385

Tracing high street centralities through spatial-morphological continuities from the past:

The case of Islington, London

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ABSTRACT

This paper builds on the authors' previous research into movement economy theory to explore Hillier's theory of centrality as a 'process'. The case study is Islington, one of London's nineteenth-century high streets, it is one example of the many cases in London where we can find spatial continuities from the past to the present. This continuity raises several questions regarding the role of street network configuration and built form adaptability in supporting the long-term socio-economic sustainability of such places. Using contemporaneous maps, including Goad fire insurance plans and the maps and notebooks of Charles Booth's poverty survey, we analyse street network configuration, building properties (size and height) and use to explore centrality as an *historical* process. We find that different sections of the town centre have varying spatial properties that work to support a finely-grained diversity of land use characteristics rather than a clustering of any particular category. We argue that it is the potential of urban centres to sustain such diversity that is essential to understanding their historical endurance.

KEYWORDS

Centrality, High Streets, London, Islington, Urban History

1 INTRODUCTION

Hillier has proposed that space syntax analysis of the complexity of the urban network reveals an underlying configurational structure which contributes to the environmental, economic and social sustainability of cities. His theory of 'pervasive centrality' states that the function of centrality pervades the urban grid in an intricate fashion, creating spatial differentiation and maintaining inter-accessibility (rather than strict boundaries) between central urban functions (Hillier, B., (2009a). A core tenet of space syntax urban theory is that the city creating process generates a seamless network of busy and quiet zones, each merging naturally into its neighbours. This theory has been developed further for the smaller town centres on London's periphery (Vaughan, L. et al., (2010). Here we have found that town centres have a wider role to play than offering central core functions of shops and offices. Instead, they diversify into other commercial activities, places of production, health, schooling and other community services. This 'active' town centre reflects a wider socio-economic role than the commonly used term of the 'live' centre, described in Hillier's Centrality as a Process (Hillier, B., 1999), with its focus on concentrations of retail activity. In this paper we seek to develop a more finely-grained analysis of the configuration of historical urban centres by proposing how 'live' and 'active' centres are mutually reinforcing in configurational terms. That is, we are concerned with how urban space structures the movement economy at different scales of market activity – such that the distinction of 'active' and 'live' centres is said to be useful empirically in distinguishing particular qualities of urban diversity generated by historical centrality processes, rather than constituting categorically distinct phenomena.

The analysis of High Street Islington is chosen as the first of a series of planned case studies that will trace the historical transformation of local centres of activity that were situated on London's periphery in the late-nineteenth century. Like all of our cases, it had already changed by this time from being an outlying village or township of London in the late eighteenth century (see Figure 1), to forming part of its suburban conurbation, so generating both localized and larger-scale movement in relation to the city. By studying the evolution of a local centre over time we are able to test the veracity of space syntax theories regarding how land use diversity evolves, and to what extent this evolution is related to the spatial properties of the network. More specifically we ask: does the historicity of Islington high street's spatial configuration explain the presence of different sorts of land use diversity in the Islington area by the late-nineteenth century?

Figure 1. Section of Sheet VI. An Exact Survey of the Cities of London and Westminster ye Borough of Southwark and the Country Near Ten Miles Round Begun in 1741 & Ending in 1745 by John Rocque Land Surveyor & Engrav'd by Richard Parr. Image © David Rumsey Historical Map Collection.

2 THEORY

Hillier and colleagues have argued that London's configuration demonstrates a part-whole relationship in the city, with a well-connected *foreground network* which predominates over the city's residential areas, or *background network*. Hillier argued that London contains a hidden geometry which is identified at the configurational level of the street network: morphologically, the foreground is made up of long streets, with a geometry that is close to linear. Syntactically, those streets consist of highly connected local-to-global arteries that present a greater chance of being part of a higher number of city routes. (Hillier, B. et al., 2012). In a sense, the proposition is that this spatial hierarchy is translated into a functional hierarchy. The argument is that cities such as London have a notional background network of streets that carries local economic activity and has a larger proportion of residential activities in contrast with the citywide economic functioning of the foreground network (Hillier, B., 2009b).

In a recent paper we showed how a key reason why one of London's oldest settlements, Chipping Barnet situated on the Great North Road leading out of London, has succeeded in sustaining its local character is due to the resilience of its spatial morphology in balancing both local and wide-reaching connections into London and its own suburban hinterland (Vaughan, L. and S. Griffiths, 2021). We showed how this multi-scale network-relationality helped Chipping Barnet as a local

centre adapt to massive socio-economic change over time, not least in sustaining a diverse range of building sizes and types. That study supported a long-term proposition we have made regarding the complexity of that notional background network described above. While a lot of the space syntax literature tends to refer to it as a singular entity that essentially lies at the back of the primary foreground structure, (and in doing so misinterpreting the sophistication of Hillier's argument), we maintain that the background network has a complexity in its own right. Indeed, this proposition supports Hillier's own argument that London (as other well-functioning cities) is comprised of an intricate network of smaller and larger centres.

In this paper we focus on Hillier's concept of the spatial 'seed'. First laid out in a conference paper, 'Spatial Sustainability in Cities', (Hillier, B., 2009b). Hillier argued that centrality pervades the network in a very specific way: it diffuses "throughout the network, at all scales, from the city as a whole to the local network of streets." Through an analysis of the city of Suzhou in China he identified the phenomenon of a significantly higher choice segment at a given scale of network distance as indicating the "seed" or origin (in a spatial-morphological sense) of the development of that centre. This complex pattern of centres of different sizes means that in evolved urban systems, centres of varying scales are likely to exist within proximity to each other. Hillier terms this the "intelligible distance created by the angular structure of the network" (op cit, p. K01:6). This structure generates the pattern of 'natural movement' , which evolves in order to sustain movement flows as the centre grows. Hillier's concept of the spatial seed as characteristic of pervasive centrality adds spatial-morphological description to the rather blunt and aspatial concept of 'polycentricity' so widely used in the urban literature but which tends to focus on the multiplicity of centres in the abstract, rather than how they are interconnected through the deep structure of historical road networks. The concept of polycentricity also tends to focus on a relatively small number of land use types, while we propose that capturing the finer detail of land use diversity helps to focus attention on how smaller town centres create vitality – through an array of activities that are attractive both to locals and to people living farther afield.

