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Making connections: the case of Borehamwood

This paper focuses on the suburban town of Borehamwood to the North of London. Space syntax analysis of the spatial structure of the area suggests that the way in which Borehamwood has been structured morphologically coupled with its distinctive social and economic history, has allowed it to grow whilst maintaining its original spatial pattern as a village and subsequently as a suburban town. The spatial form of the town centre accommodates the various populations of the town - people living and working locally; people living there and commuting to work elsewhere and people coming into the area to work. This mix has provided a greater economic stability then in other suburbs, particularly as in recent years many companies have opened offices in the area. However, small-area statistical analysis shows there is a polarisation of prosperity and deprivation.

The evolution of Borehamwood

The original aims of London’s suburbs were to relieve overcrowding of inner city tenements, but in parallel, middle class suburbs were developed along the new Underground train lines in places such as Pinner, Edgware and Stanmore, all of which were villages outside of London at the time. (Oliver et al, 1981) Unlike these ‘classic’ suburbs, Borehamwood developed into a suburb at a later stage: post World War Two, rather than post WW1. This has had an impact both on its architecture and on its urban form; with fewer examples of ‘Metroland’ types of semi-detached houses, and with a more compact pattern of street layout. It is also different from some cases in that initially it primarily contained a skilled working-class population. Only after the arrival of electrified trains in the late 1960s did a middle- and upper-middle class start to grow in any significant numbers.

Borehamwood’s first period of growth was after WW1, when the existing photography industries such as ‘Wellington and Ward’, coupled with clean air and an accessible location close to road and train links to London, attracted a large film industry. By the 1930s the district became known as ‘British Hollywood’. Many other industries followed suit until the start of WW2 when all the studios in the area were requisitioned for the war effort, including aircraft industry. Borehamwood might still have developed like many of London’s ‘classic’ inter-war suburbs, if the extension of the Underground from Edgware in the 1930s had been carried out. Instead, the coming of the war, financial constraints, and new Green Belt legislation post war, brought these plans to a halt and instead of continuous development taking place between Borehamwood and the outer suburbs of north London, a green belt between the two reinforced the area’s different identity from London’s suburbs and created a constraint on its physical growth, see fig. 1 and Castle and Brooks (1988), p. 76.
Borehamwood was selected for overspill housing from London in the 1930s and after WW2, many people moved to the area from the East End of London, having been made homeless by the bombing of WW2. The London County Council expanded its pre-war housing programme by building housing for these purposes from 1948 onwards.

The second big spurt in growth took place after the arrival of the electrified railway in 1968, and from this time onwards, an influx of people attracted by fast commuting times to London, coupled with a location at the edge of London’s green belt, started a process of transformation of Borehamwood into a commuter suburb. According to the 2001 census, the population is now estimated at 30,000. From the start of the 20th century up until the 1960s, there was a broad range of jobs available, from the skilled and technical workers to the semi-skilled, in local light industries, and a localised economy grew as the town underwent an influx of people from central London. Many of the factories have now left the town and in 1987 the former Wellington and Ward factory was demolished to make way for the Boulevard 25 Shopping Complex, located behind the western end of the high street, Shenley Road (see fig. 2, which shows the train station to the western end of the high street, the ‘Boulevard’ to the north of Shenley Road and the major supermarket in the large building set back at the opposite end of the street). New employers have come in to the area, with major insurance companies, for example, locating large office blocks along the same streets which once held the light industry. However, not as many local people are employed in these new offices and many of the people who live in the area commute elsewhere for work – either to London or outwards to major towns such as St Albans, Luton or Watford. Borehamwood has become for many a dormitory suburb.
This historical process has created two populations in Borehamwood: people who in the past found work in local factories and film companies, and their descendants, some of whom now commute farther afield to find work; and a second population, who were attracted to the town in recent years as a place accessible to London for daily commuting, and do not work locally.

