Spatial Centrality, Economic Vitality/Viability

Compositional and Spatial Effects in Greater London

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Abstract
This research is the continuation of previous studies in the literature related to space syntax spatial analyses of urban centrality. In recent years spatial economics has focused on the spatial location of economic activities and its determinants. At the city-region level a significant part of the analysis has been concerned with the concept of agglomeration as a source of economies of scale, productivity growth, and the role of transport: the spatial accessibility economies. Empirical evidence of the relationship between multi-scales spatial accessibilities and movement economies, as dependant on spatial configuration, is well charted in the space syntax literature. Using space syntax spatial analyses, the socio-economic and spatial patterns of 10 centres located in Inner and Outer London are analysed. The findings show that centres have specific spatial configuration signatures which distinguish centres from their spatial context. These signatures lead to the identification of centre spatial factor components. The interaction between socio-economic compositional effect and spatial signature profiles is investigated and leads to preliminary centre socio-economic/spatial typologies.

Introduction and Background

The notion of urban centre is related to the close co-location of activities, services and employment, in short their spatial agglomeration. In Greater London, historically, it is self evident that centres, as the agglomeration of services, activities and employment, not only grow and shrink but also shift, diversify, disappear or specialise. New centres are designed and with conurbation growth, a whole hierarchy of centres and sub-centres usually appears diffused throughout the urban conurbation and beyond. This hierarchy is encapsulated in the London Plan, the Mayor's spatial development strategy. The hierarchy of centres range from international (2), metropolitan (10), major (35), district (150) through to local or neighbourhood centres (1,300). Compared with the whole conurbation summing up the centre spatial footprints will barely amount to 20% of the area while concentrating about 80% of wealth generation activities. This is a very peculiar spatial disposition and it supports the notion that centres are the wealth generator of a city.

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In classic urban geography and in particular in classic location theory, the notion of centrality is generally defined in terms of attractiveness (Losch, 1952; Isard, 1956; Alonso, 1964; Herbert and Stevens, 1960). A central urban place is said to be a place where activities seek a location, and the competition for such a location can be seen as the ordering principle of the internal geography of urban settlements. Distance to one centre or many are used along centre sizes to derive various "gravity" models. In spatial interaction models, accessibility thus coincides with gravitational potential, each activity aiming at obtaining a location at its highest place of value.

In spatial economics the consideration of agglomeration economies or localized aggregate increasing returns are taken as the underlying force of agglomeration and centrality. The micro foundations of agglomeration are sharing, matching and learning (Rosenthal & Strange, 2004, Duranton, 2004) where economic space is the outcome of a trade-off between various forms of increasing returns and different types of mobility costs. Many scale agglomerations are the outcome of cumulative processes involving both the supply and demand sides. Price competition, high transport costs and land use foster the dispersion of production and consumption. Empirical evidence of the relationship between multi-scales spatial accessibilities and movement economies as dependant on spatial configuration is well charted in the space syntax literature (Penn, 1994, Hillier 1996, 2005, Raford, 2005, Chiaradia 2005, 2007a, 2007b).

In the space syntax literature different approaches to spatial centrality can be found from a mix of empirical and conceptualization of centrality as spatial process (Hillier, 1999) to conceptual and generative approaches (Krafta, 2003), to numerous empirical studies of the relationship between non-residential land use locations and space syntax spatial configuration variables.

This paper aims at examining the socio-economic and spatial characteristics of 10 centres in Inner and Outer London. The key objectives of this investigation are to better understand the interaction between socio-economic variables and spatial characterizations using space syntax spatial configuration analyses in order to conceptualize their interactions. This investigation is part of a large research development effort in the UK: the UrbanBuzz programme . The i-VALUL part of the UrbanBuzz programme explored the potential to monetize the various impacts of strategic urban design. In this paper the key questions we explore in turns are: Are centres spatially distinguishable from non-centres? What is the relationship between the centre and its context? What spatial factors are components of the value of centres?

A complex web of policies, national, regional and local spatial planning ambitions, indicators, strategic and detailed urban design guidance and institutional arrangement informs the objectives of this paper. The investigation undertaken was the initial template for providing two Boroughs, one in Inner London and one in Outer London with borough wide baseline evaluation of their centres. These evaluations will underpin one of the central statutory documents of their Local Development Framework: the Core Strategy (CS). The CS sets out the vision and strategic spatial objectives for the spatial development of each Borough at the 2025 horizon. The CS undergoes a public examination by an independent planning inspector who will consider if it is fit for purpose and examine if it is effective, consistent, justified, and founded on a credible evidence base In the next section we give an overview of the challenges related to the understanding of the working and spatial planning of centres.

UK policy context and the need of centre theory of change
Since 2004 a new set of national Planning Policy Statement (PPS) have been published with a particular emphasis on spatial planning rather than land use planning. Of particular interest is PPS 6: Planning for Town Centres, which emphasises the importance of centres and encouraging their growth through higher densities, sustainability, accessibility, and improved urban design (Community and Local Government, 2005). The out-of-town retail centres of the 1980's, along with recent social and economic changes, are all viewed as contributing factors to the decline of the urban centre (Jones, 2007). Many centres are now facing numerous challenges, especially to reconcile public and private motorized transport and pedestrian movement, and are feeling threatened (Urbed, 1994). It is perceived that the vitality of a centre depends on the level of accessibility for a range of users from pedestrians to vehicles. PPS6 requires local planning authorities to pursue the following policies:

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- actively promote growth and manage change in town centres by;
  - making better use of existing land and buildings including, where appropriate, redevelopment;
  - where necessary, extending the centre.
- define a network and a hierarchy of centres each performing their appropriate role to meet the needs of their catchments;
  - planning for new centres of an appropriate scale in areas of significant growth or where there are deficiencies in the existing network of centres.
- adopt a proactive, plan-led approach to planning for town centres, through regional and local planning
  - managing the role and function of existing centres by, for example, promoting and developing a specialist or new role and encouraging specific types of uses in some centres
- set out criteria-based policies, in accordance with this policy statement, for assessing and locating new development proposals including development on sites not allocated in development plan documents.

PPS 6 contains a set of indicators to monitor viability and vitality of town centres

- land use profiles
- capacity for growth
- shopping rent level and proportion of vacant street level property
- pedestrian footfall
- accessibility
- customer and residents views and behavior
- perception of safety and occurrence of crime
- public realm environmental quality

PPS 6 is complemented by Planning for Town Centres: Guidance on Design and Implementation tools (ODPM, 2005) which refers to street layout, pedestrian access, frontage orientation, landscape, and parking and safer places design. The guidance mentions three design good practices set out in:
- By Design, Urban Design in the Planning System (DETR, CABE, 2001)
- Towards Better Practice; Safer Places: The Planning System and Crime Prevention (ODPM, Home Office, 2003;
- Planning and Access for Disabled People: A Good Practice Guide (ODPM 2003).

This ambitious programme of change is complemented by a local institutional arrangement where a Local Strategic Partnership (LSP) as a single non-statutory partnership body:
- brings together at a local level the different parts of the public, private, business, community and voluntary sectors
- provides an overarching local co-ordination
- develops and drives the implementation which are contractual arrangements between central and local governance.
- allocating funding to 'narrow the gap'

LSP will be nationally evaluated according to a theory of changes. Policy evaluations in the UK have increasingly espoused a 'Theories of Change'(ToC) approach, drawing on North American experiences. (Weiss 1995, Connell 1998, Sullivan 2006, CLG 2004, 2006).

"A ToC is a system of social and behavioural assumptions that underlie a public policy which have been reformulated in the form of propositions. These propositions reflect the beliefs of policy makers about the cognitions, attitudes and behaviours of the policy's target group: the people whom the policy is to affect."

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In short these policies require a sound theory of socio-economic and spatial development for centres in a polycentric conurbation. In the following sections we set out to elaborate first a socio-economic description of the ten centres, second their spatial characterizations, and last, by discussing the findings, we attempt provisional typology of their interaction which would inform a town centre development strategy.

Centres Sample and Variables Definitions

We revisited the study Paved with Gold (CABE, 2007) which showed how public realm investment impacted positively on business rent values and on residential property prices located in the immediate context of the ten town centres. UrbanBuzz's i-VALUL 'Formed with Gold' worked on with C. Buchanan, UCL, CABE and led by Space Syntax analyzed the positive and adverse impact of urban layout design – the centrality index – on zone A retail rent level on the same sample of ten high streets. Except for the use of space syntax analyses, the study re-used the dataset initially collected. We first give an overview of the data set and identify some issues.

