Understanding the Spatial Patterns of Social Disparity in the Making of an Expatriate City

A Historical and Configurational Investigation of Social Differentiation in the City of Dubai

by

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ABSTRACT

Any cosmopolitan city is expected to have its social divisions and coalescence as people from different origins appropriate the city and form communities with their similarities and differences. This study, focusing on Dubai as a primary case study, is a theoretical and empirical exploration of the relationship between spatial morphology and social disparity in GCC cities that are characterised by rapid urbanisation with global influences, following the commercialisation of oil excavation. The key argument of this dissertation is that the spatial configuration of a rapidly urbanised environment can favour some socio-economic groups over others and may produce a more fragmented model that creates or strengthens social disparities. Furthermore, it is argued that urban networks developed organically provide more affordances for social integration through co-presence.

Since the study is centred on quantifiable spatial qualities and qualitative social makeup, it requires a combination of theoretical evidence from literature and analytical tools. In this context, the configurational underpinnings and evidence-based research techniques of *space syntax* form the basis of this research. The morphological analysis of Dubai over the years along with the understanding of the social composition shows that in the earlier years of organic development, a small population of nationals and expatriates lived in the nucleus although there existed a division between them. Over the years, the development was focused on global investments and revamping the image of the city, steering it to follow a more modern infrastructural growth which created a more profound spatial disparity for socio-economic divisions. Evaluation of vehicular and pedestrian networks reveals that the shifting of connectivity to major roadways is beneficial for the wealthier population with vehicular affordability giving fewer options to lower-income expatriates who are compelled to live in well-connected areas with low rental values, fringe developments or illegally sharing living quarters depending on the proximity to work or other services. Furthermore, a comparison of an old and new part of Dubai, shows that organically developed areas with lesser vehicular precedence provide more pedestrian movement, co-presence and street activity than the new parts where interactions are mostly limited to commercial entities due to the lack of ‘streets’.

Keywords: Space syntax, Dubai, GCC cities, social disparity, ethnic groups, spatial configuration, pedestrian accessibility, co-presence

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CHAPTER 1

1.0 INTRODUCTION

> *"Cities also believe they are the work of the mind or of chance, but neither the one nor the other suffices to hold up their walls.* ***You take delight not in a city's seven or seventy wonders, but in the answer it gives to a question of yours****."*
> *"****Or the question it asks you, forcing you to answer****, like Thebes through the mouth of the Sphinx."*
> *"The inferno of the living is not something that will be; if there is one, it is what is already here, the inferno where we live every day, that we form by being together. There are two ways to escape suffering it. The first is easy for many: accept the inferno and become such a part of it that you can no longer see it. The second is risky and demands constant vigilance and apprehension:* ***seek and learn to recognize who and what, in the midst of the inferno, are not inferno, then make them endure, give them space****."*

- Italo Calvino, *Invisible Cities (Calvino, 1978)*

1.1 PROBLEM DEFINITION- SOCIAL DISPARITY

When the Gulf Cooperation Council (GCC) cities flourished with development during the oil boom, they were arguably linked to a utopian image that opened its borders to the flow of ideas and labour in exchange for financial opportunities and an affluent lifestyle. This led to the extensive migration of expatriates to help build up the nations, who constitute the majority of the population in these cities today. Despite this, they were seldom 'thought of' in their urban planning. The goal for these cities was to establish themselves as important hubs on the global map, and there was no pausing to think socially and sustainably about the intricacy of what they were creating until 2008.

When the global economic recession hit industries, development finally slowed, and cities were urged to look at environmental, cultural, and *social sustainability* factors. By this time, social and anthropological researchers had studied socio-political issues such as the condition of immigrant workers hidden behind the 'spectacular' architecture presented as the image of the

city (Baldwin-Edwards, 2011; Kapiszewski, 2017), establishing the initial markers of social disparity. Critics and academics have also deemed Dubai 'superficial' and 'fake', claiming that it would be hollow and fall apart if one scratched beneath the 'glitzy' surface structure (AlMutawa, 2019: 185-186). However, the sense of community and belonging among nationals and expatriates has also been studied by scholars.

Figure 1: Old residences in Al Satwa behind the modern buildings of Sheikh Zayed Road.
Source: https://dubaidienhoff.wordpress.com/2014/10/26/a-morning-in-al-satwa/

In this context, Dubai, one of the most rapidly and intensively developed GCC cities, has been chosen as the case study. While the city conforms to all these notions of GCC cities, it also has its own unique urban and social structure. Scholars like Yasser Elsheshtawy and Ahmed Kanna (2011) identify the layers of old urban neighbourhoods that hold an 'authentic' social and cultural value and co-existence of communities that were not explored enough as they were not deemed worthy of serious academic study (Fig. 1) (Elsheshtawy, 2009: 6).

One of the important factors in diagnosis is defining the social phenomenon addressed in this study. After considering terms like *segregation*– which is more spatial; *exclusion* – a stark differentiation; *marginalisation* – limiting individuals; and *sustainability* – a broad term with many factors, the author argues that '*disparity*' would be an appropriate way to address the differences. The novelty of this research comes from exploring the spatial dimension of this phenomenon. In understanding how spatial morphology reflects, reinforces, or creates social disparity, planning authorities can get one step closer to a mindful prognosis for social differentiation.

1.2 BACKGROUND

Dubai is one of the port cities that gained recognition with trade activities across Europe and Eastern countries due to its prime geographic location. Later, in 1971, Dubai became one of the seven Emirates of the United Arab Emirates (UAE) (Fig. 2). Today, Dubai is an important international hub in travel, tourism, trade, and commerce. Due to the transient nature of a hub and the rapid urbanisation that took place during the oil boom, the social structure is one that lacks temporality to attain social sustainability. It is also one of the few countries that has a majority of expatriate population (88%) in comparison to the native population (12%).

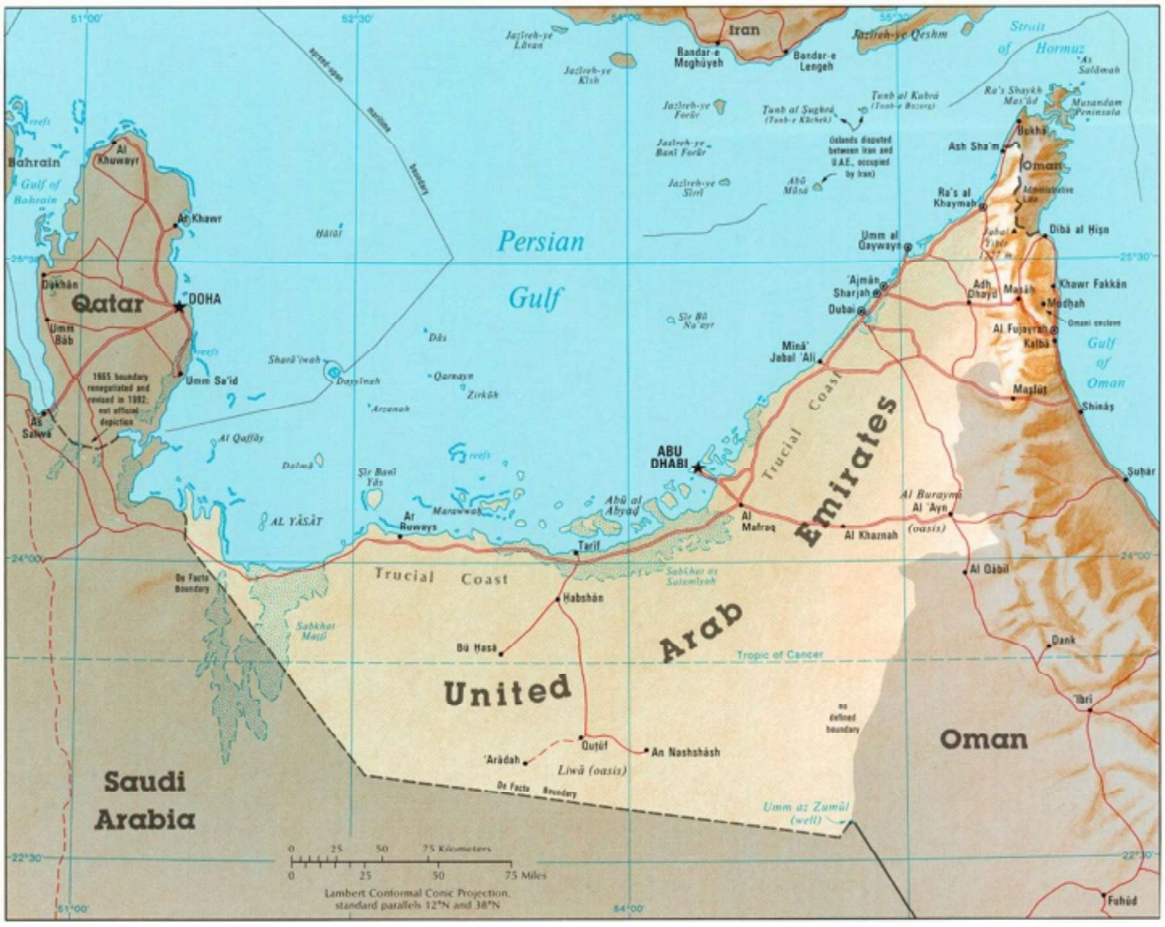


Figure 2: Map of UAE showing the position of different emirates.

Source: University of Texas, map collection,https://maps.lib.utexas.edu/maps/united_arab_emirates.html

The spatial morphology of Dubai is characterised by linear planning, heavy traffic motorways, Urban Mega Projects (UMPs), iconic buildings, islands, and a historic centre with heritage souks. The administrative division in Dubai includes 9 sectors and further subdivisions to 226 communities (Fig. 3).

Figure 3: Administrative map of Dubai showing Sector and Community divisions with Street Network. Figure by Author.

1.3 RESEARCH OBJECTIVES

The main aim of this research is to understand the relation between the spatial morphology of the urban environment and the socio-economic patterns of disparity. In order to achieve this, it is vital to understand the development of the city structure with each phase of growth and decline and also to investigate the political, financial and cultural factors that steered this growth.

To respond to the overarching question, the following three questions are raised:

1. How did the development of the urban configuration over time impact the allocation of different social communities causing differentiation?
2. To what extent does a disparity in connectivity and accessibility exist for these social groups?
3. What are the differences in the usage and social activities of people living in old and new Dubai based on their spatial qualities?