In recent years Hertfordshire County Council has produced a revised Structure Plan, which according to Cadell & Falk (2000), sets out its commitment to ‘make provision for the housing and social needs of people in ways which minimise the need to travel and otherwise exploit the sustainability advantages of urban concentration’. This has led to the development of several sites close to the railway station and main roads with new, higher-density housing in the form of blocks of flats, terraces and maisonettes. See figures 3 and 4.

The social life of streets

Young and Willmott (1957) have shown that in the past, social life was conducted outside the home, and most people met their acquaintances ‘in the street, at the market, at the pub, or at work’, (p. 107). Streets were usually characterised by a mix of locals and strangers, and by a direct physical link between inhabitants. Young and
Willmott’s seminal study of working class people in Bethnal Green in the East End of London found a strong congruence between environment and the pattern of family relations and they found that longstanding residence coupled with a high degree of ‘localism’, that is people rarely venturing out of their district, meant that there was a high level of correspondence between community and locality. Coupled with the fact that social engagement took place as part of people’s day-to-day movements on the streets of the neighbourhood, this led to a notion that the street was where community ties were developed. Social anthropologists subsequently found that streets which permit a mix of locals and strangers, promote easy interaction between different classes of people, see for example Whyte (1943), in his study of Italian ethnic enclaves.

Hillier and Penn (1996) have subsequently argued that the way in which streets are laid out in settlements and cities has a fundamental impact on the proportions of people to be found on the streets and that this distribution then influences the mix of types of movement on the street: people making local journeys and people moving at larger distances – locals and strangers. Suggesting that settlements are ‘mechanisms for generating contact’, the success of a place is shown to be dependent on how well it manages to move people around it in a beneficial way. As a social by-product to planned encounters, the street layout creates the potential for casual encounter, and co-presence. The lack of these beneficial mechanisms has been identified by Hillier and others as the cause for the social malaise found in many housing estates, see for example ‘Can Architecture Cause Social Malaise’ (chapter 5 of Hillier, 1996).

The perception has been perpetrated – partly by people reading the study by Willmott and Young (1960) of the East End community after their move to a new housing estate in Essex (1960), that suburbs have the tendency to break up the richness of street life common to city streets. The accepted interpretation of their findings is that the relative low density of the new housing estate had broken up the strong cohesiveness of families studied which had previously existed in the high density streets of the East End. In fact, they maintain that ‘[p]eople in the suburb are on the whole friendly and neighbourly and helpful to each other’, op cit, 112. They go on to say that part of the explanation of the support structure present in Bethnal Green was the fact that it was a ‘long settled community’, with layers of activities and roles played out by people who knew each other from childhood: people walking the local streets would make daily visual, if not verbal, contact with people they knew from the various aspects of their daily lives; work, shopping, visiting relatives and so on. People visiting the area would be introduced to their relatives’ friends.

Research into social networks on housing estates by Hanson (2000) has found that this accessibility is substituted by visibility, creating a ‘community of the eye’ (op cit, 118). Windows replace doors as the ‘eyes on the street’. The domestic interior is physically remote from the world outside the window, though it is directly adjacent to it. As Pearl Jephcott has shown, in housing estates, ‘there are none of the handy, neutral areas, doorstep, yard or garden, which help people to build up their dossiers on each other without necessarily exchanging a word. And [the dwelling] is blind in that its windows afford no two-way link with the outside world. This turns the block and estate into an eventless place’, Jephcott and Robinson (1971).

One important aspect which is revealed by these studies is the importance of spatial organisation in the affect it can have on people’s social lives. In particular, Willmott and Young’s analysis shows that physical proximity and continuity of settlement are a vital factor in maintaining social relationships, whilst Bayliss (2001) maintains that it is the social composition – namely having a mix of classes - that was critical to the success of interwar cottage estates.