The ten centres were chosen from a broad brush comparative study over 50 London centres in line with the following criteria, which were all intended to reach the best compromise between ensuring that the sites were comparable and that data was available:

- Similar retail classification more in line with the CACI classification than the Greater London Authority (GLA). According to GLA the selection includes 1 metropolitan centre, 4 major centres and 5 district centres. CACI is a provider of marketing information.
- Mainly retail uses at ground level
- Similar level of public transport accessibility to central London
- Availability of data on retail turnover and average turnover
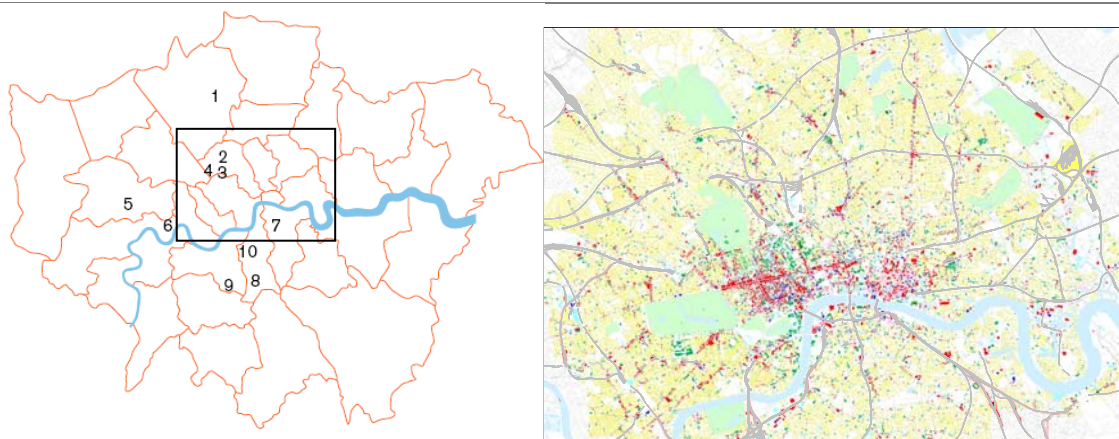- No significant off-street shopping malls in the study area

Figure 1: Locations of the centres

1 North Finchley (NF), 2 Hampstead (HD), 3 Swiss Cottage (SW), 4 Kilburn (KN), 5 West Ealing (WE), 6 Chiswick (CK), 7 Walworth (WH), 8 Streatham (SM), 9 Tooting (TG), 10 Clapham (CM). Greater London is divided in outer borough and inner borough. Residential (yellow) is the background of other land use. The central activity zone covers the most central part of the Inner London boroughs.

The data collected comprises:

- socio-economic data: measures of population, employment, incomes and spending power
- retail data: the mix and number of shops, floor space and the extent of retail competition
- prices: analysis of retail rents
- pedestrian data: counts of pedestrian activity at various points along each high street and throughout the day

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- accessibility data: space syntax spatial model and spatial analyses (angular segment Integration & Choice at different radii)
- Public realm quality surveys: assessment of the pedestrian environment Socio-economic

Census 2001

The main source for socio-economic data was the Office of National Statistics 2001 census at output area (OA) level. It covered population and employment densities, incomes and expenditure. The minimum size of OA is 40 households with a recommended size of 125 households. Population was calculated for each centre by using street network based buffer of 800m from the centre high street (see below). Population density is derived by dividing the population by the 800m buffer area giving a population by km2. The centres are ranked from the highest population, on the left of the graph to the lowest on the right of the graph. This ranking is kept for all the charts.
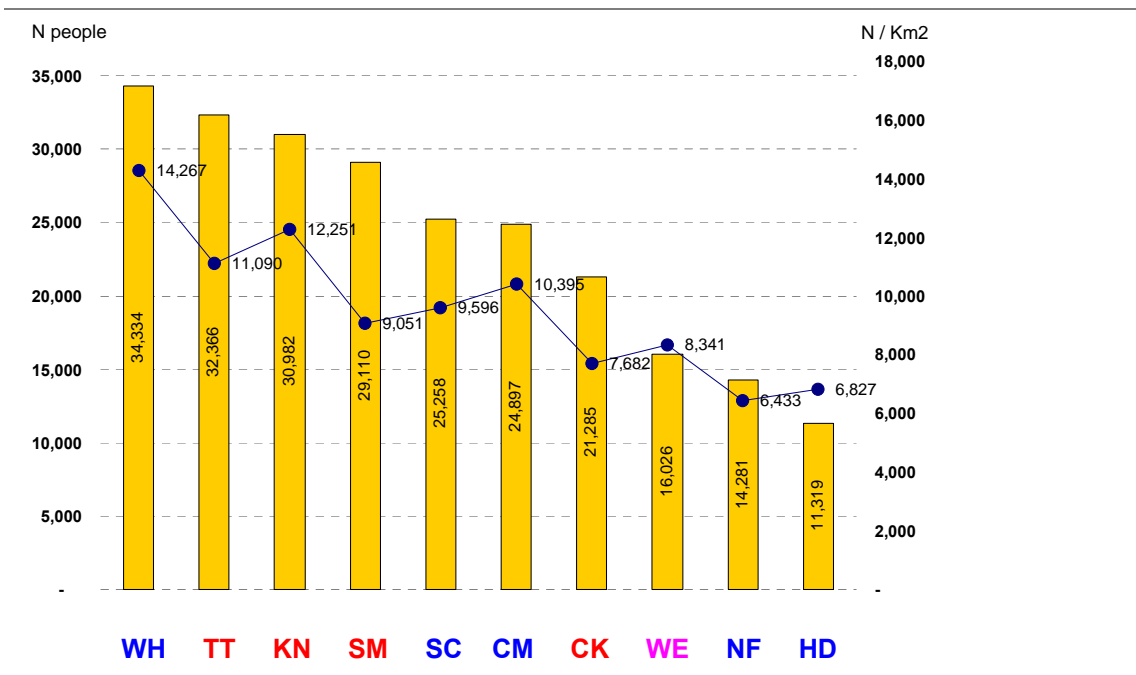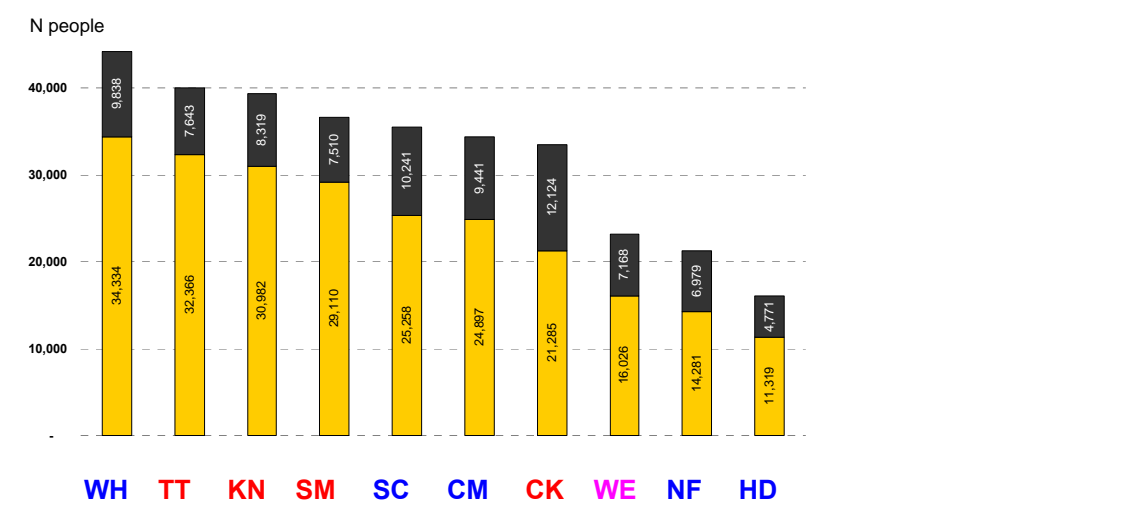

Figure 2a (above) and b (below):

(a) Residential population and residential density. Population and density are related as the centres are mainly rectilinear. Population average 24,000, density 9,593/km2.
(b) Residential population and employment. There is between 236 (Tooting - TT) and 570 (Chiswick - CK) employments for 1,000 residential inhabitants with an average of 370. Employment ratio increases as population decreases. The percentage of employment to residential varies from 19% (Tooting - TT) to 36% (Chiswick - CK) with an average of 27%.
District Centre, Major Centre, Metropolitan Centre

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Income data and household expenditure

Retail performance is closely linked with household income. Income data is available only at borough level, which was considered as not geographically detailed enough for the purpose of this study. Therefore, weekly household expenditure data was calculated using two data sources: - The ONS family spending survey for 2002/03 provides information on household expenditure by income decile – the population divided into 10 groups of 10 per cent. This can be used to understand the national distribution of household income. The national index of multiple deprivation (IMD) score for income is available and provides a recognised measure of income deprivation. Scores are available as a relative ranking of areas across England according to their level of deprivation. The IMD domains are: income, employment, health and disability, education, skills and training, barriers to housing and services, living environment, and crime.