1.4 DISSERTATION OUTLINE

Chapter 1 provides a general overview of the problem definition, research questions and context of the study. Chapter 2 proceeds to establish a theoretical framework, investigating the spatial development of Dubai over phases and its influences along with understanding the relation between spatial and social systems from a morphological and syntactic point of view. Chapter 3 introduces the methodologies selected for the study and its theoretical underpinnings. Chapters 4, 5 and 6 present and explain the results of the analysis undertaken in relation to the three questions respectively. Chapter 7 offers an in-depth discussion of the social disparities and their consequent reflections on spatial morphology. Finally, chapter 8 summarises the findings in order to form a conclusion.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

In order to examine the relationship between spatial morphology and disparity in the social structure, it is imperative to establish a wider framework of historical, political, and socio-economic contexts that highlight the development of the spatial structure and the social make-up of the city, along with an understanding of the present scenario. Firstly, this chapter presents an outlook on the historical and current premise of Dubai with regard to its spatial and social facets. The focus then moves to spatial theories that examine their relationship with social affordances in a city, focusing on syntactic studies that establish a conceptual understanding. Finally, relevant studies about this relationship in GCC states are critically reviewed to establish a conceptual and theoretical framework for the arguments presented and to choose the relevant methods for this study.

2.2 GROWTH OF A FISHING VILLAGE TO AN INTERNATIONAL HUB – URBAN SPATIAL HISTORY

The developmental boom after the discovery of oil is a well-known story, but little is known about the evolution before this phase. Literature shows that the growth before this phase was an organic process and then a slowly planned one that catered to the needs of the small town and its population. A careful study of extensive literature outlines different phases of development steered by various factors. Based on studies by Michael Pacione (2005), Gabriel Erhard (1987), Frauke Heard-Bey (1982), and Hannawi et al. (2019), the review is divided into 4 phases:

1. Origin - 1955 – early years of a fishing village
2. 1956 – 1980, a period of slow and compact growth
3. 1980-2012 – modernisation and rapid urbanisation
4. 2012 – present – mindful growth towards sustainability

2.2.1 Early Years – Origin of a Polycentric Development

Although the earliest recorded settlements in the UAE date back to the 1500s, when the region was under Portuguese control, archaeological excavations suggest the existence of settlements as far back as 3000 BC (Boussaa, 2003: 3-4). Followed by the Portuguese, the Dutch, and the British also exercised control over the region during the early 1900s for maritime trade benefits between Europe and the coasts of the Indian Ocean. The nucleus of the population of Dubai constituted an indigenous fishing village with a population as small as 1200 people. A small group of 800 people from the *Bani Yas* tribe, who migrated from the southwest (Saudi Arabia now), separated from their settlement in Abu Dhabi and joined the fishing village. This migration marked the beginning of an independent Sheikdom called Dubai under the rule of the Maktoum family and has continued to be to date (Elsheshtawy, 2009: 60-63)

This settlement was described as 'a miserable collection of mud huts' by an English traveller in 1822, who drew a trigonometrical plan of it (Fig. 4). This shows that the initial nucleus of growth was just a few houses arranged in a linear radial pattern along the creek in the Al Shindagha area of Bur Dubai. There does not even appear to be any concept of roads or streets other than the narrow passageways between houses.

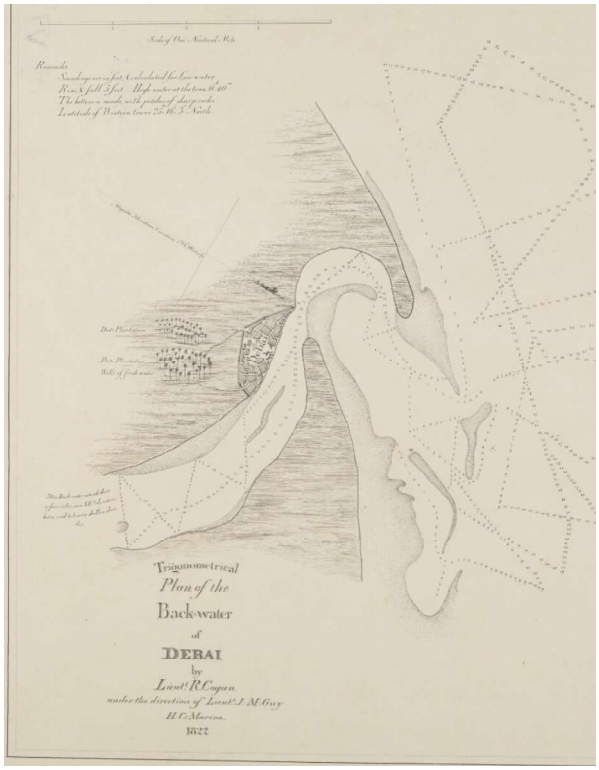


Figure 4: 'Trigonometrical Plan of the Back-water of Debai by Lieut R. Cogan showing Shindagha settlement, 1822. Source: (Elsheshtawy, 2009), original source: India office records, by British Library

By 1900 - 1955, this village grew in population to about 10,000 inhabitants, arranged in a polycentric development of three districts: Al Shindagha, Deira, and Dubai (Erhard, 1987) (Pacione, 2005: 259-260). This composition shows that even in the earliest settlements, there was spatial segregation based on social and ethnic differences. While the Shindagha area was dominated by the ruling tribe and native Arab population, there was a division between the Persian and Baluchi merchants in Deira, and Persian and Indian dominance in Dubai. Some of these areas are still dominated by these communities.

The very little information about these settlements suggests that huts were built in clusters surrounded by courtyards called *barastis* fenced with palm mats for collective security and protection from the harsh climate, as well as to be spaces for congregation and co-presence of people (Boussaa, 2003: 4-5). Each cluster was internally connected by narrow walkways for pedestrians and animals used for transport, and *abras* were used for crossing the creek (Heard-Bey, 1982).

2.2.2 Slow and Compact Growth: 1955- 1980

The growth of the city only truly began with British advice and the intentions of the ruling monarch to develop it as a trading port with pearl fishing and related economic activities. This was the first phase of this slow growth, which was before oil discovery and was modest and small-scale. This was followed by a second phase from 1971-1980, which can be classified as post-oil discovery, which was a more ambitious development. This development is reflected in the two masterplans by British architect John R Harris – 1960 described as ‘compact growth’, and 1971, described as ‘planned suburban growth’.

The first master plan of 1960 included the development of a road system, the zoning of town for different land uses, open spaces in residential planning, the creation of a new town centre, and the coming of land ownership rules. The first bridge connecting Deira and Dubai was also built across the creek during this period in 1963 (Fig. 5) (Boussaa, 2003: 7). With the construction of the bridge, there was more development happening to the east (Deira). Post-oil discovery, a new, more ambitious plan was conceived with more development in a radial pattern with the creek acting as a nucleus (Nassar et al., 2014: 54-55). It envisioned ring roads in a radial network to

the suburbs, the Shindagha tunnel beneath the creek, and the construction of two bridges, Maktoum and Garhoud, thus linking city districts on both sides of the creek (Fig. 6).

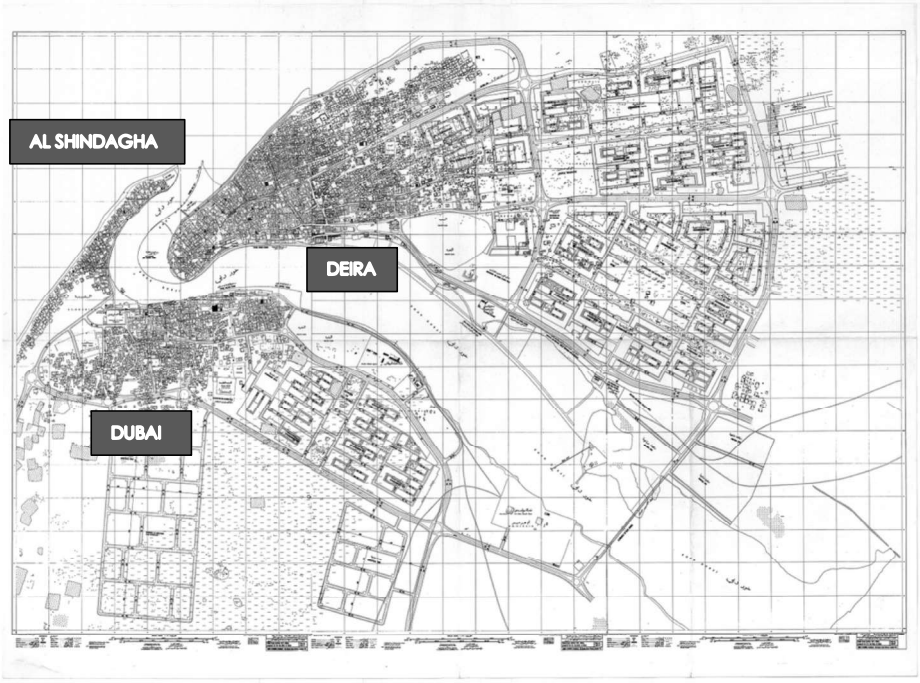


Figure 5: Masterplan by British architect John M. Harris, 1960

Source: John R. Harris Library

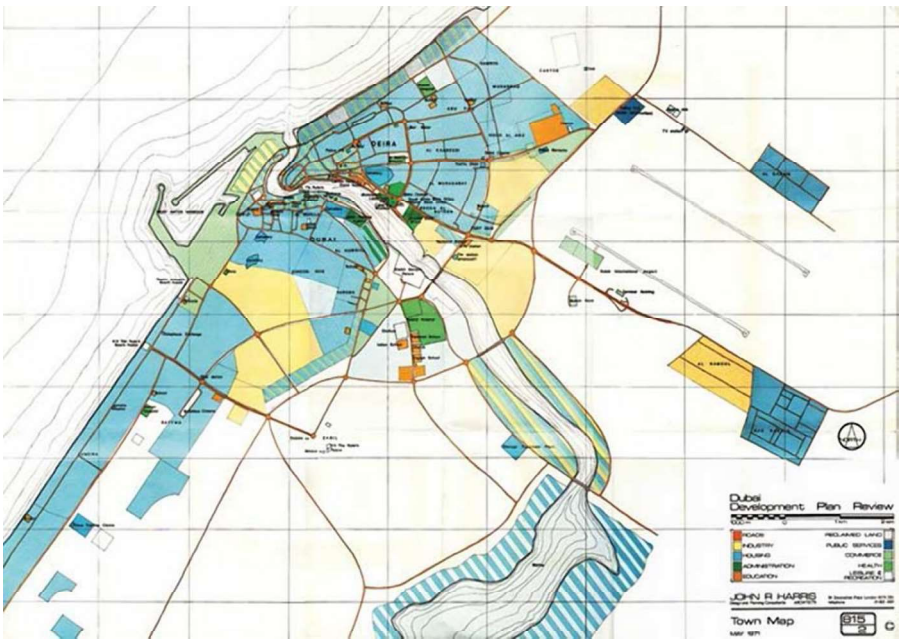


Figure 6:Masterplan by John R. Harris, 1971

Source: John R. Harris Library

Organically, Deira developed into the major business, banking, and administrative centre, with an international airport and shipping and import activities. On the other side, Port Rashid was planned in Shindagha (Pacione, 2005). Towards the end of this period, commercialising oil extraction demanded an extension of port facilities, and Jebel Ali Port was envisioned as a new industrial centre of the city. Being at the west end of Dubai and closer to Abu Dhabi, a new nucleus was formed, and the new Dubai developed in between the old and new nuclei, emerging as a coastal linear city. In this regard, Sheikh Zayed Road was in the perfect position to be the backbone of this development (Fig. 7). In 1971, the Dubai Emirate became one of the seven Emirates of the United Arab Emirates (UAE).