3 METHODOLOGY AND DATA SOURCES

This case study focuses on High Street Islington. In order to avoid any edge effects (see (Dhanani, A. and L. Vaughan, 2013), the boundaries of the studied streets were extended for approximately 3km around the case study area. Islington High Street was selected using a sampling methodology that comprised *all* high streets within the built-up area of London in the late-nineteenth century, "the extents of the metropolis" as defined by Charles Booth for his first survey of 1889 [see quotes in Pfautz, H.W., 1967, pp . 74-75; and Reeder, D., 1984]. The sampling was undertaken by taking the intersection of the map published in Charles Booth's aforementioned survey (see the Islington area of the Booth map in Figure 2) and searching for all

streets named “high street” that featured on the first series of Goad’s fire insurance plans (1887 – see Figure 3). The latter provided an additional variable for sampling in that Goad’s fire insurance plans were drawn up only for principal shopping districts and their surroundings, so any high street captured by Goad would be one that was considered at the time as having a significant presence in its area (Rowley G., 1985). A further rationale for selecting High Street Islington and its continuation up Upper Street was that it satisfied the criterion of having maintained its diverse character (including community buildings, theatres, municipal buildings, as well as shops) from c. 1890 till today. We included the neighbouring fork to Upper Street, Essex Road (known as Lower Street till 1864) both for comparison and because its development is intimately bound up with Islington town centre.

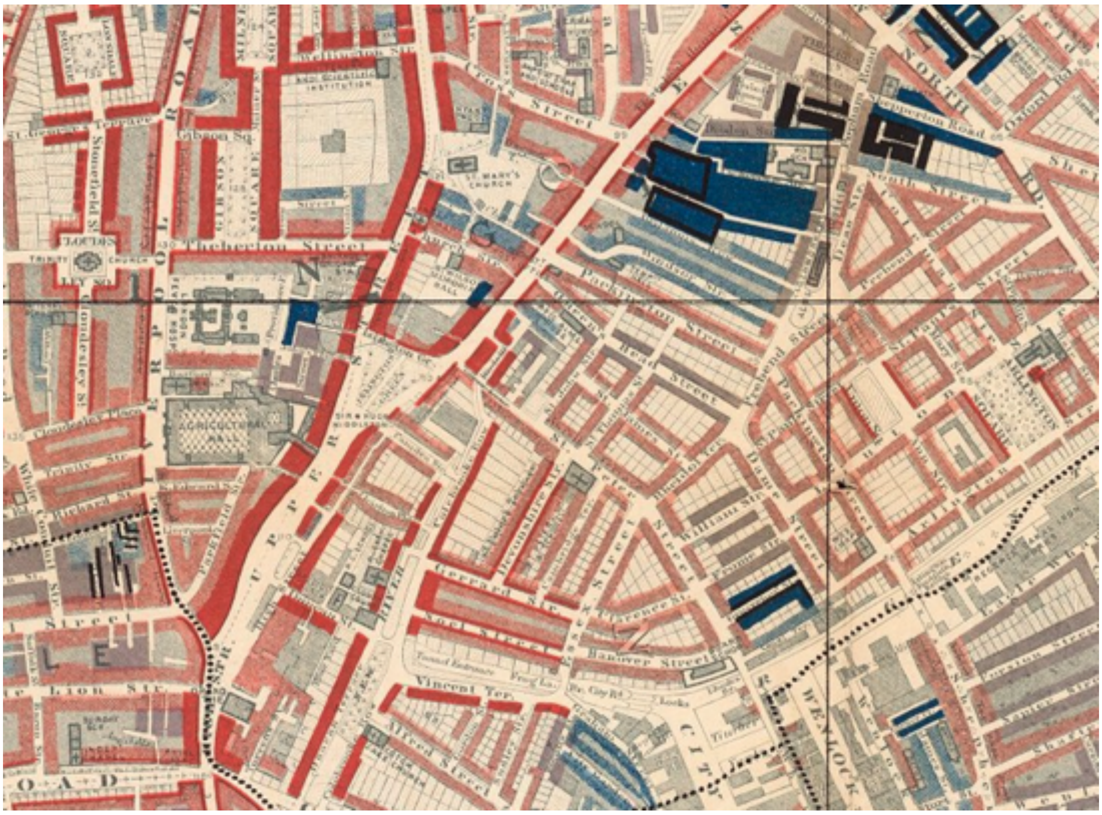

Figure 2. Section of Charles Booth’s Descriptive Map of London Poverty, 1889, sheets 1-4 compiled into a single image. High Street Islington and its continuation north-eastwards into Upper Street are on the left-hand bottom of the image. The image is coloured in a range from red (middle class) through to the cooler poverty classes in light blue, dark blue and black for the lowest class. Image © David Rumsey Historical Map Collection.

Figure 3. Goad Insurance Plan of London, North West District Vol. D; sheet 20 (BL 152597). Image public domain, via Wikimedia.

Additional sources included the London post office directory of 1895, from which all the business functions along High Street, Upper Street, and Essex Road (amounting to 738 businesses) were transcribed and classified according to land use type (Great Britain Post Office, 1899). Classification was in two levels:

- **Level 1**: Community Functions, Industrial, Agricultural, Office and Commercial, Professional and Non-Professional Services, Retail, Financial, Food and Drink.
- **Level 2**: Indoor Entertainment, Libraries, Museums and Galleries, Places of Worship, Medical and Healthcare Services, Education, Local Government, Community Services,

Factory Workshop and Premises, Store, Distribution and Premises, Industrial Services, Agricultural, Government, General Commercial, Offices, Professional Services, Non-Professional Services, Shops, Shops with Manufacturing, Financial, Restaurants and Cafes, Public Houses and Bars, Hotels, Boarding and Guest Houses.

Land uses were considered alongside the Booth police notebooks (1898-9), which provide a relatively subjective account of the characteristics of the buildings and streets within Booth's survey area, with local policemen accompanying Booth's researchers offering an impressionistic account of the people and the physical setting of their local beat. In the case of Islington, the policeman interviewed in 1897 described Upper Street and its surroundings as comprising a variety of classes from "decent" to "respectable working class", with occasional comments about "common lodging houses" for the poor, with all sorts of less salubrious activities such as bookies and prostitutes on the back streets: "Then into Upper Street northwards. On the west side of it first past the Agricultural Hall is a small nameless court. At the end of which is a side entrance to the Agricultural Hall. Here are 6 cottages. Light blue [the colour is a designation of the top of the three poverty classes used by Booth in his survey]. Clothes lines across it. Litter of paper. Poor as they look. "They are never to let," said Mason. "If you wanted one you would have to wait till the owner died, all small cottages are much sought after. They are hard to find about here." (Booth, C., 1886-1903, November 11 & 15th, 1897).

Analysis of Booth's policeman's notebooks highlights how the foreground network of socio-economic activity concealed localized pockets of poverty in the adjacent streets. For Engels in his famous description of Manchester this spatial structure was the iniquitous social logic of capitalism made manifest; an exploitative system that showcased wealth but kept the part of the population that produced it well hidden [(Engels, F., 1845/1891 English Edition). It is important though to note that in movement economy terms Engels is describing the social logic of space under conditions of laissez-faire economics and lightly regulated nineteenth-century urbanization. In the walkable city the local-to-global accessibility of urban thoroughfares is at a premium. Whereas twentieth-century planning legislation focused on replacing poor-quality housing in residential areas and extending car-friendly out-of-town developments, it was often at the cost of fragmenting the foreground network as a series of clearly defined destinations. Of course, the difficulty for town planners in post-war Britain was that historical distributions of socio-economic activity might, any given time, look messy – even chaotic – and in that sense part of the problem diagnosed by Engels that could only be solved by the imposition of some kind of order. Yet as Jacobs and Hillier have each argued, what makes cities *cities* in a benign sense was their ability to bring different kinds of people together in an indeterminate social relation and it is this emphasis on the complexity of the foreground vs. the background network structure that actually characterizes Hillier's theory of urban centrality as pervasive.