- Figure 3a shows how a weekly expenditure estimate was calculated for each super output area in the 800 metre buffer zones along the sample high streets. Based on position in the IMD income ranking, the average weekly household expenditure of each output area was estimated from the Office of National Statistics family expenditure survey. This average was then multiplied by the number of households in each output area to calculate the weekly expenditure of that output area
- This data was then used to create two key measures:
  o Average weekly expenditure per person is calculated by dividing the weekly expenditure of the output area by the resident population . An average for the whole 800 metre buffer zone can then be calculated giving an average per person.
  o Total weekly expenditure for the 800 metre buffer can be calculated by summing up the weekly expenditure of all the output areas. This gives a measure combining both income levels and population density.
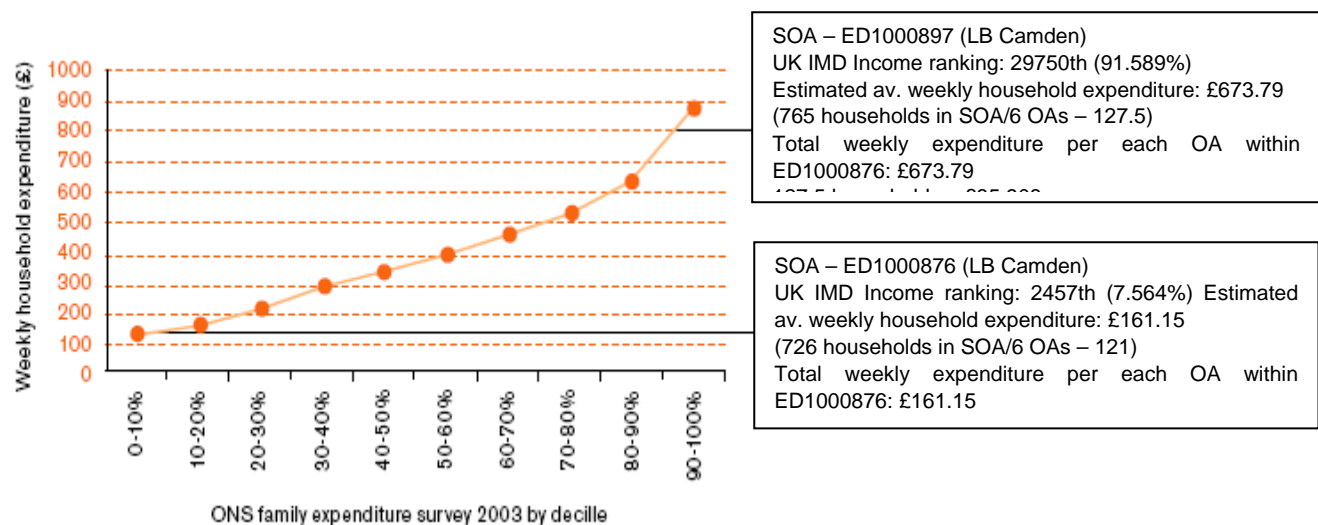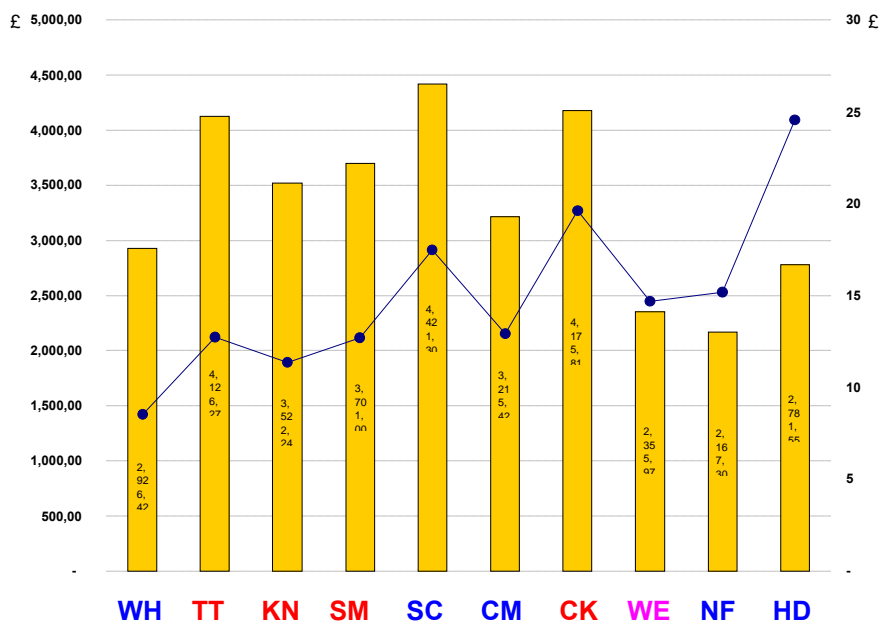

SOA – ED1000897 (LB Camden)
UK IMD Income ranking: 29750th (91.589%)
Estimated av. weekly household expenditure: £673.79
(765 households in SOA/6 OAs – 127.5)
Total weekly expenditure per each OA within ED1000876: £673.79

SOA – ED1000876 (LB Camden)
UK IMD Income ranking: 2457th (7.564%) Estimated av. weekly household expenditure: £161.15
(726 households in SOA/6 OAs – 121)
Total weekly expenditure per each OA within ED1000876: £161.15

Figure 4a (above) and b (next page)

(a) weekly expenditure estimation

(b) Average expenditure per capita and total weekly expenditure. This is an indication of the home market potential size. The centre (Walworth) with the largest population and with the lowest average expenditure per capita has a larger market potential than the centre with the smallest population and the highest average expenditure per capita. Walworth potential is higher than two centres (Chiswick and West Ealing) with 50% more average expenditure per capita.

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£ 5,000,00
4,500,00
4,000,00
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30 £
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10
5

WH   TT   KN   SM   SC   CM   CK   WE   NF   HD

Retail: land use, rent and competition

A full land-use survey on each of the high streets (24km of high street facades). Land use was categorised as: comparison, services and banking, catering and one category including: vacant, charity and betting. Comparison goods include clothing & footwear; furniture, furnishings & household equipment; medical & pharmaceutical products; therapeutic appliances & equipment; educational & recreation equipment & accessories; books, newspapers & magazines; and goods for personal care. As distinguished from convenience goods which includes food, alcoholic and non-alcoholic beverages, tobacco, and non-durable household goods Figure 4b shows the survey extends in relationship to designated centre shopping frontage. Local planning authority designates primary and secondary shopping area/frontage for spatial planning policy purpose. Primary frontage is the core of the main shopping area where the highest Zone A rental levels are achieved and where retail uses dominate. Secondary frontage is the part of the main shopping area where Zone A rents are lower and where there is a greater proportion of non-retail uses. The red line denotes the area where land uses has been surveyed and indicates land use continuity. We can notice inconsistencies in the land use surveys in relation to local planning authority designation.
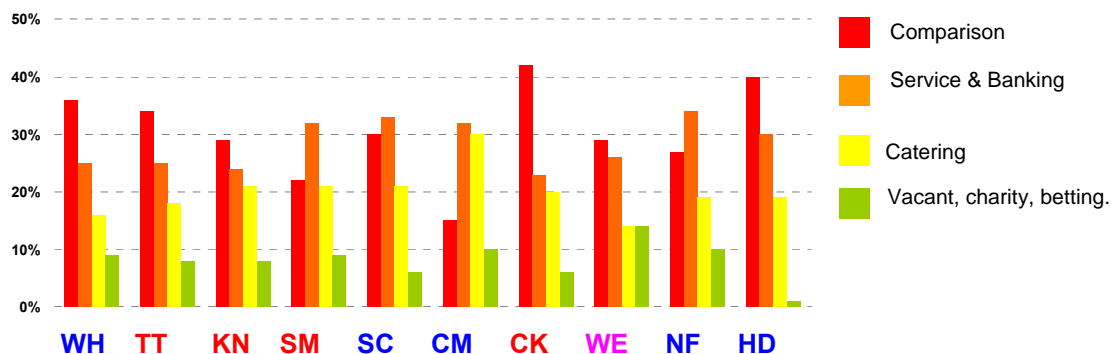

- Comparison
- Service & Banking
- Catering
- Vacant, charity, betting.

