Appendix 1: SPACE SYNTAX THEORIES AND METHODOLOGIES

1.0 Introduction
As part of the deductive approach of this research, this chapter aims to highlight the basics of Space Syntax theory and techniques. Space Syntax theory provided a valuable theoretical basis for this research, as it advocates the creation of a vital urban environment through mixed-use developments, balanced housing and working opportunities, dense development, and integrated pedestrian networks. Space Syntax analytical techniques provided a valuable tool for the empirical element of this research. It was employed to evaluate and understand the selected case studies. It provided a numerical analysis that demonstrated the level of integration of the urban fabric and allowed the researcher to illustrate the relationship between vital retailing streets, and levels of global and local integration.

This chapter outlines the general ideas that guide the development of Space Syntax and its various applications. The first section of this chapter will illustrate the contribution of Space Syntax theory to other major notions such as sustainability and urban form. The chapter gives a brief introduction to the basic techniques of Space Syntax analysis and defines the various measurements and variables employed. It also introduces the Depthmap software, the most-used software in the production of Space Syntax calculations and graphs, and explains its capabilities and usefulness in the study of the built environment. In addition, the author thought that it would be useful to shed light on the application of Space Syntax analysis to buildings and enclosed spaces, and its relevance to the study of urban areas.

Section three of this chapter illustrates how Space Syntax theory addresses social behaviour in space, and illustrates through various examples the application of Space Syntax techniques to the creation of a deeper understanding of human behaviour in public space. Section four demonstrates the relationship of Space Syntax theory to economic activities and its usefulness to the development of a better understanding of consumer behaviour in the built environment and retailing space. The section gives examples of research carried out in the area of retailing in different locations and at different scales. Section five highlights Bill Hillier's criticism of conventional
twentieth-century planning and the role of Space Syntax theory in filling in the gaps left by traditional city-planning thinking, while section six outlines arguments that criticise the theory of Space Syntax and highlights its limitations.

The benefit of Space Syntax theories and techniques was realised early in this research. It is hoped that this chapter will illustrate the relevance of the theory to the creation of vital public spaces and successful retailing in particular. This chapter will also show the value of Space Syntax theory in the analysis of existing urban spaces and development of better understanding in addressing issues of concern.

2.0 Theory and Basic
Space Syntax is a theory about space and human behaviour. It is a mathematically based environmental model that analyses space at micro and macro levels. It offers theories and methods for the analysis of human interaction within the built environment and allows the study of the impact of spatial configuration on accessibility, behaviour, communication and interaction. Space Syntax is defined as “a descriptive ‘language’, the components of which (‘the words’) are the various urban spatial units organised into a meaningful ‘text’ along the rules of ‘grammar’, which are the regulations derived from the above outlined theoretical foundations” (Attila, 2007: P. 6).

The importance of Space Syntax and its related methodologies lies in its universal themes that can be applied to various projects, sites and at different scales. Space Syntax gives an insight into the influence of spatial layout and levels of accessibility and integration on different design alternatives. Space Syntax research focuses on encouraging accessibility to a wide range of people. While many planners and urban designers are concerned about the shape and form of cities, according to Space Syntax theories, space is what really matters.

Space Syntax was developed as a research method in the 1970s at the University of London as a tool to trace movement and human behaviour within cities and buildings. The “syntactic” analytical techniques were used by Hillier and Hanson in their book *The Social Logic of Space*, published in 1984, which explores the relationship
between spatial configuration and behaviour. The book presents a theory of space that describes the spatial patterns produced by buildings and towns, and their relationship with the behaviour of society. Since then, a coherent body of research has continued under the banner of Space Syntax.

One of the principles of Space Syntax is that a global theory exists that can be applied to the study of all urban environments. Hillier suggests that “there is some kind of universal city underlying the diversity of real cities – a remarkable reflection if we bear in mind the heterogeneous social, economic and temporal circumstances in which the world’s cities have been created” (Hillier, 2009a: P.2).

According to Space Syntax, all man-made things have function and meaning, and some eventually become part of a culture. The same applies to buildings, which attract a lot of attention as symbols of power, wealth, order and happiness. “Buildings are not just objects, but transformations of space through objects” (Hillier and Hanson, 1984: P.1). Space Syntax theories state that spatial forms and social practices influence each other.