4 ANALYSIS

4.1 Islington through time: an analysis of a spatial seed

Islington has experienced successive phases of rapid development and shifting social-economic fortunes for at least three centuries. Known in the mid-16th century for its inns for long-distance travellers to and from London, the area started its first phase of development as a suburban retreat attracting rich and eminent residents due to its proximity to the City of London and Westminster. The Rocque map of 1745 (Figure 1 above) illustrates the growth of the settlement from the southern, London end of the ancient route out of London along Upper Street, with Lower Street and today's Cross Street forming a triangle around the Green, the church, and other principal buildings. Extensions to the settlement continue northwards along both Upper and Lower streets. By the late 18th century, the number of houses in the parish of Islington had increased more than fivefold to total 1745. Yet the centre's growth in the nineteenth century mainly took the form of rebuilding and changes in use, as Islington transformed from a rural area into more urban-like building densities.

Between 1841-1861, the social image of Islington underwent a radical development, resulting in a mass of terraced housing spread across the area. The parish had a near tenfold increase in population from 1831 onwards to a peak of 335k in 1901, one of the highest in southern England and greater than some cities of its time. Commercial premises increased in number to serve a rapidly rising number of middle-class residents who were attracted by the area's proximity to the city centre. Many of the old houses in Lower Street were replaced by rows of shops, while Upper Street and Essex Road were already established as the primary commercial service routes, though there were still farms in the area well until the 1870s (Baggs, A.P. et al., 1986) – See Tallis elevation from 1840 in Figure 4 below. The area's proximity to the city centre also enhanced the development of transportation links; the first horse-drawn bus connections appeared in 1829 (replaced by motor buses by 1911). An even stronger morphological imprint on the area's topology came from the tram and railway infrastructures; by the turn of twentieth century the majority of tramways had been electrified and by 1906 the area's underground railway stations had been built.

Figure 4. High Street Islington, 1840. Tallis's London street views. Image © David Rumsey Historical Map Collection. For more on the Tallis edition, see (Jackson, P. et al., 1969).

It is important to observe how Islington's situation on a main route into London is likely to have contributed to its morphological, social, and economic change in past two centuries. Barratt (2013) maintains that Islington's decline in the period leading up to the 1890s can be attributed to the coming of the railways, the intensification of building, and the commensurate increase in local population. Nevertheless, both the Post Office directories and detailed Goad fire insurance plans reveal an intriguing juxtaposition of cowsheds and smart hotels (in one instance a single segment of the east side of High Street Islington, nos. 50-66, comprises "tailor; dining rooms; stationer; coffee rooms; hosier; cowkeeper; printer") (Great Britain Post Office, 1899). By the 1890s it was becoming increasingly common for artists to move to the district out of necessity, amongst whom the fictional writer Reardon, the main protagonist in George Gissing's novel *New Grub Street* (1891). For Reardon, a move to Islington was a significant step down from his more successful days living in Marylebone. Gissing indicates that the by now failed writer knew that his wife was right not to join him there: "She knew how subtly one's self-respect can be undermined by sordid conditions." (Gissing, G., 1891/2016 edition, p. 218). It is worth noting that Gissing himself lived in Islington for 18 months, so would have been familiar with these subtle differences of the geography of class (see Dennis, R., 2020).

In social documentary mode Booth writes of the area: "High Street Islington… Upper Street... is a continuous scene of bustle, excitement, and gay life, reminding one, with its large shops, theatre, music hall, Agricultural Hall, & c., of a leading West End thoroughfare." (Booth, C., 1892, Vol. 1 p. 292). This description strikes a decidedly different note to Engels' horrified fascination with the backstreets and alleyways in the poorer parts of London and Manchester. In fact Booth was writing in a period after some slum clearances, meaning that Islington had two faces to the street: on the back streets – the garrets and grim tenements of the type described by Gissing, and on the high street – fashionable shopping, a Grand Theatre (which according to Alan Godfrey, hosted French light opera and can-can girls), as well as the Royal Agricultural Hall (1861-2), a staging point *en route* to Smithfield meat market on the edge of the City of London (Ordnance Survey and A. Godfrey, (1894a;1894b). The latter is one of several indications of the high street's reach well beyond its immediate surroundings. The late-nineteenth century was the peak of the district's population, but not of its prosperity, with much of previously open land having been infilled with terraced housing, although some sizeable villas still remained on its outskirts.

Islington is an especially interesting test case for the theoretical spatial seed process, as historical maps show an original settlement around Islington Green, with different spatial-morphological trajectories of development along Upper and Lower streets. For example, the map of 1745 in Figure 1 shows a more highly developed array of buildings around the green, then along Upper Street, while Cary's later map of 1790, produced as part of a survey of all high roads (namely main roads) out of London (Figure 5) indicates that of the two extensions, what was then Lower Street was on an important route out of the city, via Kingsland Road. By the time we get to the 1st

Ordnance Survey map of the early to mid-nineteenth century (Figure 6), Islington's two main roads have been consolidated along both Upper Street and Lower Streets with an equally dense array of buildings.