WH   TT   KN   SM   SC   CM   CK   WE   NF   HD

Figure 4a (above) and 4b (next page)

(a) Land use distribution. Chiswick and Hampstead have the highest percentage of comparison retail. Vacant shop levels vary from 1% (Hampstead) to 14% (West Ealing) with an average of 8%. Vacancy levels can have many triggers premises over supply over normal demand or for example lease coming to end at the same time.

(b) <u>Land use survey</u> (red line) in relation to designated primary (dark blue) and secondary frontage (light blue)
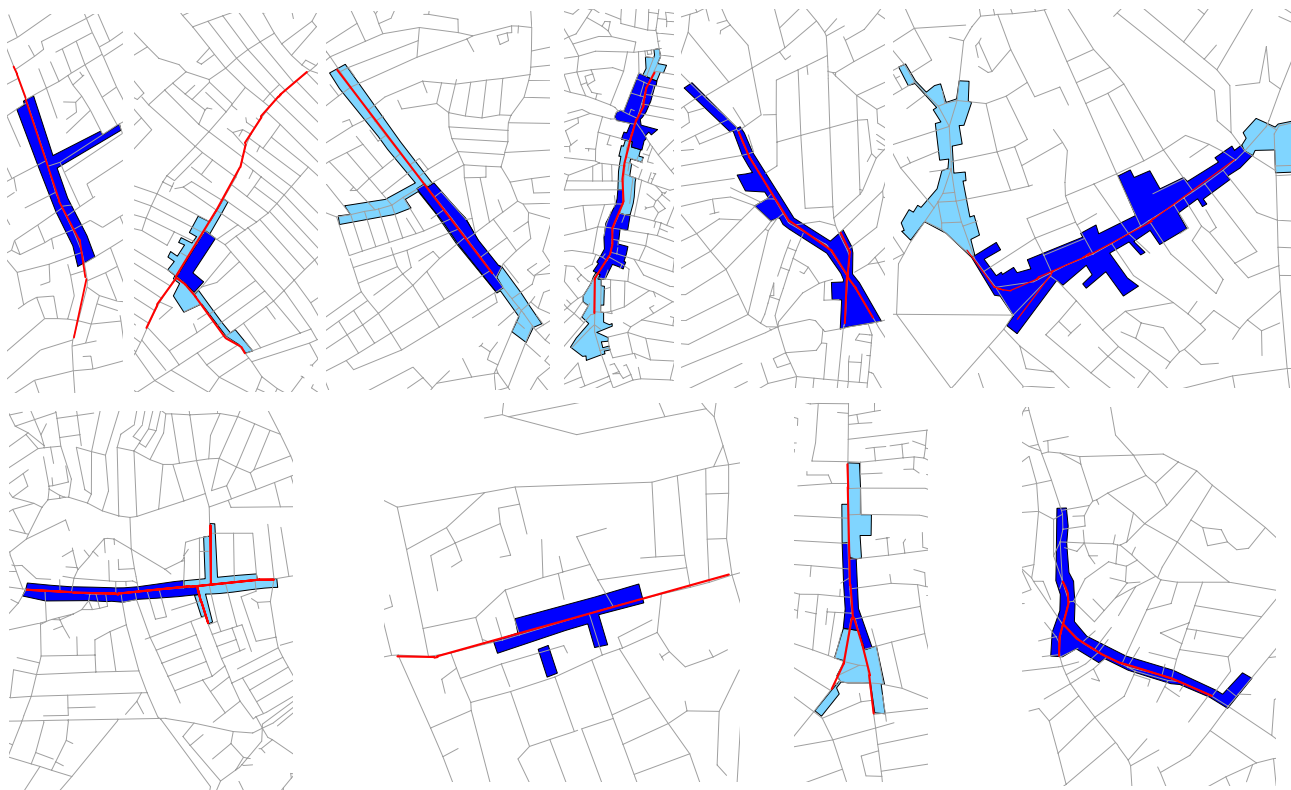
Zone A rental value were taken from the Valuation Office Agency website. Retail data was collected for all shops and premises located on the centre via the Valuation Office Agency 2005 business rates, available on their internet site. The VOA works with a breakdown of floorspace within shops and premises, with zone A being the most valuable zone which is closest (up to 6.1 metres) to the shop front. (www.voa.gov.uk):

The valuation of all shops and premises along the high street was extracted, which enabled calculations as follows:

- total number of shops and premises
- number of retail zone A units
- total of retail zone A rent value [£/m2]
- average retail zone A rent value [£/m2]
- average rateable value [£/m2]

This data is publicly available and is updated in a five year cycle. Details of the VOA principles for calculating business rates can be found in volume 4 of the instruction manual available on-line (www.voa.gov.uk/instructions/). The three main methods of valuation are based on rental evidence, the receipts and expenditure method, or the contractor's basis of valuation. In broad terms the rateable value is a professional view of the annual rent for a property if it was available on the open market on a set date. All current rateable values are based on a valuation date of 1 April 2003. Rateable value is a key factor in the calculation of business rates but it is not what business actually pays. Local councils use the rateable value, in conjunction with a factor called the multiplier, to calculate the basic business rates liability for each property, before applying any discounts or reliefs. Local councils are responsible for sending out the bills and collecting the rates payable. The multiplier – also sometimes referred to as the Uniform Business Rate (UBR) – is a key factor in the calculation of business rates bill. It is set annually by Communities and Local Government in England, and determines the percentage (expressed as pence in the pound) of the rateable value of your property that will be pay in business rates. The multiplier usually changes

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each year in line with inflation. Since VOA were originally set on the basis of value assessments, we may expect there to be some continuing relation between the distribution (as opposed to the level) of rental value and the real value of property. Rateable value should offer a good approximation of the distribution of real values. This assumption was not tested.
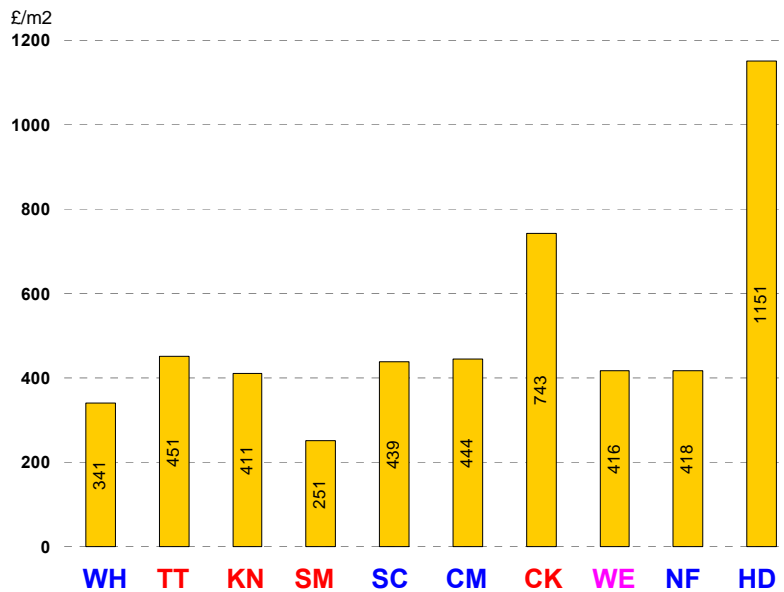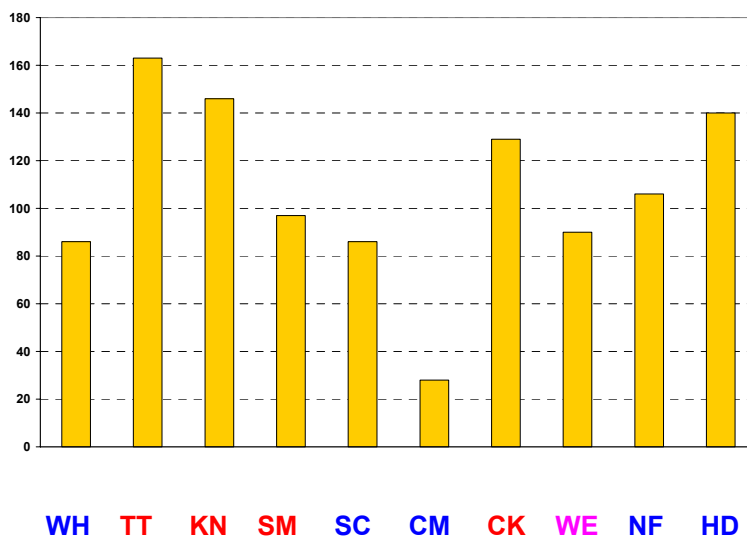

Figure 5a (above) and b (below)

(a) _Average Zone A rental value level_. Except for 3 outliers (Clapham, Chiswick, Hampstead) the average zone A rent levels are relatively equivalent. Chiswick and Hampstead have also high ratio of employment to residential population.