The spatial and social problems of suburbs are said to range from a lack of variety of scale and style, a widespread use of cars alongside low density, a uniformity of land use (mostly residential), and a lack of mixing of different classes of people, which according to some sources, leads to too much conformity, oppressiveness and isolation.
The untrammeled growth at low density has also led to cries of a ‘monstrous sprawl’, (Steur, 2002). Yet suburbs are aspirational for many people, including immigrants, see (Nasser, 2004) and (Peach, 1998). The spatial organisation of Borehamwood has helped foster community ties, by creating a spatially permeable, integrated neighbourhood, with has had the outcome of mixing together different classes of people on many of the streets of the area. Despite the fact that much of Borehamwood’s industry has been lost, the area still benefits from an (unsuburban-like) integrated spatial network, coupled with a dense layering of economic and social activities, and a variety of social classes, which together create the potential for a solution to the problems of physical, economic and social isolation which have emerged in recent years in other suburban areas.

**What makes Borehamwood work?**

The spatial analysis of Borehamwood used ‘Space syntax’ methods for modelling and analysing urban form. Space syntax is a field of architectural research based around theories of the relationship between architectural space and society. This research field uses methods of analysis of the fine scale spatial morphology of the city at the level of individual street alignments to measure their relative ‘segregation’ and ‘integration’ within the urban street network as a whole. Rather than comparing census tracts or other areal summaries (which have a boundary which is not related to people’s every day experience), the spatial elements are directly and precisely derived from the geometry of the space defined by built form. Space syntax first became prominent with the publication of ‘The Social Logic of Space’ by Hillier and Hanson (1984). Space syntax research has thrown light on a wide range of factors associated with settlement formation and human activity. In analysing space as different kinds of *patterns* of functionally relevant geometric elements, space syntax lends itself to look at the outcome of a set of human behaviours, guided by economic circumstances and the history of the city. This means a range of factors can be considered in analysis of the built environment: not only individual houses, but also the location of key cultural institutions, economic activity, and perhaps most importantly the network of streets in a local neighbourhood through which the population moves in its every day activities.

The spatial analysis of Borehamwood’s street structure was made using a computer model referred to as the ‘axial map’, which measures how directly linked each street alignment is to neighbouring streets and onwards to all streets in the area. The principle lying behind the axial line representation is that movement is mainly related to the one and two dimensional extensions of space. Indeed, Hillier (1996) maintains that the linear structure of the town is fundamental in controlling the organisation of space since the distribution of local and global integration becomes ...

‘the most powerful functional mechanism driving first the pattern of movement and, through this, the distribution of land uses, building densities and larger-scale spatial and physical elements such as open spaces and landmarks’ (p. 215). Previous space syntax research would suggest that the same general rules apply to such semi-urban structures as suburbs. Fig 5 shows the results for the analysis of global integration. It shows a clear structure reflected in the black and dark grey lines which constitute the High Street, and other important roads in the area containing the main places of employment, shops, civic centre, Village Hall and so on. This structure is maintained both when integration is measured globally (Fig 5), where each street is considered in relation to all others and from a local point of view (Fig 6), where each street is considered only in relation to its immediate surroundings (three street junctions away). The analysis of local integration also indicates that there are locally well integrated streets throughout most of the area.

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Previous space syntax research has shown that the distribution of movement densities can be predicted from the structure of the grid itself, without taking account of land uses. In the example here, the model does not ‘know’ that Shenley Road, Borehamwood’s high street, contains most of the shops, yet it emerges as the most well integrated street, both globally and locally. Shenley Road (which has never fundamentally changed in its layout) is a strong, well
constituted spine, which supports a network of streets containing a range of housing types from terraces to a small number of semi-detached houses (some of the latter were specifically built for workers at the local film studios – MGM owned large tracts of land in the area at one stage). Borehamwood is surrounded by busy roads to the south and east and to the north it is constrained by the Green Belt. This means that the growth has been somewhat constrained and this has also put pressure on the main routes through the town centre, which suffer from congestion at peak times. However, the benefit of these constraints has been that as Borehamwood has grown, it has retained a spatial structure which is more compact and dense than of typical suburban areas, see analysis by Conroy Dalton and Dalton (2005).