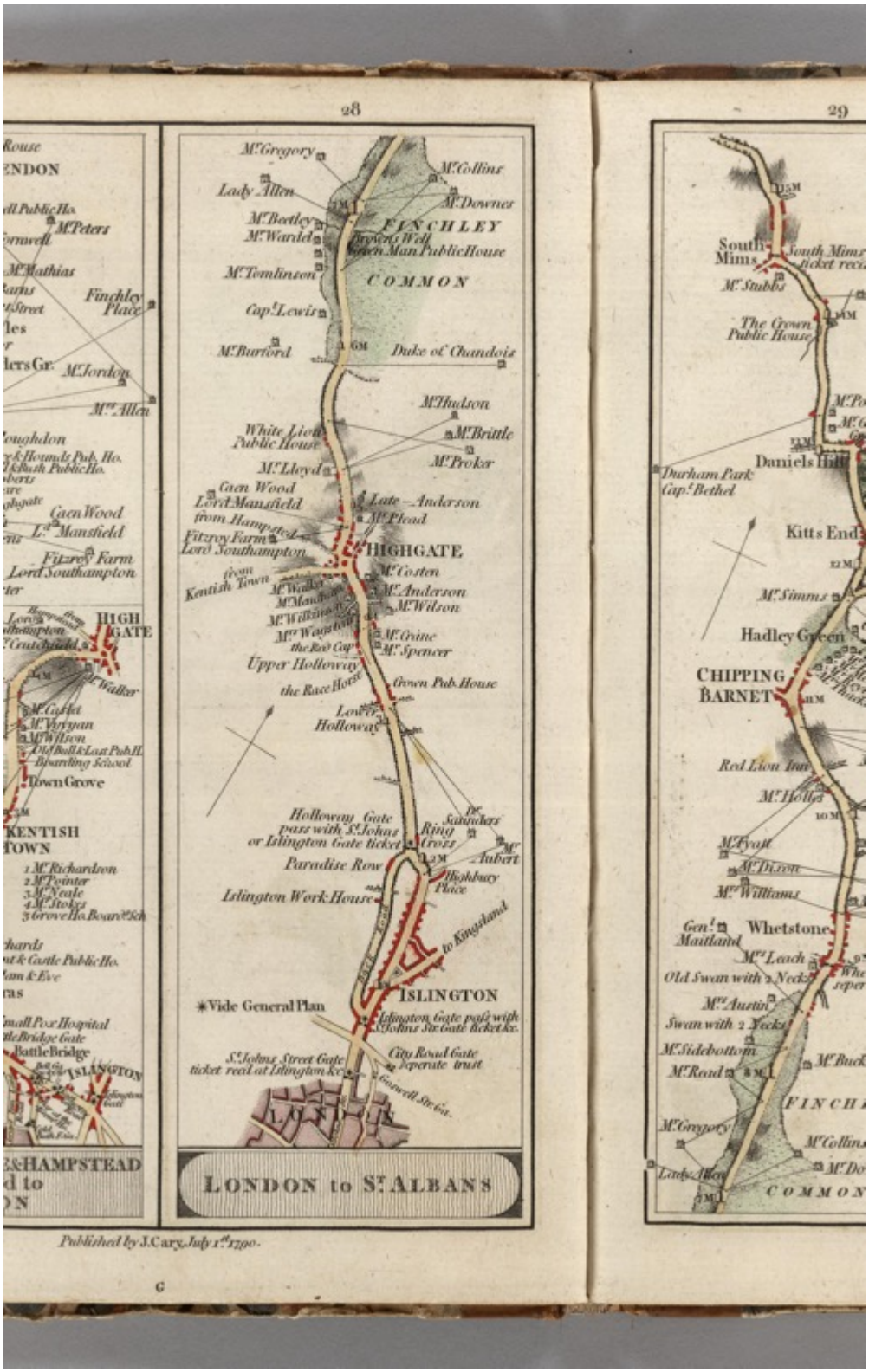

Figure 5. Section of 'London to Highgate & Hampstead to Hendon, London to St. Albans', from Cary's 1790 Survey of the High Roads from London. Image © David Rumsey Historical Map Collection.

Figure 6. 1st Edition Ordnance Survey map 1805-1880. Old series Ordnance Survey maps of England and Wales] / engraved at the Drawing Room in the Tower ... by Benjn. Baker & Assistants; printed by Ramshaw. Image © National Library of Australia. http://nla.gov.au

The following space syntax analysis used the c.1910 spatial network produced via cartographic redrawing of historical OS maps of High Street Islington along with its two northerly extensions using measures of Segment Angular Choice and Integration reveals that the original two segments of the high street, what we refer to as the settlement's spatial seed, had by the late-nineteenth century maintained its higher choice and integration values across the board, with one exception of 400m Choice, where Essex Road is much higher on average (it is, interestingly enough, only slightly lower than High Street Islington for 400m Integration too – see Table 1). Looking at the maps above, it is clear that of the two main roads, the one connecting northwards to St Albans – by this point Upper Street, and the alignment "to Kingsland" – by this point Essex Road – had become the dominant link at the more global scales of Choice 2500. The multi-scale graphs of Choice and Integration in Figure 7 below reveal the importance of Essex Road's wider-scale links in the north and north-east directions, connecting it to the Roman route north out of London, subsequently the Great North Road (and nowadays the more prosaic A10). In Figure 7, the top three segments with highest ranking syntax values amongst the main streets are highlighted (illustrated in black) confirming the multi-scale spatial significance of High Street Islington and additional seeds of configurational prominence across the length of Essex Road. These results open the second question of our enquiry: are there measurable differences in the patterns of land use diversity between the original spatial seed, namely High Street Islington, and Camden Passage, and its two extensions northwards: Upper Street (the initially more highly developed street), and Essex Road (the more globally integrated, originally 'Lower Street')?

Table 1. Average space syntax measures for the various sections of High Street Islington and its extensions showing highest values annotated in red.

	High Street	Camden Passage	Upper Street	Essex Road	*Average for all segments*
Average of Choice_400m	516.00	347.50	342.85	715.44	482.12
Average of Choice_800m	7263.80	3292.00	3668.65	5958.12	4396.18
Average of Choice_1250m	43908.20	22239.00	18713.05	25625.52	20784.72
Average of Choice_2500m	658961.60	433630.50	256516.90	339744.16	286502.71
Average of Integration_400m	72.26	58.05	51.32	67.20	60.66
Average of Integration_800m	223.47	186.28	153.43	182.19	173.91
Average of Integration_1250m	502.96	409.64	335.43	358.54	361.81
Average of Integration_2500m	1411.47	1300.25	1145.63	1147.04	1174.22

This can be explored further if we look at the tertiles of integration and choice for each of Islington's main roads. Figure 7 illustrates the space syntax analysis of the study area (zoomed in and centred on the case study), with the numerical results of this analysis laid out in table 2. The table extracts out of all segments analysed just those comprising High Street Islington and its extensions. The extracted segments are coded to indicate the main street name (High Street Islington=HS, Upper Street=US, Camden Passage=CP, Essex Road=ER) and then numbered following a south-to-north spatial sequence (e.g., segment US1 indicates the southern start of Upper Street and segment US19 its northern end). The south-to-north spatial reading matches the historical evolution processes of building development along the main street axes starting from High Street and upwards to its Upper and Lower (Essex Rd.) street branches. Following, Table 2 classifies in tertiles the numerical results for syntactic values deriving from spatial analyses shown in Figure 7 to offer a comparative analysis of the main roads' spatial prominence across different scales within the Islington wider network. In general, High Street Islington and its extension to Essex Road (through Camden Passage) shows higher concentration of segments at the 'high' tertile for Choice results. Looking at Choice for radius n, 2500m, 1250m, 800m, and 400m, 59% of the main streets' segments in the highest third of values for each scale are situated on Essex Road (with the remainder – 29% – mostly on the High Street section at both the highest scales. Integration is mostly evenly spread at the higher scales, with Integration radius n, 2500m, and 1250m apportioned at 29% apiece across High Street, Upper Street, and Essex Road. On the other hand, by far the largest proportion of lower scales of integration are situated along Essex Road, with 76% and 65% for 800m and 400m integration, respectively.