Figure 7: Satellite view of Dubai in 1980 showing Jebel Ali Port, Port Rashid, the scope for development around Sheikh Zayed Road and Jumeirah.

At this point, the focus of development was on building a modern, new Dubai and not on the importance of local culture, heritage, or social life. Development along the Sheikh Zayed Road was called the new Dubai, including the shifting of Emiratis from Shindagha to Jumeirah (Fig. 7), a new luxurious residential villa development. Deira also attempted to develop along modern lines. In the words of Djamel Boussaa, 'there was a pressing need to wipe out images of poverty, misery, and the backwardness of the past' (Boussaa, 2003: 5-7), so the older developments were hidden in the background of newly built modern buildings. A stark disparity also developed as Emirati landowners converted their land into buildings and expatriates occupied the rental apartments (More, 2017: 54).

This phase shows that even though social differentiation started to be established, the spatial planning was still focused on an integrated network, especially characterised by the addition of bridges to connect the two sides of the creek and arterial ring roads to strengthen the network. Jebel Ali Port as a new nucleus was an authoritarian decision that rose out of demand and the geographic qualities of the location. Planning around this port was called a 'new town'. Integrating this new town with the existing development could have been a challenging task.

2.2.3 The Boom: 1980 -2012

By 1980, the development expanded exponentially in terms of scale and diversity of projects in a short span – a rapid urbanisation into Dubai's ambition to become a global cosmopolitan city (Ramos, 2016: 99-105). This meant that it could no longer work with the earlier master plans, and the Dubai Urban Area Strategic Plan 1993–2012 was commissioned. Understanding the fragility of the petroleum industry, this plan focused on allocating more land for residential, industrial, and commercial uses, transport, and infrastructural facilities, attracting foreign and private investments. In the attempt to establish itself as the region's hub for commerce, leisure, education, and services, the planning was characterised by Urban Mega Projects (UMPs), which were arranged in districts mainly along the spine of Sheikh Zayed Road and southwards like internet city, media city, international city, DIFC, festival city, sports city, and Dubai Investment Park, as shown in figure 8.

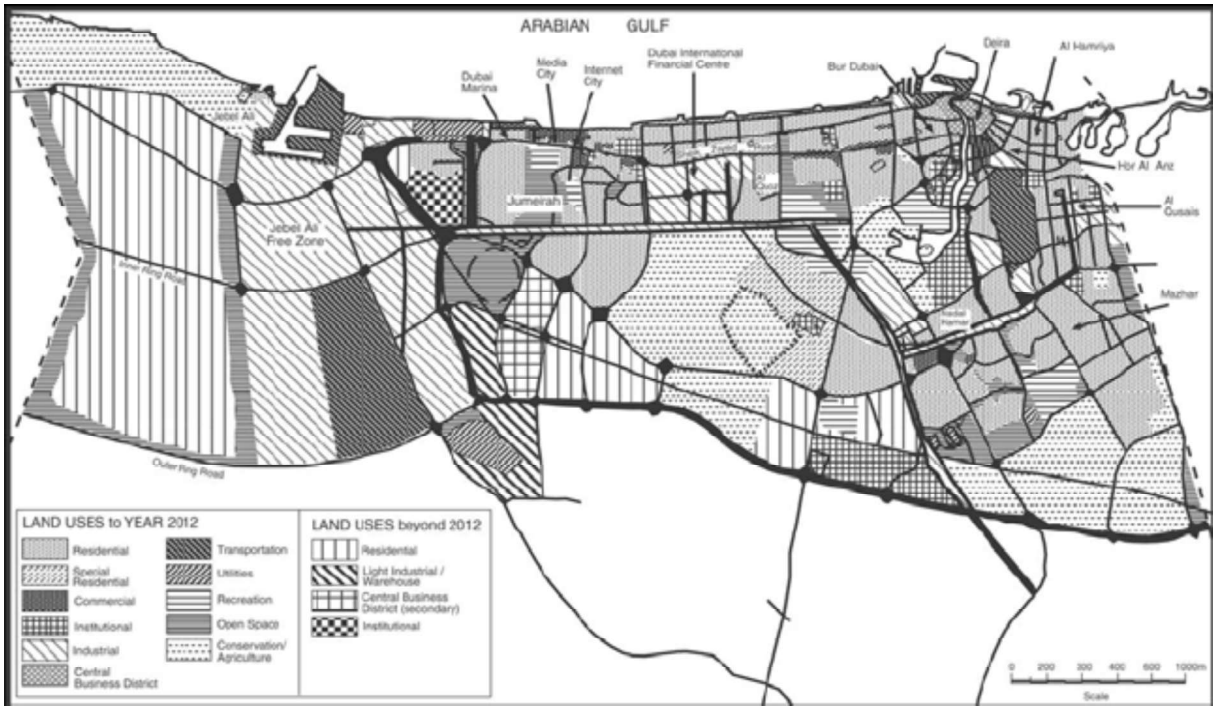


Figure 8: Dubai Structure Plan for 2012

Dubai is a unique combination of state control and global economic liberalism, where the ruling family's planning vision largely determines urban development. The city also operates under a market capitalist system, which aims to attract foreign investment and decrease dependence on local resources. This urban development approach is state-led and focused on entrepreneurship. It creates a city spatial plan that reflects economic strategy and ensures infrastructure and services. Michael Pacione suggests that this resultant differential economic growth inevitably leads to socio-spatial polarisation between high- and low-income groups in society and to the possibility of social conflict (Pacione, 2005). While social conflict most probably will not explicitly exist in the city due to political policy and because low-income groups are usually immigrant workers who often feel disempowered, the polarisation may be inevitable and may affect the cohesion of people with different socio-economic backgrounds and co-presence in social spaces.

The scale and pace of the projects added pressure to the transportation system and undermined attempts to improve the sustainability of the city (United Nations, 2005) (Hannawi et al., 2019). In order to execute these plans quickly, decentralisation of urban development occurred in the early 2000s to different government-linked bodies, including the Road Transport Authority (RTA) and private real estate companies, which further reduced the integration of all projects happening simultaneously.

Figure 9: Al Khail Road. Source: The National

The development of residential areas also boomed due to the new legislation that allows non-nationals to own property on freehold and 99-year leases, with land ownership remaining with private companies (Elessawy, 2017). The flow of expatriate workers, rising cost of living, and rental prices in Dubai led to an urban sprawl to the nearby cities of Sharjah and Ajman which are

only 7 and 12 kilometres away from Dubai, respectively. This further increased vehicular traffic during peak hours and highlighted the need for more motorway development, including wider roads with more lanes and alternate roads. Additional arterial roads, such as Al Khail Road and Emirates Road, were built along the east-west direction, which were only vehicular high-speed roads acting as barriers to pedestrians (Fig. 9). This increased car dependency among residents in Dubai.

2.2.4 Present Scenario – Social Differentiation

After the global economic recession in 2008, urban development slowed down. By this time, a lot of infrastructure was already constructed. So, in the period following 2012, urban planning became more nuanced and started focusing on intricate issues such as fragmentation, public transport, liveability, society, etc. The later master plans reflected this focus including the 2020 and 2040 urban master plans.

This was the first time environmental; socioeconomic and sustainability challenges of future growth were addressed. Since the establishment of Dubai Metro in 2009, compact growth around the metro system was also envisioned, supported by integrated public transport and these key principles of the master plan included people, society, place and experience (Fig. 10) (Hannawi et al., 2019; More, 2017).

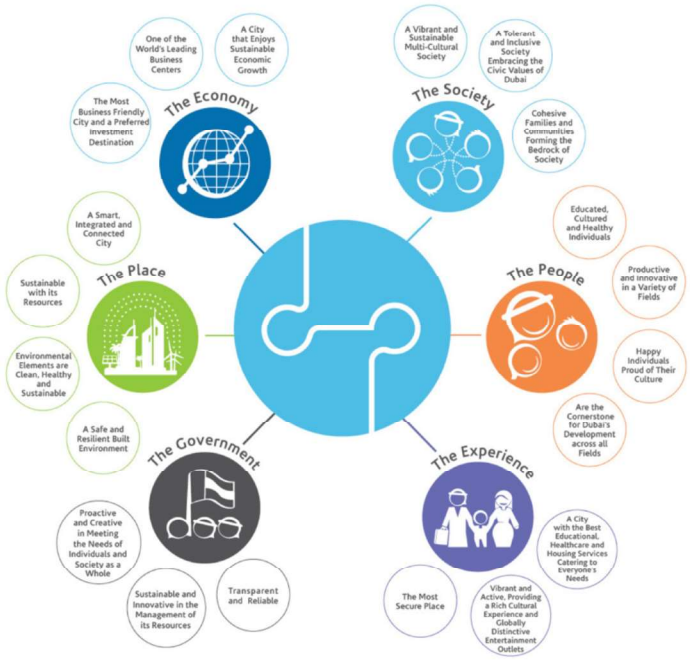


Figure 10: Six Theme's for Dubai's Vision, 2021. Source: Dubai Media office

The Dubai Urban Development Framework (DUDF) for 2020 and beyond focuses on an integrated city, addresses social sustainability and aims to improve liveability (Elsheshtawy, 2009: 117-118). It also aims to coordinate between the different developmental agencies that affect the built environment, like the Road and Transport Authority (RTA), the Ministries of Environment and Economy and the private sector, to improve the city's fragmented and splintered appearance.

Towards the end of the phase of rapid urbanisation, Dubai began to receive a lot of criticism about the nature of its development. Academics, journalists, critics and even residents started questioning the 'identity' and 'authenticity' of the city. Michele Acuto (Acuto, 2010: 282) argued that Dubai has no identity because of its rapid change, and one is left to wonder what Dubai really is, calling it a global city of 'non-places'. This makes one wonder what the culture and society of this place would mean. Culture and society are complex terms linked to the social structure. It is questionable if the city even has a social structure, or assuming it does like every other city, how solid and deep would this structure be?