(b) CACI retail footprint score.

CACI's retail footprint model provided a retail catchment model as an indicator of competition pressure. In its principle, it is a gravity model based on four components:

- a combination of distance or travel time by car
- the 'attractiveness' of the retail mix offer
- the degree of intervening opportunities or level of competition
- the size of the population within an area

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CACI's scores are proprietary; it is a well used and a recognized set of measures. The data set is to be purchased. The detail of the model workings is not known.

Pedestrian
C. Buchanan's survey team conducted pedestrian spot counts on each of the high streets. Pedestrians were counted at four cordon lines on each high street during six 15-minute intervals in three periods (07:30–09:30, 12:00–14:00, 16:30–18:30). The gained understanding of the number of pedestrians using the high street was then factored up to a full 24-hour day based on typical London high street usage patterns.
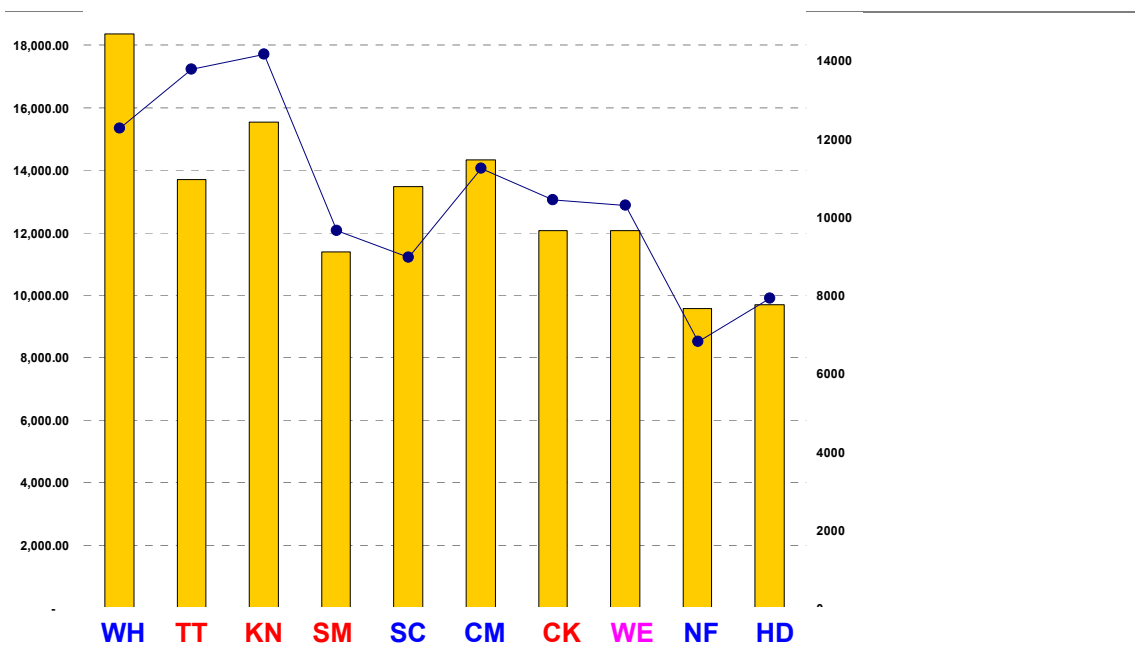

Figure 6
Pedestrian level and area population. At area level there is a consistent trend, a positive relationship between high level of population plus employment and pedestrian levels (Hillier 1993).

Spatial Accessibility

Space Syntax spatial configuration analyses

Centre line – non-centre
The object of this section is to test the proposition that centres are spatially distinguishable from adjacent non-centre areas, which would show that spatial factors are a component of the value of centres. The method is to take a linear extension of the main high street line, which we call a 'centre line', measure its spatial properties (configurational measures of Integration and Choice at low and high radii – 400, 800, 2,000, 10,000m and N) and to compare them to the adjacent 'non-centre lines' See figure below. Given a centre line is defined by land use continuity, then to the degree that centre lines are statistically and significantly distinguishable from non-centre lines, we have identified the spatial signature of centrality. Links between the spatial and performance aspects of centres on the variables will then index the spatial value of centrality. Segment length is investigated as it is an indication of urban block size which has been previously identified as a spatial characterisation of centres (Hillier, 1996) (Figure 7a).

Centre context ratio
The ratio is calculated between the average spatial configuration values of the segment in the centre line and their context at different radii (400, 800m and 2,000m). Centre segments are defined as above by land use continuity. The context is defined as the street network area within 800m from the centre (red on figure as opposed to as the crow flies in blue).
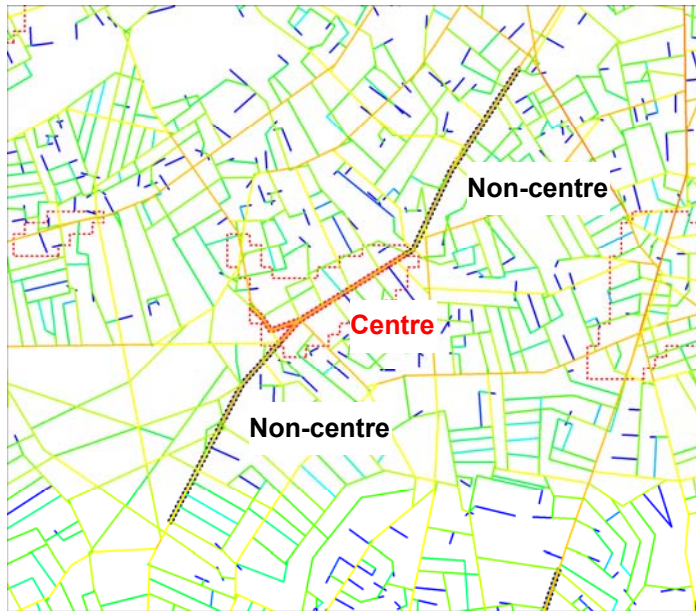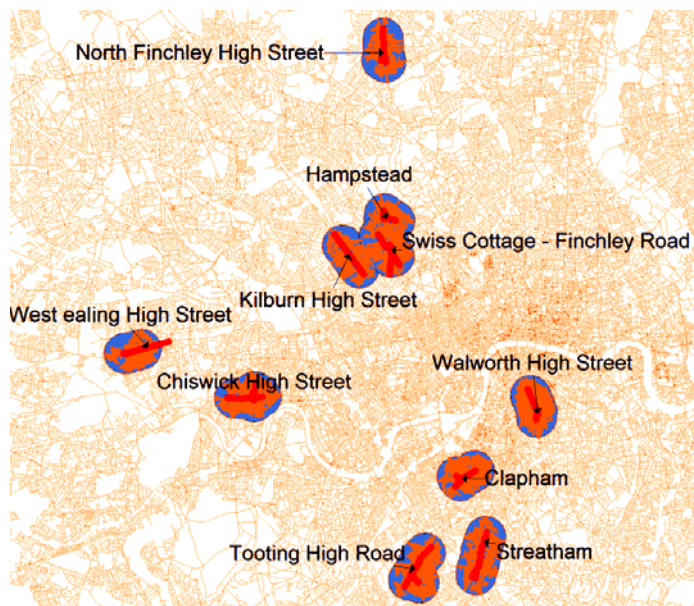
Figure 7a (above) and b (below)