Figure 7. Choice and Integration from local to global for Islington c. 1910. The top three segments with highest ranking syntax highlighted in black

Street	Sement ID (both sides)	Choice_n	Choice_2500	Choice_1250	Choice_800	Choice_400	Integration_n	Integration_2500	Integration_1250	Integration_800	Integration_400
High St	HS1	High	High	High	High	High	High	High	High	High	High
High St	HS2	High	High	High	High	High	High	High	High	High	High
High St	HS3	High	High	Middle	Middle	Middle	High	High	High	Middle	High
High St	HS4	High	High	Middle	Low	Low	High	High	High	Middle	Middle
High St	HS5	High	High	Middle	Low	Low	High	High	High	Middle	Middle
Camden Psge	CP1	High	High	Middle	Middle	Middle	High	High	High	Middle	Middle
Camden Psge	CP2	High	High	Middle	Middle	Middle	High	High	High	Middle	Middle
Essex Rd	ER1	High	High	High	High	High	High	Middle	Middle	Middle	High
Essex Rd	ER2	High	High	High	High	High	High	Middle	Middle	High	High
Essex Rd	ER3	High	High	High	High	High	High	High	Middle	High	High
Essex Rd	ER4	High	High	High	High	High	Middle	Middle	Middle	High	High
Essex Rd	ER5	High	High	High	High	High	Middle	Middle	Middle	High	High
Essex Rd	ER6	High	High	High	High	High	Middle	Middle	Middle	High	High
Essex Rd	ER7	High	High	High	High	High	Middle	Middle	Middle	High	High
Essex Rd	ER8	High	High	High	High	High	High	High	Middle	High	High
Essex Rd	ER9	High	High	High	High	High	High	High	Middle	High	High
Essex Rd	ER10	High	High	High	High	Middle	Middle	High	High	High	High
Essex Rd	ER11	Middle	Middle	High	Middle	Low	Middle	High	High	High	High
Essex Rd	ER12	Middle	Middle	High	Middle	Middle	Middle	Middle	High	High	Middle
Essex Rd	ER13	Middle	Middle	Middle	Middle	Middle	Middle	Middle	High	High	Middle
Essex Rd	ER14	Middle	Middle	Middle	Middle	Low	Middle	Middle	High	High	Middle
Essex Rd	ER15	Middle	Middle	Low	Low	Low	Middle	Middle	Middle	Middle	Low
Essex Rd	ER16	Middle	Low	Middle	Low	Low	Middle	Low	Middle	Middle	Low
Essex Rd	ER17	Middle	Low	Middle	Low	Low	Middle	Low	Middle	Middle	Low
Essex Rd	ER18	Middle	Low	Low	Low	Low	Middle	Low	Middle	Low	Low
Essex Rd	ER19	Middle	Low	Low	Low	Low	Low	Low	Low	Low	Low
Essex Rd	ER20	Middle	Low	Low	Low	Low	Low	Low	Low	Low	Low
Essex Rd	ER21	Middle	Low	Low	Low	Low	Low	Low	Low	Low	Low
Essex Rd	ER22	Middle	Low	Low	Low	Low	Low	Low	Low	Low	Low
Essex Rd	ER23	Middle	Low	Low	Low	Middle	Low	Low	Low	Low	Low
Essex Rd	ER24	Low	Low	Low	Low	Middle	Low	Low	Low	Low	Low
Essex Rd	ER25	Low	Low	Low	Middle	High	Low	Low	Low	Low	Middle
Upper St	US1	Middle	Middle	High	High	Middle	High	High	High	High	High
Upper St	US2	Middle	Middle	High	High	Middle	High	High	High	High	High
Upper St	US3	Middle	Middle	Middle	Middle	Middle	High	High	High	Middle	Middle
Upper St	US4	Middle	Middle	Middle	Middle	Middle	High	High	High	Middle	Middle
Upper St	US5	Low	Low	Low	Low	Middle	High	High	High	Middle	Middle
Upper St	US6	Low	Low	Low	Middle	High	Middle	Middle	Middle	Middle	Middle
Upper St	US7	Low	Middle	Low	Middle	High	Middle	Middle	Middle	Low	Middle
Upper St	US8	Low	Low	Low	High	High	Middle	Middle	Low	Low	Middle
Upper St	US9	Low	Middle	Middle	High	Middle	Middle	Middle	Middle	Middle	High
Upper St	US10	Low	Middle	Middle	Middle	Middle	Low	Middle	Middle	Middle	Middle
Upper St	US11	Low	Middle	High	High	High	Low	Middle	Low	Middle	Middle
Upper St	US12	Low	Middle	Middle	Middle	Middle	Low	Middle	Low	Middle	Middle
Upper St	US13	Low	Middle	Middle	Middle	Low	Low	Low	Low	Low	Low
Upper St	US14	Low	Middle	Middle	Middle	Middle	Low	Low	Low	Low	Low
Upper St	US15	Low	Middle	Middle	Middle	Low	Low	Low	Low	Low	Low
Upper St	US16	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Upper St	US17	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Upper St	US18	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Upper St	US19	Low	Low	Low	Low	High	Low	Low	Low	Low	Low

Table 2. Choice and Integration tertiles for segments constituting the active and live centres of Islington High Street and enviro
streets are listed from south to north

There are two ways of looking at the data in Table 2. The first is vertically (i.e. in columns). This reveals how segments comprising the main streets of Islington town centre typically move from high to low Choice and Integration at a greater network distance from the seed segment – but equally that the profile is different in detail at each of the five scales of choice and integration presented. This configurational profiling allows us to get a sense of the distinctive spatial-morphological texture of Islington as a centre in how the balance of high, middle and low values for each metric scale is produced by a different combination of individual segments. The second way of looking at Table 2 is horizontally (i.e. in rows). This shows how every street segment has a distinctive spatial-morphological profile that inflects its potential for generating 'to' and 'through' movement at multiple scales in the network. Whereas for seed segments (e.g. HS1 and ER2) the potential for to and through movement is almost uniformly 'high', for more peripheral segments (e.g. US19 and ER25) the potential is almost uniformly 'low', with a great deal of variety in between. Characterising those results from an urban perspective, the seed segments are closest to the heart of the city of London (and in fact closest to its historical district, The City), while the segments named with the higher numbers are more remote from the centre, or in simple terms, more suburban (and indeed the Post Office directory shows there to be more residential land uses on those streets, with a greater number of land uses relevant to domestic use).[1] Yet the configurational profiles of individual segments is only a preliminary to the more significant point that, considered as contiguous series that follows the historical line of development of the Islington seed from south to north, it becomes apparent how, by 1910, the superficially unitary physical entity of Islington as a local centre in fact describes a spatial morphology that is highly complex. Not complex in the sense of 'being complicated' but in the sense of its combinatorial possibilities for generating natural movement and co-presence within, between and across intersecting spatial scales. It is this historical complexity, we propose, that enables the emergence of the spatial-morphological 'niches' that contribute to sustaining land-use diversities under changing socio-cultural conditions.

