# The persistence of suburban centres in Greater London: combining Conzenian and space syntax approaches

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**Abstract.**  *The relationship between settlement form and the historical persistence of concentrations of diverse socio-economic activity in Greater London's suburban centres through successive phases of rapid urban transformation is examined.  Particular consideration is given to the development of three suburbs in Greater London: Barnet, South Norwood and Surbiton.  Conzenian and space syntax approaches are combined within an integrated GIS environment.  Both these approaches identify the historical grain of settlement forms as the key to understanding how socio-economic activity becomes organized in the built environment.  Using Surbiton as a case study the analysis demonstrates firstly, how the configuration of Greater London's historical road network relates to the persistence of socio-economic activity in the built environment over time, and secondly, how diverse, localized patterns of such activity are accessible at a range of morphological scales.  It is concluded that the relationship between suburban built form and socio-economic activity is both configurational and historical in nature*

*Key Words: suburbs, London, space syntax, Conzenian methods*

The prodigious growth of London since the late-eighteenth century led to the expansion of the built-up area of the city into its surrounding hinterland, assimilating many villages and small towns during successive phases of suburban development. However, the nature of London's urbanization is misunderstood if the 'absorption' of these peripheral settlements is thought to mean an end to their identity as distinctive places. On the contrary, from a morphological perspective the popular image of London as a 'city of villages' (Greater London Authority, 2002) implies the persistence of distinctive pre-urban

structures within the urbanized landscape. Such structures have played an important role in sustaining the local centres of socio-economic activity associated with urban life (Griffiths, 2009; Griffiths *et al.*, 2008). Urban morphologists, historians, geographers and architectural researchers increasingly display an awareness of the socio-spatial complexity of the suburbs (Harris and Larkham 1999; McManus and Ethington, 2007; Vaughan *et al.*, 2009a; Whitehand and Carr, 2001). This interest in the urban periphery is complemented by a parallel and increasingly convergent research agenda concerned with the diffuse regional settlement patterns identified by Sieverts (2003) as 'cities without centres' and which Phelps *et al.* (2006) characterize as 'post-suburban'. Although London itself is undeniably a metropolitan centre, the distribution of smaller centres of activity throughout its region is indicative of the multiple scales at which everyday socio-economic life operates.

A regional focus on urban settlement patterns lends itself to analysis of morphological structures in terms of a network of linked centres (Hillier and Vaughan, 2007). Such an emphasis naturally highlights the role of pre-urban road systems in accounting for differential patterns of settlement development within a region. At issue is the historical relationship between the form of road network structures that extend to the regional level and the emergence of relatively localized concentrations of socio-economic and cultural activity (Hanson, 2009). Exploring this relationship is difficult without methods of analysis that can provide meaningful descriptions of road networks from the macro-scale to the micro-scale where day-to-day human activity takes place. This paper proposes that by combining Conzenian analysis (Conzen, 1960, 1968; Whitehand, 1981, 1987, 2007) with the space syntax method of network analysis associated with Hillier's configurational theory of built form (Hillier, 1996; Hillier and Hanson, 1984), an enriched morphological perspective is possible in which an awareness of the specificity of local built forms is complemented by a more

generic understanding of the role of road networks in explaining the conditions of their emergence. Drawing on research conducted for a 3-year research project at UCL (SSTC, 2006-9), it focuses on the Greater London suburbs of Barnet, South Norwood and Surbiton and enquires how far the long-term persistence of socio-economic activity in these centres has a morphological explanation.

## The 'complementarity' of Conzenian and space syntax perspectives

Larkham (2006, p. 130) notes how the potential 'complementarity' of Conzenian and space syntax traditions represents an opportunity for research collaboration. However, the necessary theoretical-methodological groundwork for these perspectives to be used in conjunction with each other has yet to be undertaken. The quantitative aspects of space syntax analysis and its use of graph representations of street plans make it inaccessible to those from other disciplinary backgrounds. Conversely, the painstaking historical research involved in executing traditional Conzenian methods means that to space syntax practitioners working with a more generic theory of urban form, it can appear excessively concerned with the historically particular.

While acknowledging the significant differences in outlook that distinguish the Conzenian and space syntax traditions of built environment research, the inevitable difficulties of conducting dialogue across disciplinary lines does not alter the fact that genuine areas of congruence exist that might provide the basis for a more productive collaboration. Principal among these is a shared belief that it is the *fine historical grain* of the built environment, rather than the contingent administrative boundaries that have been imposed upon it by tradition, political bureaucracies or abstract planning models, that constitutes the proper object of analysis in addressing the interrelationship of society and space. This shared emphasis on form is neither superficial nor coincidental; on the

contrary it implies the existence of a common theoretical position in which the integrity of the interpretation arises, in the first instance, from the appropriate application of analytical methods in which the everyday built environment that is meaningful to human inhabitants undergoes a process of formal 'description' through which morphological structure is revealed.

The now well established 'spatial turn' in social theory emphasizes how socio-economic processes and cultural identity must be recognized as emergent in space as well as time (Gunn, 2001; Massey, 2005). But, to assert the spatiality of social processes is not the same thing as asserting that space itself is fundamentally social. After Lefebvre (1991) it is widely acknowledged that society in some sense 'produces' space through hegemonic systems of socio-economic and cultural power. To suggest, however, that society's spatial organization at the level of the built environment is itself implicated in the reproduction and transformation of society, is to court accusations of *excluding* the social by seeming to endorse built-environment determinism.