(a) Centre and non-centre definition
(b) Centre / Centre context definition

Public Realm quality survey

The pedestrian environment review system (PERS), a score card software developed by the Transport Research Laboratory (TRL), was used to assess the quality of each high street and an average score was calculated to assess the street design quality from a pedestrian's point of view. PERS is a qualitative multi-criteria assessment score card tool designed to assess the quality of the pedestrian environment by having multiple surveyors placing scores on a number of characteristics and assessing the qualities of a particular street regarding its link or place function. The following categories are assessed under two broad themes of link and place. PERS – link: effective pavement width, dropped kerbs/gradient, obstructions, permeability, legibility, lighting, personal security, surface quality, user conflict, maintenance, quality of the environment. PERS – place: moving in the space, interpreting the space, personal safety, feeling comfortable, sense of place, opportunity for activity. A complete description is available from the TRL. PERS creates an all encompasing systematic and structured framework to capture qualitative pedestrian issues using rating criteria on a seven point scale which are otherwise difficult to quantify. Two of the

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identified problems are that the assessment criteria overlap so much that it is somehow difficult to understand what is scored, and variations in scoring can be substantial according to surveyors and their predisposition to the place or to events occurring on the day of the survey. For example the presence of signs recording a crime will affect the personal safety scoring beyond the sense of perceived safety without the sign. In this study PERS was simplified to assessing: capacity, safety, quality and legibility.
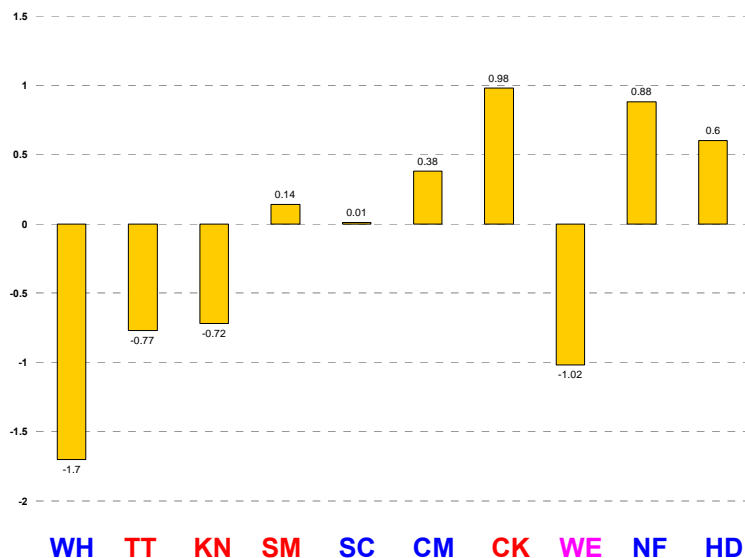

Figure 8
Public realm quality – PERS scores. Except for one centre, West Ealing, there is a consistent trend: a negative relationship between high level of population + employment and public realm quality assessed by PERS score.

Results

Space syntax spatial configuration analyses

Choice
A first investigation was to look at the relationship between angular segment Choice at different radii and the location of the centre. Figure 14 shows how the centres sample is in general located on the large scale movement network. Choice at large radii account for road hierarchy (Penn, 1994, Chiaradia 2007). Most of the centres are directly on the Transport for London Road Network (TLRN), the strategic road network (SRN) or A and B roads or in close proximity. The TLRN is only 4% of the network but carry 33% of the traffic. This is general in London except for the central activity zone – the hyper centre where land use continuity is pervasive and the density of public transport provision is the highest. Varying low Choice radii (400, 800, 1,200, 1,400) show the highest value slide along the centre line according to the extension of the local network and its spatial relationship to the centre line. (Figure 9a and b)

Centre / non-centre
In all cases, centres have shorter segment lengths than non-centres on average by about 40%. Segment length constitutes urban block side; it implies those urban blocks are smaller in centre than non-centre (Hillier 1999b). Segment lengths for centres against non-centres co-vary, so there is a segment length context. In all cases, centres have higher local choice. But the difference disappears as we increase the radius from low to high.

When investigating centre – non centre difference for the 10 centres at different radii, three different variation profiles across radii can be noticed.

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Group 1 (Clapham, Hampstead, Tooting) Figure 10a
The centre segments have slightly higher choice values (10-40%) than the non-centre segments from a radius of 400 to 3,000m. They peak at 800m (Hampstead) and 1,200m (Clapham, Tooting), but this is not significantly higher than the other values. From a radius of 3,000m, only Hampstead and Tooting show higher values in the centre, while Clapham has higher non-centre values. (Figure 9c)
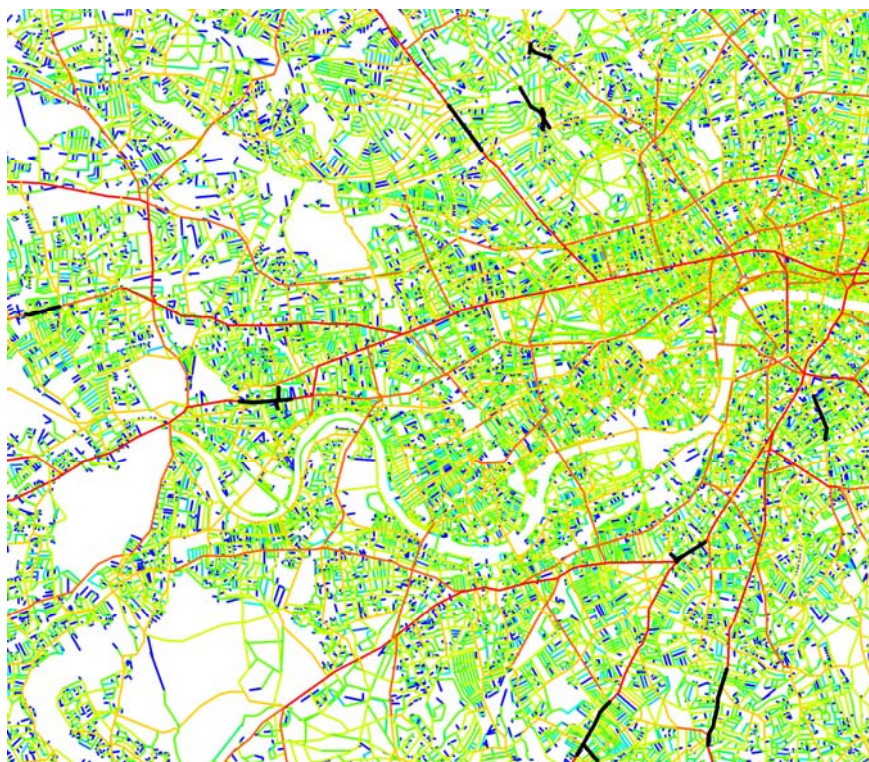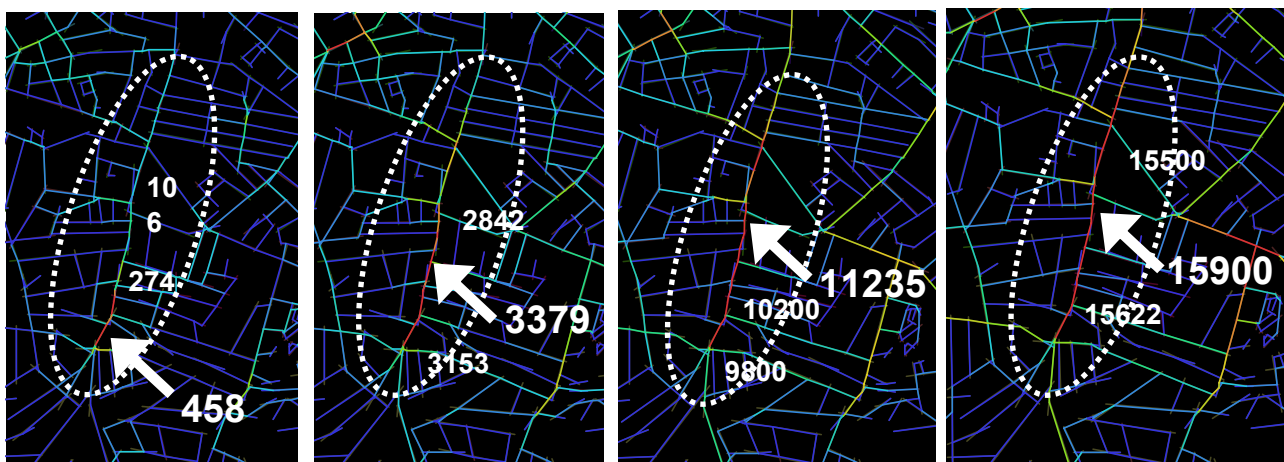

(a)