4.2 Does pervasive centrality result in differing patterns of land use diversity?

In this section we take the linear extension of the high street to its full axial extent by studying the length of Upper Street and Lower Street (now Essex Road). Having transcribed the business directories for all business entries along their lengths we ask: to what extent is the variation of different land use types along their length consistent with descriptions of choice and integration that correspond to what we know about the movement economy of nineteenth century London.

[1] Taking the last three segments on Essex Road, we find: upholsterer, chemist, confectioners, provision dealer, butcher; *Royal George* public house, fruiterer fancy repository, corn dealer Cheesemonger coffee rooms Home & Colonial Stores Ltd. Tea dealers confectioners fishmonger stationers grocer; *Royal William* public house, fishmonger.

Looking purely at the number of functions and taking the possible maximum of 20 land use functions across the area, we find that a full 60% of the High Street's segments have 7 or more functions, while Upper Street has 40% of its segments with 7 or more functions and Essex Road has only 24% of its segments with 7 or more functions. Obviously the number of functions per segment is somewhat determined by the segment length. However, Essex Road is well in line for the average across the studied streets (62.21m), at 62.50 metres, similar to High Street (69.85) and Camden Passage (62.75), with only Upper Street's segments 20% longer on average, at 76.24m. Given the limited number of streets involved in a case study of this nature, we do not believe that normalising for segment length would affect the results or greatly improve the accuracy of our analysis.

The types of land uses differ across the three principal streets of Islington. A descriptive analysis at the higher level of eight broad land use functions reveals that the dominant land use for five High Street segments is retail, with food and drink a close second. In contrast, Upper Street, while having retail as the dominant land use, has industrial or office and commercial as the second most common. Essex Road differs again in that, although it has retail as the dominant land use, there is no single dominant secondary use class: most are a mixture of other classes, with professional services being only the most prominent. A closer examination of the available Goad plans for the streets (see Figure 3 above and Figure 8 below) which only reach as far as the junction between High Street Islington and Upper Street, reveals more about their different characters. The former – dominated by food and drink functions, and the latter – which has a much greater mixing of uses. Indeed, a descriptive analysis at the higher level of eight broad land use functions reveals that the High Street's five segments are dominated by either retail, or food and drink functions (just under 30% of its businesses are either Restaurants and Cafes, Public Houses and Bars, or Hotels, Boarding and Guest Houses, while a person moving northwards along Upper Street would soon find the appearance of many more, diverse uses. The same applies to Essex Road, which, like its westerly counterpart, has an increasing number of financial services functions (many, like banks, serving the residential hinterland) appearing on the area's more suburban streets.

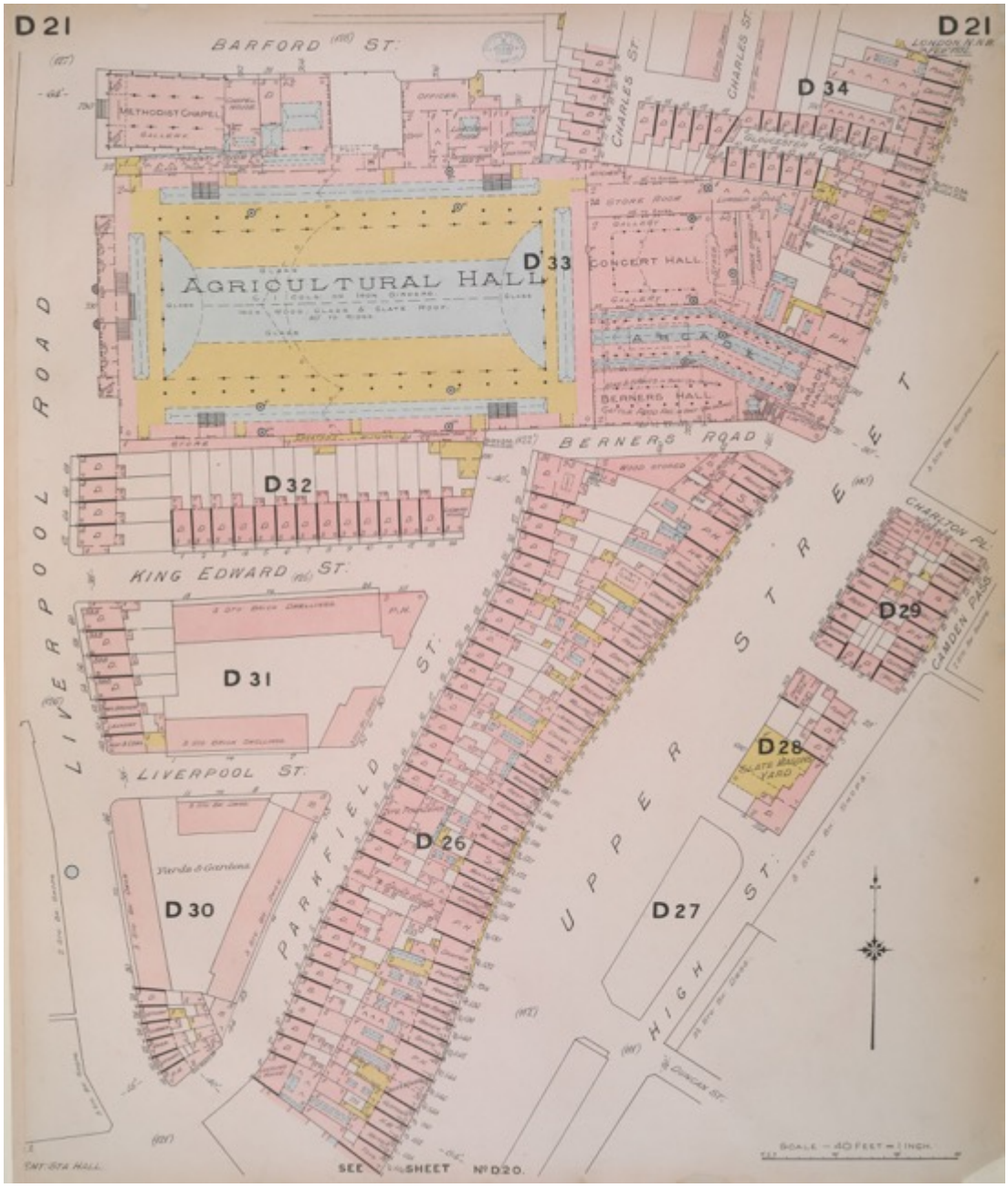

Figure 8. Goad Insurance Plan of London, North West District Vol. D; sheet 21 (BL 152597). Image public domain, via Wikimedia.