The quantitative nature of space syntax analysis makes it particularly vulnerable to criticism from social theorists who would naturally associate it with the discredited mathematical reductionism of geography's 'quantitative revolution'. Hillier (2008, p. 223) identifies an irony in the fact that two such theorists, Soja (1990, 2001) and Harvey (1973, 1996), in rejecting spatial determinism, in fact deal relatively little with the spaces of everyday life in which the relatively abstract socio-economic processes they are concerned with are manifested. This principled but occasionally misdirected apprehension of environmental determinism has negative implications for disciplines that prioritize the shape of the built environment by representing its research as concerned with little more than the trivialized 'products' of spatialized social processes. The consequence, Hillier argues, has been that the spatial turn in social theory has had the paradoxical effect of relegating the built environment domain in which space becomes genuinely *social* and generative of meaning, to a mere physical backdrop.

In contrast, research in both Conzenian and space syntax traditions has shown how it is the emergent *structure* of space, rather than the formal geometric definition of any particular physical object or array of objects, that explains its fundamentally social nature. In the Conzenian tradition this structure is approached from an evolutionary perspective on the interrelation of streets, building plots and buildings, in which distinctive morphological periods are said to give rise to 'morphogenetic' units that influence subsequent phases of settlement development (Whitehand, 1981). In space syntax research morphological description focuses on identifying the characteristic configurational structures in road networks at different geographical scales, with the most persistent representing the most 'structurally invariant' over time (Hillier, 1996, p. 70). Space syntax research diverges from the Conzenian perspective in that its primary concern is not with historical morphological periods *per se* but with the relationship between road networks, movement patterns and land-use distributions (Hillier, 1999). However, both perspectives advance an evolutionary approach to the study of the built environment in which specialist methods are brought to bear on the task of describing the structural regularities or 'genotypes' that occur in settlement patterns. Further interpretation then explores the general relationship between particular morphological structures and prevailing socio-economic and cultural mores on the premise that neither can be satisfactorily understood in the absence of the other. This key area of theoretical-methodological congruence provides a solid basis for future collaboration between Conzenian and space syntax researchers.

## Combining Conzenian and space syntax approaches

Both Conzenian and space syntax methods informed the research presented in this paper. For example, town-plan analysis does not rely

exclusively on the existence of historical maps or other documentary evidence but is able to employ meticulous cartographic exegesis to reconstruct the development of urban landscapes. This method provides a useful conceptual starting point for considering the extent to which space syntax representations of contemporary built forms might similarly help elucidate historical patterns of urban trans-formation. Such an approach recommended itself because the preparation of space syntax 'graphs' of road networks involves a considerable investment of resources, especially in the case of regional systems, meaning that it was not logistically possible to create new graphs on the basis of historical maps.

Conzen identified three key morphological levels of analysis: the street system, plots (aggregated into street blocks) and land and building utilization. Broader socio-historical processes can be identified in the emergence of distinctive unitary areas within the street plan, the phases of the building plot (or burgage) cycle and the periodicity of what Whitehand (1987) has defined as suburban 'fringe-belt' development, that is the retention of large land-use parcels at present or former urban peripheries for such purposes as recreational and institutional use. From a space syntax perspective these ideas can help identify the historical processes that explain the singular topological and geometrical properties of a spatial configuration.

A characteristic of much research, both in the Conzenian and space syntax traditions is a tendency to focus on detailed case studies of individual settlements. While this focus is relatively unproblematic at the resolution of the plot or building block plan, at the street plan resolution it can appear rather arbitrary, in the sense that a principal function of an arrangement of streets is to connect the settlement to its surrounding region. The emergence of a 'street plan' and the internal organization of space it represents are intimately related to the position of a settle-ment within a larger regional road network. How the properties of this network relate to established Conzenian categories such as plan,

plot and land use is a relatively unexplored area of research where space syntax can make a contribution.

Configurational theory offers two key propositions in this respect. The first of these is the theory of natural movement which argues on the basis of empirical studies that the relative inter-accessibility of street space is the primary explanatory factor in accounting for patterns of pedestrian and vehicular movement, before the effect of particular attractors or regulatory regimes are taken into account (Hillier *et al.*, 1993). The second, related insight, is the theory of the 'movement economy' which maintains that the distribution of land uses in the urban grid is fundamentally related to the extent of their reliance on movement (Hillier, 1996). Typically, in a contemporary Western city, retail functions will occupy high movement streets (in graph terms these are likely to be well 'integrated'), while residential streets are likely to be more segregated. According to Hillier, the 'interfaces' between relatively integrated and relatively segregated street space are vital in giving rise to the distinctive 'spatial cultures' through which societies reproduce themselves.

