UNIVERSITY COLLEGE LONDON
Bartlett School of Graduate Studies
MSc Built Environment: Advanced Architectural Studies

BUILT ENVIRONMENT REPORT [BENVBE90]

THE SOCIAL LOGIC OF SHOPPING

A SYNTACTIC APPROACH TO THE ANALYSIS OF SPATIAL AND POSITIONAL TRENDS OF COMMUNITY CENTRE MARKETS IN NEW DELHI

This report is submitted in partial fulfilment of the requirements of the degree of Master of Science in Built Environment from the University of London

AMIT KUMAR SARMA SEPTEMBER 2006

Abstract

This paper examines Community Centre markets in New Delhi, and proposes that the spatial and configurational properties of the markets as embedded in the urban grid can, in part, explain their social and economic differences. Shopping is considered a social activity, and the choices made by shopper and shop to visit or to locate in a particular area together constitute an ‘interface of exchange’. The paper demonstrates that spatial properties of Choice and Integration inform this ‘interface of exchange’ between shop and shopper, and implicates to-movement, through-movement and the distance at which the urban grid affects such movement as prime influences of this interface. The paper concludes that the nature of movement impacts the category of shops, while the distance from which this movement originates effects the social and economic value attached to the market.

Key Words

Shopping, Interface of Exchange, Space Syntax, Movement, Retail Mix

List of Illustrations

Acknowledgements

The author wishes to acknowledge Prof. Bill Hillier for kindly consenting to guide this paper, and for his encouragement and advice throughout; also Prof. Ranjit Sabikhi, for providing the author with valuable insight into the history and planning policies of Delhi; V. Parthasarthy and Debajit Baruah for invaluable help in acquiring data, and Mahesh Singh Jador and Akhilesh Maurya for assisting in the movement study. The author also wishes to thank the staff of the MSc AAS programme, in particular Dr. Laura Vaughan, for making this possible.

Contents

Introduction

This paper describes a case study of Community Centre markets in New Delhi, in light of the spatial constituents of their socio-economic differentiation. The question asked is whether the differences in the character and mix of shops and in the volume and mix of movement in the markets can be partly or wholly explained by the spatial properties associated with the markets. The paper examines this question in light of theories of consumption, and links the network properties of urban space to the sociality of shopping, and through this to the economic realities of the market place.

This question will be examined in the context of planned, gated, Community Centre markets, in New Delhi, India. These markets have, to a greater or lesser degree, exceeded their mandate, serve a larger, global population today and have become integral to the city's shopping culture. A unique opportunity to raise the question arises from the fact that these markets were originally conceived in the Master Plan for Delhi (MPD 1961) to serve similar populations of similar wealth and diversity, to have similar facilities, and provide a similar intermediate level of shopping to the community. These markets differ from the typical high street, in that being planned markets, they have not naturally developed along, or in close proximity to, major routes, nor even in areas of spatial integration[1]. They do not form linear developments, but enclose space and are located generally on geometrical principles, in line with the Neighbourhood Unit planning ideology prevalent at the time. Today, however, each market is highly differentiated in terms of the mix of shops, the range and mix of customers and the volume of traffic[2]. This situation presents a case of markets originating from similar socio-economic backgrounds, but achieving

[1] Spatial integration is a Space Syntax term for the measurement of centrality in urban networks. It can be measured at any scale: global, local or intermediate, and reflects the topological propensity for an area to be a 'destination' of movement from surrounding areas.

[2] The markets are also differentiated in their success levels. However, data representing economic success in terms of turnovers is not available. For the purposes of this paper movement statistics will be used to express success of the respective markets, that is, their ability to attract people.

highly differentiated outcomes, which can be correlated to their spatial differences in terms of embedding in the urban network. However, this relation implicates a more complex understanding of how spatial structure relates to the movement of different social groups in space, and how the presence and absence of these social groups, with their attendant perspectives of consumption, interface with the observed realities of shopping.

The spatial characteristics of each of the markets are explored using 'Space Syntax'[3] theories and methodologies, and have been combined with a movement survey and retail survey. Spatial properties are described in terms of spatial Integration[4] and spatial Choice[5], while movement is discriminated on the basis of high, medium and low income group categories. The mix of shops is categorised as multipurpose or comparison shopping (Eaton and Lipsey 1982, 105), determined by the nature of shopper behaviour associated with the product for sale. These three strands of data represent the description of the existing spatial organisation of the city, existing movement patterns within each of the markets and the volume and type of retail facilities offered respectively. The analysis of these descriptions, individually and collectively, links spatial features and the economic act of shopping to the social realm of markets and consumption.

The analysis will distinguish between two different types of movement, *to* movement and *through* movement expressed as spatial Integration and spatial Choice, and suggest that these relate to the nature of the market as either a destination in its own right or *en route* for some other origin-destination pair. The paper will propose that the scale at which a market attracts movement

[3] Refer Hillier and Hanson, 1984, The Social Logic of Space, and Hillier, 1996a, Space is the Machine

[4] In the context of this study, integration is mathematically defined as the node count divided by the mean topological depth of a line segment at any predefined scale.

[5] Spatial Choice refers to the importance of a line segment as a route from all line segments to all other line segments. In this study, it is calculated by the number of times a line segment is used while travelling the shortest angular route for all possible origin-destination pairs in the system.

relates to the social and economic categories to which the market caters, while the type of movement relates to the nature of the goods sold. These two factors provide a basis for the distribution and mix of goods: en route markets specialise in *multipurpose* shopping, while destination markets specialise in *comparison* shopping. In addition, the idea of distance translates into more specialised, higher end or more highly valued goods.

This paper will, therefore, seek to draw links between space, society and shopping. These links will demonstrate that a logic exists to the observed differences of the markets, and that spatial factors play a fundamental role in this differentiation. This logic is, however, mediated by movement, the mix of social groups in space and the social importance attached to shopping: therein arriving at a *Social Logic of Shopping.*

This paper will first highlight existing research on shopping as an economic and social activity, and will review literature suggesting that the laws of demand are only applicable where value is considered a social phenomenon. Literature on consumption highlights the social basis of value, which may take the form of taste, identity, sacrifice, expression of social relations or the psychological and social distance between the consumer and the commodity. Considering that all social acts are produced and reproduced in space, the paper then reviews literature on the spatiality of markets, and argues that existing economic theories of market aggregations ignore both the effects of urban morphology and the social aspects of shopping. Space Syntax literature then presents the argument that the network effects of the urban street structure play a fundamental role in the distribution of movement in space: naturally high movement areas attract commercial land uses such as shopping, and describes studies which highlight some of the relationships between spatial structure and the distribution of goods.

This paper, thus, hypothesises that spatial structure not only affects gross movement, where areas of high movement attract shops, but also plays a role in determining the type and constitution of that movement. This differentiation in movement creates differentiated *social* potentials for markets, termed the ‘interface of exchange’, which develop different forms of shopping in order to tap this potential.

This hypothesis is tested against the specific case of Community Centre markets[6] in New Delhi, India. The paper presents a detailed description of the markets under consideration and the urban context in which they exist, followed by a statistical analysis of the relationships between space, movement and the mix of shops. The paper concludes with a discussion of the findings and presents initial ideas about the interface of exchange in the case of Community Centre markets in New Delhi.

[6] The six case studies include four community centre markets, one sub-district centre market and one residential planning unit market (MPD 1961).

Literature Review

Marshall in his seminal work '*Principles of Economics*', defines the perfect market as 'a district, large or small, in which there are many buyers and many sellers all so keenly on the alert and so well acquainted with one another's affairs that the price of a commodity is always practically the same for the whole of the district' (Marshall 1920, 72). His definition implicates space, time, the ability and desire to exchange goods, and the awareness of commodities and their prices. His development of Demand Theory[7] brings to light the relationship between demand for a product and its price. As Mary Douglas (2003) suggests, this is at 'the very centre, even at the origin, of economics as a discipline'. The principles of demand and supply, 'alternative cost' and 'diminishing marginal utility' describe the fundamental means by which classical microeconomics addresses the mechanics of exchange. In a simplistic form, these principles suggest that the differential between demand and supply affect the resultant price of a commodity, where if demand for a product exceeds its supply, the price will rise and vice versa. Alternative cost suggests that for every quantity of a commodity there is an alternative quantity of a different product, and the two products will be produced in such quantities as to maintain equilibrium between their respective alternative costs. Diminishing marginal utility describes a process where every additional unit of product consumed provides a decreasing level of benefit. Based on these three principles, classical economics suggests, a free market economy self-organises in terms of volume of goods, type of goods and price.

The market economy described above also holds that the pursuit of rational self interest is in the best interest of society. Adam Smith (1776) argues 'By pursuing his own interest [an individual] frequently promotes that of the society more effectually than when he really intends to promote it', and defines humans as rational, utility seeking people who try to maximise their pleasure. Veblen (1925), on the other hand, argued against human rationality and considered humans as irrational and seeking social status. He considered conspicuous

[7] First introduced by Leon Walras in his 'Elements of Pure Economics', 1874

consumption and conspicuous leisure as the prime motivating force behind consumption, and argued for a shift of emphasis from the means of production to the means of consumption.

Douglas (1979) argues that conspicuous consumption cannot take into account all consumer choices beyond the necessary physical services. She suggests that social life is essential to the understanding of consumption, and disagrees with the classical economic view of assigning to 'taste' or conspicuous consumption all the variation in consumer behaviour. Her belief is that the consumer is rational, but only in the context of a rational world, where the social value assigned to a commodity provides the rationale behind individual choice. The individual has to be considered along with his social obligations and consumption as a social, rather than economic, process. Goods are to be treated as markers of rational categories and behaving in a rational manner implies making physical, visible statements about the values to which the consumer subscribes. Commodities constitute an intelligible universe where individual choice informs lifestyle choices and identity of the consumer.

This idea of individual choice perhaps originates from Simmel's (1907) ideas of value as a social entity. He describes value not as an inherent property of objects, but as a subjective judgement about them (63). Objects, he suggests, 'are not difficult to acquire because they are valuable, but we call those objects valuable that resist our desire to possess them' (67). He further goes to suggest that the value of an object does not originate from the enjoyment of the object but of the distance between the object and the enjoyment of it: to be attained by the 'conquest of distance, obstacles and difficulties' (66). This distance could be physical distance, scarcity, cost, time, renunciation or sacrifice, and is overcome in and through economic exchange, where one's desire for one object is fulfilled by the sacrifice of some other object[8]. He suggests that economic activity is reciprocal sacrifice expressed by the *exchange* of values, as opposed to the *value* of exchange (80, emphasis in original).

[8] This closely relates to the theory of alternative cost.

Perhaps the best-known work of relating social choice and consumption is that of Pierre Bourdieu. For Bourdieu (1984), consumption is a way of perpetuating and naturalizing social (class) distinctions. He demonstrates the extent to which the reproduction of a class society is crucially based on consumption and taste. Instead of regarding consumption choices as an individual affair, Bourdieu stresses the importance of class position or social location as a determinant of taste. Cultural or aesthetic judgements are rarely disinterested, instead serving to sustain social inequalities. Baudrillard's writings have a broadly similar implication, in that objects function as symbols, to which people relate in the hope that possessing them will facilitate communication with others. For Baudrillard, objects of consumption have use-values, exchange-values and also sign-values. It is the sign-value of an object that turns it into an item of consumption. Needs are socially determined, and it is sign-value that guides determined consumption, rather than some objectively defined need.

Daniel Miller (1987), however, argues that Bourdieu's (and others) approach to consumption, based on direct mapping between goods and existing social groups is flawed, and proposes an alternative approach, where object groups relate to divisions that may or may not relate to exiting social groupings. This approach he suggests 'may not be reducible to some central hierarchical principle' (1987, 106). He continues that the distinction between goods may relate to differences within social categories as well as to similarities between the categories themselves. Douglas (1997) extends this argument, and argues that there are four categories of shoppers (independent of their , gender, creed or ethnicity) identified through their types of consumption and points out that consumer preference, either for a particular product or against all other products, is a powerful force in the understanding of consumerism. She suggests that retailers alter themselves to take into account consumer preferences, rather than the other way round. Miller (1998) also suggests that the act of consumption expresses more than just identity or position: his ethnography of a shopping street in north London suggests 'how shoppers develop and imagine those social relationships which they most care about through the medium of selecting goods' (1998, 5). He argues that shopping

exists between the concepts of the ‘treat’ and ‘thrift’, and that commodities are used to constitute the complexity of contemporary social relations.

The above literature summarises existing thought on social relations expressed through the medium of commodities. However, Giddens(1981, 1984), in his theory of Structuration, suggests that all social relations are produced and reproduced only by being realised in space-time, through a system of presence and absence in space (1984, 173). Hillier and Hanson (1984, 36; also Hillier 2001) also highlight this realisation in space, but go on to suggest that space itself has structural properties. Space, they suggest, is both the generator and the medium of movement and co-presence. Space then creates and controls the interfaces between different categories of people and the objects they interact with.

Penn (2005, 29-30) reviews economic literature linking spatial features to land use and the processes of urbanisation. Amongst these, of immediate relevance to this paper, are the theories of Central Clace by Walter Christaller (1933), developed by Eaton and Lipsey (1982) and further tested by West et al in 1985. Central Place Theory was an attempt to explain the size, nature and spacing of cities as central places supplying goods to the surrounding population. He classifies goods in either lower or higher orders, where lower order goods represent those which consumers frequently need and are willing to travel only short distances for, while higher order goods represent those which are needed less frequently, and require further travel. A result of these consumer preferences is that a system of centres of various sizes will emerge over space, each with goods according to its position in the hierarchy of centres. Works by Losch[9] and Heilbrun[10] extend the argument with Hielbrun developing the widely used gravitational model, where individual units are kept in place by quasi-gravitational forces between them.

[9] Losch, A., 1954, The Economics of Location: A pioneer Book in the Relations Between Economic Goods and Geography, trans Woglom, W. H., (from 2nd esition 1944), Yale University Press

[10] Heilbrun, J., 1987, Urban Economics and Public Policy, 3rd edition, St Martin’s Press, New York

It was Eaton and Lipsey (1982) who suggested a model based upon cost minimising consumers, in addition to the simple demand economies considered by Christaller. They set out to show that the clustering of firms selling heterogeneous goods can be derived from a model with profit maximising firms and cost minimising consumers. Both Cristaller and Eaton-Lipsey (E-L) suggest that a hierarchy of central places can exist in equilibrium, and that the highest level centre will offer all goods sold at a lower level. While the Christaller model suggests equidistant centres, E-L's model does not depend on regularity of spacing. The main difference between the two models is the assumption by E-L that the demand for a market is dependant on multipurpose shopping behaviours and that the consumer minimises transportation costs on each trip.

West et al (1985) demonstrate the efficacy of the Eaton and Lipsey model in a test case in the city of Edmonton, USA. They further highlight the key insights of the model as below.

