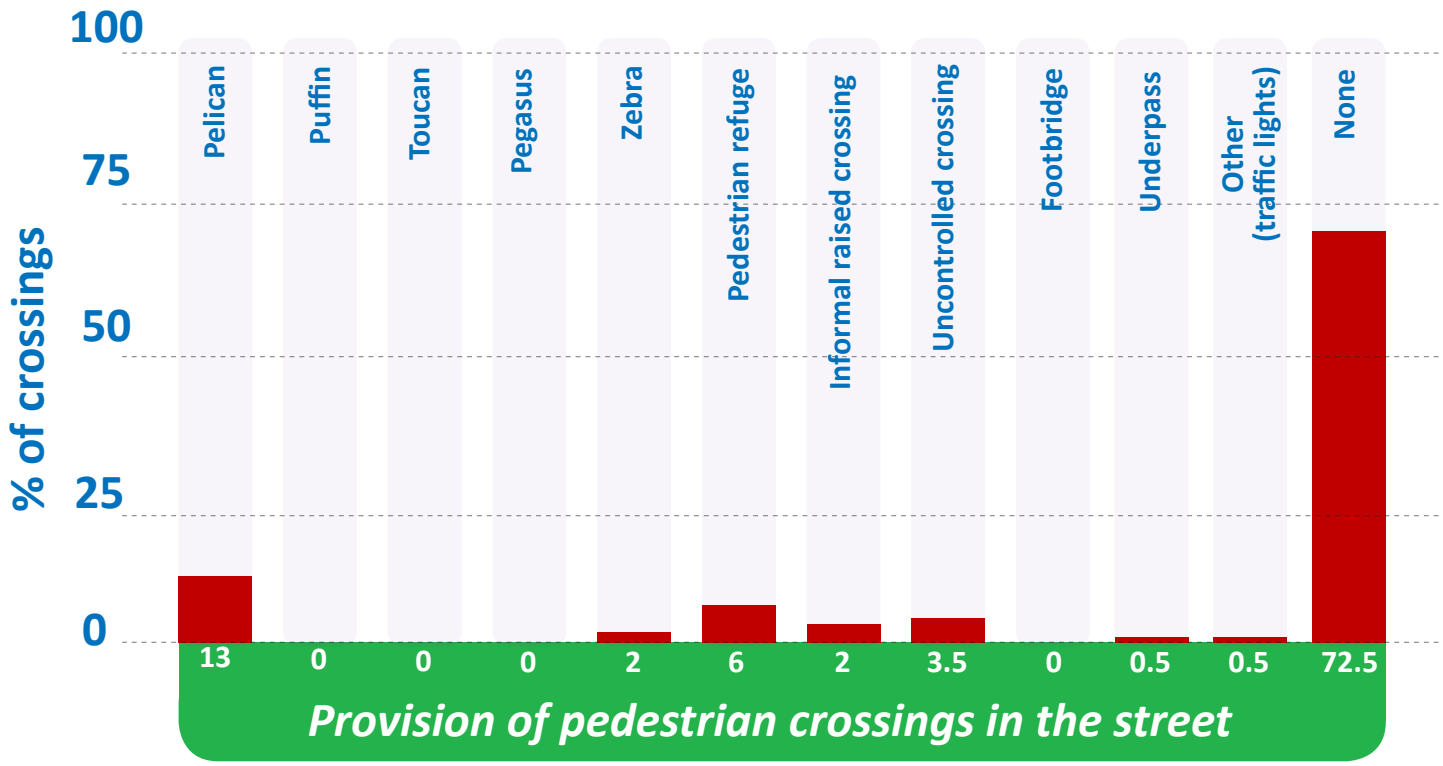
In general, UK guidance recommends that crossings are 'at grade', that is, at road level, wherever it is "safe" and "feasible" (see *Inclusive Mobility*). In *Manual for Streets* (DfT, 2007), it is recommended that "**footbridges** and **subways** should be avoided unless local topography or other conditions make them necessary. The level changes and increased distances involved are inconvenient, and they can be difficult for disabled people to use. Subways, in particular, can also raise concerns over personal security – if they are unavoidable, designers should aim to make them as short as possible, wide and well lit".