From a methodological perspective space syntax network analysis provides a technique for bringing the regional properties of a road network to bear on the morphological characteristics and land-use patterns of particular centres. However, its concern for the generic properties of urban form means it can lack sensitivity to the place-specific complexity of historical processes of change and continuity in the relationship between society and space that research in the Conzenian tradition can provide. In combination, the Conzenian and config-urational approaches promise an enhanced analysis of the relation between street plan, plot pattern and land use in which it becomes possible to describe the relationship between the extensive road network structures in which street plans are embedded and the fine grain patterning of socio-economic activity within particular settlements. By drawing on both research traditions it is intended that the struc-
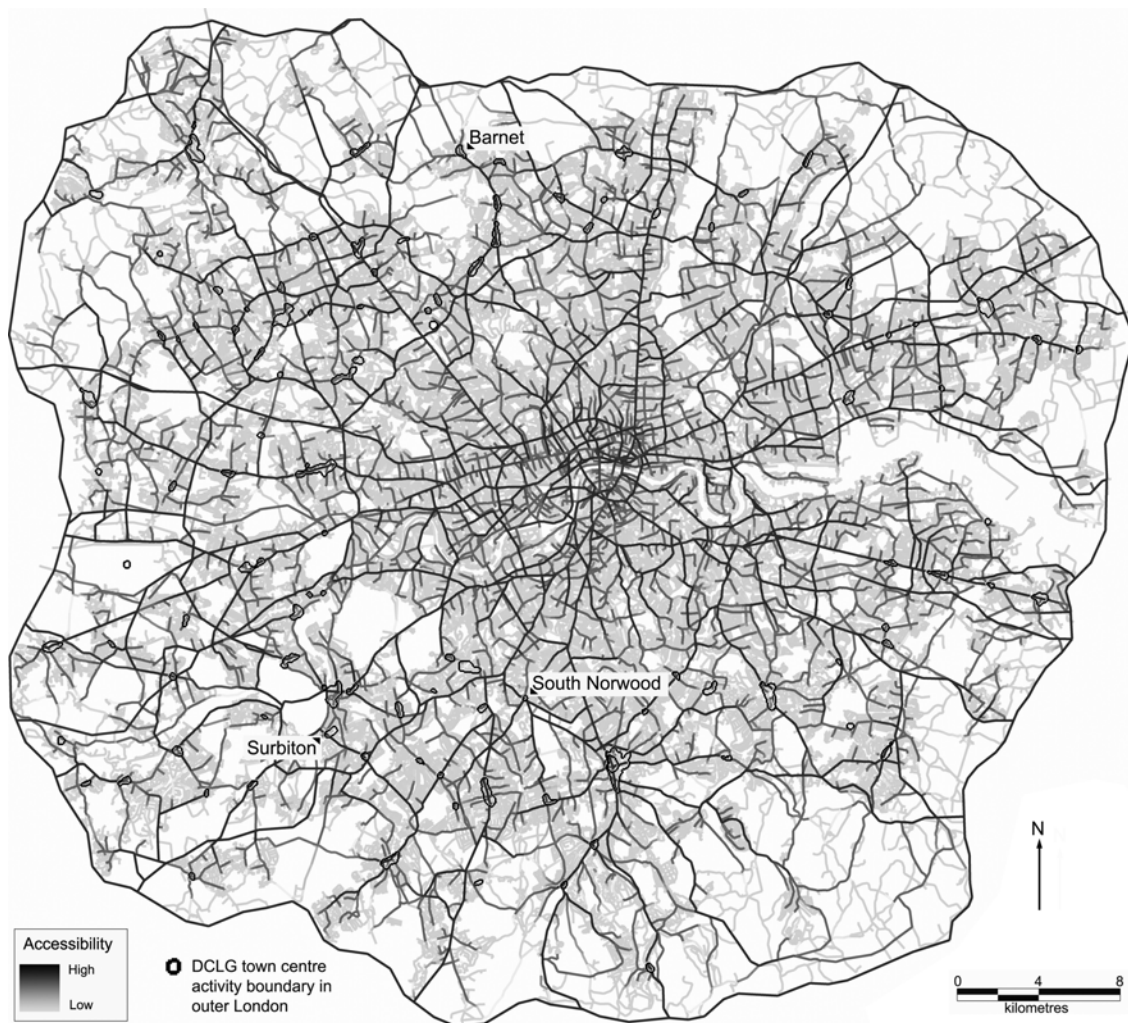
**Figure 1. Space syntax graph of Greater London showing through movement radius-*n*.**

tural categories of urban morphology should contribute to an improved understanding of the meaningful spatial milieux of human social life, avoiding the criticism levelled at crude functionalists by the anthropologist Clifford Geertz (1973, p. 20) that they were concerned with 'bodiless landscapes'.

**Methodology**

The methodology for the suburban town centres study was informed by the Conzenian emphasis on plan, building form and land use as the three morphological-temporal levels of analysis. Space syntax network analysis was used to explore the hypothesis that different

spatial levels of accessibility were related to distinctive phases of suburban development. The space syntax data were derived from the analysis of a segment graph mapping the contiguous street network of the Greater London region within the M25 (Figure 1). Each segment (there are over 280,000) constitutes a spatial element, created where road lines intersect or change direction. The segment graph allows a system of urban space to be analysed at different spatial scales (for example, at a given number of metres from each segment), in terms of its relative accessibility to other spaces (segments) at that scale. In this study the focus will be on accessibility as potential for 'through movement' (Hillier and Iida, 2005). This

measure expresses the probability that a road segment lies on a route between two other segments at a given scale, reflecting our emphasis on how suburban centres are embedded in the regional road network.

The contemporary socio-economic data for this research were extracted from the Ordnance Survey Address Layer Two dataset, which provides an individual point location and category of activity for each address in the UK. The dataset is for 2006, sufficiently recent for the purposes of this paper which is less concerned with the current fortunes of the high street *per se* than with the morphological factors favourable to sustaining socio-economic activity in a more generic sense. Address point data were extracted for all land-use types associated with street-level activity at 800 m (approximately 10 minutes walk) from the suburban town centre boundary as defined by the British Government (Office of the Deputy Prime Minister, 2002). Vaughan *et al.* (2009b) have proposed distinguishing between 'live' and 'active' suburban centres to reflect a distinction between the retail-intensive 'high street' (often understood metonymically as referring to the whole central area) and the diversity of retail, commercial, community and even industrial functions that are situated in the surrounding area and which also benefit from easy pedestrian accessibility. The socio-economic activity referred to in this paper therefore encompasses those activity-generating land uses located within a short walking distance of the high street.