Space Syntax theories are holistic in nature; they encourage the examination of models of social behaviour and spatial structures. “Both space organization and social encounter patterns are orphic languages, the construction of a social theory of space organization becomes a question of understanding the relations between the principles of patterns generated in both” (Hillier and Hanson, 1984: P. 50). Space Syntax theories stress the role of human perception on the creation of local movement patterns; and note that the geometric and topological structure of a city’s network generates movement and, as a consequence, the land-use patterns that exist on the ground. “[T]he human mind is actually the means through which cities are created bottom up by the aggregation of building and spaces, but function top-down through the influence of the larger scale grid on movement patterns” (Hillier, 2009a:P. 17). The human mind as the creator of the city is “a generalised individual located at all points in time and space in the city and everywhere imposing its cognitive apparatus on the ambient city. We might call this generalised individual the objective subject of the city creating process, and therefore of the city” (Hillier, 2009a: P.17).
Space Syntax theory starts with an idea that cities are a collection of buildings held by a network of space. Space makes up the largest part of cities; it has a certain architecture, geometry, topology and pattern of connection (Hillier, 2008). Bill Hillier explains urban systems as “discrete systems”, which are “system[s] with a countable number of states. Discrete systems may be contrasted with continuous systems, which may also be called analog systems. A discrete system is often modelled with a directed graph and is analysed for correctness and complexity according to computational theory. Because discrete systems have a countable number of states, they may be described in precise mathematical models” (2010).

**Space Syntax and Sustainability**

Space Syntax as a comprehensive tool can be utilised to assess existing urban conditions, guide future development and achieve sustainability as a holistic notion built on the three pillars of social, environmental and economic development. “[T]he generic form of cities is already the product of interaction between all three kinds of sustainability: the environmental, the economic and the social” (Hillier, 2009b: P. K01:9).

Space Syntax theory stresses that cities consist of two networks – residential and public. The ability to enhance the structure of the networks and their relations in terms of integration, centrality and mixed use can have a direct impact on environmental sustainability, a “relation between the structure of the dual network of cities and environmental sustainability, seeing this in terms of the minimization of the energy needed for useful movement in the system” (Hillier, 2009b: P. K01:8). Hillier illustrates through various research projects the relationship between spatial structure and economic activities in the foreground and the background network.

An “intricate pattern of centres at all scales is potentially a vital component of spatial sustainability, for the very simple reason that it means that wherever you are, you are close to a small local centre and not far from a much larger one” (Hillier, 2009b: P. K01:6). Space Syntax theories and techniques can assess the quality of the spatial layout of town centres, and through theoretical and technical means can guide
developments that encourage local activity and walkable cities, thus improving economic growth, protecting the environment and promoting social cohesion.

Social cohesion and vitality is one of the main components of sustainable development. Space Syntax research is aware of the social aspect of space and the life of the street. According to Hillier, “the culture of the street, and the structure of the street pattern, is in effect the means to the normal, peaceful co-existence of diverse and dense populations, and this is why the life of the streets seems the most powerful indicator of the presence of civil society” (Hillier, 2009b: P. K01:19).

Security and safety are crucial for the creation of lively public space. Friedrich states that “sustainable communities are safe, perceived as safe (low levels of fear) and attractive (low levels of disorder)” (Friedrich, 2009:P. 34:1). The issue of safety and crime prevention has been one of the major themes of Space Syntax research. With the ability to study the level of integration and visibility in space, one can assess and recommend certain types of spatial layout that can improve overall safety. High volumes of pedestrian movement and the capability of Space Syntax tools to suggest means to improve it through enhanced integration and visibility are a crucial element for the sustainability of cities.

**Space Syntax and Centrality**

In line with the main Space Syntax theories which emphasise integration and vital city centres, various research projects associated with Space Syntax focus on the issue of centrality as a concept strongly related to the development of sustainable settlements, social vitality, cohesion and economic prosperity.

Space Syntax theory is closely concerned with the issue of urban centrality, both in the geometric and the topological sense. The urban centre is defined as the close co-location of activities, services and employment, in short their spatial agglomeration. “In classic location theory, the notion of centrality is generally defined in terms of attractiveness” (Alain Chiaradia & Bill Hillier, 2009: P. 016:2). Space Syntax theory distinguishes between two types of centrality – metrical and topological centrality. Metrical centrality refers to the middle of an area, while topological centrality is
concerned with whether “something is spatially integrated in an area” (Nes, 2007: P.1). Space Syntax states that cities consist of two types of network: the foreground network, which links centres of different scales and consists of a small number of long lines, and the background network, which links residential spaces and consists of larger numbers of shorter lines. The proximity to centres depends not just on distance but on “the intelligible distance created by the angular structure of the network” where centres fit with the natural movement of the area at various scales (Hillier, 2009b).