Figure 11 depicts the Ethnic demographic distribution of the population in UAE. The UAE statistics centre does not publish data based on nationality. The data was collected from different country embassies (Snoj, 2017). A higher percentage of expatriates are from the nearby countries of India, Pakistan, Bangladesh, Philippines, Iran and Egypt. The social communities in UAE are often known by their ethnicities, namely South Asian, Filipino, Middle eastern, African, Emiratis

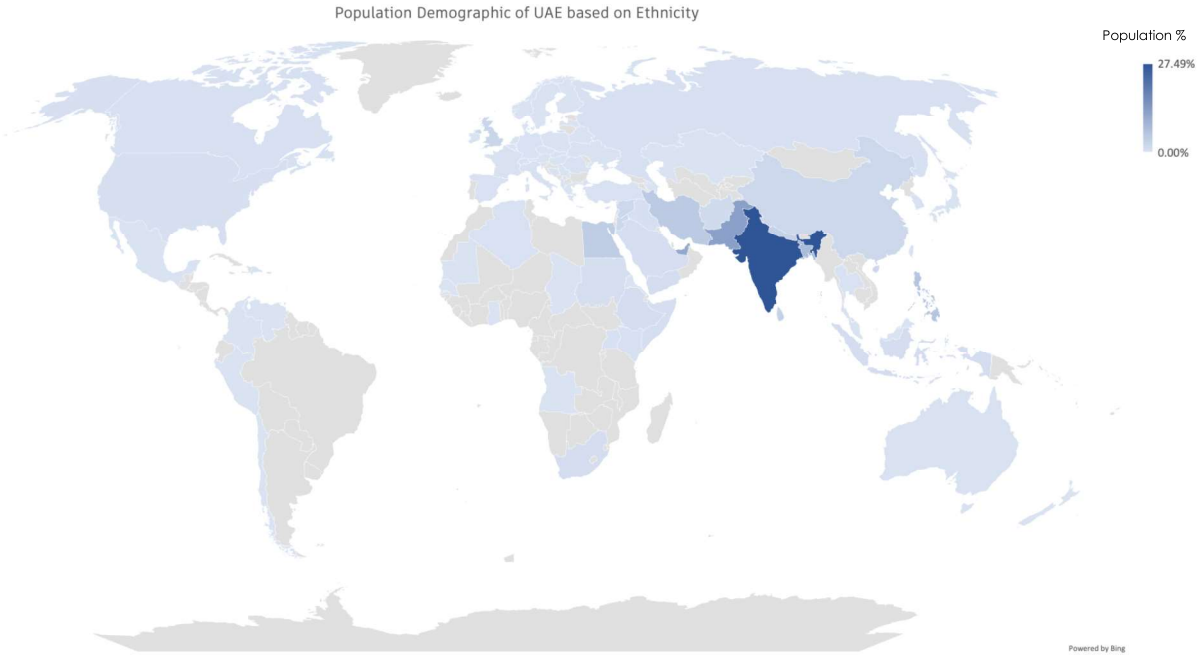


Figure 11: Map depicting population composition of UAE from different countries. Figure by author.

(nationals) and Western. Table 1 shows the accurate percentage of their populations and the countries they include. Figure 12 shows the growth of population and urban area discussed in the previous subsections.

Table 1: Table of Communities and their Population Percentage in UAE

Community	Nationality	Percentage of Population
Emirati	UAE	11.48%
South Asian	India, Pakistan, Bangladesh, Others	53.92%
Filipino	Philippines	5.56%
Middle Eastern	Iran, Egypt, Jordon, Others	18.11%
Western	UK, EU, America, Others	5.53%
African	South Africa, Ethiopia, Sudan, Others	5.27%

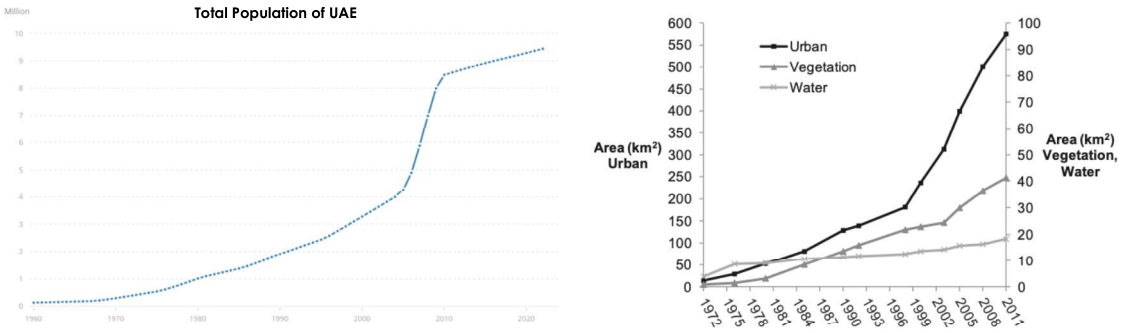


Figure 12: Graphs depicting total population growth and urban coverage over the years

2.3 RELATION BETWEEN SPATIAL MORPHOLOGY AND SOCIAL STRUCTURE

To understand the relationship between spatial networks and social disparity, it is necessary to adopt a more comprehensive relational and configurational perspective. In this regard, Space Syntax offers a theoretical and methodological approach to understanding space and society (Hillier and Hanson, 1984: 2). The relationship between space and society is so profound that the direct influence of space on society cannot be described. Space syntax argues that cities generate a 'potential field of probabilistic co-presence and encounters' also called the *virtual community* of co-presence (Hillier et al., 1986: 248) (Hillier, 1989: 11)

Bill Hillier and Julienne Hanson interpret functionalist sociologist, Emile Durkheim's, two fundamentally different principles of social solidarity, *organic solidarity* and *mechanical solidarity* (Durkheim, 1964). In organic solidarity, interdependence and interactivity brought about by the differentiation of individuals impose a collective identity on a group, and integrated streets play an important role in it. However, mechanical solidarity is characterised by similarities in belief and group structure and is profoundly spatial.

Hillier proposes, through the *theory of natural movement,* that the spatial network of the street configuration in itself produces *attraction inequalities*, which generate or restrict co-presence (Hillier et al., 1993). Further, with the theory of multiplier effect, Hillier (1999) suggests that the relocation of retail to areas with high levels of movement invites more and more movement as these areas draw land uses that profit from movement, like shops. This cycle then creates a multiplier effect, attracting additional varied usage to that area. According to this finding, land uses in cities are referred to be 'movement economies,' 'both adapting to and compounding its effects.' (Hillier and Leaman, 1973: 633) (Hillier, 1996: 170)

Hillier and Hanson (1987: 257) propose that the lack of a clear boundary and internal hierarchy of space allowed for the informal meeting of people, which strengthened community ties through their study of *Bethnal Green* in *East London* and the *West End* in *Boston*. Another study of ethnic marketplaces suggests that "of all opportunities in the public sphere, economic exchange is arguably the most important between migrant and host culture since, while it requires acquaintance and trust, it remains a rational transaction" (Vaughan, 2016: 36). More broadly, land-use diversity has been advocated to promote co-presence in cities.

Jane Jacobs (1961: 63) argues that heterogeneous land use enables different activities to take place at different times, affording greater opportunity for co-presence. The distinction between a *road* and a *street* is made clear. The *road* is uni-functional, existing for the single purpose of maximising vehicular movement. A *street*, on the other hand, is a concept of multi-functionality, a social space, in which movement channels are seen as public spaces that have a relationship with a variety of activities. Other authors like W. H. Whyte (1980), H. Lefebvre (1991), O. Newman (1974), and A. Coleman (1985) also write about how environments can be successfully designed to 'create life' and their beneficial social effects.

2.4 SPACE SYNTAX RESEARCH ON GCC CITIES

A study of Dubai's neighbouring city Abu Dhabi, focusing on space syntax methodology, revealed the inequality in connectivity for different social groups in the city (Zhand et al., 2022). As a result of the car-driven development strategy implemented in Abu Dhabi, wealthy Emiratis have benefited more than foreign workers who rely on the sparsely connected public transport (Fig. 14). Various studies by Mark David Major on the city of Doha show the transformation of the spatial strategy from random aggregation to one based on cultural intent, which depicts hierarchal separation by linear integration leading to social disparity (Major et al., 2019). A study of the ethnic souks also represents the importance of the dense, historic souks in the city centre as important public spaces for co-presence (Major and Tannous, 2020). Space syntax methodology has also been successfully used to devise improvement plans for the city of Jeddah, particularly for the socially segregated unplanned settlements (Karimi et al., 2007) (Karimi, 2012). The analysis of these GCC cities shows a similar pattern of growth to a vehicularly integrated network, leading to socially segregated lower-income immigrant workers and abandonment of the historic centre in new development plans (Fig. 13).

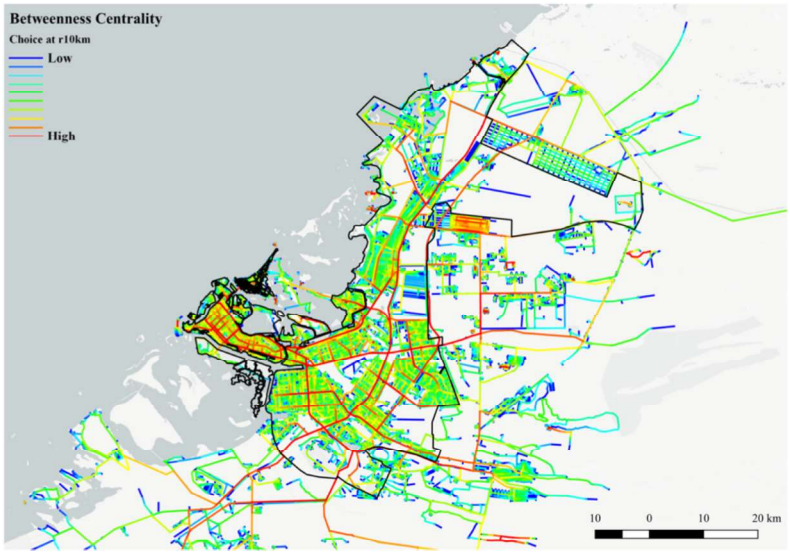


Figure 14: Global Integration model of Abu Dhabi showing highly integrated road network system