1. Cost-minimising consumers will wish to engage in multipurpose shopping,
2. Firm's location decisions will take into account the demand externalities[11] which multipurpose shopping behaviour can produce,
3. The importance of demand externalities to a particular firm will depend upon the nature of goods it sells, and
4. The size of the customer base necessary to support a particular firm's store will depend upon the location-specific demand for the store's products as well as the costs of operation (West et al 1985, 104).

In order to differentiate between markets store categories are defined in terms of customer base and the extent of locating near other firms that sell the same or different goods. Their thesis suggests that the position of a shopping centre (or market) in the hierarchy from central business district to local neighbourhood centre can be correlated to the proportion of shops in each category.

[11] Demand externalities refer to additional benefits gained from demand. In this case shoppers may come to a market for one item, but may then shop for other items due to their presence in the market. Thus, multipurpose shoppers create additional opportunities for multipurpose shops.

1. M1 stores (Multipurpose 1) are establishments that cluster together to attract mainly multipurpose shopping; the patrons of these stores will not usually engage in search because expenditures on the goods involved, and quality and price variations between stores, tend to be insignificant compared to the associated search costs. Examples include drug stores, groceries, gasoline stations etc.
2. M2 stores (Multipurpose 2) are similarly defined in that they cater to multipurpose shoppers, but they need a larger customer base, as for instance book stores, music stores, gift shops etc
3. C stores (Comparison) cater mainly to single purpose comparison shoppers; consumers will perceive some net gains to search while acquiring the goods such stores sell. Examples are automobile dealerships and appliance stores.
4. MC stores (Multipurpose-Comparison) rely on externalities created by a combination of multipurpose and comparison shopping. Shoe stores, clothing stores and camera stores belong to this category.
5. S stores (Single isolated purchase), finally, are establishments that cater to single isolated purchases, i.e. neither multipurpose nor comparison shopping is important for their business. These firms locate in retail districts for extraneous reasons; movie theatres, for instance, take advantage of ample parking facilities at night, arcades engage the children of shopping parents. (West et al 1985, 105)

In an earlier paper[12], the author demonstrated that the categorisation of retail facilities on the lines indicated above captured the development of a high street in north London from a linear, more uniform distribution to a stratified, hierarchical system in the present day. This paper will also utilise this

[12] Sarma, A., 2006, A study of the Spatial Impact of Planned Retail Development on Clustering and Mix of Shops in a Traditional High Street. Case Study: Borehamwood High Street (Shenley Road), Hertsmere. Paper for Architectural Phenomena, MSc. Advanced Architectural Studies, University College London.

classification of retail facilities to describe the characteristics of the markets under study.

A major drawback of the central place theories is the absence of any element of urban morphology. Neither model utilises theoretical or mathematical descriptions of the city, nor any of the associated issues like differentiated population densities, accessibility or movement patterns. Hillier and Hanson (1984) present a unique perspective on the nature of urban and architectural space and develop methods to describe this in an objective and rigorous mathematical way called Space Syntax. Their method involves representing the open space network of a city as a line graph having the fewest number of longest straight lines that pass through all spaces, and complete all rings, with streets represented as nodes and intersections as links. This map is termed an axial map and can be used to describe characteristics of individual spaces relative to all other spaces in the system (Hillier and Hanson 1984).

Hillier et al (1993, 30; 1987, 237; Hillier and Iida 2005, 556) describe two types of movement: to movement and through movement, and suggest that both are affected by the configuration of the urban grid. They further suggest that in a situation where configuration, movement and land use are in agreement, configuration must be given causal primacy (Hillier et al 1993, 31). The authors suggest that the ‘primary property of the urban grid is to privilege certain spaces over others for through movement’ (Hillier et al, 1993, 20). Retail and other movement-seeking uses locate along these privileged areas, to make maximum use of the opportunities for passing traffic and subsequently act as multipliers on the basic pattern of movement. This theory, termed the theory of ‘natural movement’ provides an alternative to the ‘gravitational model’ described earlier and, in several studies, demonstrates that movement patterns are closely related to the spatial property of global Integration.

A second theory, the theory of the city as a ‘movement economy’ (Hillier 1996a, 1996b) extends the idea that the urban grid is the prime determinant of movement in the grid. The relationship between the grid configuration and movement underlies many aspects of the urban form like land use, crime, the evolution of different densities and even the part-whole structure of cities’ (Hillier 1996b, 1). Cities have been conceptualised as ‘movement economies’ with

movement, as determined by the urban grid, leading to the dense and sparse patterns of mixed use encounter that characterises urban social life.

Hillier and Iida (2005, 556-557) suggest a principle of distance decay: that one visits more destinations closer by and less destinations further away[13], and that this has the formal consequence that locations which are closer to all others in the network (locations of high integration or high accessibility) will be more attractive as destinations than remote areas. They also highlight the effect of the grid on through-movement, as whatever route is selected, all available sequences are determined by the grid, and suggest that as trip lengths increase, the movement patterns will more reflect the choice or between-ness structure of the graph than the integration or closeness structure. The paper concludes that the measurement of distance in terms of least angle change provides the best correlation between movement and the urban grid. These ideas present cogent arguments that the urban grid affects movement, and that the effects of differential movement rates are differentiated land uses, with movement seeking uses aggregating along high natural movement locations. These aggregations then attract even more movement and create a multiplier effect.

Again, using a Syntax background, Hossain (1999) examines spontaneous (unplanned) retail development in Dhaka in terms of the relationships between location, retail cluster patterns and observed movement. Her research findings strongly implicate configuration as a prime influence on the functional distribution of retail types within a market. She conceives of a system where different degrees of attraction are created by securing specific locations for a particular retail types. She differentiates between the main ‘generative’ functions, ‘shared’ functions and ‘suscipient’ functions[14] (p5). The category of

[13] This also links to the Christaller model, where low order and high order goods exist at different distances from the consumer. Low order goods are used frequently and exist in close proximity to the consumer, while high order goods exist at larger distances and require greater premeditation and formality.

[14] ‘The Selection of Retail Locations’ (Nelson, 1985) distinguishes between these three categories. Generative functions are defines as those whose sales are produced by the store itself; shared businesses have sales secured by the store as a result of the generative power of

goods that acted as generators varied for each market, but the categorisation always existed. The important finding of the study is that the generative and suscipient functions were spatialised differently. Generative functions clustered together, but could survive a degree of isolation, while suscipient functions dispersed, but favoured spatially strategic locations. Penn (2005, 33) suggests a simple logic behind this phenomenon. He suggests that the generative functions are the main attractor for the market, and can therefore occupy a locally isolated position within the market without any loss in customers, as with comparison shopping (Eaton and Lipsey 1982, West et al 1985). Conversely, suscipient functions are sensitive to movement flows and thus require the most strategic positions within the market, again similar to multipurpose shopping in the Eaton and Lipsey model. Furthermore, suscipient functions are also sensitive to competition, and so tend to disperse.

This literature review highlights several key aspects of the nature and functioning of markets. The price, nature and quantity of commodity production follows the fundamental laws of economics: demand, alternative cost and marginal utility. In addition the seller has to take into account social and culturally determined forces at play. He has to account for value and distance (Simmel 1900), taste (as suggested by classical economics), conspicuous consumption (Veblen 1925), status and social differentiation (Bourdieu 1984), identity (Mary Douglas 1979) and social relations (Daniel Miller 1998) in determining the products he wishes to sell. At the same time, the consumer has to consider the same socially determined factors while deciding which market to visit.

All interactions take place in space, and spatial configuration is a prime determinant of movement and the potential for interaction (Hillier and Hanson 1986; Hillier et al 1987, 1993; Hillier 1996a, 1996b; Hillier and Iida 2005; Penn 2005). Thus, the shopper and the retailer have to locate in space in such a way as to maximise the potential for those with surplus and those with needs of a particular social category of product to interface with each other. This interface

neighbouring stores; and suscipient functions are those whose sales are not generated by the store itself or neighbouring stores, but attracted coincidentally.

of exchange exists at several levels: the type, mix and location of shops within a market, the location of the market within the urban context, the accessibility/visibility associated with the shop window, and the display of goods within the shop. The market (and the individual retailer) determines the interface in light of the potential customer, and the consumer visits a particular market (or shop) in light of the social (and economic) values attached to the commodities available.

The mix of shops can be considered in terms of the generative, shared or suscipient (Hossain 1999), but is stable only for a particular market. Categorisation in terms of multipurpose or comparison shopping (Eaton and Lipsey 1982, West et al 1985) is universal for all markets, but fails to account for the implications of specialised markets. However, in the context of this study, the markets studied offer a wide range of goods, and the broad categorisation of the Eaton and Lipsey model offer better means for cross-comparisons. The dominant class of goods can be considered generative, and the multipurpose category suscipient. Thus the variations in shopping categories provides a base of data to represent the social ‘status’ of the market, while the categories of people visiting indicate those who seek this ‘status’. The spatial characteristics of the markets provide the primary element of the interface that brings the shopper, the shopping and the shop together.

The Context: New Delhi and its markets

Delhi is a metropolis in Northern India, having a population of 13.81 million[15]. The metropolitan area of Delhi, or National Capital Region (NCR) includes neighbouring satellite towns of Faridabad, Gurgaon, Ghaziabad and Noida, and is the sixth most populous agglomeration in the world, with an estimated population of 19.7 million[16].

The original core of the city was formed when the Mughal Emperor Shahjehan moved his capital from Agra to Delhi in 1638, and built for himself a magnificent palace called the Lal Qila or Red Fort. The walled city that developed around the palace was called Shajehanabad. The morphology of the city (refer Fig 1) was determined by the location of a few elements: the central avenue known as Chandni Chowk (Moonlit Way), the Jama Masjid (Great Mosque) and the palace itself. Fonseca (1969) describes Shajehanabad as 'organic, informal process… Along the main roads were the centres of activity, the retail shops, as well as the work areas of production units, which were closely related to the residential units behind'. Sabikhi (1996, 110) highlights the absence of single-use zoning, and the prevalence of a mixture of uses even within the same premises. He suggests that the major land uses followed the hierarchy of the city form, with the main bazaars located along primary streets; secondary streets accommodated bazaars of less importance and the tertiary lanes, or *gallis*, led to a

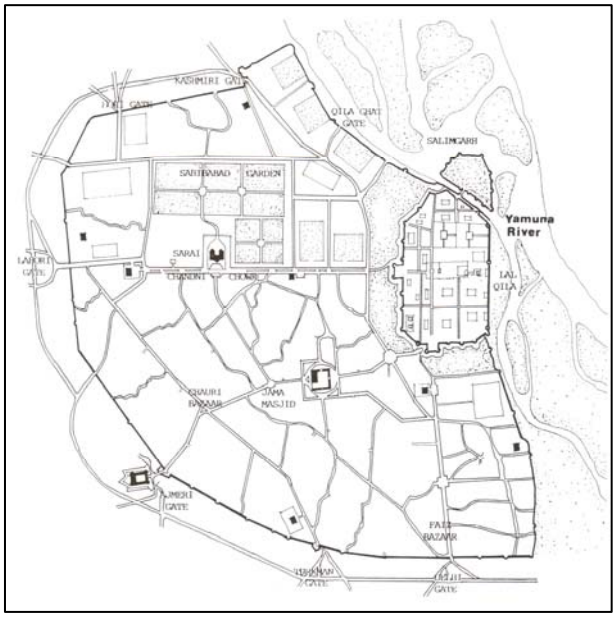

Figure 1: The Walled City of Shajehanabad (1739). [courtesy: Sabikhi, R., 1996, 111]

[15] From the Government of National Capital Territory of Delhi [http://delhigovt.nic.in/dept/economic/stat/statistics.asp]

[16] As per Brinkhoff, T., 2006, The Principle agglomerations in the World [http://www.citypopulation.de/world.html]

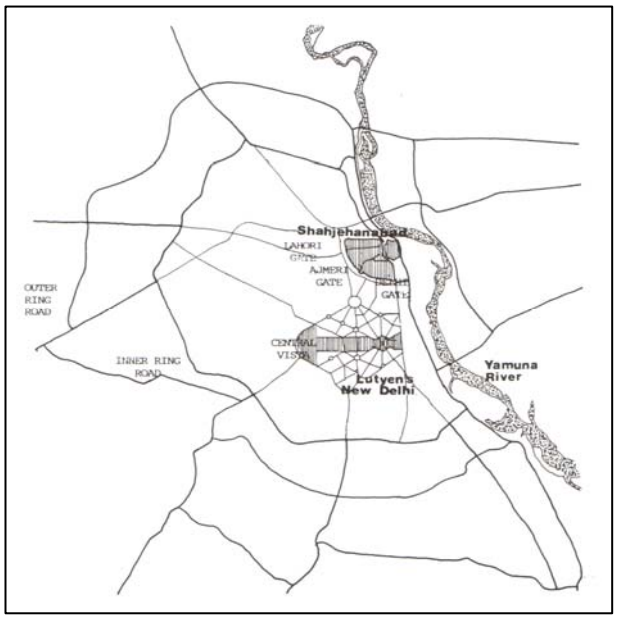

Figure 2: Lutyens' New Delhi in relationship to Shajehanabad [courtesy: Sabikhi, R., 1996, 112]

lower density network of residential areas.

Sabikhi (1996, 110-111) also traces the development of the British capital, New Delhi, designed by Edwin Lutyens along the lines of Wren's plans for the city of London and L'Enfant's plan for Washington. He describes the development: 'Lutyens imposed on the landscape an axial structure with a system of grand diagonal avenues and roundabouts' (110). The new development occupied a vast area to the south of Shajehanabad with a central feature of a grand avenue flanked by lawns and pools known as the Kingsway (now Rajpath), which led from the viceroy's palace and the secretariat buildings to the War Memorial arch (India Gate). The new district contrasted greatly with the lifestyle that prevailed in the indigenous cities and lacked any sense of urbanity (111). Yet, its Garden City ideas and concepts of exclusive activity zones continued into modern policy.

Following the independence and subsequence partition of the country in 1947, the influx of refugees doubled the population of Delhi. These refugees either settled in the old city, or in hastily built, low density resettlement colonies around the city, giving the city a distinct suburban character. In response to the pressures of growth, the authorities instituted the Delhi Development Authority in 1955, who prepared the first Master Plan for Delhi in 1961.

The Master Plan defines its purpose 'to check the haphazard growth of Delhi … with its sprawling colonies' (MPD 1961, i). In order to achieve this, its primary tool was the land use plan: 'there is an undesirable mixing of land uses almost everywhere in the city; residential with shopping and industry, wholesale with retail, business with service industry' (5). The plan proposed to decentralise places of employment. This objective of decentralisation along with the residential policy of neighbourhood units was configured in the form of a

hierarchical system of shopping and business centres (12). A five tiered commercial plan was proposed with residential shopping (convenience shopping) comprising 4 to 6 shops for every 3500-5000 population; Residential Planning Area Centres of 15 to 20 shops for every 12000-15000 people; Community Centres of 80 to 100 shops catering to groups of 40000 to 50000 persons; District Centres of 200 to 350 shops for every 150,000 to 250,000 residents; and Central Business Districts serving the whole city. The plan proposed new central business districts to cater to the new eastern conurbations, fifteen new District Centres and thirteen new Sub-District Centres (13-14) (refer Fig 3).