What I'DGO found

Are there sufficient crossings on UK streets?

Image © John McGonagle. With thanks to Joan Turner.

In *Local Transport Note 1/95*, the Department for Transport states that "where there are sufficient crossing opportunities in the vehicle flow most people are able to cross without the provision of a crossing". It recommends that "generally the provision of crossings should be targeted at the needs of those people who experience most difficulty and danger" and acknowledges that "at sites with higher vehicular flows, pedestrians, in some cases particular groups of pedestrians may require a crossing facility before they feel secure enough to cross". When I'DGO audited 200 residential streets (see Methodology 1), we found that **72.5%** had **no** pedestrian crossing at all – either formal or informal – but that, of the limited number of crossings provided, more (30) were formal than informal (23). In focus groups, participants typically told us that there was a lack of crossing facilities near to where they lived, that they perceived their neighbourhood traffic to be "very heavy and fast" and that "the traffic is so much more now, you can't just go across the road without a signal".



DSOPM004

Methodology 1

These findings are taken from a physical audit of the local neighbourhoods of 200 older people in a variety of locations throughout the UK. The audits were conducted within a 300m radius of each person's home and only included the places they could reasonably get to on foot. Using an externally-validated, 12-part toolkit, we assessed the provision, design and condition of streets during 'off-peak' hours. We then spoke to the same 200 participants, all aged 65 or over, for the qualitative element of our research and further information on our mixed-methods approach can be found on **www.idgo.ac.uk.**

What types of pedestrian crossing do older people generally prefer?

In interviews with 200 older people (see Methodology 2), we specifically asked about people's preferences for different types of road crossing. Participants were able to state a preference for more than one type so, while most of the people we spoke to (90%) preferred a signalised formal crossing, approximately half would also use a Zebra crossing. Again, around 50% considered informal crossings – specifically those with a pedestrian island – "better than nothing", though concerns were expressed about feeling safe when so often there were visible signs that cars had knocked into poles and bollards etc. and the islands were not considered wide enough to accommodate mobility scooters. Footbridges were considered "safe but impractical", un-friendly to pedestrians and "impossible with a scooter", while underpasses were perceived as both tiring ("too much walking") and intimidating ("dark, usually damp, with graffiti and rubbish").

Methodology 2

The findings above are taken from a survey of 200 older people selected on the basis of geographical settlement, housing ownership, deprivation and living arrangement. We surveyed them to assess their preferences for how streets are designed at detailed level using a structured questionnaire filled in by interview and photo elicitation. Most participants had lived in their neighbourhood for at least five years and were satisfied with it as a place to live. 51% had mobility, vision and hearing difficulties, to the extent that their daily activities were limited, 35% per cent used some form of mobility aid and 20% had stumbled or fallen outside within six months of the date of interview.

Pedestrian Crossings

- Still from KOVE film, *Where's the Green Man?* (Tony Ellis, www.kove.org.uk)

"Signalised pedestrian and cycle facilities have been used on our roads for a number of years but the ... sequences are not standardised and experience has shown that many people do not fully appreciate how they work leading to confusion and conflict.

To improve the situation, the Department for Transport developed a new type of crossing, known as a Puffin, which can be used both at junctions and at crossings away from junctions. It will provide the basis for a standardised form of signalling at all crossings"

- Puffin Crossings Good Practice Guide (Department for Transport and the County Surveyors' Society, 2006)

Do pedestrians typically understand the different crossing types and how they work?

When we interviewed 200 older pedestrians in the UK in 2005-2007, Puffin crossings had only recently been introduced, nationwide. Pelican crossings were the most commonly found type of signalised crossing in residential streets (26 of 26 in our survey) and older people generally preferred them (90% of our participants).

Typical responses were "you know you are safe when the green light comes on" and "it bleeps, which is good". While older people had grown up with Zebra crossings, and most had a good understanding of the priority they gave to pedestrians, some expressed concern over their own understanding of how they worked ("I'm never sure what to do"), while others feared that drivers did not understand them properly.