Cartographic data were drawn from four Ordnance Survey maps of the Greater London region from *c.*1820s, *c.*1890s, *c.*1950s and *c.*2005; the database of topographic land-use categories was extracted from Ordnance Survey Mastermap. Another Ordnance Survey dataset used was the Meridian data on transport infrastructure, including the location of A and B roads, railway and tube networks.

The cartographic, topographical, syntactic and socio-economic data were integrated in a Geographical Information System (GIS). The ability of GIS technology to layer and cross-reference socio-economic data from different periods according to their spatial location has created new opportunities for research into the historical relationship between the built environment and patterns of socio-economic organization (Gregory and Ell, 2007). The generally high degree of continuity in street plans over time means space syntax measures of accessibility provide a relatively robust spatial index for the consideration and analysis of change and continuity in patterns of land use, especially where data can be mapped to individual segments. The ability of GIS to integrate and visualize diverse datasets means it provides a natural platform for morphological analysis at the regional scale (Jones *et al.*, 2009).

**Three Greater London suburbs: Barnet, South Norwood and Surbiton**

Space syntax network analysis suggests that the reality may be rather more complex than the whimsical description of London as a 'city of villages' implies. Figure 1 shows a greyscale space syntax graph of the Greater London area produced using *Depthmap* software (Turner, 2000-2009). Statistically the graph represents network accessibility as potential through movement at radius-$n$; that is, each segment is given a value and 'coloured' (from black to white) according to how many times it falls on the shortest angular path (that is, relatively straightest route) between all other pairs of segments in the system. The polygons outlined in black represent peaks of office and retail activity in outer London's suburban centres (ODPM, 2002). It is apparent in Figure 1 how each centre is positioned differently in relation to the web of radials and lateral roads in which it is embedded; one may hypothesize that variations in the concentrations of socio-economic activity in these centres are historically related to differentials in road network accessibility. Hillier (1999) has argued for this reason that the emergence of socio-economic 'centrality' is a socio-spatial 'process'.
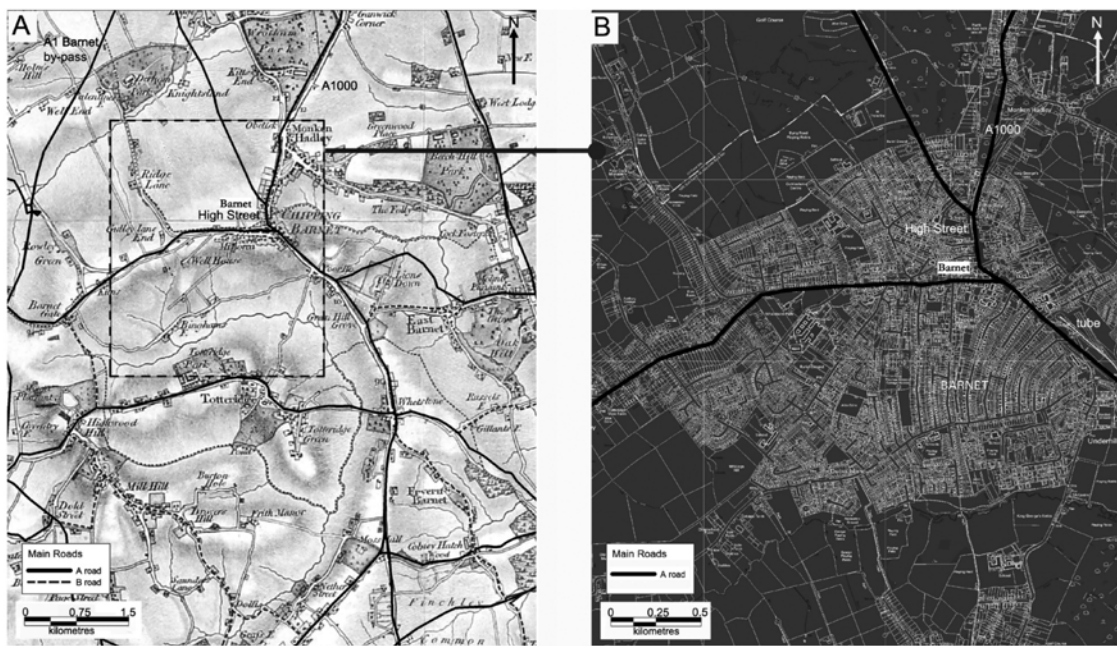
The majority of the centres visible in Figure

**Figure 2.  High Barnet, showing A and B roads.  (A) *c*. 1820s; (B) *c*. 2005.  Ordnance Survey Crown copyright 2007.**

1 are clearly 'picked-out' by the routes of high potential through movement at radius-*n*, shown in darker shades.  Bearing in mind that a space syntax graph is a purely geometrical representation of urban space, this is quite significant.  It demonstrates how concentrations of socio-economic activity arise at relatively accessible positions in a spatial network, raising serious questions about how such activity can be planned *a priori* using conventional models of the urban hierarchy.  If even smaller town centres such as Barnet, South Norwood and Surbiton are identified at this regional level (radius-*n*) then what other kinds of centre might be revealed as accessible at lower levels, for example within a walking distance of 400 m or a short drive of 2 km?  This question will be returned to later in the context of a detailed survey of land uses in Surbiton.  In more general terms Figure 1 suggests how space syntax network analysis can help 'unpack' conventional assumptions as to what constitutes an urban or suburban centre by showing how the definition of a 'centre' is sensitive to the range of spatial levels at which the different elements of its internal street network become accessible to the wider network.