A good match of spatial structure and movement densities means that there is a range of movement rates, from the busy high street to the quiet back street, but without the hyper-segregation and desolation found in many housing estates (which tend to be dislocated from the urban grid structure). In social terms, the existence of medium to high pedestrian movement rates in the town centre, means that there is a mix of locals and people travelling to and from work or the shops, bringing about the lively pedestrian activity seen as the elusive solution to the abandonment of many town centres.

The permeability of the grid means that people who move around on foot can easily traverse the residential streets to get to local shops, surrounding parks and to the train station. However, not all residents benefit from this accessibility. As the area has grown, the distant, more impoverished residential areas have suffered from a loss of local work and low rates of low car ownership, with the obvious subsequent social problems. This is evident from analysis of the most recent census returns (using 2001 census Lower Layer Super Output Area statistics, for around 600 households per area). Analysis of simple measures of deprivation, such as levels of education, health and unemployment, shows that some sub-areas are well below average for the area, whilst others are well above; some are also below the national median. Two particular areas (third and seventh from left in each of the graphs) suffer from much lower than average rates of ‘good’ health and higher than average lack of qualifications and unemployment, whilst a contrasting pair of areas (the last two on the right in each of the graphs) has above average ‘good’ health, low rates of ‘no qualifications’ and very low rates of unemployment.

Figure 7a: chart showing percentage of Borehamwood population in 2001 defining their health as ‘good’. Each point represents a single Lower Layer Super Output Area (approximately 600 households). Nationally, the range is 36.19% to 93.12%.
Source: www.neighbourhood.statistics.gov.uk

Figure 7b: chart showing percentage of Borehamwood population in 2001 with no qualifications at age 16-17. Each point represents a single Lower Layer Super Output Area (approximately 600 households).

Figure 7c: chart showing percentage of Borehamwood population unemployed in 2001. Each point represents a single Lower Layer Super Output Area (approximately 600 households). Nationally, the range is 0.31% to 18.12%.
Growing polarisation

It is likely that diminishing industrial employment in the district has contributed to the economic deprivation of a sector of Borehamwood’s population. Recent research has shown that people with few skills are likely to look for work in the area closest to home (this is partly due to transport difficulties, such as lack of car ownership). As shown by a recent report by Green and Owen (2006), p. 106: analysis of work patterns in the 2001 census shows that ‘…geography matters most for those with poor skills.’ Thus, whereas in the past local inhabitants could seek work in the numerous factories in the area, now local employment is more likely to be in more highly skilled office work (although some call-centre work is available). The provision of local low-skilled employment is clearly an important aim for planning for the future economic sustainability of the district.

Borehamwood also contains a large commuter population. Neighbourhood statistics show that the percentage of adults aged 16-74 in work who travel to work by train, ranges by area from 7% to 19%, and statistical analysis shows that the areas with high unemployment and other indicators of deprivation, have the smallest percentages of long-distance commuters (regression analysis between the two indications found R^2 of .675, p<.0001). These statistics support the contention that a significant proportion of the population are using the area as a dormitory suburb, perhaps utilising the local major supermarket on the weekend and visiting places of worship on occasion, but in general, for them their life in the area is confined much more to home and a small circle of friends and family and they are much less likely to spend time on the streets of the area. The remaining population work much closer to home, and are more likely to be using the town centre on a daily basis.

Economic trends

Although Borehamwood’s high street no longer contains the clutch of family owned hardware, food, clothes and shoe shops that used to line its high street - like many other high streets around the country - the street still looks healthy, with family owned bakers, hairdressers, butchers and a thriving twice-weekly market. This is in sharp contrast to many other ‘clone towns’, highlighted in a recent report by the New Economic Foundation (2004). With a diverse range of shops and occasionally astonishing juxtapositions, such as a pawnbroker’s opposite a smart coffee shop – it is as if the high street represents the variety of populations in the town. However, the situation is more complex, with many of the shops dependent not only on local inhabitants of all types, and local office workers. Others survive partly due the large numbers of people who come into the town centre from the surrounding villages and towns specifically to shop.