However, the implementation of the Master Plan proposals remains unsatisfactory. Sabikhi (1996, 117) indicates that of the fifteen proposed District Centres, only three had been constructed by 1981, and only six by 1992, and not completely at that. Similar slippages occurred in the construction of Community Centres and Local Shopping centres. Thus, as extensive residential development occurred, large quantities of retail and other community support facilities found outlets within the residential developments themselves. However, the pressures of growth and the collapse of the planned framework have resulted in a kind of spontaneous development extending retail uses ‘along major circulation routes, with tentacles extending into the surrounding residential areas’ (120) .

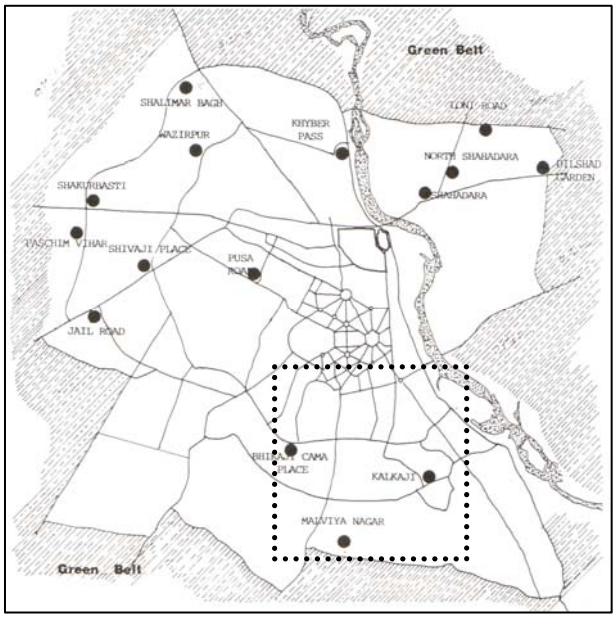

Figure 3: 1962 Master Plan with District Centre Locations. The area of the study has been highlighted. [courtesy: Sabikhi, R., 1996, 114]

Figure 4 shows the Segment Map[17] of south and central Delhi, with the main shopping areas[18] highlighted in red. The central business districts are clearly visible to the north of the picture, and take the form of large aggregates, while the shopping to the south is relatively isolated and dispersed. There also appears to be a distinct division between shopping to the centre and north, and shopping in the south. Visually, the whole of south Delhi appears to be relatively segregated, with the river to the east, a green belt to the west and undeveloped farmland to the south forming physical barriers.

Figures 5 and 6 show the global Integration and Choice maps respectively. The core of the city comprising the old city, Lutyens' Delhi and the wholesale district is highlighted in the integration map, with a rudimentary 'deformed wheel' pattern emerging. The choice map shows the main routes linking the city centre to the periphery. In the south of the city, the area of study, the choice patterns clearly show a grid like tendency, with the neighbourhood units (the colonies) relatively segregated, but surrounded on all sides by higher choice routes.

Within this context of conflicting morphologies, planning principles and spontaneous development, several Community Centres, especially in South Delhi, have uniquely exceeded their mandate. Centres such as New Friends Colony to the south east, Greater Kailash 1 and 2 and Defence Colony in south centre, R K Puram to the extreme south and Vasant Vihar to the south west no longer merely cater to their target populations, but have become global in their own right. These markets attract people from all round the city, and have become markets 'to be seen in' for a large proportion of the middle and upper middle sections of society. It is with these that the following section will deal.

---

[17] The Segment Map is a derivative of the Axial Map, where the primary element is the line segment between two intersections, rather than the entire line itself. This map gives a greater degree of resolution than the traditional Axial Map, and uses angular distance as opposed to topological distance. For more details of angular analysisrefer Turner, A. (2000) Angular analysis: a method for the quantification of space. CASA Working Papers, no.23 (UCL), London, UK.

[18] Shops have been manually marked as per the Eicher Delhi city map 2001, Eicher Goodearth Ltd, New Delhi.

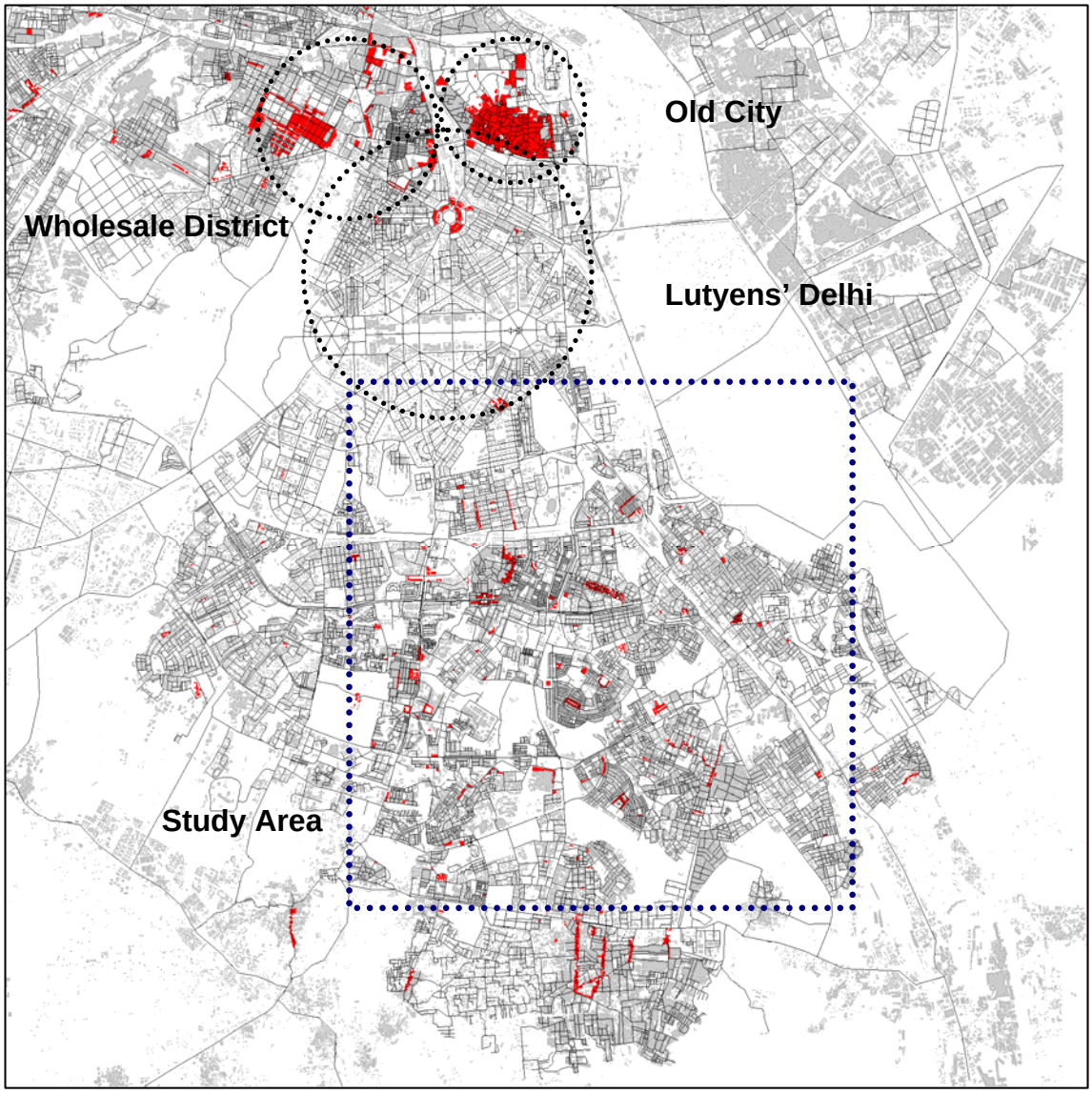

Figure 4: The Segment map of South Delhi with Shops marked in red. The area of study (enlarged in fig 7) has been highlighted. [Image by the author]

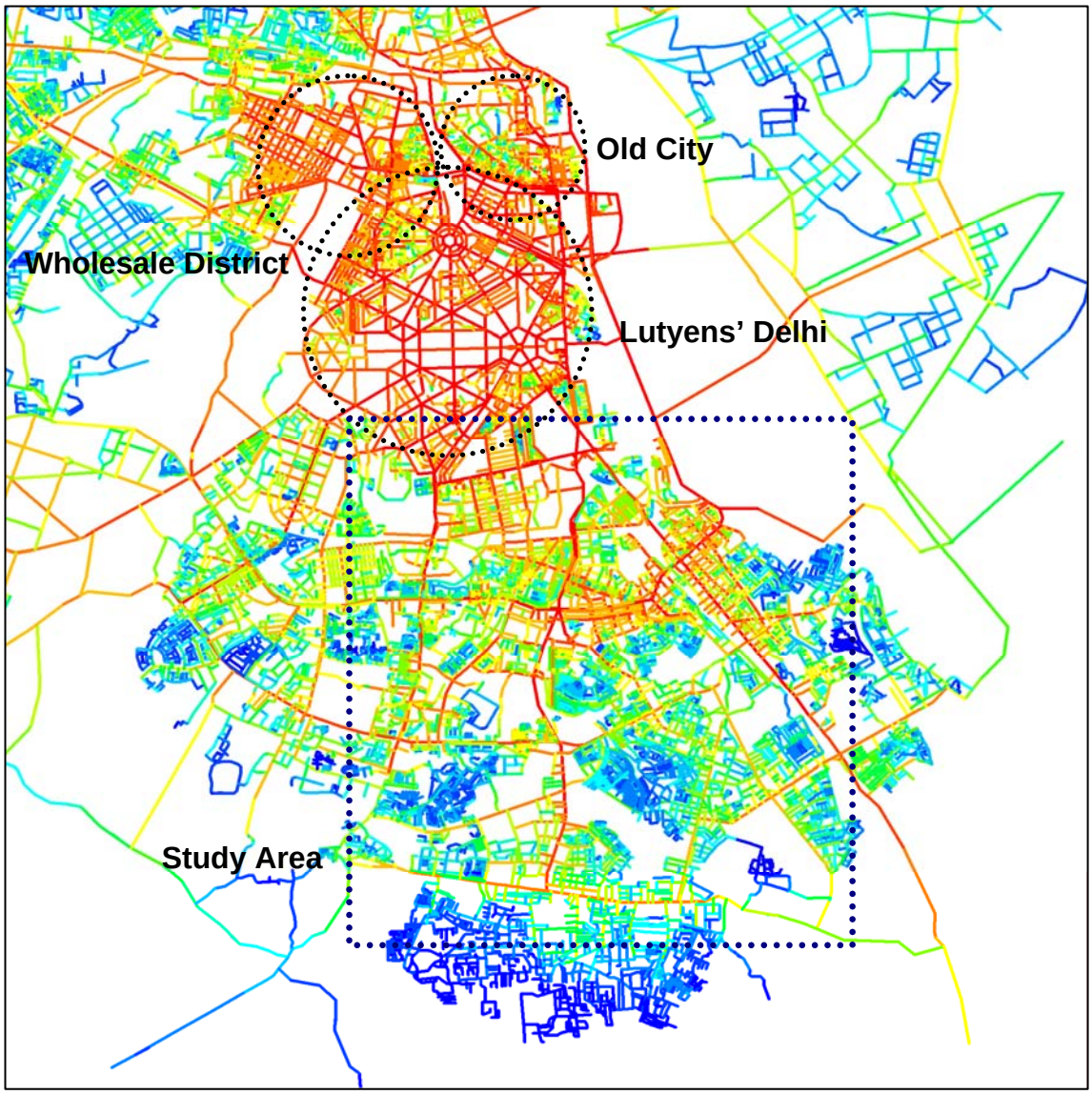

Figure 5: The segment Map of Delhi showing global Integration (1/Mean Depth radius N). Note the Integration core of the city includes Lutyens' Delhi, the old city and the wholesale district. South Delhi, mainly composed of Neighbourhood units, comprises of differentiated 'grid' like structures against a background of more segregated neighbourhood residential colonies. [Image by the author]

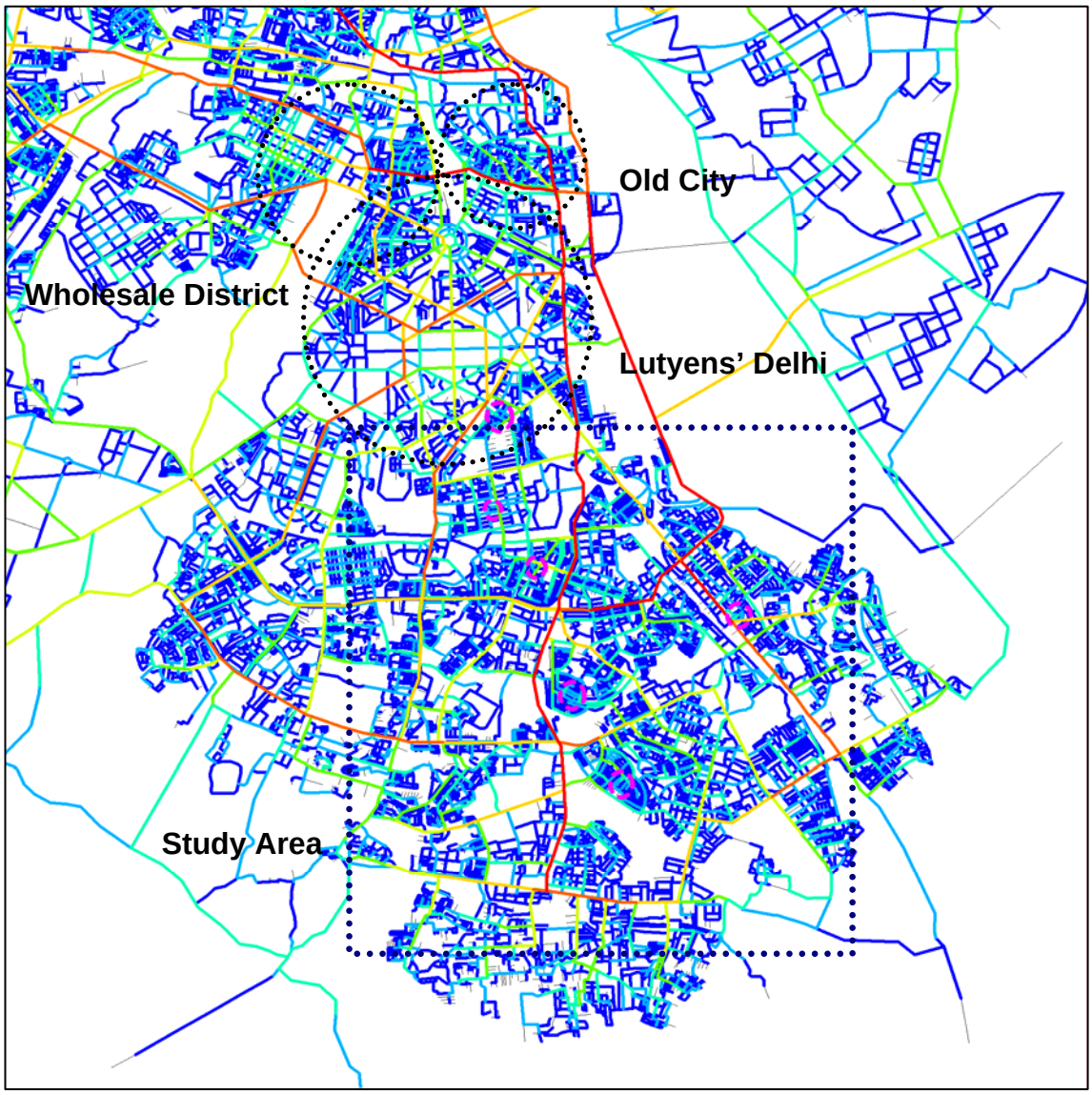

Figure 6: Global Choice map of Delhi. Lines of high Choice radiate from the core of Lutyens' Delhi. In the south of the city, there is one very strong north-south axis in the centre, and several others radiating out. These are joined together to form a sort of 'choice grid' by the east-west ring roads. Residential colonies are located within these high choice grids but are themselves low choice areas, surrounded on all sides by higher choice routes. [Image by the author]