Also apparent from an examination of Figure 1 is how the organization of London's road network is characterized neither by simple continuity nor discontinuity; rather areas of built form and open land are present at various spatial levels within the region.  This road network is largely pre-urban in nature, despite the impact of by-passes and motorways constructed in recent times.  The extent of continuity and change is illustrated in Figures 2-4 which show the location of contemporary A and B roads for Barnet, South Norwood and Surbiton, overlaid on a historical Ordnance Survey map dating to approximately 1820 and on a contemporary map.  In some cases the historical maps show how these roads clearly cut across historical field boundaries, indicative of more recent interventions in the landscape, but more often they follow much older lines.

'Chipping' or 'High' Barnet (Figure 2) lies to the north of London.  It developed in the twelfth century as a market sited at a junction along the main road leading north out of London.  The current high street still runs along this axis but the construction of the A1
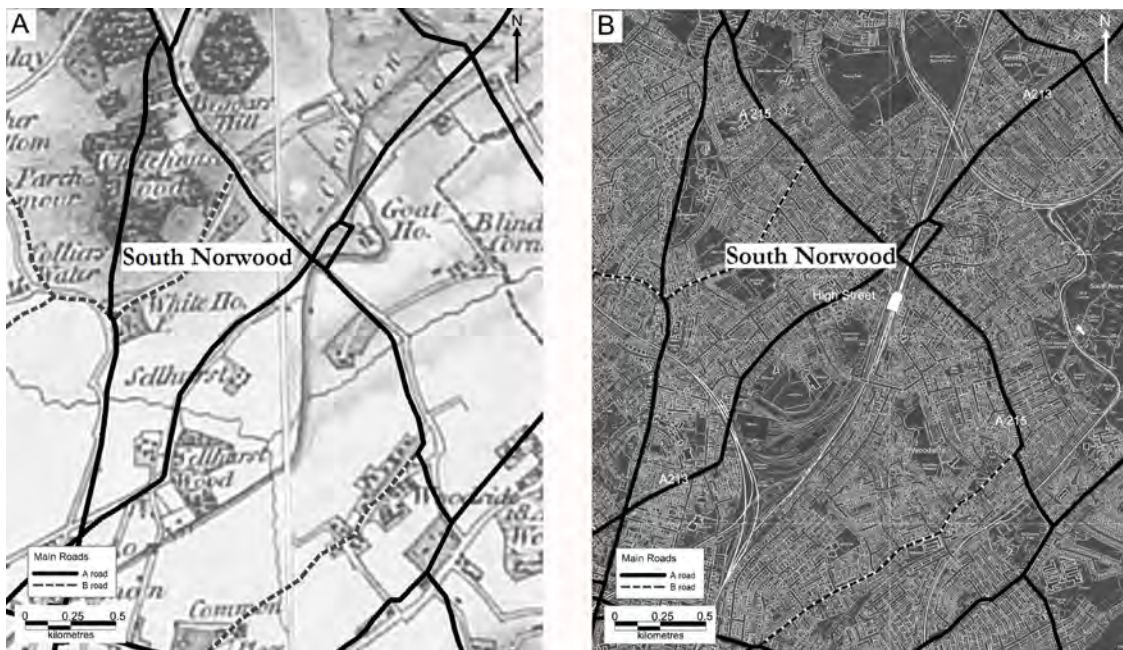
**Figure 3.  South Norwood, showing A and B roads.  (A)** *c***. 1820s; (B)** *c***. 2005.
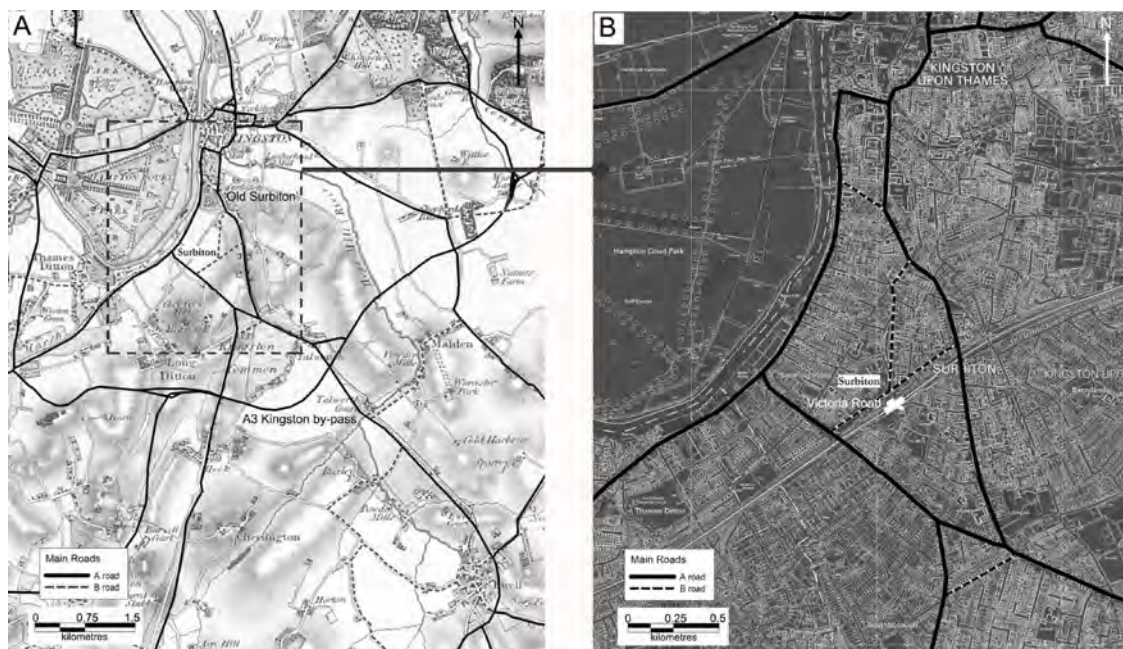Ordnance Survey Crown copyright 2007.**