Variety of shops The shops were analysed using Goad Experian historical shopping plans from 1970, 1990 and 2005, coupled with direct observations of movement patterns conducted in February 2006. Comparison of the most popular shop types in the three periods, indicates declining variety with 103 shops of the most common ten types in 1970 particularly clothes, shoes, food and furniture. compared with 88 shops in 2005 with a growth in restaurants, hairdressers and food outlets. In the earliest period, there were many more shops selling commodities – both convenience and durable goods (72% of shop units in 1970, dropping to 60% and 54% in 1990 and 2005, respectively); whilst the number of shop units selling services (such as banks) has increased significantly, from 31 in 1970 to 46 in 1990 and 54 in 2005.

These changes are a useful measure of the transformation undergone in the high street, which is much less of a place to buy daily and weekly goods now, than it used to be in the past. The comparison across time suggest that the trend is towards fewer goods as time goes on, as is evidenced from the following chart (Fig 8), which also shows
that the proportion of vacant premises has risen from 1% in 1970 to around 6% in more recent years. If charity shops are also considered, as another indication of decline, the result is also significant, with no charity shops in 1970 rising to 2% in 1990 and 3.5% in 2005.

Also striking is that restaurants, which were an important presence on the 1970 high street (10 units, 8% of 25 shop types), have multiplied by a factor of 2.5 in 2005 – a possible indication of a change in the general leisure activities, or that the expanded office population has led to greater demand. Other striking differences are the 14 furniture and household goods shops in 1970 in contrast with only 5 in 2005. The likely interpretation is that many of the smaller suppliers have been moved aside by the larger department stores in the area. Lastly, there were only 2 estate agents in 1970, with 8 in 2005.

**Pedestrian movement** In recent years a redesign of the town centre’s road layout, including traffic calming measures such as roundabouts, speed restrictions and central reservations have eased pedestrian movement in the area, both along and across the busy traffic (see figure 9) and from farther afield, as evidenced from the relatively large proportion of shoppers observed arriving on foot. Space syntax analysis of the local spatial structure, using fine scale segment analysis (where each street section between junctions is considered) can be seen in fig. 10, where the measure of Choice is displayed. Choice is a measure of the likelihood of a space in the street network being used as part of a route from all possible origins and destinations. It is computed by plotting the shortest origin-destination journeys within a given radius from a single segment and calculating the likelihood that each segment within that radius will form part of the shortest path. In contrast with integration, which is a measure of ‘to-movement’, choice is a measure of ‘through-movement’. It shows that the high street is (as was also shown in the axial integration analysis above), the most important route in the system, but also shows that there is variation along the high street, with the central section having a higher value (the segment in black). Observations of pedestrian movement patterns, seen in fig. 11, shows that movement follows the pattern predicted by the measure of Choice, with the central section (closest to the entrance to the Boulevard complex where the largest concentration of chains stores is situated) possessing a higher rate of movement than the adjacent segments.
Figure 9: Borehamwood high street – traffic calming has improved pedestrian movement in area.

Figure 10: Choice analysis of the street segment network of Borehamwood. Black indicates high 'choice', white indicates low 'choice'.
Figure 11: Observed movement along all segments of Borehamwood high street (courtesy Amit Sarma). Underlying plan scale 1:1250 (c) Crown copyright/database right 2005. An Ordnance Survey/EDINA supplied service.

The spatial and movement patterns are also reflected in the types of shops along the high street. Analysis of the various street sections indicates a wide variation between chain and independent stores depending on the street section – at the station end, both sides of the street have a high proportion of independent shops (82 to 85%), at the opposite end of the street (close to the major supermarket), the results are similar (75 to 81%). Yet, the central section has a much more even distribution on the north side, close to the entrance to the Boulevard and where pedestrian traffic is highest (50% independent shops), in contrast with the other side of the street (82% independent shops).