The Case Studies

This section examines six markets in the South Delhi area highlighted in figure 7, in order to demonstrate the hypothesis that the spatial structure of the markets relates both to their social and economic functioning, and plays a key role in determining the interface of exchange. The case study draws from theoretical arguments discussed in the literature survey, and begins with a spatial analysis based on Space Syntax theories and methodologies to distinguish between the spatial characteristics of each market. Two significant spatial properties of the markets have been examined; those of spatial Integration and Choice as defined earlier. In addition, spatial Choice in the areas immediately around the markets, and the total segment length[19] within axial radii of 2, 3, 4 and 5 are used. The second part of the study distinguishes between different shops retailing in each market. Two websites: the Yellow Pages for Delhi[20], and the Office of the Labour Commissioner, Government of NCT Delhi[21] were used to list each shop and main commodity sold for each market. These shops were then categorised in terms of multipurpose or comparison categories as discussed in the literature review. Finally, a pedestrian survey was undertaken in five locations[22] per market. The number of pedestrians passing through each location was measured to give a sample of typical movement through the market. Each movement count lasted five minutes, and was repeated three times a day for two days. Thus in total, each market was counted for a total of thirty minutes over two days. The pedestrian

[19] The total segment length indicates the total length of line within a specified radius, in this case topological steps of 2, 3, 4 and 5. This measure represents the density of the street network accessible to each market at different radii.

[20] Sulekha Yellow Pages for Delhi http://www.yellowpages.sulekha.com [accessed June 2006]

[21] Website of the Shops and Establishments Inspectorate, Office of the Labour Commissioner, Government of National Capital Territory, Delhi http://labour.delhigovt.nic.in/shop_establishment/public [accessed June 2006]

[22] These locations represent the areas of highest integration and choice at both the global and local scales, as well as the area of highest observed movement. Where these overlapped the next highest location was selected.

study distinguished between male, female and youth (school going children), and also between categories of High, Middle and Low income groups. These three categories were distinguished by appearance: persons wearing dirty, torn or old clothing were classified as Low Income Group (LIG); persons wearing neat and clean clothing and having leather shoes or trainers, but not sporting designer labels, sunglasses or other high end accessories were distinguished as Middle Income Group (MIG); persons wearing designer labels, sports attire or having accessories like sunglasses etc or having some sort of 4-wheeled vehicle were classified High Income Group

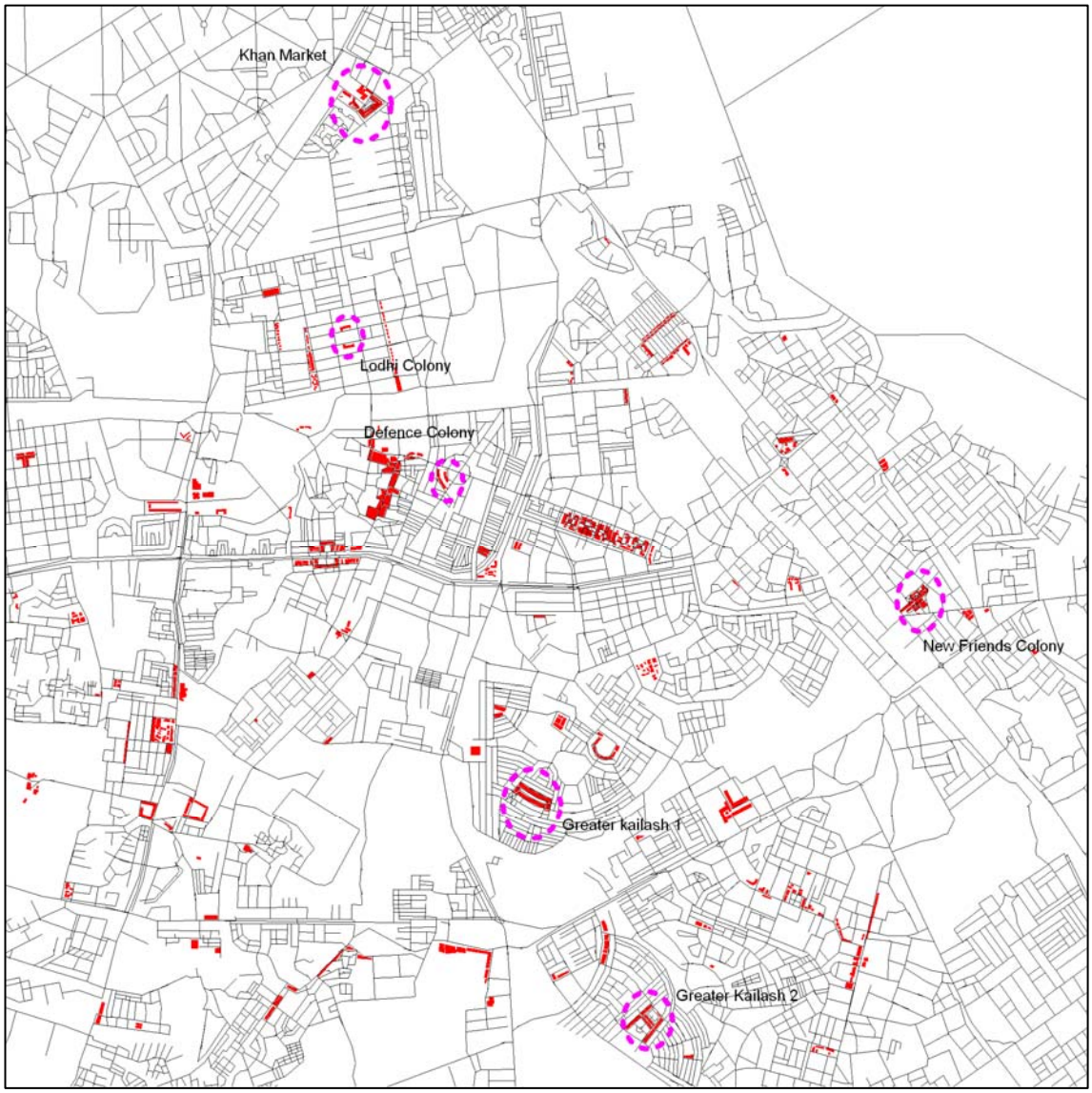

Figure 7: The study area of South Delhi. The Case study markets are highlighted. Khan Market is a District centre, Lodhi Colony a Residential Planning centre, and the rest are Community Centres. All the Community Centre markets are located on or around the two main East-West routes, the inner and outer Ring Roads. Lodhi Colony market is adjacent to a locally important North-South connector, while Khan market is well connected to both Lutyens' and South Delhi. [Image by the author]

(HIG). Each market will be subsequently described in terms of the quantum and mix of shops, average and maximum movement patterns, and average and maximum spatial values

Of the case studies, Khan Market is classified in the Master Plan (MPD 1961, 14) as a sub-district centre, and comprises 169 shops in approximately 55,000 sq metres. Four of the markets studied (Defence Colony, Greater Kailash 1 and 2, and New Friends Colony markets) are Community Centres and range from 65 to 193 shops over areas of approximately 16,000 to 56,000 sq metres. All the markets selected are reasonably successful examples of Community Centre markets, and are located on or around the two main ring-roads in South Delhi. The last case study is Lodhi Colony market, which is included as an example of Residential Planning Unit, having only 19 shops, and catering to a smaller clientele.

Khan market lies to the south of Lutyens' Delhi, on the border with south Delhi, and attracts a large number of the upper middle class and expatriate communities. Figure 8 shows a graphical representation of Khan Market, with the light red representing retail land use, and the bold red lines representing the actual length of active façade observed. The blue areas represent parking, and it is interesting to note that Khan Market, alone, provides free parking facilities to its customers. The market takes the shape of a 'U' with shops facing outwards on both sides. There is another row of shopping slightly to the north, and an office building, 'Lok Nayak Bhavan', with internal corridors and shopping on the ground floor. The form of the market exposes one face to the main external road, and

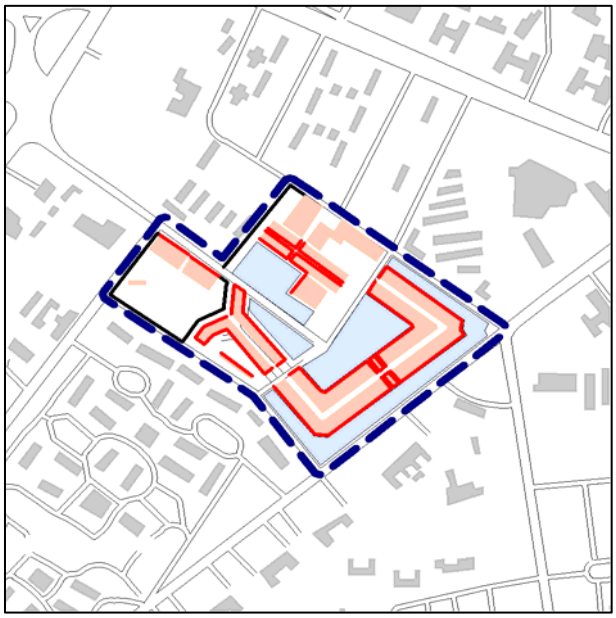

Figure 8: Khan Market. The image shows the structure of Khan Market, with retail shown in light red, and the extent of 'active façade' in thick red lines. Parking and parks are shown in pale blue and green respectively. The market encloses a central space directly accessible by cars and pedestrians from the surrounding grid. [Image by the author]

Figure 9: The main promenade of Khan Market. The photograph, taken in the early morning, shows the internal road and parking facilities facing the front row of shops. The main road is visible to the extreme right. [Photograph by the author]

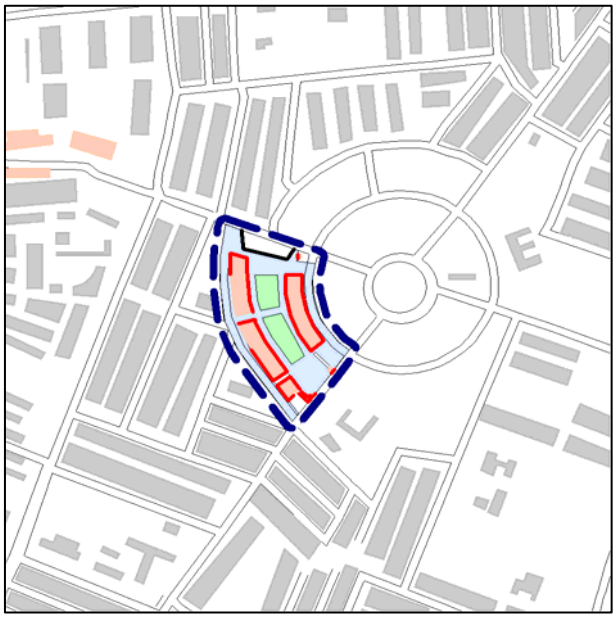

Figure 10: Defence Colony market is located within a gated community, but is not gated itself. It lies on two major routes within the colony, and is easily accessible from the outside. [Image by the author]

it is on this face that the majority of 'posh' shops, like garment stores, jewellers, music, book and electronic stores, locate. The remainder of the shops face inwards into a large central court that supports vehicular and pedestrian movement and a large quantity of parking space.

Defence Colony market (Figure 10) lies well within south Delhi, and lies adjacent to one of the major north-south routes in the area. It lies within a gated community but is not gated itself. As is typical of DDA planned markets, it is developed around a central green space, and faces problems of over crowding due to insufficient parking. It supports a large proportion of multipurpose shopping and caters to similar proportions of HIG, MIG and LIG groups. Defence Colony market comprises 65 registered shops and a substantial quantity of informal hawking over an area of roughly 16,000 sq metres.

Figure 11: The main concourse of Defence Colony market interfaces pedestrians, vehicles, parking and shops. Two LIG pedestrians are visible in the forefront, while a typical variety of cars, two wheelers and the 'auto rickshaw' are seen parked to the right. The central green park can also be seen to the extreme right. [Photograph by the author]

Greater Kailash 1 market is considered by many to be the success story of the Community Centre. It lies hidden within a gated community, but has achieved a level of attraction well beyond any expectation. Colloquially, the ‘GK-ite’ is a term used to depict the typical shopper here: young, upwardly mobile, affluent and sporting the latest in designer wear and hairstyles. The market supports 193 formal shops over 45,000 sq metres. The main access to the market is from the

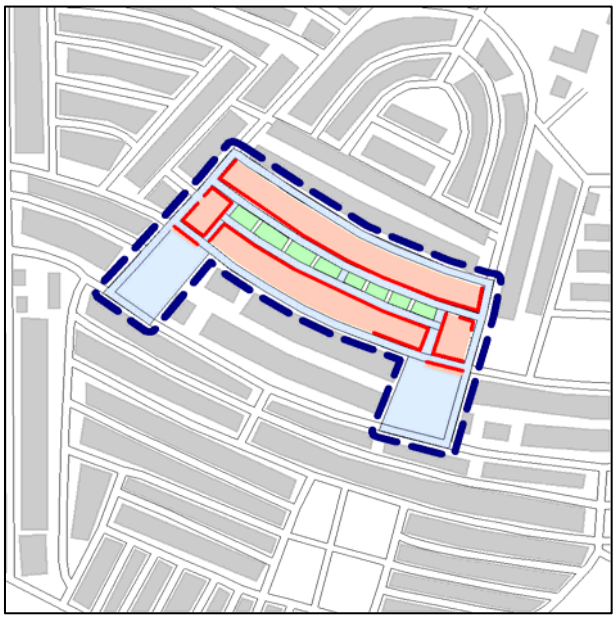

Figure 12: Greater Kailash 1 market also follows the typical layout of shops arranged around a central green. Here, two large parking areas are also integrated with the market, though vehicles are usually also found parked in the neighbouring areas. [Image by the author]

Figure 13: Greater Kailash 1 market is another typical example of the community centre format. Here the pedestrians are nominally separated from vehicles by means of a colonnade. [Photograph by the Author]

south where two large parking lots exclusively serve the market. In addition, cars park within the market and extend into the residential colony. The market follows the typical layout, with four rows of shopping enclosing a central green space. However, in this case, the shops open out onto all sides, with the more 'posh' shops facing the central green, and the informal and service shopping occupying all other available space. The bulk of the shopping here comprises durables: over 70% of all shops sell durables, while 68% sell MC goods, with jewellers, fabrics, readymade garments and high end accessories the main attractions.