Modern planning models of pedestrian or vehicular movement predict the level of traffic based on land use and attractors. All movement would be generated from these attractors or go toward one of them according to its assumed weight. Through simulation modelling from origins to destinations a total pedestrian or vehicle flow rate is produced. On the other hand, Natural Movement theory states that every space is an origin and destination, and the rate of movement is mainly the product of the configuration of the urban grid. Based on such a model some streets are more accessible and integrated than others in the system. Natural Movement theory illustrates how the configuration of the urban grid influences movement.

Social and cultural centres are those areas that possess historic and religious significance, thus contributing to the image of the city and attracting investors and visitors. In many cases, where the spatial order is fragmented and there is not a sense of centrality, the importance of the cultural and social centre is reduced significantly. “According to the theory of the natural movement economic process, centralities of a spatial order support centralities of a social order” (Nes, 2007: P.1). The ability to understand both spatial and socio-cultural structures can enhance the vitality of public spaces. “Complexity regarding city centres means a space that carries significant aspects of the history and the memory of the entire city and where the interface of different social categories made possible by and through the urban layout can at least produce awareness of each other” (Rigatti, 2005:P.241).

Like cultural centres, economic centres benefit from topological centrality. Strong centrality and high integration values that naturally generate higher volumes of
vehicular and pedestrian movements are desired for most businesses. “Therefore an economic centre is heavily dependent on a street structure, which relates to topological centrality. Accessibility to potential customers is at issue” (Nes, 2007: P.3).

### 3.0 Space Syntax and Social Behaviour

Space Syntax emphasises the relation between abstract social structure and spatial form through the properties of physical space. “Social cohesion can be realised in two ways: through local networks and social networks overarching the whole urban society” (Attila, 2007). Accessibility is one of the most important properties in Space Syntax theories. One of the elementary ideas of Space Syntax is how boundaries and connections govern human behaviour. Space Syntax theories emphasise the role of the physical environment on accessibility and social segregation. Space has a social logic and one can read societies through their spatial forms. At the same time, Space Syntax analysis illustrates that the social meaning of space is carried through topographic relations rather than formal relations.

Michael Batty gave three definitions of the concept of accessibility. Type one is **generic accessibility**, which illustrates the proximity of an individual to opportunities. Type two is **geometric accessibility**, which is calculated as the “total distance from one node to all others as a measure of inaccessibility; it might be computed as an average if normalised by all nodes in question and it might be converted to a measure of accessibility if the reciprocal of this total or average is used.” A third type, which, according to Batty, has emerged in the last 20 years, is more abstract and “extends the physical definition on the basis of networks in order to define relationships between the physical components of the underlying network itself.” Type three is used in Space Syntax (Batty, 2009: P. 102:2).

The holistic approach of Space Syntax theory provides a comprehensive perspective on the issue of social segregation. Segregation may refer to the separation of people and or activities in terms of class, race, age or other considerations. According to Franz’en, most research concerned with the issue of social segregation is focused on residential space, although housing makes up only part of the city, and urban life
requires moving and occupying different locations. “Consequently, to look at urban segregation demands us to ask the question if there is any segregation pattern in the urban lives people live, that is, if living at a certain address goes hand in hand with working, shopping and amusing oneself in determined locations. In short, if life in the city is being lived in parallel social worlds or not” (Franz'en, 2009:P. 105:1). Segregation is a dynamic process that continuously changes and is reflected in the spatial order of urban environments in the form of barriers and bridges. “The merit of Space Syntax very much lies in delineating how spatial segregation and spatial integration come together in, or help to constitute, an urban configuration, as a city. [Space Syntax theories] gives a comprehensive view of the specific pattern of spatial integration and segregation in the city in question” (Franz'en, 2009:P. 105:2).