This land use expression of Hillier's concept of the spatial seed is revealed in Figure 9, which illustrates the shifting change in land use mixing from the more urban southerly segments (HS1, HS2, HS3, HS4, and HS5, as well as US1, 2 and so on, and ER1, 2 and so on up the road – see map of the segments in Figure 10).

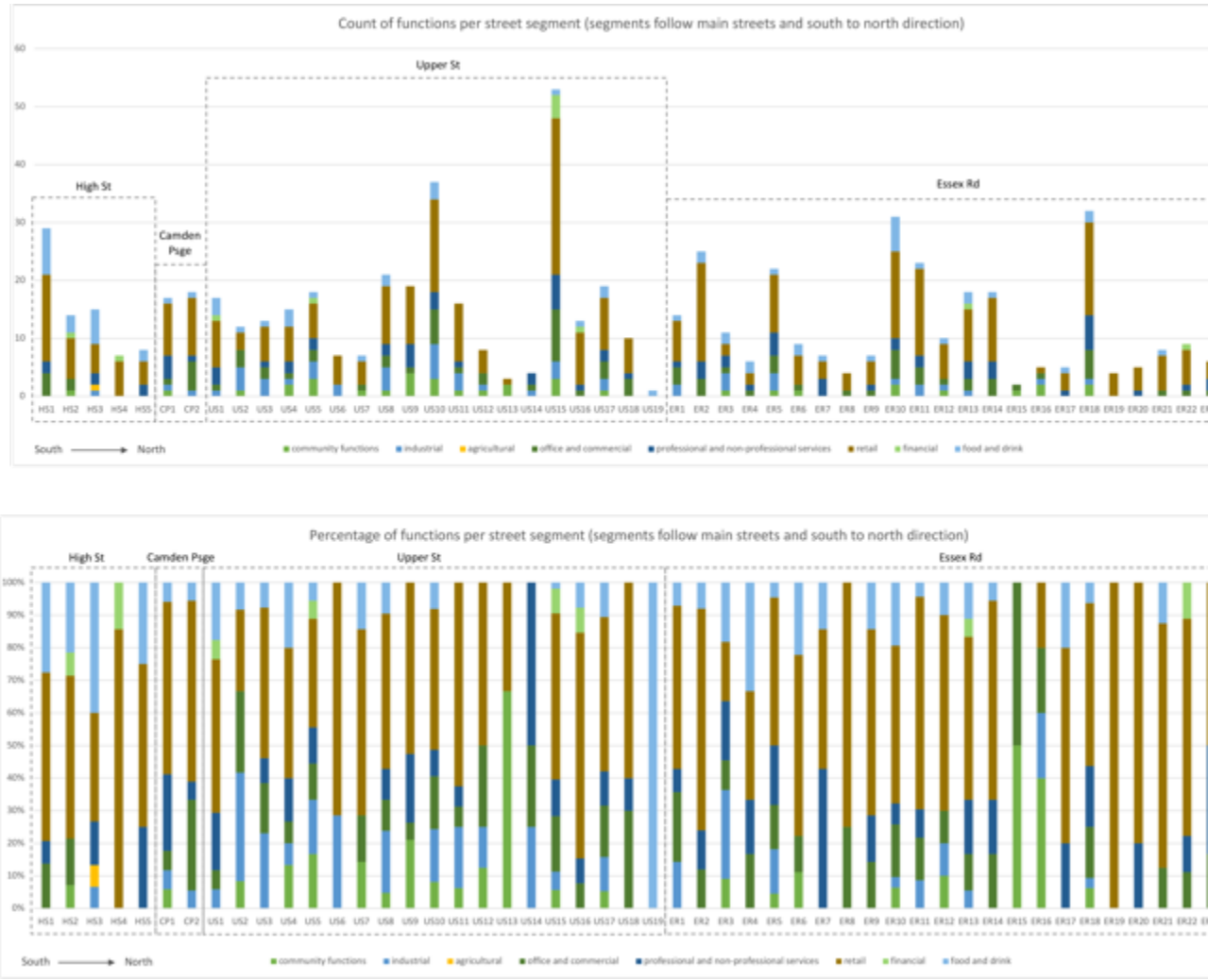

Figure 9. Percentage of function per segment from High Street Islington northwards along Camden Passage, Upper Street, and