Greater Kailash 2 market is located further south of GK1, and is built around two parks. While it is located in a gated community, the market itself is not gated, and lies close to one of the main thoroughfares within the Colony. The market comprises two 'U' shaped developments facing away from each other, and separated by a service lane. All active façades face inwards, towards the parks. The upper section has more general purpose stores, restaurants and banks, while the rear 'U' is predominantly furniture, fittings, and restaurants. The entire market comprises 67 shops on the ground floor, and numerous offices, service providers and residences on the upper floors. This market is largely self contained, with parking facilities along the edge of the parks, and a large stretch of car park at the rear.

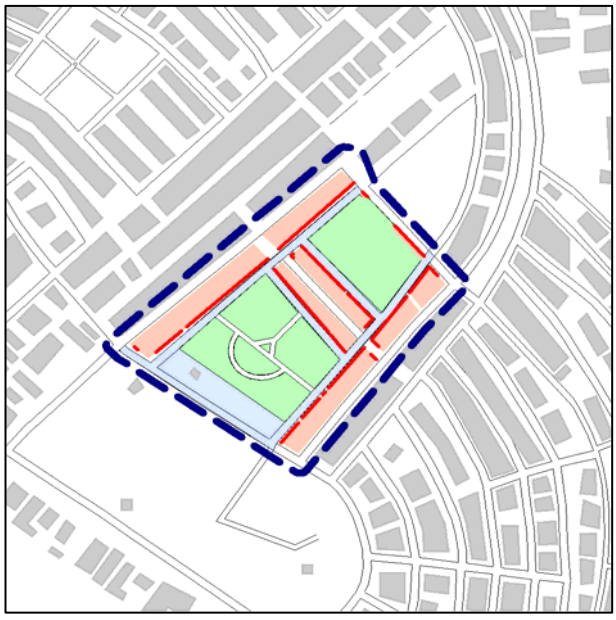

Figure 14: Greater Kailash 2 market is a variation on the typical layout. Here two large green parks form the focus of the market, while two 'U' shaped blocks of shops face towards them. The upper block is mainly restaurants, general stores and banks, while the rear block sells mainly furniture and fittings [Image by the author]

Figure 15: The front boulevard of Greater Kailash 2 market mainly comprises restaurants, general stores and banks. Here a large part of the road is appropriated for vehicles and parking, creating conflicts with the pedestrians despite the colonnaded walk. [Photograph by the author]

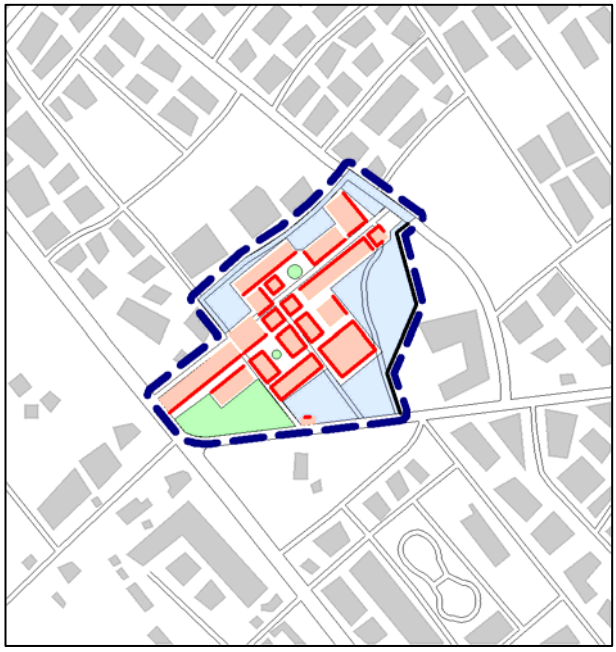

Figure 16: New Friends Colony market displays the characteristics of grid intensification, and forms a dense network of pedestrianised boulevards and courtyards, with parking and vehicular access around the periphery. [Image by the author]

New Friend's Colony market differs from the other examples in that it is located to the east, is adjacent to one of the busiest intersections in the city, and is located to the edge of the Colony. Moreover, it does not bear any resemblance to the typical layout of Community Centre markets, but approximates a town centre development, having the typical property of grid intensification from the surrounding areas. The centre comprises 94 shops over 42,000 sq metres and a large number of informal, temporary shops selling items like cigarettes

and ‘paan’, magazines, and a variety of food. The market is also highly spatialised: the central boulevard consists of specialty restaurants and coffee shops, the central court a variety of conveniences like office stationery and general stores, and the rear portion an informal food court with a several versions of Indian fast-food. There is also a cinema which is under redevelopment and a luxury hotel adjacent.

Figure 17: The main boulevard of New Friends Colony market highlights its ‘upward-ness’ with speciality restaurants and cafes. [Photograph by the author]

Figure 18: The central court of New Friends Colony market presents a very different picture to the main boulevard. Here, the majority of shops are groceries, general stores, stationers and conveniences. [Photograph by the author]

The last case study, Lodhi Colony Market falls under the plan classification of Residential Planning Unit. This market has remained a localised neighbourhood market, though it has attracted a couple of specialty restaurants. There are 19 shops arranged in two linear strips around a large neighbourhood park, which has a health centre and is used extensively for recreation. The market is predominantly used by MIG and LIG customers, and has significantly lower levels of movement throughout the day. The central park, is however, utilised in large numbers on the evenings by locals about their recreation.

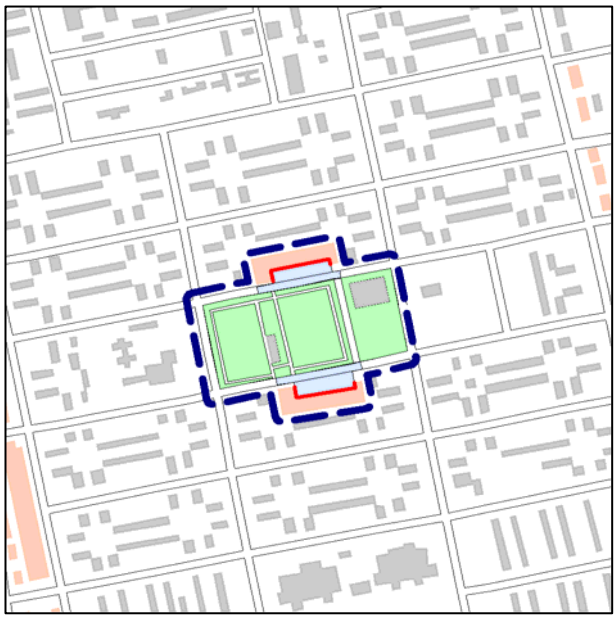

Figure 19: Lodhi Colony market is a residential Planning Unit located within a residential community, and takes the shape of two linear strips of shops facing a central green park. The park is highly valued as a means of recreation for the local residents

Figure 20: Lodhi Colony takes the form of two linear strips. The difference in movement and 'buzz' is evident.

Analysis

Space

The objective of the spatial analysis is to highlight the spatial characteristics of the case studies. An axial map of the main routes of the city was first developed, after which internal roads and other details were added to an area of approximately 9 km radius around the selected sites. Additional areas within the ring road defining the inner city were also detailed. Direct observations of the six selected sites were also used to develop the detailed internal structure of the markets. This Axial Map was then converted into a Segment Map and processed using Depthmap[23]. Two main spatial characteristics obtained from the above process; those of Spatial Choice and Integration have been used in this paper. Choice refers to the importance of a particular line segment as a route to get from all points to all other points in the network within a particular radius. In this case metric radii have been used from 250m up to global Choice. A line segment having high Choice value, at say, radius 5000m, would be an important route for 'through movement' for journeys up to 5 km. Similarly a measure of Integration determines the relative importance of a line segment as a destination within the radius specified, and relates to 'to-movement'.

[23] Developed by Alisdair Turner, UCL © Space Syntax Limited

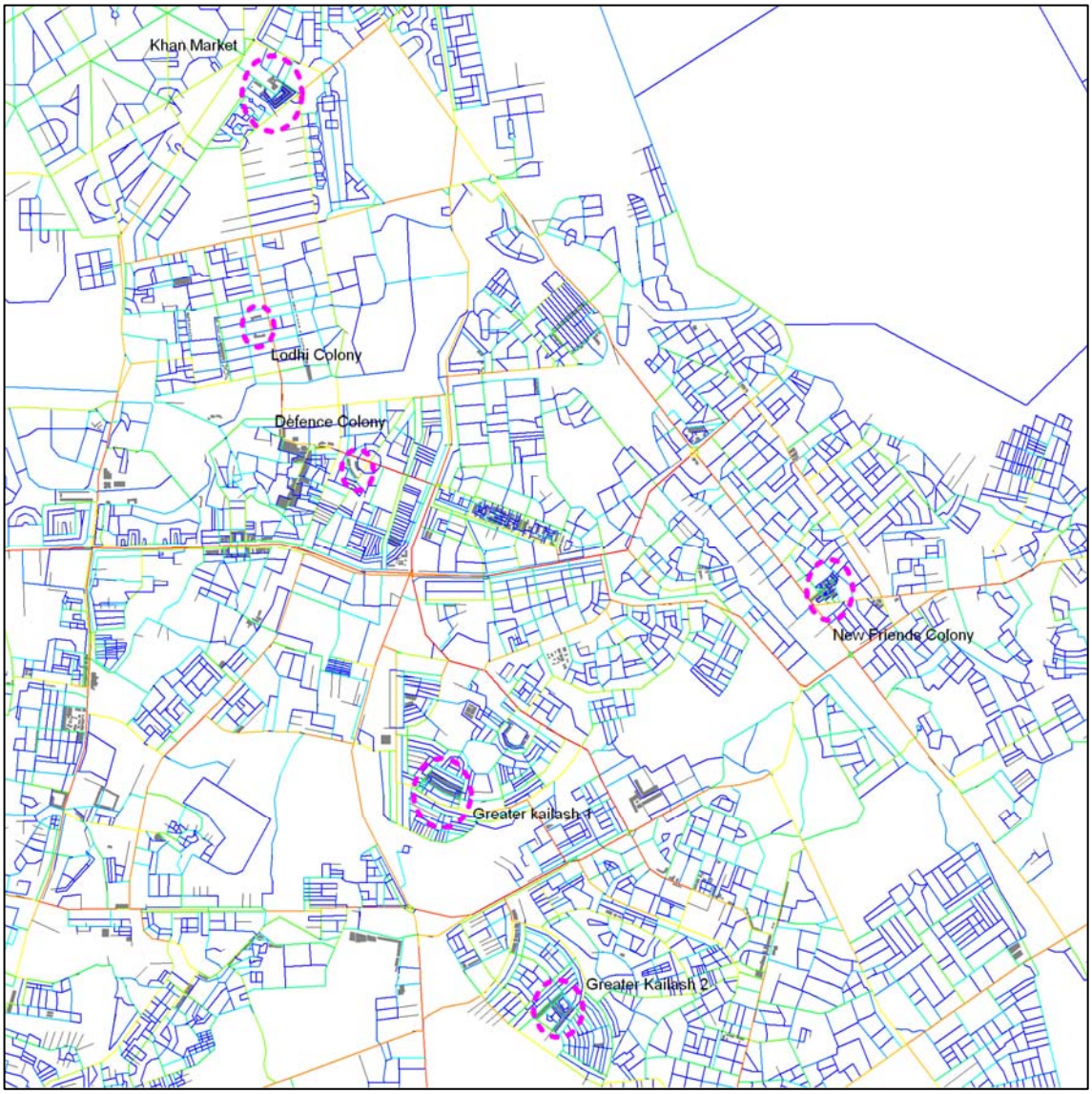

Figure 21: Segment Map of Delhi showing the area of study. The colours represent Choice radius 5000metric, with red indicating high Choice, and blue, low Choice. This particular radius has been chosen as it best represents observed movement and the intermediate structure of the city. The six markets have been highlighted. Note that all the markets have at least one line of yellow or higher in their near vicinity. [Image by the author]

Figure 21 represents the Segment Map for the case study area coloured according to Choice radius 5000 metric. In the case of Community Centre markets, Choice at radius 5000 metric appears to provide the best insight into the functioning of the markets. Not only does it relate best with overall movement measured in the markets, but also highlights the intermediate structure of the city. This is perhaps significant in that Community Centre markets are planned as intermediate level markets catering to a population of between 40 and 50 thousand persons. The two important horizontal lines visible

represent the inner and outer ring roads respectively, with several important north south routes connecting them. Considering that all the markets are planned markets, it is expected that important routes at a 5km range will not pass through the markets. However, each market does have a route of colour yellow or higher in the near vicinity. New Friends Colony market is adjacent to a main highway leading to Agra in the south, while Defense Colony, Lodhi Colony and Khan Market lie on important routes within the city. Both Greater Kailash 1 and 2 lie adjacent to less important routes, and are relatively segregated from the main through routes in the city.

Figure 22 graphically illustrates the differences in each market in terms of high Choice routes in the near vicinity. New Friend's Colony has the highest global through movement in its vicinity, followed by Defense Colony, Khan Market and Lodhi Colony. This suggests large volumes of vehicular movement close by. At the local end of the scale at radius 500 metres, all the markets, with the exception of Lodhi Colony, have similar local pedestrian movement in the near vicinity. At the intermediate (pedestrian scale) of 2000 metres, Defence Colony followed by Khan Market have the highest Choice, while GK1, GK2 and NFC have relatively less through movement nearby. This suggests that NFC has the potential to attract large numbers of global vehicular traffic, while Khan and Defense Colony can attract passing local pedestrian traffic. In relation to the other markets, GK1 and GK2 attract less through movement at all scales. Lodhi Colony exhibits a significantly lower potential at all scales to attract passing traffic.