Figure 9a, b (above) and c (next page)
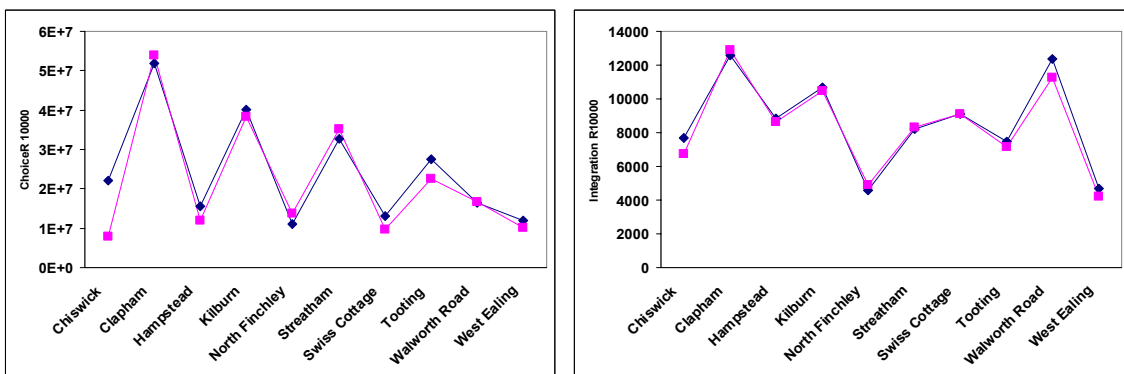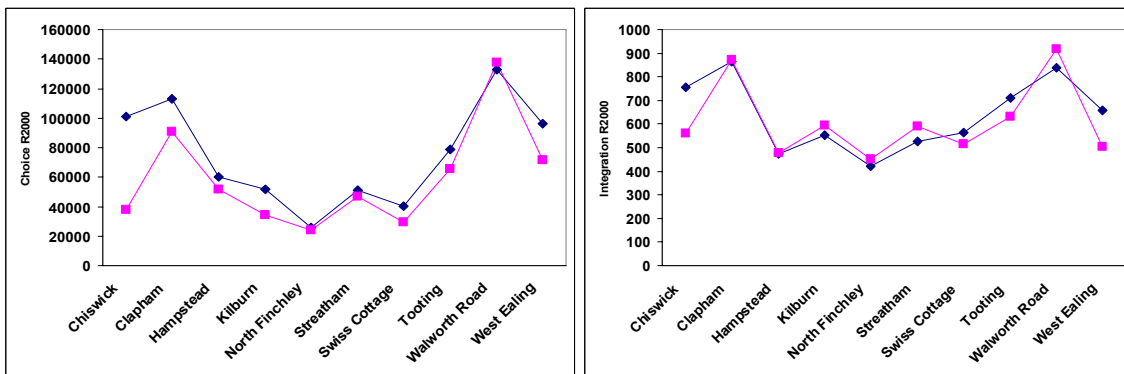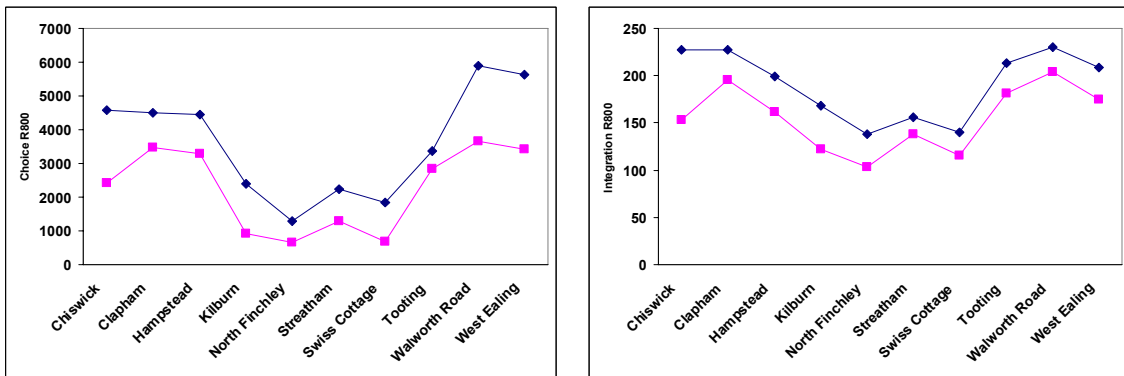*(a) Choice N and centre locations (black)*
(b) Choice (400, 800, 1,200, 1,400) for Streatham (SM) showing how the low radii choice values slide along the centre. Starting at the southern end of Streatham High Street Choice highest value shifts gradually to the north as the radii increase.
(c) Centre non-centre – Choice (left) and Integration (right)

Group 2 (Streatham, Walworth Road) Figure 10b
These centres have a small peak at a local radius of 400m, stay significantly higher up to 1,200m and decrease to similar values as the non-centre segments.

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Figure 9c

400m

800m

2000m

10 000m

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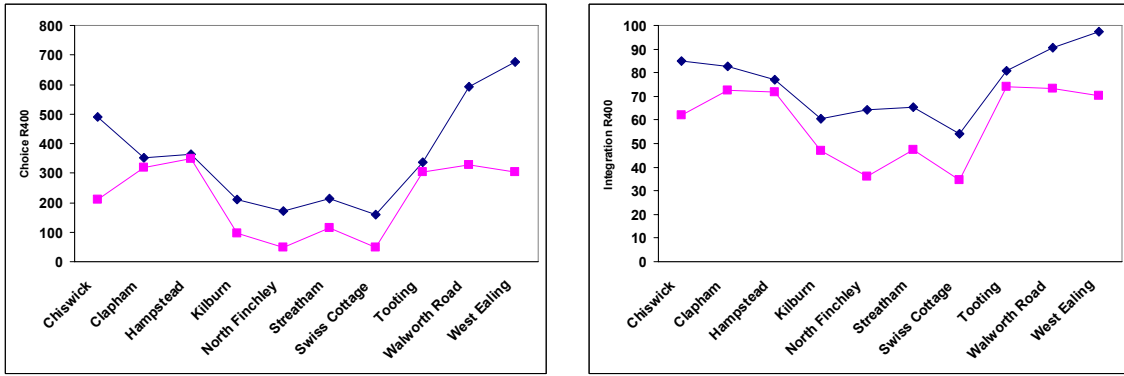
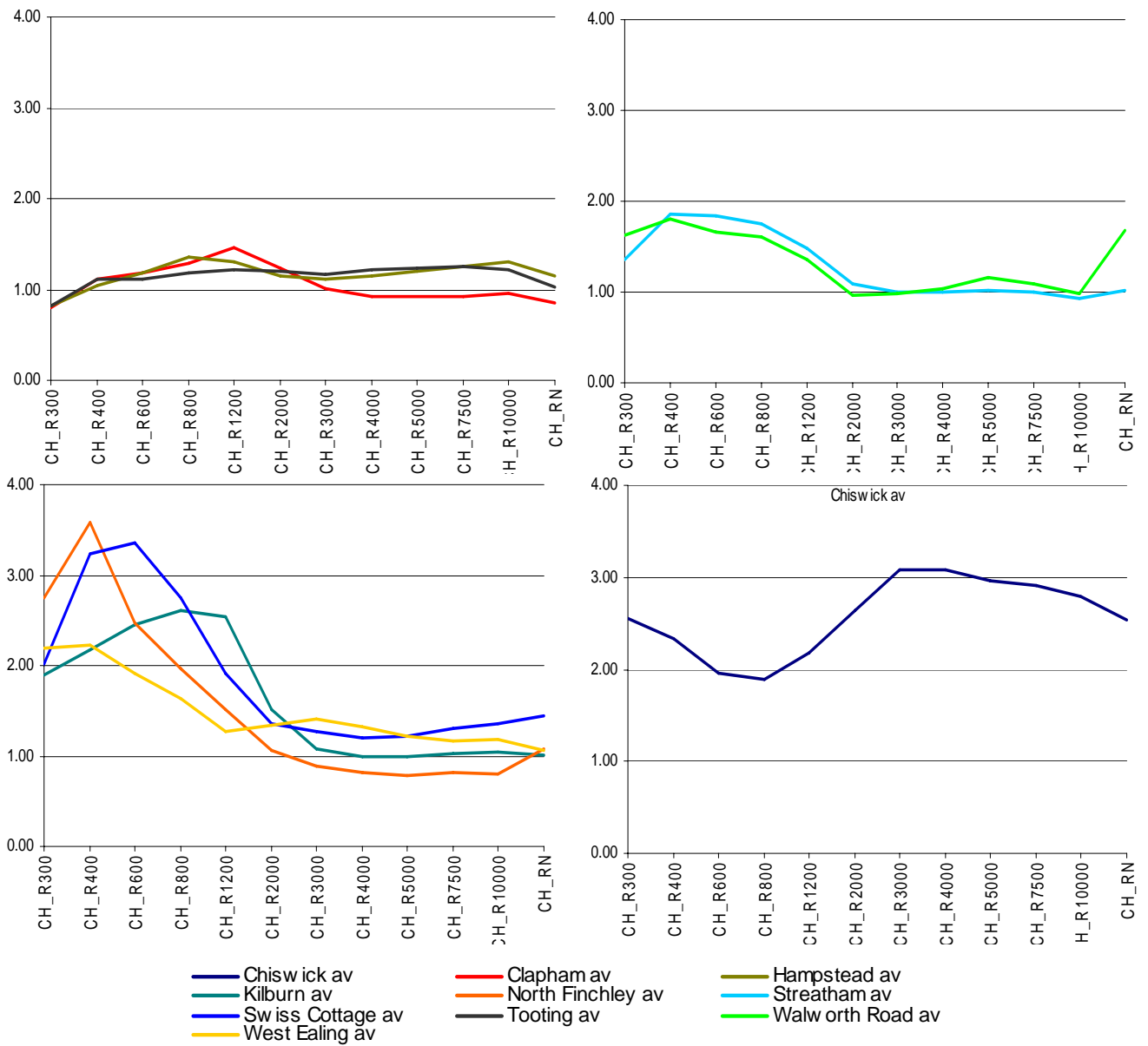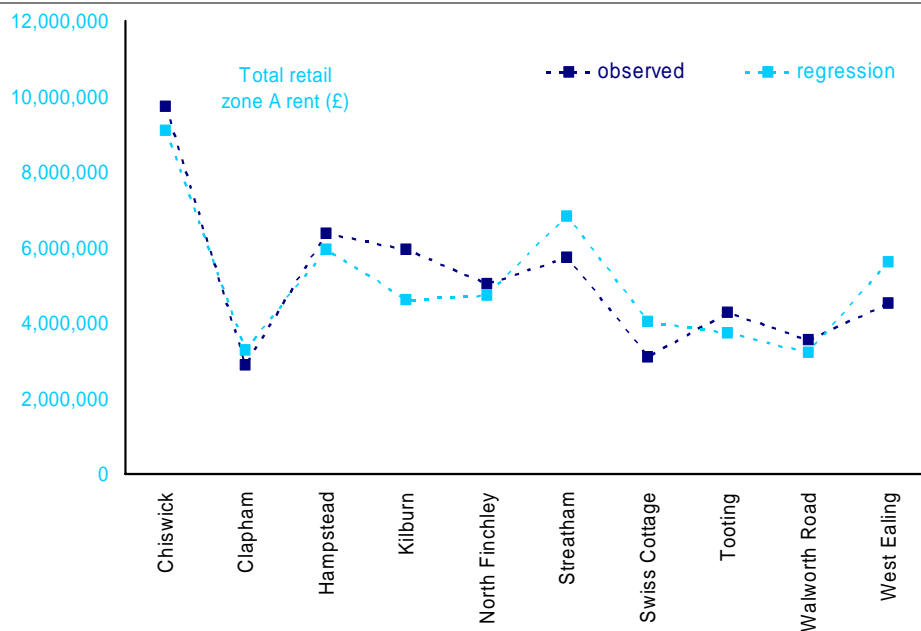**Figure 10 a, b, c, d (above) and e (below)**