Urban vitality is a much sought-after quality, yet it is difficult to assess. According to Legeby “urban life could be described as an unintended by-product of a number of frequent and rather anonymous encounters in connection to everyday life activities” (Legeby, 2009a:P. 064:3). In order to create a vital urban environment, one needs to understand the structure of both the spatial and social network. According to Hillier: “In cities, it is the network of streets and spaces formed by buildings that link the city into a single system. In societies it is the network of interactions that link individuals into a community or society” (Hillier, 2009c: P.042:3). A strong thorough understanding of human behaviour patterns is essential to the creation of a vital urban environment. “Human action … must be the medium through which spatial laws shape the emergent city” (Hillier, 2009c:P. 042:4).

Ann Legeby completed a research project that tried to link spatial configuration and social data. She studied four housing estates in Stockholm: Ronna, Geneta, Hovsjö and Fornhöjden. She found a strong correlation between accessibility and population density as well as accessibility and working population. She found that knowledge of various spatial configurations can guide and support urban design practices, especially in the area of anti-segregation. “It is stressed, that an increased and nuanced knowledge about the spatial configuration is a necessity for more effective urban design and planning policies within anti-segregation initiatives” (Legeby, 2009b: 064:10).
Several research projects based on Space Syntax methodologies emphasise the importance of the presence of people in increasing safety and providing natural surveillance. Hillier found that certain spatial configurations can contribute to the likelihood of the presence of people through movement generation. A study completed by Eva Friedrich, Bill Hillier and Alain Chiaradia tried to find links between spatial configurations and anti-social behaviour. The research found that within various spatial layouts, patterns of anti-social behaviour such as violence, theft and vandalism correlate with the level of pedestrian presence and residence surveillance (Friedrich, 2009). “Permeable constituted neighbourhoods seem to mediate the co-existence of strangers and residents; they work precisely because, not in spite of, they allow for the co-presence of strangers and residents. These neighbourhoods, as our results suggest, are ‘socially effective’” (Friedrich, 2009:P. 34:15).

Space Syntax developed as an urban theory based on understanding of social logic. Thus, various theories and methodologies have proven to be useful for the study of the social dimension within urban and architectural settings. Space Syntax provides notions and techniques that enhance accessibility and diminish segregation. The ability of various techniques to generate higher levels of movement and use of public space based on understanding of both human behaviour and urban network structures is very valuable to urban vitality. In addition, the capability of Space Syntax to offer tools of analysis that enhance the level of safety and security in buildings and urban spaces is important in assessing various means that can help to increase public presence and visual fields.

4.0 Space Syntax and Economic Activities
Space Syntax theories and techniques have been valuable tools for the analysis of economic activities within the urban environment. They illustrate that both social and economic activities share a mutual spatial interface. This stems from a belief that cities worldwide share similar urban structures within public areas, and are distinguished through the urban structure of their residential areas, which tend to reflect local culture the most. “The space of cities is generated by a dual process: micro-economic factors created by a public space process which tend to be invariant
and give cities a similar global structure; and cultural factors that creates background residential space process, driven and thus tend to make cities locally different” (Hillier, 1996).

Space Syntax analysis is mostly concerned with movement. Hillier uses the term natural movement to define “the relationship between the structure of the urban grid and movement densities along lines” (Hillier, 1996: P. 161). He also explains that every trip has three elements: an origin, a destination and the series of spaces that are passed through on the way. A journey from one place to another rarely has a single purpose, people stop on the way to buy something, chat, watch something, etc. Hillier uses the term by-product of movement to refer to such activities that result from movement. Thus, he argues for the importance of aligning the streets with buildings that address the sidewalk and which have various active frontages that generate contact. One of the basic principles of Space Syntax theories is that “the network shapes movement; it also over time shapes land-use patterns, in that movement-seeking land uses, such as retail, migrate to locations which the network has made movement-rich while others, such as residence, tend to stay at movement-poor locations. This creates multiplier and feedback effects through which the city acquires its universal dual form as a foreground network of linked centres and sub-centres at all scales set into a background network of residential space. Through its impact on movement, the network has set in train the self-organising processes by which collections of buildings become living cities” (Hillier, 2009a: P.14).

4.3.1 Space Syntax and Retailing
The relationship between successful retailing and high volume of movement is clear. Several researchers have used Space Syntax theories and techniques to examine retailing areas at different locations, settings and forms. Early research in Space Syntax indicated that shops tend to be located on the most integrated streets and those with high connectivity to their local environment (Hillier, 1993: P.31) (Hillier, 1999: P.110). “[S]hopping is an economic activity essentially relating to the consumers’ spatial behaviour in a built environment” (Nes, 2005: P.176).