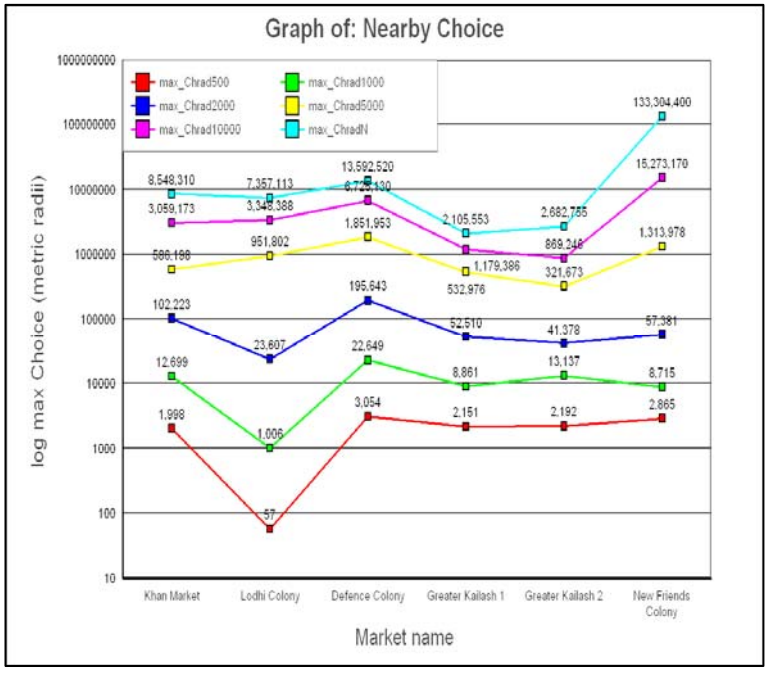

Figure 22: Relative Choice values in areas adjacent to the markets at different metric radii. [Image by the author]

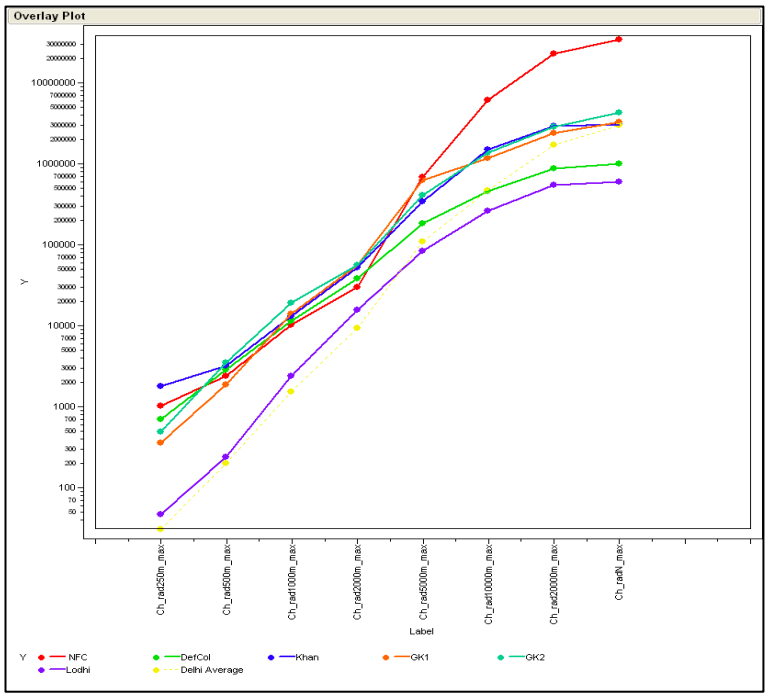

Figure 23: Relative Choice values within the markets at different metric radii. Average values for the entire city are in dotted yellow. [Image by the author]

Figure 23 illustrates the relative Choice values within the market, that is, the potential through traffic actually passing within the market. New Friends Colony again exhibits the highest global (radius n) through movement, while Defense Colony and Lodhi Colony fall even below the city average. At the intermediate scale GK1, GK2 and Khan Market show the maximum Choice, while at the local scale; Khan Market and GK2 show the highest potentials for movement through the market.

These potentials theoretically correlate to movement through the markets en route to other destinations, and represent multipurpose trips as suggested by Penn (2005). They also suggest the scales at which these multipurpose trips occur, with NFC potentially catering to shoppers from a larger geographical area; while Lodhi Colony is not able engender the same levels of natural, multi-purpose movement.

The other spatial variable affecting natural movement to the markets is spatial / topological Integration, measured here as Node Count divided by Mean Depth at varying axial radii. Figure 24 illustrates the relative variations in Integration over the six case studies. Khan market appears to be the natural destination for global and intermediate scale to-movement, while NFC naturally draws a high degree of localized to-movement. Alternatively, GK1 does not naturally draw as much local to-movement, nor does GK2 draw much global to-movement.

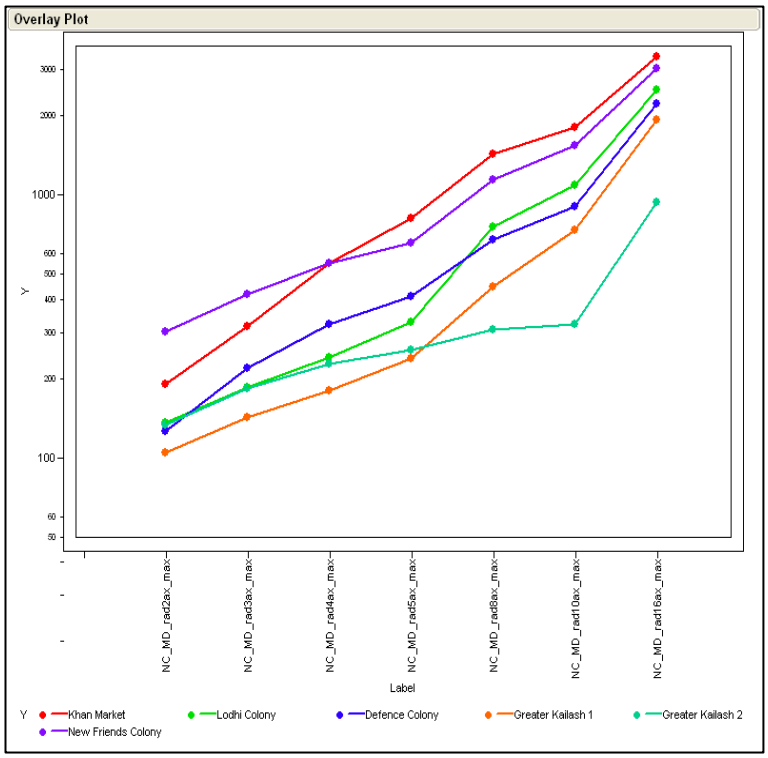

Figure 24: Relative Integration (NC/MD) values within the market at different axial radii. [Image by the author]

However, considering both the relative Integration exhibited by each market and the range of that Integration, figure 25 demonstrates that Khan Market indeed has the highest potential for attracting longer range (radius 5) consumers, followed by NFC and Defence Colony markets. At the local end of the scale, NFC potentially draws the maximum custom, followed by GK1 and GK2. Surprisingly, GK2 potentially draws on a larger customer base at axial radius 4 that it does at axial radius 5.

This measure of Integration relates to the conception of the market as a natural destination (Hillier and Iida 2005, 556-557). Theoretically, a market which is naturally a destination does not need additional resources to increase its attraction to its customers. This relates to Hossain's (1999) observations that generative functions can

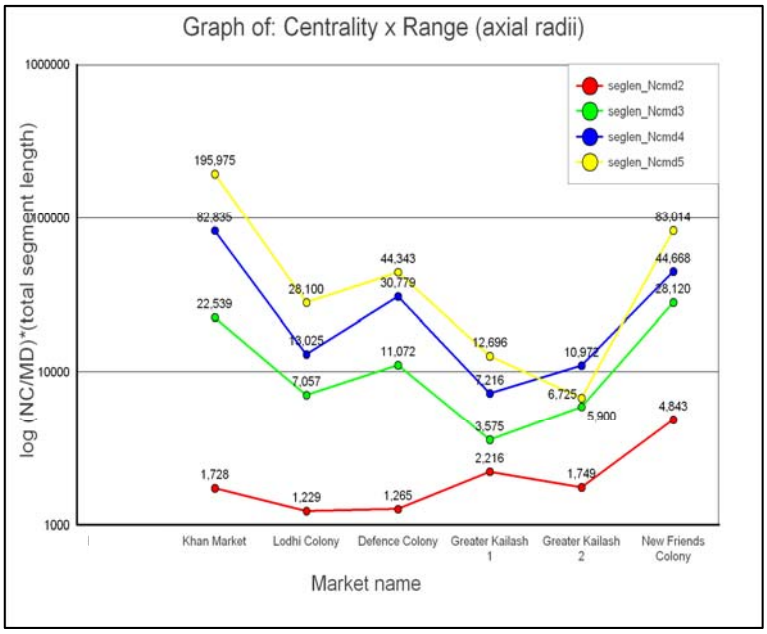

Figure 25: Relative Integration values multiplied by the total segment length at different axial radii. [Image by the author]

afford to be relatively isolated within the market. In other words, if a market is naturally central to an area, it needs only tap the existing resource, however, if a market is not so fortunate, it requires additional resources to increase its attraction to potential customers. Thus Khan Market is naturally central, and as such does not need to offer specialty goods in order to be successful, whereas GK1 and GK2 may need to specialise in order to excel.

So far, the markets have been described in terms of the potentials for movement generated by the spatial structure. The potentials described are nearby Choice and Choice at various metric scales and Integration at various axial scales, but in the segment map. The following section will deal with the actual observed movement. The similarities and differences between predicted potentials of movement and actual observed movement will provide key elements into the development of the social logic of shopping in New Delhi.

Movement

The first concern is to identify various movement patterns in each market. Figure 26 illustrates the variations in movement patterns in each market. Average movement for all lines counted in each market is highest for GK1, followed by NFC and Khan markets. The lowest movement rates were observed in Lodhi Colony. This average movement rates correspond best with spatial value of Choice at radius 5000 metric with a correlation coefficient (r2) of 0.93. It is noteworthy, perhaps, to suggest that movement displays a lower relation (r2=0.55) with Global (radius n) Choice, due to the nature of the markets as intermediate level markets.

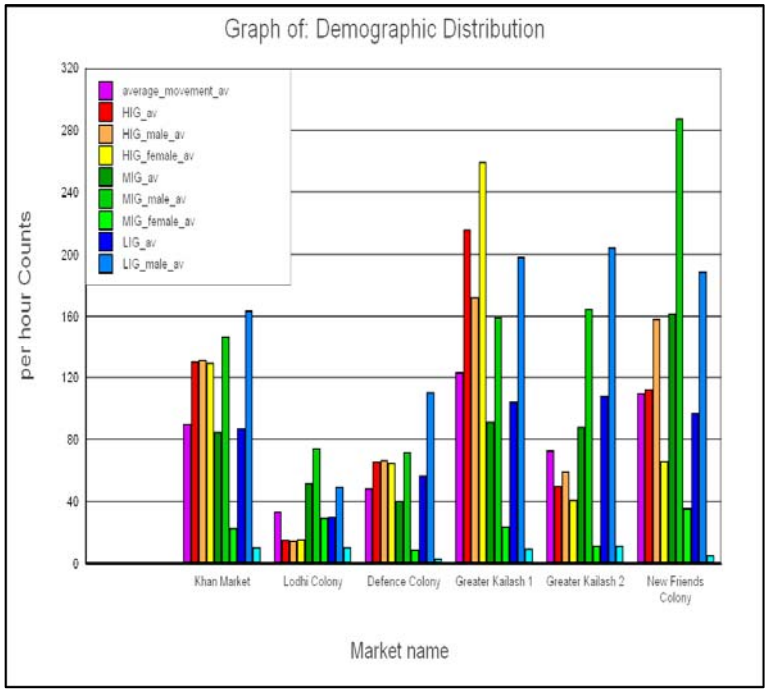

Figure 26: Distribution of movement in each market. [Image by the author]

However, another variable combining Choice (radius 5000 metric) and Integration (NC/MD radius 5 axial*total segment length radius 5 axial) gives an even better correlation of 0.962 (figure 27). Both these relate intermediate spatial factors to average movement rates within the markets.

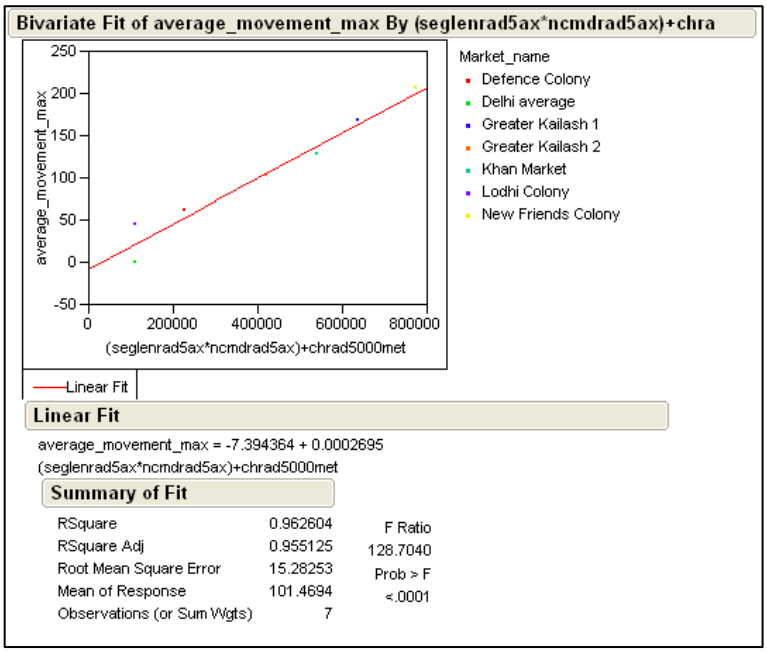

Figure 27: Bivariate fit of average movement against combined choice and Integration measure (NC/MD radius 5 axial*total segment length radius 5 axial). [Image by the author]

While overall movement relates to a combination of through movement within an area of 5000 m, combined with to-movement from 5 axial steps, the distribution of people in terms of HIG, MIG and LIG also highlights several differences in the markets. HIG is concentrated in GK1, Khan and, to a lesser extent, Defence Colony and New Friends Colony; MIG in New Friends Colony and Lodhi Colony; and LIG in GK2. Each of these categories relates to different spatial properties, together combine to give a more detailed picture of each market.