**Figure 4.  Surbiton, showing A and B roads.  (A)** *c***. 1820s; (B)** *c***. 2005.
Ordnance Survey Crown copyright 2007.**

by-pass led to its being renumbered the A1000.  High Barnet's identity as a London suburb derives from the late-nineteenth century with the extension of the railway in 1872 and its incorporation into the tube network in 1940 (Figure 2B).  However, its emergence as a settlement and the location of its high street are primarily explained in terms of its historical location at a strategic position within London's regional road network, as

indicated by the presence of significant institutional and public buildings from the eighteenth century.

In contrast to High Barnet, the south London suburb of South Norwood (Figure 3) might be considered a 'railway suburb'. However, such archetypes can be misleading. It is certainly true that South Norwood's existence as a settlement does not pre-date the coming of the railway in the mid-nineteenth century. However, the site of contemporary South Norwood developed near the intersection of two major roads, the A213 and A215, to which Norwood Junction railway station (opened in 1859) is adjacent (Figure 3B). The high street runs along the line of the old Croydon Road (A213). This history suggests why it is not sufficient simply to regard South Norwood as a railway suburb without also addressing the relationship of the station to the structure of the road network in which it is situated and the effect that the railway line itself has on structuring the configuration of space.

Surbiton (Figure 4) provides another contrast to Barnet and South Norwood. Here the original settlement shifted south with the coming of the railway. Surbiton station and its high street (Victoria Road) were built as a single development on open fields in the second quarter of the nineteenth century and the new suburb grew rapidly in the period after 1850. This gives the centre of Surbiton a distinctive character, being a relatively recent intervention in the historical road network. The early-twentieth-century Kingston by-pass, bears little obvious relation to this topography.

Urban historians are used to thinking of urban areas as complex 'palimpsests' but the suburbs are also a source of complexity. One aspect of this, it has been suggested, lies in the relation of the different elements of the historical regional road network to more recent infrastructural interventions such as the railway network. Figure 5 illustrates this argument by indicating how suburban form is subdivided and constrained by major roads, railway lines, inland water and fringe-belt land parcels dominated by protected green belt, urban parks and golf courses. These constraints have affected the emergence of the

three suburban centres in Figure 5, not only by differentiating their internal settlement forms, but also by providing them with a distinctive signature of continuous and discontinuous elements in relation to the surrounding area. Each case is different, reflecting the particular history of the suburb. For example, the railway has clearly had much less impact on the form of Barnet than on the forms of South Norwood and Surbiton, but whereas South Norwood's high street developed along the line of a previously existing road, Surbiton's socio-economic centre was a Victorian creation.

By employing space syntax analysis it is possible to investigate these distinctive suburban built forms by examining the extent to which different phases of suburban growth relate to different levels of potential movement as these are expressed in the configuration of suburban space. At short-distance levels of movement, for example, one would expect the analysis to pick out more localized clusters of space which may identify historical village structures, whereas at long-distance levels of movement the accessibility of the suburb in relation to the regional road network should become apparent.

Figure 6 shows a space syntax network analysis of potential through movement in Surbiton at three different levels: (a) walkable – 400 m, (b) drivable – 2000 m and (c) regional – $n$ metres. Analytically speaking these levels are equivalent to radii at different network distances (as opposed to distance 'as the crow flies'). This means that the quantity of potential through movement for each segment (representing a road link) is constrained by restricting the analysis to a particular network distance measured in metres. The measure of potential through movement therefore gives the number of times that a given segment falls on the shortest angular (that is, accumulatively the straightest) path between all pairs of segments that fall within a specified network distance (or 'radius') of each other (in this case either 400 m, 2000 m or $n$ m). The statistical distribution is divided into sixteen clusters of similar values, with segments in the highest value