Between 2007 and 2012, we returned to the UK streets, this time speaking to just over 1,400 people (53% over 65, see Methodology 3). With regards to formal, signalised crossings, Puffins were now in wider use , though Pelicans were still the norm. While inconsistencies within the same general crossing type were impacting on confidence – e.g. "do I wait for a beep, or does this crossing not have a beep?"(Pelican) – the variability across crossing types was of particular concern to many of our participants, especially given the introduction of the Puffin to an already rich mix. Not all pedestrians perceived such crossings to be safe (despite research demonstrating them to be so, Maxwell et al, 2011), few people realised that they had 'intelligent' features that were capable of extending the crossing time and there was considerable concern about "leaving the green man behind as I cross".

- Maxwell, A., Kennedy, J., Routledge, I., Knight, P., Wood, K. (2011) Puffin pedestrian crossing accident study, London, Transport Research Laboratory

"With farside pedestrian signals, pedestrians look away from approaching traffic to see the pedestrian signal. When pedestrians look at a nearside Puffin pedestrian display they are also looking in the direction of approaching traffic. Seeing the approaching traffic and the pedestrian display at the same time should reduce accident risk.

Pedestrians with sight problems (and it is estimated up to two million pedestrians fall into this category) also should find it easier to see a nearside pedestrian display compared to a pedestrian signal at the opposite side of the carriageway."

- Puffin Crossings Good Practice Guide (Department for Transport and the County Surveyors' Society, 2006)

Methodology 3

The findings on this page are taken from a total of 972 self-completed questionnaires and 430 interviews exploring factors such as participants' use of, and preferences, for crossings, their health and history of falls and their experiences of tactile paving.

The questionnaires were handed out at 48 road crossing sites throughout the UK; the sites at which the interviews also took place. The majority of sites (41) were controlled crossings in urban locations, with 31% being in the lowest 20% of UK deprived areas and 25% in Conservation Areas. Of the 972 people who completed the questionnaires, 53% were over 65, 52% were overweight or obese, and there was a wide range of health conditions, including arthritis in the lower limbs (26.7% of respondents), reduced vision (16%) and asthma or breathlessness (16.5%).

What helps us feel safe when crossing the road?

When we spoke to 1,400 pedestrians (see Methodology 3), around **16%** of respondents felt **unsafe** or **very unsafe** at the crossing site where they were interviewed. Although just under half (**46%**) felt safe, only **15%** felt **very safe** and **23%** were **undecided**. We investigated whether crossing types and features predicted feeling safe when crossing the road and found four statistically significant predictors. Having controlled for the effects of age, gender, health conditions, previous falling incidents and road width, these predictors are as follows:

1. **The less traffic there is on the road, the safer people are likely to feel crossing it**
2. **The shorter the waiting time to cross, the safer people are likely to feel when crossing**
3. **If there is a green man present, people are likely to feel safer using the crossing. The longer its duration, the safer they feel**
4. **The better the level of information and signage as to *when* to cross the road, the safer people are likely to feel in doing so**

These effects did not vary significantly according to demographic variables or health conditions, suggesting that all users find these features important to providing a safe experience when using a crossing.

Sensory cues – bring back the beep!

In *Local Transport Note 2/95 The Design of Pedestrian Crossings* (DfT, 1996) the Department for Transport notes that audible signals are "intended for the benefit of blind or partially sighted pedestrians although they can also be helpful to others". As detailed in *LTN 2/95*, however, there are a number of instances in which such signals cannot be used, for example, where there are two crossings in close proximity. In these instances, the Department for Transport recommends, "tactile signals... should always be provided"; small cones mounted beneath the PDU which rotate when the steady green man is shown, in addition to tactile paving. The guidance states "If there are local people with vision and hearing difficulties, tactile signals are strongly recommended".