Figure 13: Global Integration model of Jeddah

CHAPTER 3

3.0 METHODOLOGY AND LIMITATIONS

3.1 METHODOLOGY

This chapter introduces the methodologies through which this research is conducted to answer the three research questions and through them, the overarching question. An overview of the type of methodologies used – quantitative and qualitative, the different variables and attributes are given along with the sourcing and preparation of different data sets. A schematic summary diagram of the methodologies shown in figure 15 shows that the study is divided into three parts. The first part in an extensive study of the historical evolution of the urban spatial morphology of Dubai. Building on the foundation of the different influences on urban planning from chapter 2, various historical evidence and documentary records are examined to understand the social makeup of Dubai and mapping them to find out the relation between the spatial configuration and the socio-economic structure. Once the socio-economic disparity is revealed, the second part of the study looks at the differentiation in connectivity between vehicle users and

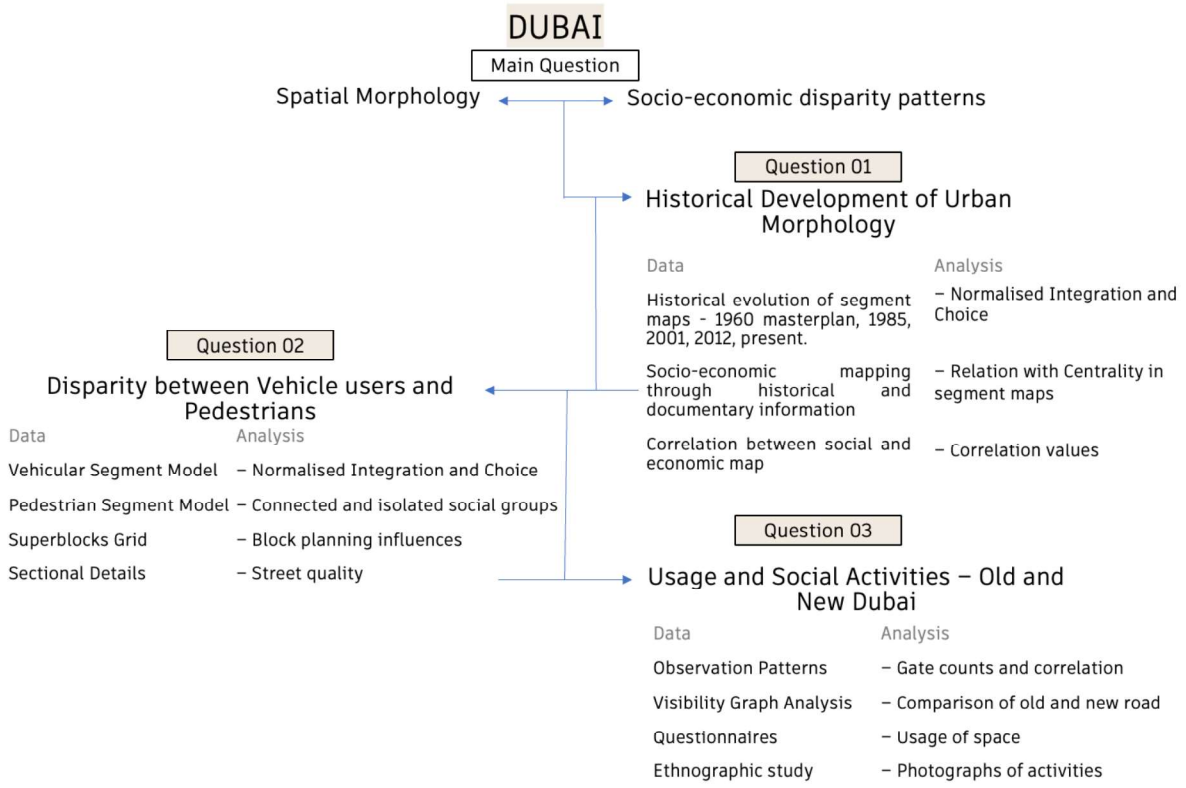


Figure 15: Schematic Diagram of Methodologies

pedestrians and the third part focuses on usage and social spaces on a micro scale of old and new Dubai along Sheikh Zayed Road. The brief description of the main methodological approaches is given below.

3.1.1 Development of Urban Morphology

In order to understand the social structure of Dubai in relation to its development, and the relative change in pervasive centrality, Angular Segment Analysis of the spatial configuration is performed using *DepthmapX*. The segment model for Dubai was generously provided by *Space Syntax Limited* and was updated by the author to incorporate the present changes and to extend its boundaries to the Sharjah emirate as the links are continuous. Historical maps of the 1960 masterplan, 1985, 2001 and 2012 were developed from the present model and using cartographic modelling by utilising the geo-referencing tools in QGIS and Google Earth Historic maps (Fig. 16). Angular segment analysis and the measures of integration and choice are explained in the next subsection.

Figure 16: Development of Spatial Configuration over the Years

The social makeup of Dubai is pieced together from different books, journal articles, census data and also from the grey area of literature, i.e., travellers' accounts and newspaper articles from the national papers of *Gulf News* and *Khaleej Times*. The economic differentiation of communities is also investigated from similar resources including rental prices, housing density, and housing conditions. Correlation and other statistical analyses are carried out using SPSS.

3.1.2 Vehicular and Pedestrian Models

From the above-mentioned current strategic plan of Dubai, a vehicular model which has only vehicular roads and no pedestrian bridges or walkways; and a pedestrian model which eliminates all motorways that do not have sidewalks, were created. Angular segment analysis uses

segments from one intersection to another and is calculated based on the least angular distance (Hillier and Iida, 2005). This is slightly different from the other two approaches of *metric* distance (measured distance) and *topological* distance (accounting for amounts of turns). The *least angular distance* is more relevant to how pedestrians and vehicles navigate in cities (Psarra et al., 2013: 260).

The attributes of 'integration' and 'choice' are used to capture to- and through-movement respectively. Integration refers to the connectivity of spaces by considering them as origins and destinations, in the sense that for every trip in the city, we start from one space and select all other spaces to go 'To' (Hillier and Iida, 2005: 491-492). The higher an integration value is for a segment, the more likely it is to become a destination within the spatial network. Choice measures the number of times we pass 'through' a series of segments on our routes between any pair of an origin and a destination. The higher the choice value of a segment, the more likely it is to be passed through on journeys.

Normalisation of angular choice (NACH) and integration (NAIN) measures were developed as they have the advantages of giving a profound understanding of the fundamental structure of urban forms and allowing comparisons between configurations of different sizes, be it in the same city or different cities (Hillier et al., 2012). The formulas used for normalisation are as shown below (Al_Sayed et al., 2014: 77-78).

$$NACH = logCH+1/logTD+3$$

$$NAIN = NC^{1.2}/TD$$

3.1.3 Superblocks and Sectional Details

These approaches were found imperative during the inductive process of this research. By studying the spatial morphology, the peculiar grid structures that are repetitive throughout the city and arranging community areas into superblocks can be noticed and a lot can be understood from their patterns. Sectional details are schematic for providing a more profound depiction of the scale, road and street quality of main segments.

3.1.4 Observation Study – Gate Counts and Photographs

The observation study included empirical data of pedestrian movement counts and a qualitative ethnographic study through photographs. Movement counts were recorded for 20 gates in Old Dubai and 14 gates in New Dubai over three hours for 2 days – a weekday and a weekend. Photographs were collected from various sources, primarily from the book *Dubai: Behind an Urban Spectacle*, social platforms, and others taken by the author during the field study.

3.1.5 Questionnaires

A short questionnaire investigating the usage of social spaces was carried out, and 22 responses were collected in the old Dubai and new Dubai areas, respectively. The questionnaire was answered by pedestrians during the field study and did not collect any personal data, keeping it exempt from ethics approval. Open-ended questions and the small quantity of the data set provided a qualitative understanding of the usage and social quality of the different spaces used in old and new Dubai.

3.2 LIMITATIONS

Among the many limitations of this research, the predominant ones include the availability of datasets, particularly social data. Many datasets that could have been beneficial to the study, like land use, community population, bus stop points, etc., were not openly available. Another important limitation is the season of study. Due to the harsh weather conditions, there are various seasonal differences in usage and activities in Dubai. It is important to understand this difference in usage during the winter, when outdoor spaces are more active, as compared to the extremely hot summers, where people avoid staying outdoors for most of the day. Unfortunately, the field study was conducted during the peak summer months. Finally, it is worth noting that the resolution of the segment model is such that it is relevant to a city-wide study. In this model, dual carriageways are represented by only one segment. A detailed model with higher resolution would be beneficial, especially while studying vehicular and pedestrian networks, but it is more time-consuming to produce.

CHAPTER 4

4.0 DEVELOPMENT OF URBAN MORPHOLOGY

4.1 The Period of Slow and Compact Growth – 1955 - 1980

According to the literature assessment, there were three densely populated localities in 1955: Al Shindagha, Dubai, and Deira. (Fig. 18). It is important to note that these areas were distinct nuclei for growth with pre-existing social divisions. Al Shindagha area housed the former residence of the ruling family with 250 houses of exclusively Arab residents; Deira had more residential and commercial development with 1600 houses and 350 *suq* shops with Arab, Persian, and Baluchi inhabitants; and Dubai was the smallest settlement with 200 houses and 50 *suq* shops composed of Persian and Indian merchants (Erhard, 1987) (Pacione, 2005: 259-260) (Fig. 17).

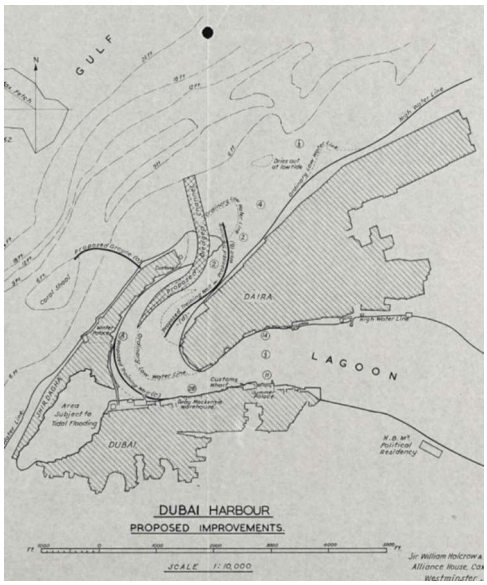


Figure 18(left): Map showing Al Shindagha, Deira and Dubai Settlements. Figure by Julian Walker. Source: Arabian Gulf Digital Archive

Figure 17(right): An Aerial Shot of Dubai in 1950. Figure Modified by Author. Source: Gulf News Archive

This polycentric settlement shows that while Al Shindagha represented an administrative and residential complex with only a native population, Deira and Dubai had inner social cohesion between different ethnic groups with commercial and adjacent residential quarters. Commercial areas are centres that have the potential for the co-presence of diverse communities. An article published in *National Geographic in* 1956 highlighted the co-existence of various nationalities,

including Arabs, Iranians, Baluchis, Africans, Pakistanis, and Indians, in the traditional marketplace, which consisted of open-fronted shops selling fabrics and some articles spread out on the floor (Codrai, 1956: 68) (Fig. 19 and 20). A travelogue also mentions that the city closed when moving from the *souq* area to the residential complex. The narrow pathways were arranged like a labyrinth, with hidden inner courtyards and rooftops connected by plank bridges (Headley, 1958: 258) (Elsheshtawy, 2009: 70). This kind of arrangement could be influenced by the climatic conditions in the Middle East, as seen in other historical examples, including one of the earliest settlements of *Çatalhöyük* which features closely arranged residential blocks with rooftop connections.