a) Barnet

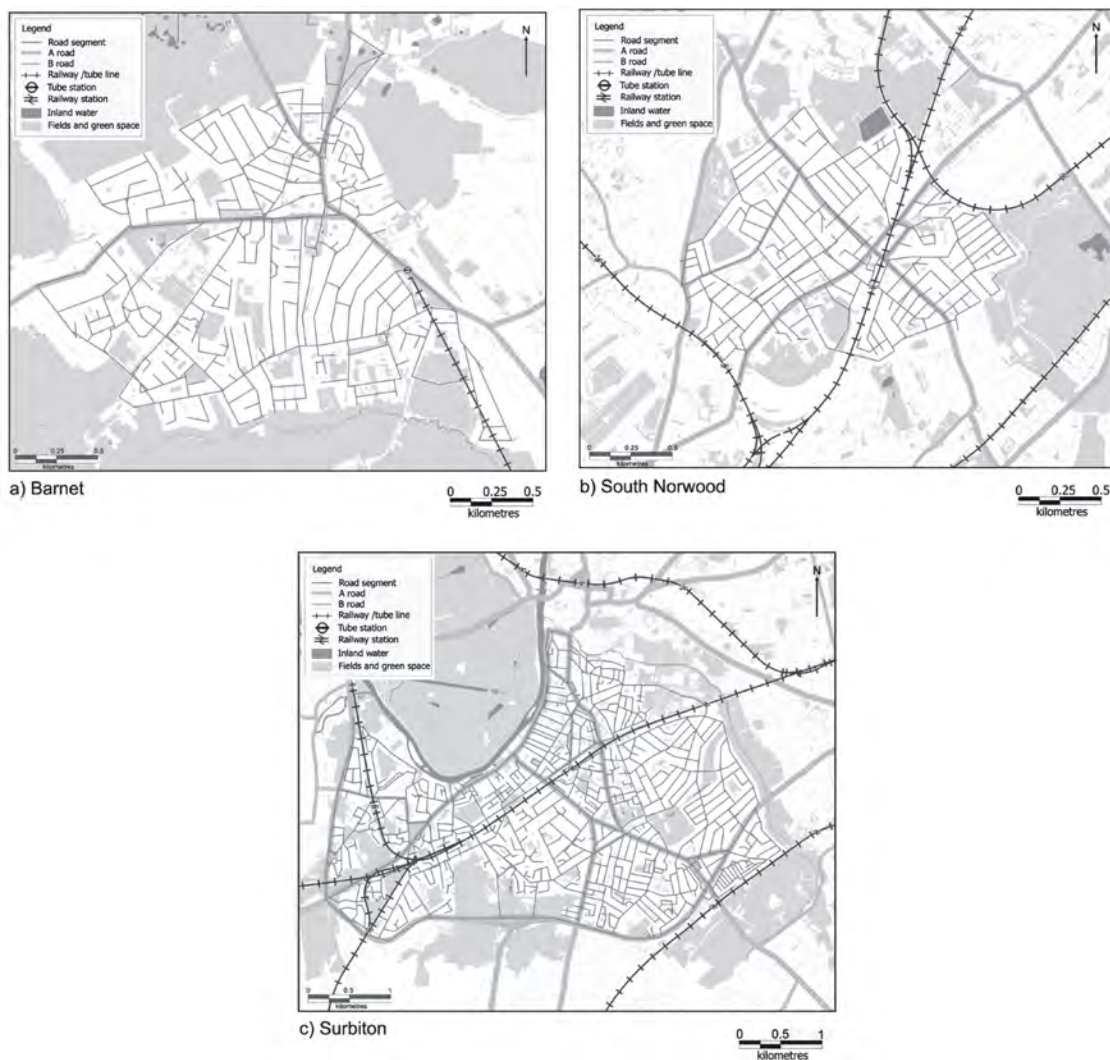b) South Norwood

c) Surbiton

**Figure 5. Infrastructural and fringe-belt constraints on three suburban morphologies.
Ordnance Survey Crown copyright 2007.**

cluster emphasized by thick white lines on the maps. Potential through movement is highest in these segments and lowest in the dark coloured-segments, meaning that they are relatively inaccessible at that scale.

Interestingly, the analysis at radius-400 m (Figure 6a) clearly highlights a circulatory structure that incorporates the area referred to as Surbiton on the Ordnance Survey map for *c*.1820 (Figure 4A). At radius-2000 m (Figure 6b) most of the main streets in Surbiton are picked out, suggesting that this is the level at which most movement *around* this area can be expected. At the level of radius-*n* (Figure 6c) the resilience of the macro-structure is

indicated by the primacy of the line of the old Brighton Road (which has the highest through movement values). This analysis suggests how a single street plan may sustain the signature of different structures of through movement relating to distinctive phases of a settlement's historical development (see also Vaughan *et al.*, 2009b).

The persistence of historical road networks has been referred to in this paper as a possible source of continuity in the socio-economic life of suburban centres. Figure 7 suggests where such continuities may be found in Surbiton. Using the contemporary Ordnance Survey topographical layer as a basis, building plots

a) Segments with highest potential through movement radius-400m



b) Segments of highest potential through movement radius-2000m



c) Segments with highest potential through movement radius-*n*

**Figure 6. Potential for through movement in
Surbiton at three levels of analysis.
Ordnance Survey Crown copyright 2007.**

that were developed in *c*. 1820, *c*. 1890, *c*. 1950 and *c*.2005 have been identified and layered from light grey (*c*. 2005) to black (*c*. 1820). Three clusters of black buildings show where land has been continually developed since 1820, one around the area of old Surbiton village and two others farther south, sited along the roads leading north into Kingston. The contemporary centre of Surbiton around the high street is clearly

**Figure 7. Continuity in development of building plots in Surbiton from
*c*. 1820. Ordnance Survey Crown copyright 2007.**

revealed as a Victorian intervention, illustrating the overlapping of different morphological phases of change and continuity in contemporary Surbiton.

The thick light-grey lines in Figure 7 represent roads from *c*.1820 where the same routes are still extant in contemporary Surbiton. Unsurprisingly, they are proximate to the clusters of building plots dating from the same period. At one location near the old village, the historical route appears to cut through a street block containing plots developed in the 1820s. A careful comparison of the cartographic sources in a GIS shows that the orientation of the historical route, which passes *between* the plots developed here in the 1820s is substantially correct. However, the projection of the original survey is somewhat irregular and the slight inaccuracies this introduced into the georeferencing process

account for the grey line partially intersecting with the early-nineteenth-century plots at this point. Later in the nineteenth century the alignment of the road was altered. Although the route was left substantially intact overall, the modification explains why the original orientation cuts through the later street blocks. Even allowing for this anomaly, Figure 7 suggests how the built form of a suburban settlement such as Surbiton may contain deep structural continuities that demonstrably connect its past to its present.