The High Income Group preferentially visits GK1, which has the relatively low local choice, is relatively isolated in terms of through movement in the vicinity and has low measures of Integration at all radii. At the same time the HIG also frequents Khan Market, which has relatively higher through movement nearby, high Choice at the local and global ends of the scale, highest Integration measure at the medium to global radii and the highest combination of Integration and segment length. It is apparent that the HIG visit markets for two contrasting reasons. Firstly, due to high global accessibility, and secondly due to the attraction and status attached to individual shops located in less accessible areas. This phenomenon is illustrated by the fact that male HIG persons correlate significantly (r2=0.89) to a combination of Choice radius

5000metric and Integration radius 5 axial (Fig 28) but no significant relationship exist with either the average HIG movement or female HIG movement. Both total movement and HIG male movement correlate significantly with the combined measure of Choice 5000 metric and NC/MD radius 5 axial. This suggests that in the case of community centres in New Delhi, these two spatial variables are the critical variables to the success or failure of the market.

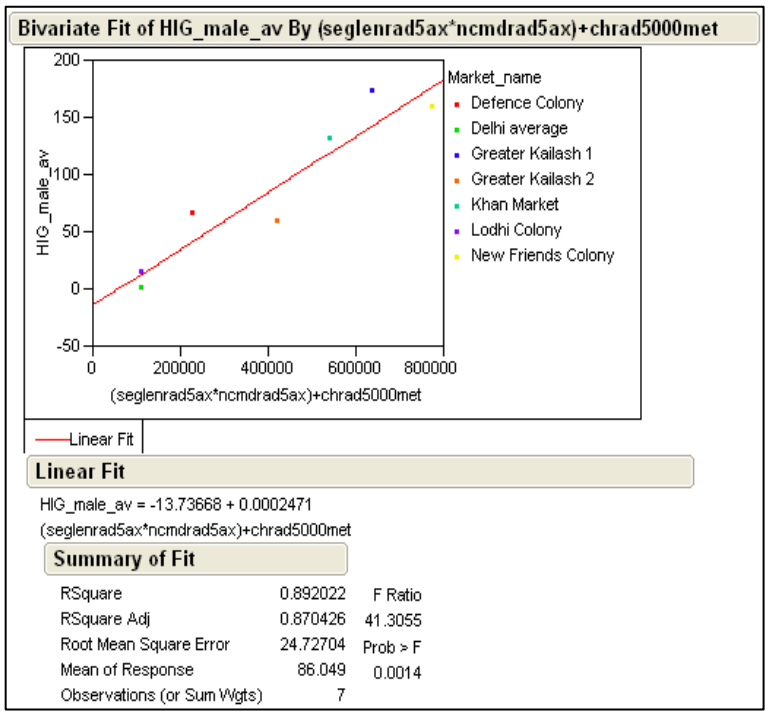

Figure 28: Bivariate fit of average HIG male movement against combined choice and Integration measure (NC/MD radius 5 axial*total segment length radius 5 axial). [Image by the author]

In the case of MIG movement, there appear to be two separate spatial parameters at work. HIG movement relates significantly to Choice at a 10km radius but also to Integration at a radius of 2 axial steps (figures 29 and 30). This suggests that the

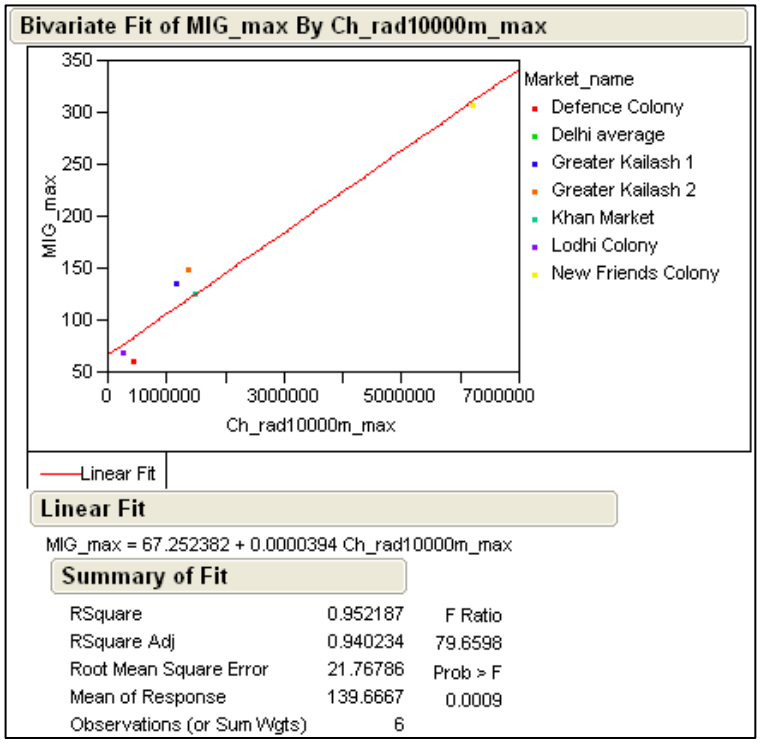

Figure 29: Bivariate fit of MIG movement against Choice radius 10,000 metric. [Image by the author]

average person visits the market either as part of another journey within a radius of 10km, or makes a conscious decision to visit the market within a radius of only 2 axial steps.

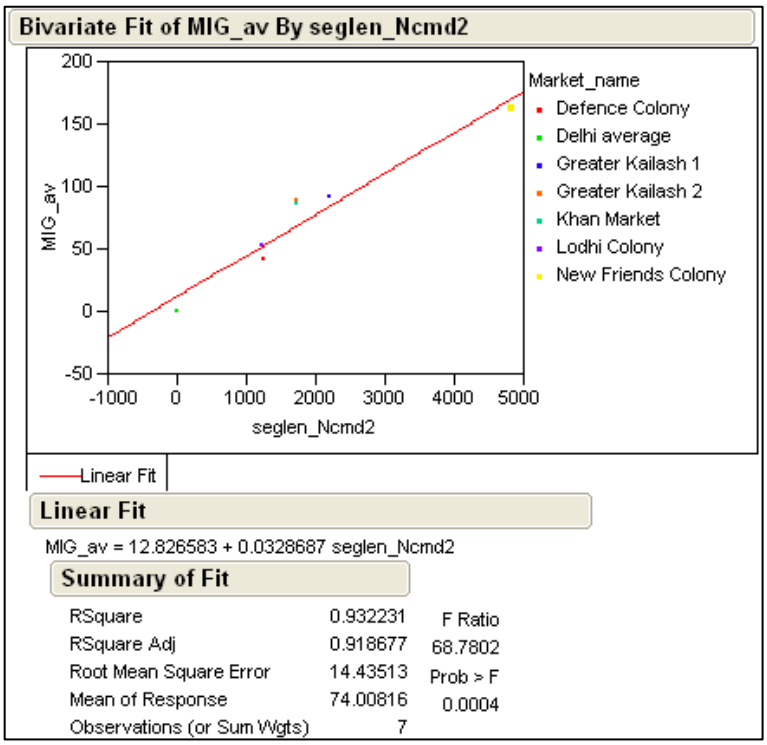

Figure30: Bivariate fit of MIG movement against Integration measure (NC/MD radius 2 axial*total segment length radius 2 axial). [Image by the author]

The Low Income Group is visible significantly in all the markets, and relates closely to a combination of Choice radius 1000 metric, Integration (NC/MD) radius 2 axial and the total segment length radius 2 axial (figure 31). This is a local measure and suggests that LIG movement is generally restricted to the immediate surroundings. While the scattergram shows a correlation coefficient (r2) of only 0.60 for all the markets, if GK1 and GK2 are removed all other markets show a fit of r2=0.99 with a significant probability less than 0.0004.

This can perhaps be explained by the fact that both these markets are specialised: GK2 comprises a large number of offices whose staff are perhaps catered to by the large presence of informal shops manned by the LIG. Similarly, GK1 comprises a large proportion of designer wear and jewellery, attracting more wealthy customers. These wealthy customers attract the Lower Income Group, as a large proportion of their income comes from being in close proximity to others with greater wealth.

The basic logic that emerges from the study of movement and the mix of movement is clear. The overall movement measured for the markets relates to the mid to global level properties of the grid. The HIG movement also relates to the larger scale properties of the grid, with the exception of visiting relatively low integrated markets due to their exclusivity factor. The MIG also follows two

simultaneous spatial patterns: larger scale choice and local Integration. The LIG basically inhabit local spaces except where there are specific externalities which could result in greater income for them.

Thus, movement relates to spatial structure, and this movement attracts retail. It is hypothesised that the type of movement attracted to any market has an impact on the type of shops that settle there, and that subsequently the type of shops in any market attract additional people to shop there. Thus, the multiplier effect not only affects the total flows but also emphasises the constituent groups within that flow. The following section will analyse the mixture of shops within each of the markets and the relations between those mixtures, movement and space.

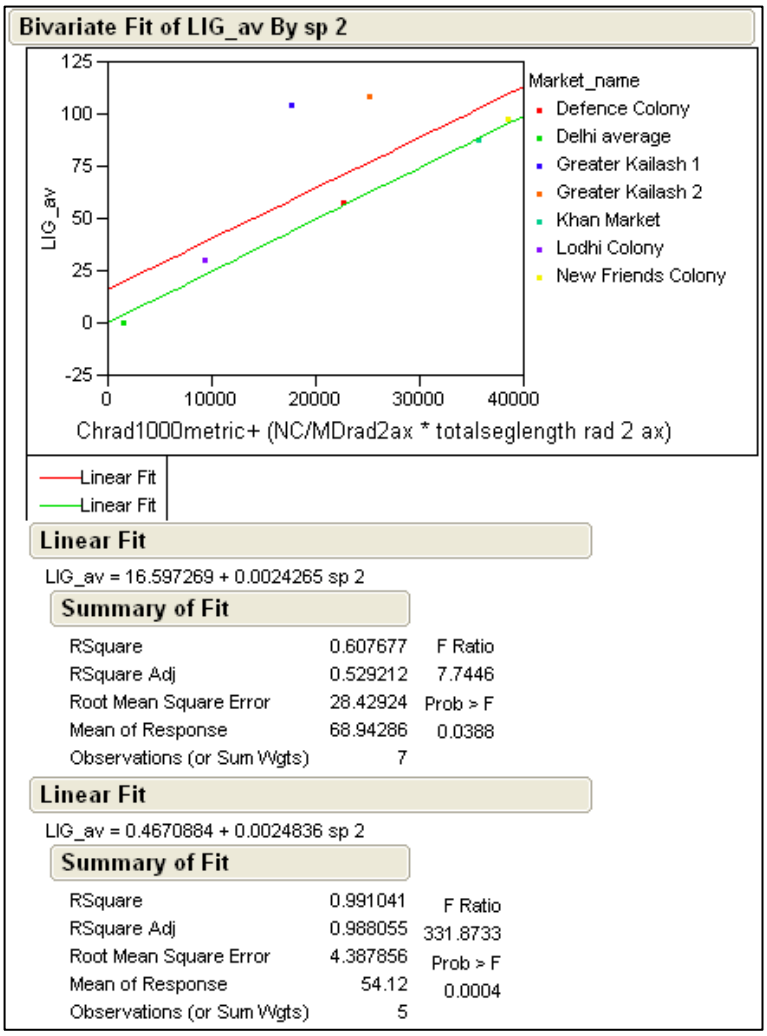

Figure 31: Bivariate fit of LIG movement against choice radius 1,000 metric + Integration measure (NC/MD radius 2 axial*total segment length radius 2 axial). [Image by the author]

Retail

The mix of retail facilities in each market represent not only variations in local demand, but also a provide insight into the social processes underpinning the decision to visit a particular market. Greater Kailash 1 market is a prime example of this. Not only is the market famous for its exclusive range of garments and footwear, but like the term ‘mall rats’, has defined a new class of the upwardly mobile, identified by their penchant for shopping there. The mix of

retail thus is a key component in any retail analysis both as an economic and a social tool.

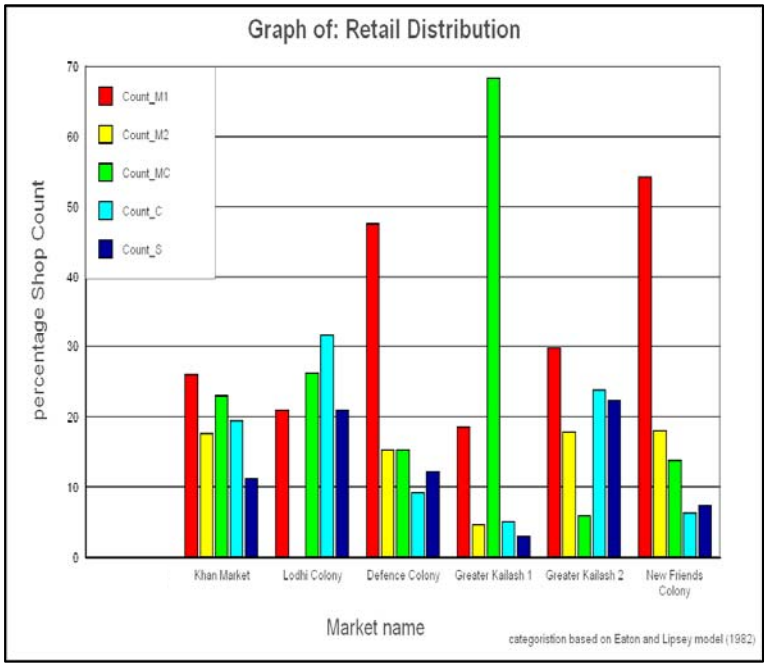

Figure 32: Column graph of Retail Distribution for all markets. [Image by the author]

Figure 32 illustrates the range of shopping found in each of the markets. As examined in the literature review, the Eaton and Lipsey (1982) model has been utilised to differentiate between different shopping behaviours. This model mainly differentiates between multipurpose shopping and comparison shopping, suggesting that shops selling multipurpose goods make use of external movement patterns to maximise sales, while comparison shops do not depend on such externalities. This foundation suggests a hypothesis that both to and through movement support multipurpose shopping, with larger scale movement supporting higher end shops; and comparison shopping depending only on accessibility; the quality, price and range of the individual product determines the actual sale.

Figure 32 also highlights several similarities and differences between the markets. New Friends Colony market and Defence Colony market seem to be very similar in composition: a large proportion of M1 shops, followed by M2 and MC, and a lesser proportion of C and S type stores. At the same time, Khan market and GK1 also have certain similarities, in that with the exception of exaggerated MC stores in GK1, the proportions of other type stores is similar. Greater Kailash 2 is predominantly M1 and C, while Lodhi Colony exhibits a higher proportion of C type stores. However these similarities and differences do not represent the ‘feel’ of the markets. New Friends Colony market ‘buzzes’ in the evening when the numerous speciality restaurants attract the young, ‘happening’ Delhi-ites, but during the day it supports office goers and locals for

their daily groceries, office equipment and informal lunch. Defence Colony, on the other hand, supports a large contingent of lunch goers, with its relatively inexpensive restaurants, and prettily dressed women out for a bargain. Khan market presents a picture of industry and leisure, with the rich leisurely browsing, and the poor running errands or bargaining with the vegetable vendor; while GK1 displays the fashionable ladies looking for that perfect shoe or handbag. Grasping this character requires a composite analysis of retail types, movement and space.