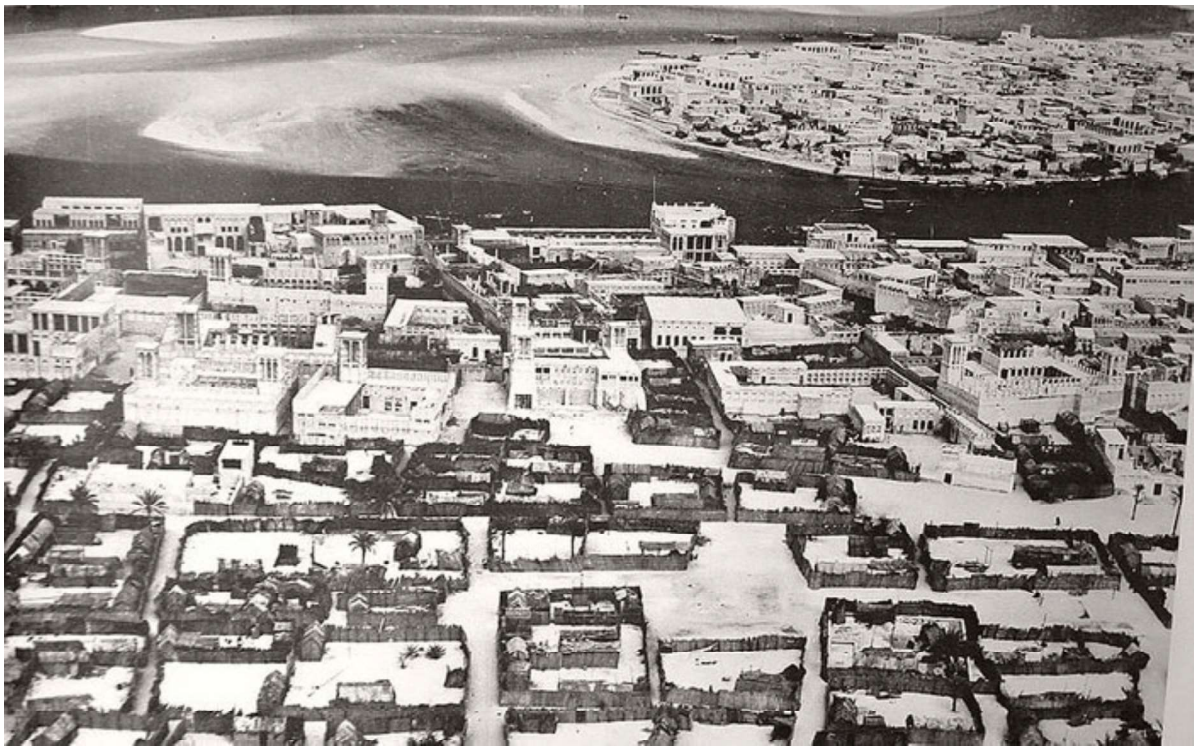


Figure 21: An Aerial Shot of the Dubai Region in 1950. Source: Dubai Culture and Arts Authority

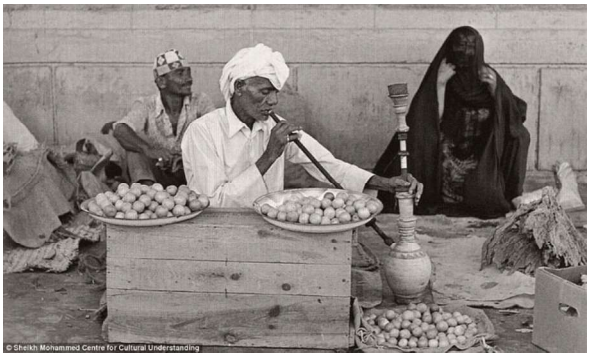


Figure 19: A man selling dried herbs and lemon. Figure by Sheikh Mohammed Centre for Cultural Understanding, 1960.

Figure 20: An open market in downtown Dubai, 1960. Figure by Sheikh Mohammed Centre for Cultural Understanding

The primary aim of the first master plan in 1960 was to develop road networks and connect the east to the west. As the plan shows, it was a compact plan in a radial pattern from the existing centres (Fig. 22). Residential planning was more spacious, with generous public space. But there is no information as to who these developments target. Since the expansion is on the periphery of the Deira and Dubai nuclei, it can be assumed that it is for the expansion of these residential areas. However, it is unlikely that Al Shindagha, which houses the natives and the ruling family, would be neglected.

Figure 22: John R. Harris' First Masterplan of Dubai from 1960showing radial pattern.

Figure modified by author

Figure 23: An Aerial Shot of Dubai Creek in the 1960s. Photograph by Ramesh Shukla

Source: Gulf News Archive

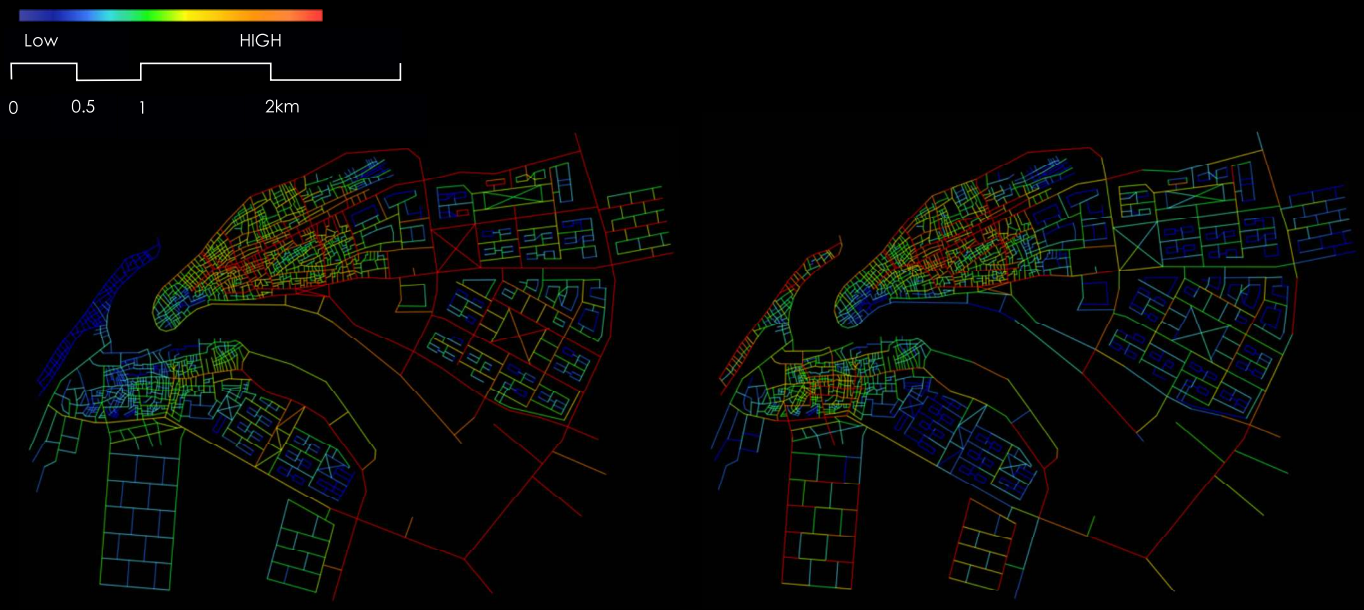


Figure 25: Closeness Centrality [Integration], Angular Segment Analysis in metric radius N, NAIN rN

Figure 24: Closeness Centrality [Integration], Angular Segment Analysis in metric radius 800, NAIN r800

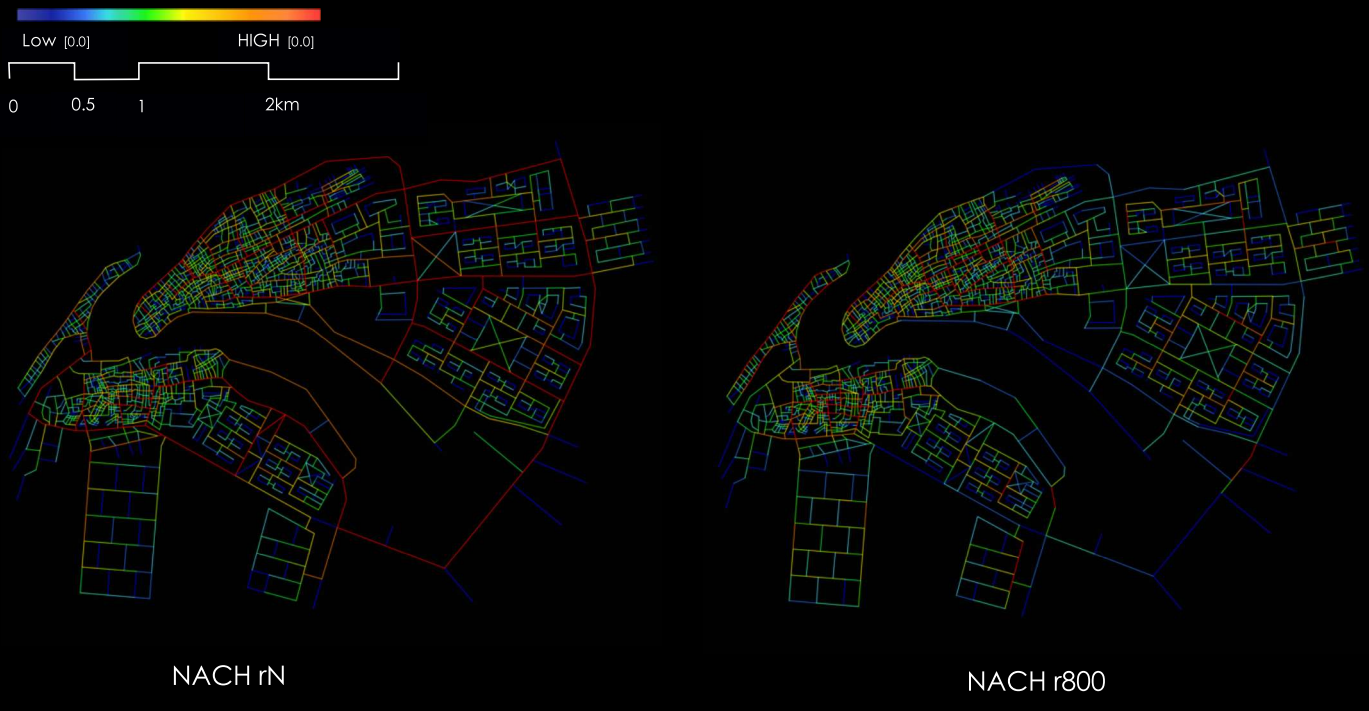


Figure 26: Betweeness Centrality [Choice], Angular Segment Analysis in metric radius N, NACH rN