Space Syntax research and theories have focused on the area of retailing in order to understand the effect of spatial layout on shoppers to generate higher rate movement
and natural way finding. Space Syntax theories and techniques can offer design appraisal, investment advice, strategic design and monitoring services to business owners. The tools available could provide advice to retailers that optimise movement and increase the probability of buying (SSL, 2010). This section presents examples of studies that use Space Syntax theories and techniques, and illustrates the analysis of retailing environments at different scales and at different locations. A study from London will be used to illustrate the relationship between socio-economic variables and spatial characterisations. Studies from Amsterdam and Delhi illustrate the relationship between the level of integration and retailing type. A study of Iranian bazaars shows how the location of different bazaars gives an indication of their socio-economic role.

A group of researchers from UCL prepared a study to examine the socio-economic and spatial characteristics of 10 centres in inner and outer London. The aim of the study was to “understand the interaction between socio-economic variables and spatial characterizations using Space Syntax spatial configuration analyses in order to conceptualize their interactions” (Alain Chiaradia & Bill Hillier, 2009: P. 016:2). The 10 centres were chosen based on various criteria such as: similar retail classifications, retail use on ground floor, similar level of transport accessibility, availability of retail turnover date and location away from a significant shopping mall. The study also collected socio-economic data such as population, employment, income and spending power, and reviewed retail data such as retailing diversity, floor space, rate of competition and retail rental values, as well as conducting surveys on pedestrian volume at various points along the selected streets throughout the day (ibid.). “A first investigation was to look at the relationship between angular segment choice at different radii and the location of the centre. [Figure 4.1] shows how the centres, sample is in general located on the large-scale movement network” (Alain Chiaradia & Bill Hillier, 2009: P. 016:12).
The study showed that “two profiles can be identified as scale and scope economy variations of home market – import/export trade:

- Populous centre on main arterials:
  - is sharply distinguished from its context on Choice
  - has high local population and employment densities
  - has high rates of pedestrian activity
  - success comes from numbers rather than affluence
  - larger, less street-oriented shops

- Sparse centre on secondary arterial:
  - is more like its context on Choice
  - has lower local population and employment densities
  - lower rates of pedestrian activity
  - success comes more from high value and local affluence
  - smaller, more street-oriented shops” (Alain Chiaradia & Bill Hillier, 2009: P. 016:17).
In a study completed by Akkelies van Nes, which analysed the typologies of shopping streets in Amsterdam, vital shopping areas were found to be highly connected in the local and global level, and located within high density areas. Shops that cater for the private vehicle tend to depend on global connectivity. In contrast, shopping-based activities tend to be located within locally connected areas (Nes, 2005: P. 185). The study also found that the size of a shopping street or a shopping centre depends on its degree of connectivity to its vicinity, its strategic, topological and metrical location in an area, and its location in a city as a whole. In an attempt to find correlations between density of the street network and shopping streets, the study also found that “the higher the density of streets in the vicinity, the more intense the shopping street in terms of number and variety of shops” (ibid.). The study also indicated that vital shopping centres require a mix of shopping streets and centre sizes. According to van Nes, “the more local a shopping street or centre is, the greater the density of streets in a short metric distance in the local catchment area. A combination of these two scales must then indicate a highly vital shopping street or centre” (ibid.).

Another study, conducted by Amit Kumar Sarma on the community centre markets in New Delhi, titled ‘The Social Logic of Shopping’, found that a strong relationship exists between movement and spatial patterns, and retail types are influenced by movement patterns. High-end multi-purpose retailing is located on global routes, while low-end multi-purpose shops tend to be located on local routes. The study concluded that “distance is directly proportionate to social or economic class in terms of movement and in terms of shops” (Sarma, 2006: P.54) [Figure 4.2].
There are several studies that have focused on the bazaar and its relation to the spatial structure of historic cities. Bazaars are major retailing sites that are strongly embedded in the socio-culture of Islamic cities. “The bazaar is not only the main socio-economical centre, but also is unsurprisingly the main spatial structure of the Iranian city. This spatial system is the spine of global structure of the city as well as a spatial system to organize the main public, socio-religious and commercial spaces of cities” (Nejad, 2005: P.189).