a, b, c, d: Centre / Non Centre

e: Total rateable value multivariate regression model.

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Group 3 (Kilburn, North Finchley, Swiss Cottage, West Ealing) Figure 10c
These centres show a high peak (over 2) at a radius between 400m (Clapham, West Ealing), 600m (Swiss Cottage) and 800m (Kilburn) and decrease then to a level of 0.7 to 1.5 at higher radii.

Group 4 (Chiswick) Figure 10d
Chiswick is a special case: the centre-non centre variable is extremely high and shows a peak at a radius of 3,000m and 4,000m. This could be caused by the fact that the area east of Chiswick is part of the continuous West London town centre and therefore not included in the non-centre area.

Centre / Centre Context
This is the ratio between the average spatial values of the segments in the centre and their context in different radii. In all cases the centre segments are sharply distinguished from their surrounding context. The difference increases with increasing radius.

	Seg L max	Seg L av	Ch300	Ch 400	Ch 800	Ch 2000	Ch10,000	Ch N
Centres	155.9	56.9	156.2	356.7	5632.4	9,3441	31,107,168	2,502,094,571
Non-centres	248.7	93.7	90.6	212.0	4,366.9	8,3634	32522119	2,502,215,728
% difference	-39%	-39%	+72%	+68%	+29%	+12%	-4.5%	0.0%

Table 1
Centre / non-centre

	Mean	Std. Dev.	Std. Error	Count	Min	Max
C/CC Choice 400	2.397	0.609	0.193	10	1.643	3.339
C/CC Choice 800	3.230	0.696	0.220	10	2.539	4.543
C/CC Choice 2,000	4.356	0.903	0.286	10	3.019	5.584

Table 2
Centre / Centre context

Socio-economic / spatial configuration exploration
There is no relationship between the CACI score and the Centre / Centre Context. This seems to suggest that the centre context variable does not explain the ability of centres to capture the spend of their catchment areas.

Following the Paved with Gold report we constructed a multivariate regression model taking the total rateable value as independent variable as follows:

Total rateable value (£) = constant +
a* Total floorspace +
b* Average local spending power +
c* Local accessibility variable (Average Choice 800m) +
d* Centre context Choice 2,000m dummy (Centre/Context > 4.5 = 1)

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Centre / Centre Context ratio	r^2	β	intercept
Pedestrian activity	0.58	+2016.60	1767.53
Expenditure	0.59	-33.85	295.96
Population + employment densities	0.45	+8954.76	9755.18
Zone A rent	0.35	-170.07	1247.33
Floorspace	0.42	+	

Table 3
Centre / Centre Context ratio

Conclusions

This paper aims at examining the socio-economic and spatial characteristics of ten centres in Inner and Outer London. The key objective of this investigation is to better understand the interaction between socio-economic variables and spatial characterizations using space syntax spatial configuration analyses in order to conceptualize their interactions. It has been clearly shown that once centres are exogenously defined, it can be shown that space syntax spatial configuration measures identify particular spatial signatures for centre and non-centre and centre and centre-context. Empirical evidence of the relationship between multi-scales spatial accessibilities and movement economies as dependant on spatial configuration is well charted in the space syntax literature. From spatial economics we know that there is generic economic value associated with spatial accessibility. The economic value associated with the variables which distinguish a centre from its context can be understood in terms of the home spatial market profile (both in terms of local spatial accessibility and population quantum and profile) versus spatial import/export market profile push and pull – attract or leak – to other centres. In London, for most centres, in average 30% of comparison shopping will take place in London's main central activity zone. The balance between these two sides, the demand and supply of the centre vitality/viability and the context at large, can be realised in many ways. The relation between home market and import/export trade at large is often referred to as the centre competition. In this small sample study two profiles can be identified as scale and scope economy variations of home market – import/export trade:

- Populous centre on main arterials
    - the centre is sharply distinguished from its context on Choice
    - has high local population and employment densities
    - has high rates of pedestrian activity
    - success comes from numbers rather than affluence
    - larger, less street oriented shops
- Sparse centre on secondary arterial
    - the centre is more like its context on Choice
    - has lower local population and employment densities
    - lower rates of pedestrian activity
    - success comes more from high value and local affluence
    - smaller, more street oriented shops

In marketing this can be understood as market segmentation, the centre flavour is segmented according to its home market. In spatial and social policy terms this can be interpreted as centre specialisation or polarisation. Any of these qualifications imply spatial sorting through the housing market surrounding the centre.

The multivariate regression is of great interest to designers. It includes variables that can be under control of different spatial development-design triggers. The centre / centre context ratio at 2,000m is probably most likely to be amenable to change from medium-large transport scheme without

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precluding the effect of soft and localised schemes such as for example new cycling links, bus and tram priority schemes. The 800m Choice variable is likely to be changed via urban design development. Floor space and population change will be depending of the scale of new development.

As this research uses only a small sample, some further research will be necessary to understand how this could become part of a town centre development strategy. Another challenge would be to be able to spatially define centre endogenously.

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