Figure 27: Betweeness Centrality [Choice], Angular Segment Analysis in metric radius 800, NACH r800

Hillier and Vinicius Netto (2002: 182) advocate that a city is ordered according to how a culture seeks to restrain or generate co-presence. They propose that a city is composed of two broadly different spatial elements, *foreground and background networks*. The *foreground network* is generative in nature, driven by micro-economic activity, which seeks to maximise movement and co-presence, and the *background network* is conservative, driven by socio-cultural residential processes, which typically seek to diffuse and structure movement in the image of cultural ideas. This concept is also called the *generic city* (Hillier, 2016: 200). The closeness centrality model and betweenness centrality model on a global scale highlights the new system of roads with residential areas in the background network. However, in a radius of 800, local centres of Deira and Dubai are identified as activity cores (Fig. 24-27).

The master plan prepared post-oil discovery in 1971 was a more ambitious plan with more development in a radial pattern with the creek acting as a nucleus (Nassar et al., 2014: 54-55). It envisioned ring roads in a radial network to the suburbs, the Shindagha tunnel beneath the creek, and the construction of an additional Garhoud bridge, thus better linking city districts on a

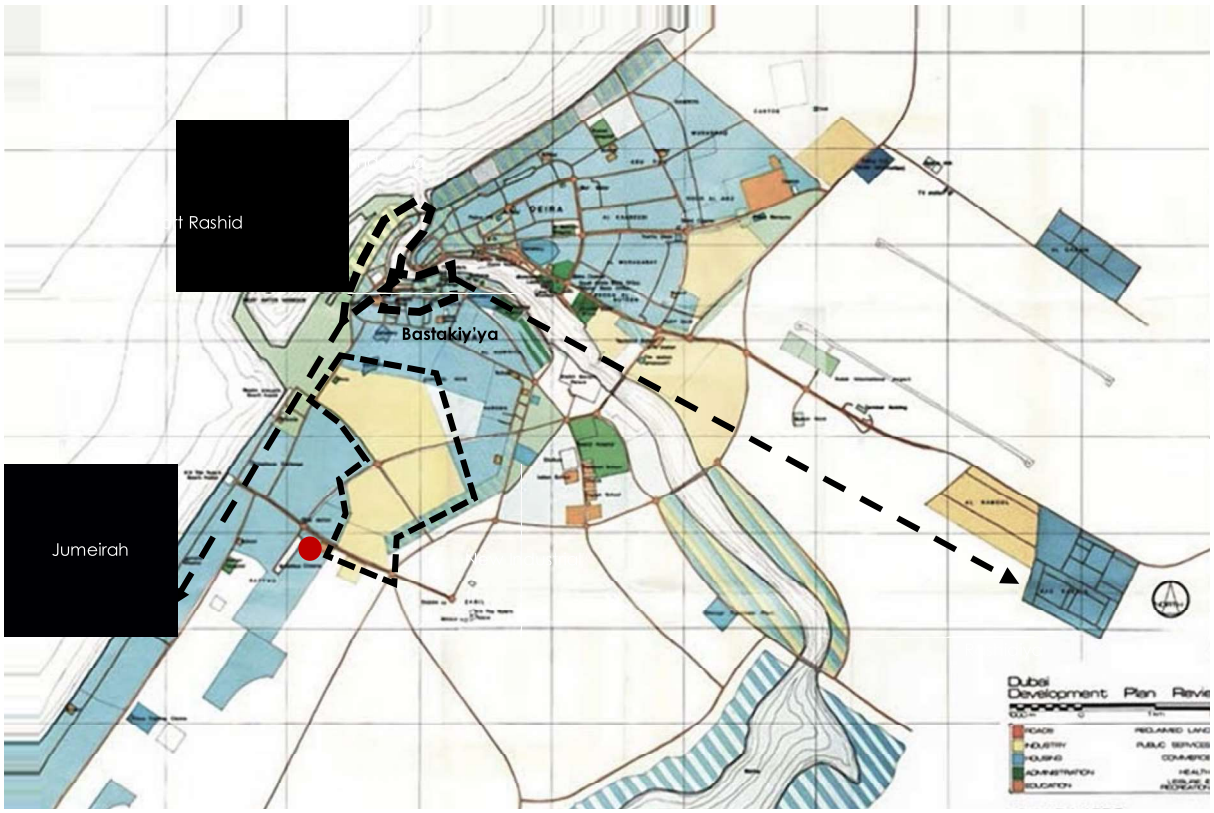


Figure 28: John R. Harris' Second Master Plan from 1971 highlighting changes. Figure Modified by Autho

whole and the significant expansion of residential areas to the west. It also included zoning for different land uses with the initiation of port and industrial activities. Planning industrial land use next to the newly established Port Rashid is reasonable. However, this industrial area consumes an integral part of the city and separates the old Dubai from the 'new Dubai.' Together with plans to relocate the Emirati population from Al Shindagha to new developments in Jumeirah, this spatial intervention can be assumed to be a step toward social demarcation.

Figure 29: Dubai World Trade Centre After Completion. Figure by Gulf News Archive

Al Shindagha at this period was considered 'primitive', old, and crammed in between the new port development and the dense settlement of encroaching low-income expatriates (Elsheshtawy, 2009: 73-78). Jumeirah area was being developed for spacious residential villas for locals and important expatriate officials, which also aligned with the 'new Dubai', marked by the Dubai World Trade Centre (Fig. 29). It was the first modern high-rise building in the area, designed by British architect John R. Harris. However, there was also a small area of low-income communities adjacent to Jumeirah, that lived in small huts. This contrast between 'rich mansions' and 'miserable shacks' was described by a British travel writer in the 1970s (Raban, 1979: 194) (Fig. 31 and 32).

Figure 32 (right): Satwa in 1976. Source: http://www.boxnewsbox.com/unseen-pictures-of-dubai-in-50s-60s/13/

Figure 31 (left): Jumeirah Beach Road in 1970. Source: https://www.dubaiasitusedtobe.net/

Another significant change can be seen in Bastakiy'ya, which accommodated some of the local population along with wealthy merchants. Some stories documented from the area suggest that it was socially segregated from the others with a distinct merchant community and also due to its distinct architectural features, which include the traditional wind towers (Fig. 30). Due to the conservative nature of their ancestral lineage and the Muslim culture, women were not allowed in specific public congregation spaces along with men, including mosques, which are integral public places. However, Bastakiy'ya's relative isolation allowed women to swim in the creek on certain days. Some stories also depict the protective nature of the youth, who defended the women from flirty men in the surrounding regions (Wheeler and Thuysbaert, 2005).

Figure 30: A Detoriating Wind Tower Used for Drying Clothes. Source: Dubai: Behind an Urban Spectacle

In the 1970s, many residents left Bastakiy'ya to move to newly developed suburbs in Rashidiya, which offered great space and more privacy (Fig. 28). Subsequently, the old merchant houses started to deteriorate and became a refuge for squatters and low-income labourers (Elsheshtawy, 2009: 78). The single labourers often lived in crowded conditions, also dividing the rooms using partitions that further damaged these houses, leading this area to be perceived as a 'decaying slum'. An attempt to improve the area and the plans for extending the ruler's office led to the demolition of many houses. Even though the potential for commercialising oil was found at this time, the boom that transpired in terms of economic and infrastructural development was unforeseen by the Arabs.

4.2 Development During the Boom – 1980 -2012

Towards the beginning of 1980, the Jebel Ali port was established on the west end of Dubai. The location was carefully selected based on the geographical conditions that are beneficial for port activities (Ramos, 2016). This acted as a new nucleus (Fig. 37) for urban growth and was called 'Jebel Ali New Town' which would subsequently bring residential developments for the working class of the new port. As mentioned earlier, Jumeirah was also slowly developing on modern lines. The normalised global integration model [NAIN rN] of 1985 shows that these areas are segregated and far from being integral to the network (Fig. 37).

The global integration model highlights the connectivity of the Deira region (Fig. 38). Although, land use data is not available to back this, it reflects Deira's status as the central business district (CBD) of Dubai in the 1980s (Boussaa, 2003). As a part of revamping the CBD, modern buildings were developed along the waterfront and major roads for banking and financial sectors while still retaining the markets, souqs and dense residential quarters in the background network with Iranian, Baluchi, Pakistani and Indian demographics (Elsheshtawy, 2009). The normalised global choice model [NACH rN] also shows high accessibility in Deira, with good potential in the road networks of new Dubai (Fig. 39).

Meanwhile, the historic centre of Dubai was relatively densifying with South Asian, Filipino and Arab populations, and areas abandoned by Emiratis were either getting dilapidated or being redeveloped for other land uses (Elsheshtawy, 2009). Realising the loss of cultural identity by adopting a global and modern architectural and urban style, revival of Bastakiy'ya was planned. The old houses were conserved and many of the demolished ones were rebuild. However, this

revival was only architectural. The urban character of the area which included inherent spatial cultures was lost. The new Bastakiy'ya was desolate with few wandering tourists. Now managed by Dubai Culture and Arts Authority, Bastakiy'ya holds upscale souqs on weekends, but in a manner that evocates high-end shopping. This does not integrate with the surrounding old Dubai and creates a perceived barrier. Elsheshtawy believes that this is done to protect the area in a manner that is precious and not tainted by the surrounding (Elsheshtawy, 2009: 77-78).