When I'DGO surveyed 1,400 pedestrians, of which 16% had reduced vision (see Methodology 3), there was strong feeling amongst blind and visually impaired participants that there was little point in providing only one type of sensory cue to cross the road. So, while it was sufficient to have tactile paving and an audible signal, a combination of tactile paving and a rotating cone was inadequate. Although the Department for Transport recommends two PDUs per side of the crossing, this is atypical in practice, leading one blind interviewee to comment "Do I have to fight through the crowds (that I can't see) waiting on the crossing in order to find the cone?" We found that some blind and visually impaired participants were unaware of the provision of a rotating cone because they had either not received mobility training, or, if they had, it was some time ago (before cones were introduced).

In line with what the Department for Transport anticipated in *LTN 2/95*, we talked to many people who were not blind or partially sighted but who still felt that the audible signal at pedestrian crossings was important. Instances included where the crossing was busy, or unfamiliar. These participants also found it confusing that a specific crossing type might have an audible tone, but that the same crossing type further down the road (e.g. at a junction) would not. Anecdotally, when we presented our findings to older audiences in the dissemination phase of our research, we encountered numerous calls to 'bring back the beep!', the perception being that fewer crossings now have this feature.

One participant in our research found it "embarrassing" to be seen fumbling under the push button box for the rotating cone when "no-one else knows" what he is looking for. In May 2013, an article on the *BBC Ouch blog – The secret button at pedestrian crossings* – agreed that "few seem to know about this useful little device" (the article received over 500 comments and was one of the most read across the whole BBC website on the day it was posted).

Image © BBC Ouch Blog

Despite the emphasis placed on the need for education, training and awareness raising in Department for Transport guidance, it would seem that there is still a lack of understanding across all sectors of the population as to how the different types of crossings work and to what purpose. One organisation attempting to redress the balance, particular for older pedestrians, is Kilburn Older Voices Exchange (KOVE); a London-based campaigning group with a particular interest in pedestrian safety (see www.kove.org.uk for useful videos, including the Puffins crossing feature, Where's the Green Man?).

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Recommendations

Older people have told us that their biggest concern when using a pedestrian crossing is knowing **when** to cross safely. They perceive a lack of understanding on the part of both pedestrians and drivers as to who has priority; exacerbated by increasing diversity within, and across, crossing types. When made aware of how each crossing works, particularly those with 'smart' features, older people tend to be supportive of the technology. It is a lack of education as to functionality, together with inconsistency of provision, which pose a challenge.

Inclusive Design for Getting Outdoors (I'DGO) recommends that:

- Diversity between crossings should be minimised.
- Local authorities should prioritise providing the public with information about different crossing types in the area, especially when new facilities – particularly Puffin crossings – are introduced. Likewise, when new crossing features are piloted or rolled out (e.g. countdown facilities).
- A national body should launch a campaign to improve driver awareness of how crossings work and of the various needs and behaviour patterns of pedestrians, including older people.
- Rotating cones should be routinely provided (and well maintained), but sensory cues should not be reduced to tactile indicators only; tactile cones and tactile paving are an insufficient substitute for audible / tactile signal combinations. Bring back the beep!
- Crossing times should be more generous. Currently, pedestrian crossings allow for a walking speed of 1.2 metres per second. Various pedestrian studies, and our own pedestrian counts, indicate an average walking speed, on crossings, of between 0.7 and 0.9 metres per second. This falls further at busy crossing sites.
- Department for Transport guidance with regards to the provision of dropped kerbs (every 100 metres) should be routinely observed, with particular attention paid to corresponding sides of the pavement.
- Pedestrian islands and kerb build outs should be of a sufficient size to accommodate wheelchairs and mobility scooters and signs of damage by cars should be removed, as they make people feel unsafe.
- Priority should be given to 'at grade' facilities. Underpasses and footbridges place older people and people with disabilities at a significant disadvantage.

About this guidance:

The Design of Streets with Older People in Mind was originally published electronically in 2007. This version of **DSOPM004: Pedestrian crossings** dates from June 2013 and is available in both hard copy and pdf format. All queries should be addressed to the author, Rita Newton (r.newton@salford.ac.uk), who retains the copyright.

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