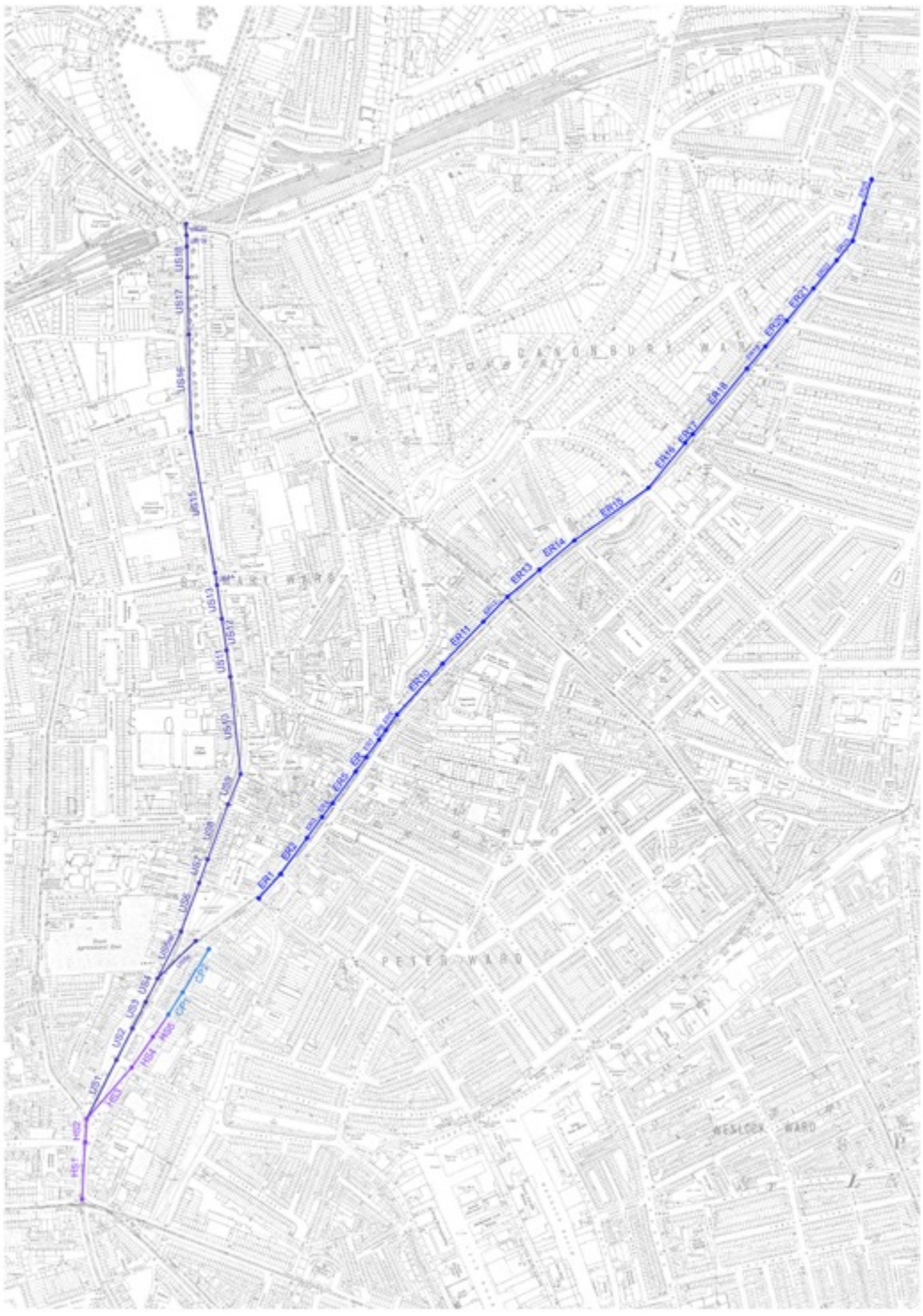

Figure 10. Segment numbering for the case study streets. Numbering is from south to north to capture differences from the putative spatial seed onwards.

On the one hand Figure 9 establishes a broad pattern of similarity in distribution of land uses (here considered as both counts, top graph and percentages, bottom graph – shown alongside a map indexing the location of all the segments). We can say on this basis that most segments in

the Islington centre contained a 'little bit of everything' (or at least retail, food and drink, professional and non-professional services, and offices and commercial). Of course, there a few obvious exceptions which will have much to do with specific local conditions (e.g. short segments such as US19 with only one building facing them or such as ER8 with very few buildings but only one instance of non-residential land use; segments constituted by larger building units, such as US13 with only 3 buildings and two different use classes; segments where one side of the street – such as ER19 and 20 – or large proportions on either side – e.g. ER15 – are lined-up with residential use; and finally segments such as HS4 and US6 with only one side of 'active' frontages which are part of a single larger blockfront yet subdivided in smaller segments due to streets ending on the other segment side). But look more closely and the pattern is highly variegated in detail and it becomes necessary to examine the micro-morphology of the street frontage, plot size and building stock to understand more. Finally, in looking to establish the historical trajectories of the spatial seed, the live (retail) centre and the active (multi-functional) centre we realize that over time these too have become characterized by a high degree of irregularity that makes formal description difficult. Yet if we look at the seed of the High Street it is apparent that the most high-end uses and successful establishments will have taken root there – while, as described in the above section, at the more residential periphery numbers fall off and increasing residential uses are found. We can see a confirmation of this reading of the data in the charming memoir by M.V. Hughes of growing up in Canonbury in the 1870s. Molly Hughes lived in a small villa on a residential street close to the northern edge of Upper Street and describes her four older brothers taking in entertainments at the Agricultural Hall (Upper Street segment 2, namely US2), with its conceptual remoteness from home, despite the fact that the Agricultural Hall was "within easy reach", while her own "outside amusements were mainly pale reflection of what the boys told me of theirs" (Hughes, M., 1934/1980 edition, p. 30). Thus, our analysis of Islington shows why centrality as an (historical) process rather than a synchronic state is likely to be characterised by apparent messiness of land use in which spatial morphology itself harbours the seed of urban possibility that continually reinvents itself in the contemporary urban fabric. While it is possible to describe the resilience of this spatial morphology, we should hesitate before claiming any determinate relationship between a given set of configurational potentials and a particular distribution of land uses at a particular moment in time. The point is that such assertions of order are entirely contrary to the qualities that enable urban centres to persist *in* time. In other words, while broadly speaking there is clear evidence that land use diversity and mixing followed a spatial logic, it would be incorrect to assert a correlation between integration and land use patterns.

5 DISCUSSION AND CONCLUSIONS

We have set out to assess Hillier's proposition regarding the evolution of local centres of activity, or, as they are commonly termed in the UK, high streets – though we prefer the more expansive 'active' centre proposed by Vaughan and colleagues in their study of London's suburban evolution. Hillier's theory of pervasive centrality has been a vital stimulus to our analysis, in

asking us to test whether centrality has an identifiable historical origin that stems from a particular seed of activity shaped by a specific set of spatial circumstances. In tracing the maps of Islington's origins from the eighteenth century onwards, we have shown that the historical record, including contemporaneous accounts of the locality, bears out this proposition to a significant degree. We have enquired as to the extent to which we see the spatial seed reflected in corresponding shifts in land use characteristics within each segment along the historically named high street and, specifically: whether the historicity of Islington high street's spatial configuration explains the presence of different sorts of land use diversity in the Islington area by the late nineteenth-century. Our results have indeed shown a distinct difference between the original so-called seed, Islington High Street, Upper Street, and Essex Road (and the additional short length of Camden Passage), with a consistently higher range of configurational properties for the seed, than for its extensions out of London. Interestingly – as close readers of the text would have noted – the alignment of Essex Road, which was originally called Lower Street, has maintained its more global reach. This is in contrast with Upper Street, which has maintained a local character throughout the study period, and indeed to this day (as earlier research by has borne out (Palaiologou, G., 2015).

Though outside of the scope of this paper, a study of the naming of places, toponomy, is apposite in this context. The change of name from Lower Street to Essex Road in 1864 hints at a shift from local importance to global reach in a period that coincides with Islington becoming more of a suburb of London and less of a local township as it had been prior to that date. Indeed, by this period the high street had evidently become of sufficient importance to feature in Tallis' street views of London (see Figure 4 above). It is also important to revisit the Rocque map of 1745 (Figure 1) as it indicates that the seed was not purely a single alignment in the form of the high street, but actually formed a triangle of streets around a green, as we described in the introduction, with Upper Street, Lower Street and today's Cross Street forming a triangle around the Green, the church, and other principal buildings. This raises the question whether Hillier's spatial seed proposition might be found in the form of a locally important network of streets and activities, rather than a single, linear, street. Hiller's discussion regarding the 'ars combinatoria' is the possibility that architecture might be comprised of basic elements limited by a set of rules (Hillier, B., 1996, online version 2007) This provides a possible resolution to our proposition; namely, that there might be a combination of locally-specific conditions, or restrictions on the combined properties of spatial network, form/grain, and topology that collectively foster the emergence of spatial seeds.

To conclude, this study has formed the first of what is intended to be a series of studies taking us around the periphery of late-nineteenth century built-up London in order to first: shed further light on Hillier's important proposition regarding how local centres are formed over time, and secondly, to explore further how they result in the patterns of land use diversity to be seen on the ground in contemporary London. Studying the changes in building footprint and plot morphology

is likely to illuminate further how certain areas maintain their vitality through massive social and economic change.

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