In his study, Nejad found that the spatial structure of various bazaars within different Iranian cities varies widely. He concluded that the level of integration of the bazaar in certain cities depends on the historic, economic and political role of that city. He found that there are two types of bazaar. One is the “commercial bazaar”, which consists only of retail clusters and does not include other socio-economic activities,
and the other is the “socio-commercial bazaar”, which has a linear form and is the centre of spatial configuration of cities (Nejad, 2005).

A scatter diagram presents the strength of the relationship between these two variables. If a straight line is drawn through the points, and the points scatter closely around the line, we can draw a conclusion on the relationship that exists through the linear relationship between these two variables. The scatter diagram in Figure 4.3 illustrates the relationship between local and global integration, and shows the position of the centre of Dizfoul city and the bazaar. “The local/global Scatter gram of Dizfoul shows two distinct areas: Firstly, the central spine (the core integrated area) which includes the bazaar, Friday mosque and the majority of mosques and shrines. Secondly, the area, which is around the city core and has lower global integration value. This part of the city is generally a residential area. This spatial condition is detected by Karimi (1997) in his cases as well. Furthermore, although Friday mosque is located in the main global area of the city, it is not connected to the bazaar like typical Friday mosque in other Iranian cities that Friday mosque is formed within the bazaar” (Nejad, 2005:P. 190).

![Figure 4.3 Scattergram showing local integration against global integration (R5/Rn) of Dizfoul (Nejad, 2005: P. 190).](image)

Space Syntax has been a valuable tool for the study of the retailing environment. This section tried to illustrate the relevance and usefulness of Space Syntax theory in the assessment and creation of vital urban settings in general and the retailing environment in particular. In addition it aimed to illustrate through various examples
the benefit of using Space Syntax techniques in the analysis of retailing environments at different scales and locations worldwide.

5.0 Critique of Twentieth-Century City Design

Space Syntax offers a new way of thinking about cities and provides different methods of analysis compared to those that prevailed in the twentieth century. According to Hillier, modern city planners gave little attention to the study of networks. Twentieth-century urban models analysed the city in fragments, and traffic engineers understood that movement is independent from place (Hillier, 2008). Hillier criticises twentieth-century planning for failing to realise the relationship between movement and place, and local and global organisation, pointing out that it was unable to comprehend the complexity of the urban system and relied on simple language to describe the urban environment (Hillier, 2007: P. K01:18). Twentieth-century planners, according to Hillier, had two limitations. First they did not provide a novel method of analysis for architectural and planning works. Second, they tended to borrow lessons from other disciplines such as linguistics, biology, engineering and psychology, and in doing so ignored reality and failed to learn from their experiments (Fanek, 1997: P. 34).

Space Syntax theories, as outlined by Hillier’s writings, explain that the relationship between human beings and space is governed by two laws: first, ‘spatial emergent’, where large-scale configurations are derived from local physical interventions in space; second, ‘generic function’, where constraints are placed on space by basic aspects of human activities, such as ways of occupation and movement (Hillier, 1996: P. 335). Hillier criticised twentieth-century planning and urban design, claiming that it followed principles that contradicted basic laws that govern spatial development and human usability of space.

Hillier points out that urban form must overcome two paradoxes. “It must create external integration for the sake of relation to the outside world, as well as internal integration, for the sake of relations amongst locations within … Second, it must pursue both compactness and linearity, the former for the sake of trip efficiency, the
latter for the sake of visibility and intelligibility” (Hillier, 1996: P. 343). Hillier’s ideas encouraged urban designers and planners to contemplate the relationship between spatial configuration, movement and land use.

### 6.0 Critique of Space Syntax

This section sheds light on two types of criticism of Space Syntax. First is its limitation in movement generation and social comprehension. Carmona highlights that there are many factors that contribute to the generation of movement other than mere network structure. For instance, “restriction on the freedom of various modes of traffic can have major effects on movement densities: for example, closing streets to cars results in their more intensive use by a greater number of pedestrians” (Carmona, 2004:P. 172). Carmona indicates that Hillier's ideas may ignore the importance of accessibility and the character of urban space. In addition, Space Syntax theory ignores the distinction between types of movement, where no two journeys are the same. Hillier pays more attention to movement than attractors, even though attractors and magnets certainly matter (ibid.). Nevertheless, Carmona acknowledges the successes of Space Syntax theory in the prediction of the impact of layout on movement generation. He states that: “it must, however, be acknowledged that although Hillier’s theory might be based on a rather mechanistic view of people and their behaviour, it supports predictions that correlate highly with observed patterns of movement” (Carmona, 2004:P. 172).