Independent shops Borehamwood, unlike many other high streets, appears to have a healthy mix of chain stores and independent shops. It also has a twice-weekly market, which attracts shoppers from surrounding villages and towns and the Village Hall has daily activities of particular interest to the older segment of the population. The redevelopment of the supermarket on the high street into a cinema and bowling centre has created another attraction along the high street. Yet closer analysis is required. The New Economic Foundation (2004) has recently published a report on the transformation of British high streets by chain stores replacing locally owned, independent shops. The report provides tools for analysing a high street to see to what degree it is a ‘Clone Town’ (dominated by chain stores) or a ‘Home Town’ (still retaining a mainly local character). The analysis considers the number of shop types set against the number of independent shops and the number of chain stores, see page 23. ‘Clone Town’ analysis of the main body of Borehamwood high street in 1970, 1990 and 2005 shows it is not yet a ‘clone town’, yet, as figure 12 shows, has become more ‘clone’ like over time.

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<tr>
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<th>1970</th>
<th>1990</th>
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<tbody>
<tr>
<td>Chain store</td>
<td>13 (10%)</td>
<td>32 (21%)</td>
<td>43 (31%)</td>
</tr>
<tr>
<td>Independent</td>
<td>117 (90%)</td>
<td>120 (79%)</td>
<td>96 (69%)</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>152</td>
<td>139</td>
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Figure 12: Frequency distribution of chain and independent stores in Borehamwood, through time.

Borehamwood is now at a tipping point. With indications that rental rises are driving independents and smaller chains out of the high street (a stationery store and a small children’s clothes shop have both closed in the past 6
months and anecdotal evidence suggested this is directly an outcome of rent rises), it remains to be seen if chain stores will spread along Borehamwood high street and change its character further. It also remains to be seen whether the increase in indicators of decline, as evidenced by the increase of charity and vacant shops described above will continue. There is the risk that the high street will be left behind by the economic success of the Boulevard (which is about to open several more national stores). Yet bearing in mind the considerable number of independent shops which continue to thrive (such as the wool shop, the second-hand book shop and the Turkish mini-market opened in 2006), and the amount of activity generated by the market (see figure 13), it is equally possible to predict that if circumstances allow, the decline can be reversed in the high street. The importance of independent shops should not only be quantified in economic terms; there is evidence to show that open markets and independent shops engender a greater amount of sociability not provided by large supermarket and national chains (Common Ground, 2006).

Figure 13: Borehamwood high street: sociability on market day

**Permeable street network**

A study of the street layout in Borehamwood (see figures 5 and 6, above) reveals that it differs spatially from many suburbs, with fewer tortuous layouts of cul-de-sacs. This has been confirmed by a mathematical study of sprawl in a range of urban and suburban settings by Conroy Dalton and Dalton (2005), who studied an axial map of Borehamwood, alongside Manhattan, Atlanta, Soho and Peachtree (a suburb of Atlanta). Their analysis was based on the proportion of streets in each case which are grid-like (urban) or with dead-ends (suburban) and the results showed a measurable continuum between ‘suburbia’ and ‘urbanity’ reflected in the frequency, length and distribution of graph network circuits. Borehamwood was found to be mid-way on the spectrum in the amount of ‘ringiness’ in its layout – that is the high level of route choice throughout the street system: ‘almost a small town rather than a suburb’ (ibid, p. 11).

**Social contact** The presence of a permeable grid means that there is the potential for social contact on the main streets, a ‘virtual community’. Previous research suggests that sociability is engendered by the way in which houses are laid out on a street. Fox (2004), has pointed out that the English are so respectful of others’ privacy, that they will wait for their neighbour to venture into their front garden, say to cut the lawn, before they will ‘bother’ them with a conversation opening. It is evident that at the fine scale, residential streets in Borehamwood are frequently sized such as to enable sociable encounters in the front garden, and laid out such as to minimise through traffic, yet without eliminating cars entirely, see figs 14 and 15. Distances between houses, pavement widths, heights of front hedges, street widths and low car traffic rates, can all come together to create a street which does or does not create
the potential for neighbourly interaction. The long-standing continuity of residence for many inhabitants must also contribute to their sociability, as mentioned in the earlier section.