Where the data are available the analysis of street plan and building plots can be complemented by detailed land-use data. Figure 8 shows the distribution of non-residential land uses in contemporary Surbiton overlaid on the space syntax network analysis of through movement at radius-400 m, which highlights the relatively local structures of
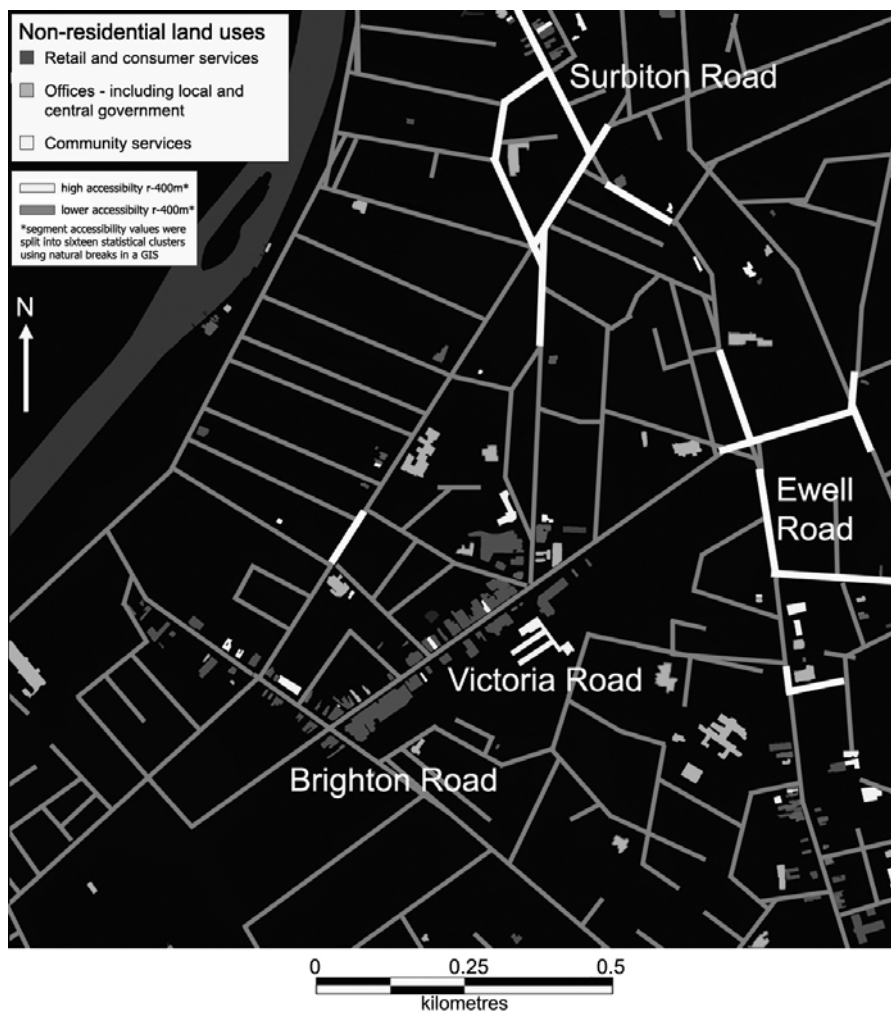
**Figure 8. Potential through movement at radius-400 m showing non-residential land uses in Surbiton *c*. 2005. Ordnance Survey Crown copyright 2007.**

movement (shown in thick white lines). It is apparent from Figure 8 that a significant number of non-residential land uses are still evident on Surbiton Road, near to the circulatory structure where the historical village of Surbiton was located (although as Figure 7 showed, not all elements of the contemporary structure pre-date the Victorian suburb). A larger area of activity is located along Ewell Road, including many plots developed in the 1820s. The cluster of activity along the contemporary high street (Victoria Road), turning right into Brighton Road are not located on segments highlighted at radius-400 m, reflecting their greater accessibility to relatively larger scales of movement.

*Kelly's Suburban Directory of London* for 1901 was consulted to ascertain the degree of continuity represented by the contemporary distribution of non-residential land uses (Kelly, 1901). This revealed an overall contraction in the distribution of contemporary land uses to relatively fewer locations in the suburban fabric. However, there is also evidence of considerable continuity of socio-economic activity; for example along Surbiton Road and Ewell Road for which the directory reveals a variety of some 85 non-residential uses. Although the overall picture remains unclear and awaits further research, the evidence indicates that the distribution of socio-economic activity in contemporary

Surbiton can be understood in relation to the persistence of such areas of activity over time, and that this persistence can be explained in terms of the scaled accessibility of this suburban built form in relation to the historical road network.

## Conclusion

This paper has proposed that space syntax methodology complements Conzenian analysis by facilitating the analysis of street plan in terms of its scaled relationship with the regional urban road network. Conversely, the quantification of accessibility represented by space syntax graphs requires fuller interpretation in the light of thorough historical research to establish the extent to which these graphs are socio-spatially meaningful. The research presented in this paper has presented a complex picture of three suburban built forms and particularly of the distribution of socio-economic activity in Surbiton. This activity has been shown to have emerged not at a single location but rather to have developed at a range of different morphological scales during different historical periods. While such areas of activity have shown a strong tendency to persist, they may also be expected to dissipate where broader social and cultural developments are not favourable.

## Acknowledgements

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