The goal of Space Syntax methods, as indicated by Hillier and Hansson, is to reveal the social roles that govern societies and explain social interaction through spatial analysis. However, various critics claim that mere spatial representation is unable to describe the complexity of social systems. For example, Edmund Leach argues that, “from my point of view the syntactic argument is meaningful and interesting, but I do not believe that one can immediately infer the generative syntax simply by looking at the layout of settlement patterns on the ground, and even if one could be sure of what the generative syntactic rules have been, one cannot infer anything at all about the society that makes use of the resultant settlement” (Leach, 1978: P. 397). In a paper prepared by Osman and Soliman, who acknowledge the advantages of Space Syntax theories and techniques, the claim is that there are several limitations to the method.
First, the method of producing the justified graph does not fit with non-western houses, which follow different socio-cultural rules. Second, they criticise the binary coding, which they claim fails to represent reality. Finally, they claim that Space Syntax methods alone are not sufficient to describe social practices and insist that social sciences possess better tools for the understanding of socio-cultural practices (Osman: P.201).

7.0 Conclusion
Space Syntax is a theory about human behaviour in space. It is a descriptive method of urban systems. Its value is derived from it being a global theory that can be applied to the study of urban systems of different sizes and at different locations. Space Syntax theory is holistic in nature; it examines urban systems in relation to various political, social and economical factors. It seeks to enhance the relationship between the three elements of the human settlement, economic, social and environment, in order for it to reach a sustainable form. Space Syntax theory offers researchers and planners tools that measure the urban network to explore the structure and function of cities.

With regard to the retailing environment, Space Syntax offers valuable tools and insights for the development of successful retailing that is built on urban integration, and social vitality and cohesion. First, it calls for a compact urban form that enhances centrality for the sake of ensuring efficient movement and lively urbanity. A high concentration of retailing is desirable for business and the social vitality of city centres. The theory emphasises integrated networks at global and local levels, which correspond with the higher volume of movement that is necessary and desirable for retailing. Planners and urban designers have to understand the proposition that movement is the generator of land-use pattern, rather than the conventional theory which prevailed in planning thinking.

In order to enhance social cohesion, planners need to depart from traditional modes which addressed only residential areas to fight segregation. Rather, they need to understand the dynamic nature of urban life which is built on movement. The allocation of mixed residential, commercial and work areas in a highly integrated
network produces higher movement and results in interaction (as the by-product) and leads to more social cohesion.

Planners have to encourage active frontages to utilise movement and generate contact and interaction. Permeable urban spaces mediate the co-existence of strangers and residents and encourage the presence of people. People want to be in public, thus planners and urban designers should offer places for unplanned stationary activities that provide good views and controlled exposure. Intelligibility and linearity are desired spatial characteristics for retailing that provide strong visibility and encourage shopping, but can also be used to create a sense of excitement to encourage buying.

Retailing areas should be distinct from their context in location and form. Planning for retailing should be based on an understanding of its typology and intended customer base. Shops that cater for the private vehicle need to be connected at the global level, but those that cater for pedestrians should be connected at the local level. It is also necessary to understand the social aspect of retailing which tends to promote segregation. Thus, it is essential to enhance accessibility in such a way that mixed types of shops (high and low end) are accessible to all. All in all, city centres should aim to achieve a balanced mix of activities that create a strong urban centre rich in both social and cultural activities.

In addition to the above mentioned theoretical findings, the researcher has applied Space Syntax analysis to the four selected case studies as shall be seen in chapters five, six, seven and eight. Results from Space Syntax analysis have been evaluated and compared to results and findings derived from other methodologies. The author prepared a Space Syntax model for each of the selected case studies. The models provide information about configuration accessibility, which are the non-metric and non-geometric configuration properties of space. It illustrates the level of integration and level of accessibility to other streets in the city. It illustrates the connectivity of a street and shows the number of streets that are directly connected to it. The aim is to understand the relation between the spatial and social structure in urban environments. All in all, it has provided strong empirical proof and assisted in answering the research questions.