Figures 14 and 15: residential streets in Borehamwood

Studies of historical and contemporary suburbia, such as Bayliss (2001) and Clapson (2004), suggest that some suburbs have high rates of participation in leisure and social activities in the neighbourhood, inferring from this a high rate of social and community ties, as would be evident from a study of available activities in Borehamwood. However, a more cautious interpretation would suggest that not all inhabitants participate at the same rate in local social life: those that choose to live a more suburban way of life can dip in and out of town life as suits them, whilst those who prefer to lead a more anonymous lifestyle can opt out of such activities. It is clear from long-term observations by the author of the Borehamwood commuter trains to and from London, that some of the commuter population is socially active on a local basis: many people have regular train companions, whilst others frequently meet friends or acquaintances whilst waiting for the train.

Conclusions

Previous research suggests that walkability and accessibility are key components of successful suburban life. Whether a person owns a car or not, the ability to easily gain access to many of the functions of day-to-day life on foot is evidently a desirable aim for the future sustainability of suburbs. Suburbs serve families with young children particularly well, with clean air and open spaces. The analysis shown here has suggested that the morphology of the street can have a positive impact on sociability. The social and economic success of Borehamwood’s town centre is also due to its benefiting from a mixed customer base composed of local residents, local workers and shopping day-trippers. What seems evident from the analysis of this particular case is that suburban areas have the potential for sustainable living, and living in a way desired by the majority of this country’s inhabitants.

Borehamwood has prospered because of its a multi-layered character, comprising a varied population with access to a variety of work opportunities. Whether or not Borehamwood will succeed in the future is likely to depend on whether the poorer segment of the population has the education and skills training that will enable their social and economic integration. There is evidence to suggest that there is a growing traffic congestion problem in the town, along with other problems such as flooding of low lying areas. This is partly due to an increase in car use alongside an increase in housing density (in some cases on sites of old film studios and factories) without there having been an
improvement of the infrastructure or a transfer to non-car means of transportation. The spatial constraints on Borehamwood make this a particularly difficult problem to solve, and this is likely to be a problem with other suburbs undergoing densification. Despite these problems, Borehamwood serves as an example of how an architecturally undistinguished suburb can be sustainable.

References

Conroy Dalton, R. and Dalton, N. (2005) A Spatial Signature of Sprawl: Or the Proportion and Distribution of Linear Network Circuits, Gencompuation 2003, Ann Arbor, Michigan, USA,

Endnotes

1 Borehamwood is commonly associated with Elstree, a nearby village which shares the town council and both are served by the ‘Elstree and Borehamwood’ train station. The streets on the western side of the railway tracks, are sometimes referred to as Elstree. This paper refers to the geographical entity of Borehamwood, which includes those streets, but excludes the village of Elstree (see figure 1).
2 A wide variety of film and television companies owned vast lots in the town until recent years (and there are two large lots extant). Information provided by Elstree and Borehamwood Museum, 26.1.06.
3 See Warren (1983).
4 Castle and Brooks (1988).
5 The ODPM statistics on Town Centre Activity for 2002 finds over 1,000 people employed in central Borehamwood in offices and an additional 2000 more employed in retail, restaurants and arts, culture and entertainment.
6 In fact this has led to traffic calming measures to slow down traffic along the main street, see Cadell and Falk (2000).
7 A few examples of the latter remain: and until recently there was a family-owned clothes shop stating self-deprecatingly on its sign that it has branches in ‘New York, Paris and Borehamwood’.
8 I am grateful to Amit Sarma, a student on the MSc Advanced Architectural Studies at the Bartlett, UCL who conducted the observation work and also drew GIS plans of Borehamwood, which were used for this section of the paper.