While there are some trends to be examined while relating retail to movement, there are no outright significant correlations. Figure 35 illustrates the correlations between movement and retail. Some key observations are as follows: M1 type shops correlate positively with the Medium Income group, while M2 type shops relate to both MIG and LIG. MC type shops relate to HIG, which is expected, while C and S are negatively correlated, suggesting they occur in greater numbers where movement is less, that is, emphasising their exclusivity.

Similarly, comparing retail distribution to the spatial values of Choice (figure 33), M1 shops have a positive correlation with Choice radius 500 and global Choice, suggesting that at some level convenience stores are a global phenomenon. M2 stores are best correlated to Choice radius 500 metric with a significant correlation coefficient of 0.91. MC is not significantly related to Choice, with the correlation peaking at 0.42 with Choice radius 2000 metric, suggesting that shopping for clothes, footwear, jewellery or designer wear is not an action related to through movement. Both C and S type stores are again negatively correlated, suggesting their dislike of spaces with high natural through movement.

The correlation matrix for Integration against retail distribution (figure 34) highlights the local properties of M1 shopping, with a best relation with radius 2 Integration. M2 also correlates positively with Integration, with the correlation peaking at 0.65 at radius 4. MC enjoys a decreasing negative trend, suggesting that the global Integration measures are less actively discriminating against MC, while C and S type stores are consistently negatively correlated.

Row	Ch_rad250m_max	Ch_rad500m_max	Ch_rad1000m_max	Ch_rad2000m_max	Ch_rad5000m_max	Ch_rad10000m_max	Ch_rad20000m_max	Ch_radN_max
Count_M1	0.27640502	0.36118372	0.03239598	-0.2622558	0.22416576	0.64914212	0.68270794	0.68654612
Count_M2	0.71105082	0.90827656	0.62780964	0.4104343	0.31501774	0.47044918	0.4168428	0.40533096
Count_MC	-0.2557154	-0.3990168	-0.057314	0.25624786	0.30108942	-0.2323844	-0.2460656	-0.2483886
Count_C	-0.2222325	-0.3123735	-0.3193411	-0.3135988	-0.6871204	-0.4665469	-0.4539991	-0.4518064
Count_S	-0.3240201	-0.083517	-0.1149766	-0.2710628	-0.6650984	-0.399688	-0.377602	-0.3647527

_	NC_MD_rad2ax_av	NC_MD_rad3ax_av	NC_MD_rad4ax_av	NC_MD_rad5ax_av	NC_MD_rad8ax_av	NC_MD_rad10ax_av	NC_MD_rad16ax_av
Count_M1	0.92556918	0.85348506	0.6525207	0.46282334	0.19360286	0.19387344	0.21053664
Count_M2	0.57422109	0.65785592	0.6282345	0.54520971	0.28287234	0.16073655	0.00066983
Count_MC	-0.6125119	-0.6332833	-0.5572524	-0.458782	-0.2811504	-0.2175876	-0.0745719
Count_C	-0.3253259	-0.2633947	-0.1547234	-0.0557783	0.11629048	0.10751984	0.00205894
Count_S	-0.1183153	-0.1429146	-0.1360503	-0.1316149	-0.1106098	-0.1457455	-0.2628339

	average_movement_av	HIG_av	MIG_av	LIG_av
Count_M1	0.02441813	-0.182208	0.40813489	0.06156668
Count_M2	0.24198428	0.00220249	0.40353415	0.53721188
Count_MC	0.49038451	0.76031991	-0.0530027	0.13461359
Count_C	-0.6904625	-0.7209312	-0.4392547	-0.4864716
Count_S	-0.7838262	-0.8912308	-0.4350701	-0.4029211

Figures 33, 34 and 35: Correlation matrices of Retail distribution by Choice, Integration and Movement. [Image by the author]

Discussion

This paper, so far, has discussed shopping as an economic and social phenomenon, bound in a spatial interface. This section will develop theses ideas and research findings to move towards an understanding of the logic behind the Community Centre phenomenon. As has been indicated, each market has differing spatial, demographic and retail characteristics. Clear, direct correlations between spatial factors and movement have been examined; however, no such direct correlations exist between movement and retail mix, though certain trends have been indicated. For example, HIG movement is best related to MC type shopping, while MIG and LIG are somewhat related to M1 and M2 shopping. It is conceived, that the retail mix is not dependant on a single factor, but on combinations of factors.

The movement study highlights the spatial characteristics of movement. HIG movement appears related to a combination of both global choice and global Integration while also visiting areas having high exclusivity values. MIG flows relate to global choice and local Integration; and LIG groups generally follow a combination of local choice and Integration, though they also appear in areas where industry, office workers or large numbers of HIG people are found.

Thus, Khan Market attracts all categories of movement (with an emphasis on HIG) due to its natural high Choice and Integration measures at all scales. Defence Colony has an almost identical distribution of movement as Khan Market, but to a lesser degree due its relatively lower spatial choice and Integration measures. New Friends Colony, on the other hand, has high global and local Choice combined with high local and mid range Integration, and therefore attracts a larger proportion of MIG, but also substantial volumes of HIG and LIG. Greater Kailash 2 has similar proportions of movement to NFC. However, due its relatively lower spatial characteristics, especially global Integration, it attracts a lesser proportion of HIG and a larger proportion of LIG traffic. Lodhi Colony market has little Choice at any scale, and falls below the Delhi average above radius 5000 metric, nor does it have particularly high Integration, resulting in the lowest movement rates of all the markets studied. It

exhibits a high proportion of MIG movement due to its location next to a large park which is extensively used for recreation in the evenings.

Greater Kailash 1 is unique in this study as it is relatively segregated at most levels compared to the other markets, but enjoys high degrees of (especially HIG) movement. This phenomenon can perhaps be explained by the disproportionately high degree of MC type goods available; the market has developed into a speciality market, and MC goods, by definition, are generally high end durables which require a degree of comparison. They engender longer trip lengths and general awareness in the customer of prices, quality and range. In this context, the very inaccessibility, which would perhaps have discouraged other markets has given GK1 a high degree of exclusivity, which in turn supports high HIG movement patterns.

The variation of shops can also be explained by combinations of global and local movement. Khan market displays all the characteristics due a district centre (or any other central business district shopping facility): an even mix of all demographic groups, and an even mix of global and local attractors. This is apparent in the retail mix, with every category of goods available in substantial proportions.

New Friends Colony, on the other hand, exhibits the propensity for a high degree of passing trade, realised in the high proportion of M1 and M2 type shopping. Since the passing trade is as much global as it is local, NFC has developed both high end conveniences, like a number of speciality restaurants, and low end conveniences. It also supports a small proportion of other goods due to its role as the central market for the locality demonstrated by its high local Integration.

Defence Colony market has a similar, though lesser, demographic distribution to Khan Market, and should display a similar retail character. However, considering its smaller catchment area, it appears unable to support large volumes of MC, C and S type stores. In addition, due to a high degree of intermediate to global Choice in nearby areas, it has gone the NFC way, providing additional high end convenience (M1) shopping to tap this potential.

Greater Kailash 1 and 2 are both relatively segregated, though movement patterns are contradictory. GK1 supports a high degree of HIG movement combined with a highly disproportionate degree of MC shops, while GK2 supports MIG and LIG movement with a greater proportion of M1, C and S type stores. These can be considered to be two diverging forms of development in similar, relatively inaccessible locations. Both markets cater to the multipurpose and other needs of the immediate surroundings, however, it is in the interface generated at the larger scale that the two markets differ. GK1 has developed into a speciality market, catering to the demand for exclusivity, and emphasising its segregation; whereas GK2, in addition to a few restaurants and general stores, is almost exclusively a market of C and S type stores; goods that do not depend of natural movement, but exist due to a small, dedicated, specialised customer base. Lodhi Colony provides a similar case to GK2, with the absence of anything but the most basic local through traffic; it caters mainly to services and goods that depend on local idiosyncrasies.

Conclusions

This paper set out to study Community Centre markets in New Delhi, which having similar socio-economic origins are highly differentiated in the present day. The paper hypothesised that the spatial configuration of the urban grid informed movement patterns in and around the markets which subsequently created an ‘interface of exchange’ exploited by both shoppers and shops. This interface was considered the prime determinant of the characteristics and mix of shops found in each market. The analysis highlighted the spatial, movement and retail properties of the markets, while the discussion section suggested the social logic uniting spatial structure, movement and retail facilities.

In conclusion, this paper has demonstrated some basic ingredients of a social logic of shopping. Firstly, movement patterns are related to spatial patterns. Higher, more mobile social groups follow the global properties of space, while the middle groups follow both global and local properties. The lower end groups follow the local properties of space.

Retail types also follow basic spatial patterns mediated by movement patterns. Through movement, predicted by choice, generally results in multipurpose shopping. Where the through movement is global, high end multipurpose shopping results, and where movement is local, lower end multipurpose shops develop. Integration and its associated movements generally result in other types of shopping, especially MC but also C type shops. The relative segregation of markets can result in either exclusivity, or in general degeneration. Both types of movement relate to shopping by means of a distance law: that distance is directly proportionate to social or economic class in terms of movement and in terms of shops.

Selected Bibliography

Bourdieu, P., 1984, Introduction to Distinction: A Social Critique of the Judgement of Taste. In: 2000, Lee, M. J., (ed) The Consumer Society Reader, Blackwell Publishers Ltd., Oxford

Christaller, W., 1933, Central Places in Southern Germany, trans (in part) 1966, Baskin, C. W., Prentice Hall.

Delhi Development Authority, 1961, Master Plan for Delhi, Government of India, New Delhi

Douglas, M., 1997, In Defence of Shopping In: Falk, P. and Campbell, C. (eds) The Shopping Experience, Sage, London

Douglas, M., 1979 (8th edition 2003), Collected Works: the World of Goods, Routledge, London

Eaton, B.C. and Lipsey, R.G (1982) An Economic theory of Central Places In: Economic Journal Vol. 92, pp 56-72

Fonseka, R., 1969, The Walled City of Old Delhi: Urban renewal, and an Indigenous Community, In: Landscape, Vol 18, no. 3

Giddens, A., 1984, The Constitution of Society. Cambridge: Polity Press

Giddens, A., 1981 A Contemporary Critique of Social Materialism. Macmillan, London

Hillier, B., and Iida, S., 2005, Network and Psychological effects: a theory of urban movement. In: Cohn, A.G. and Mark, D. M., (eds) proceedings of Spatial Information Theory: International Conference COSIT, Elliotsville, NY, USA.

Hillier, B., Penn, A.,Hanson, J., Grejewski, T., Xu, J., 1993, Natural Movement: or, configuration and attraction in urban pedestrian movement. In Environment and Planning B: Planning and Design 20

Hillier, B., 1996a, Space is the Machine, Cambridge University Press

Hillier, B., 1996b Cities as Movement Economies In: Urban Design International 1 (1), pp 41-60

Hillier, B., Burdett, R., Peponis, J., and Penn, A., 1987, Creating Life: Or, Does Architecture Determine Anything? In: Arch and Comport/Arch. Behav., Vol 3, no 3. p 233-250

Hillier, B., Hanson, J., 1984, The Social logic of Space, Cambridge University Press

Hossain, N., 1999, A Syntactic Approach to the Analysis of Spatial patterns in Spontaneous Retail Development in Dhaka, proceedings of the 2nd Space Syntax Symposium, Brasilia

Marshall, A., 1920 (first published 1890), Principles of Economics, 8th edition, Macmillan and Co., Ltd, London (pdf version downloaded from http://www.econlib.org/library/Marshall/marPtoc.html [accessed Aug 21, 2006])

Miller, D., 1998, A Theory of Shopping, Polity Press, Cambridge

Miller, D., 1987, Object Domains, Ideology and Interests, In: 2000, Lee, M. J., (ed) The Consumer Society Reader, Blackwell Publishers Ltd., Oxford

Penn, A., 2005, The complexity of the Elementary interface: shopping space, proceedings of the 5th Space Syntax Symposium, Delft

Sabikhi, R., 1996, The Collapse of Planning: A case study ofDelhi.Hoffman, A, (ed) Form, Modernism and History, essays in honour of Eduard Sekler, Harvard University Press.

Simmel, G., 1907 (English translation 1978) The Philosophy of Money, Routledge, London, New York

Smith, A., 1776, An Enquiry into the Nature and Causes of the Wealth of Nations, (pdf version downloaded from http://www.econlib.org/library/Smith/smWN.html [accessed Aug 21, 2006])

Veblen, T., 1925 (first edition 1899 New York), Conspicuous Consumption from The Theory of the Working Class, In: 2000, Lee, M. J., (ed) The Consumer Society Reader, Blackwell Publishers Ltd., Oxford

West, D.S., Hohenbalken, B.V., Kroner, K. (1985) Tests of Central Place Theory In: Economic Journal Vol. 95 No. 377 pp 101-117

Appendix 1

RETAIL CATEGORIES (based on the Eaton and Lipsey Model)

M1 (Multipurpose 1)
Restaurants
Beauty Shops
Drug Store/Chemists
Barbers
Dry Cleaners
General Stores
Grocer/Baker/Fishmonger/Butcher
Cafés
STD/ISD booths
Photocopier
Cigarettes

M2 (Multipurpose 2)
Banks
Music Stores
Book Stores
Florists
Liquor Stores
Shoe Repair
Gift and Novelty
Candy and Nuts
Hobby, Toys and Games
Miscellaneous Food
Film Developers
Stationery
News Dealers
Cyber Cafés

MC (Multipurpose-Comparison)
Sporting Goods
Jewellery
Travel Agencies
Men's/Women's/Children's Clothing
Shoes
Miscellaneous Apparel
Department Stores
Cameras
Sewing and Tailoring
Variety Stores
Luggage
Accessories
Opticals
Tableware
Mobile Phones

C (Comparison)
Household Appliances
Radio and TV sales and repair
Used Merchandise
Auto and Home Supply
Hardware
Paint and Wallpaper
Furniture
Drapery and Upholstery
Car Dealers
Floor Coverings
Miscellaneous Home Furnishings
Building Materials
Garden Supplies
Electrical Repairs
Jewellery Repairs
Real Estate Agencies
Computer Sales and Service
Electronics Sales and Repair

S (Single Isolated Purchase)
Hotels and Motels
Movie Theatres
Photography Studios
Printers
Billiard and Pool Halls
Drinking Places
Car Rental
Bowling Alley
Car Wash
Carpet and Upholstery Cleaning
Dance Halls
Coin Operated Amusement Devices
Amusement Services
Medical Consultancy
Other Consultancy
Courier Services
Financial Services
General Trading Business
Paging Services
CA/Architect/Civil Conctructor