Figure 34: Transformation of Deira during the boom. Source: https://www.atchuup.com/dubai-in-1950s/

Figure 33: Transformation of Sheikh Zayed Road during the boom. Source: Gulf News Archive

Figure 36: Transformation of Bastakiy'ya from demolition to rebuilding

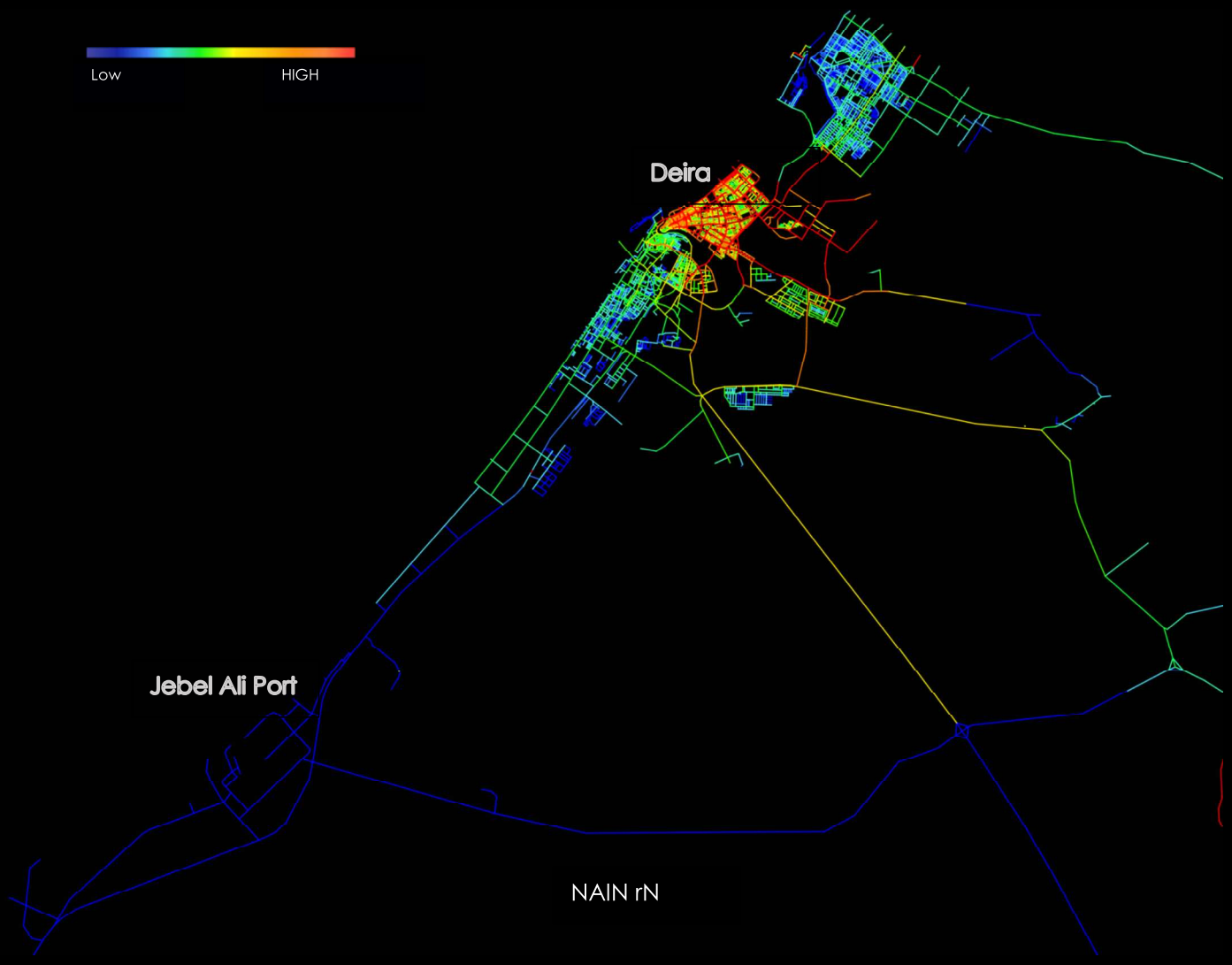
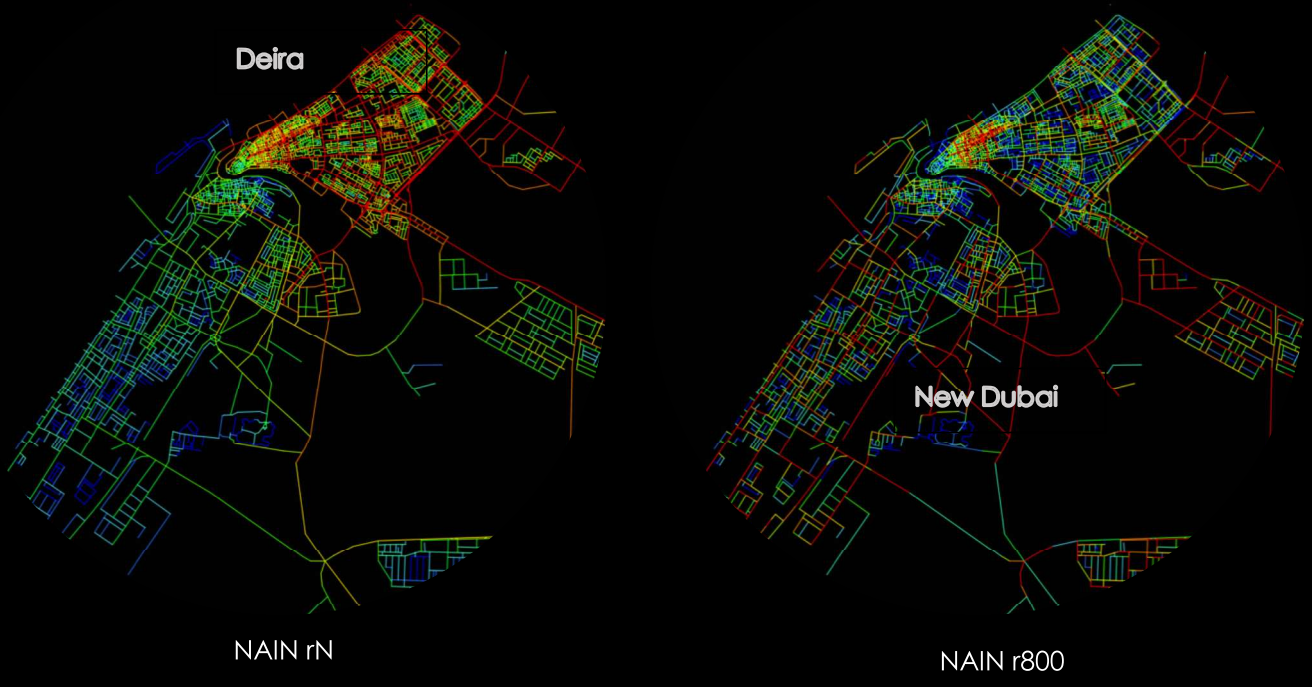


Figure 37: Closeness Centrality [Integration], Angular Segment Analysis in metric radius N, NAIN rN for Dubai in 1985

Figure 38:Angular Segment Analysis depicting Integration, NAIN rN(left) and NAIN r800 (right) for Dubai in 1985



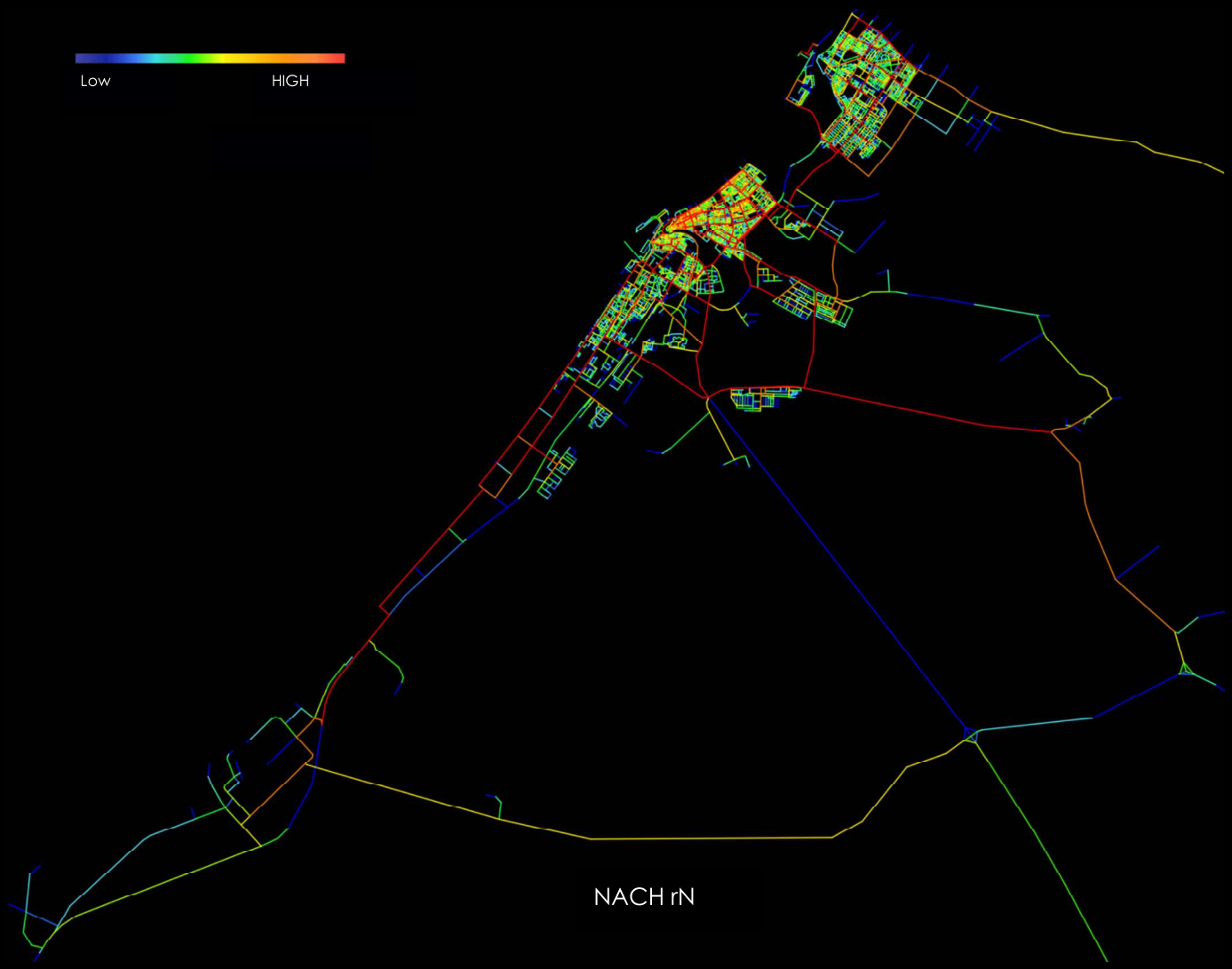
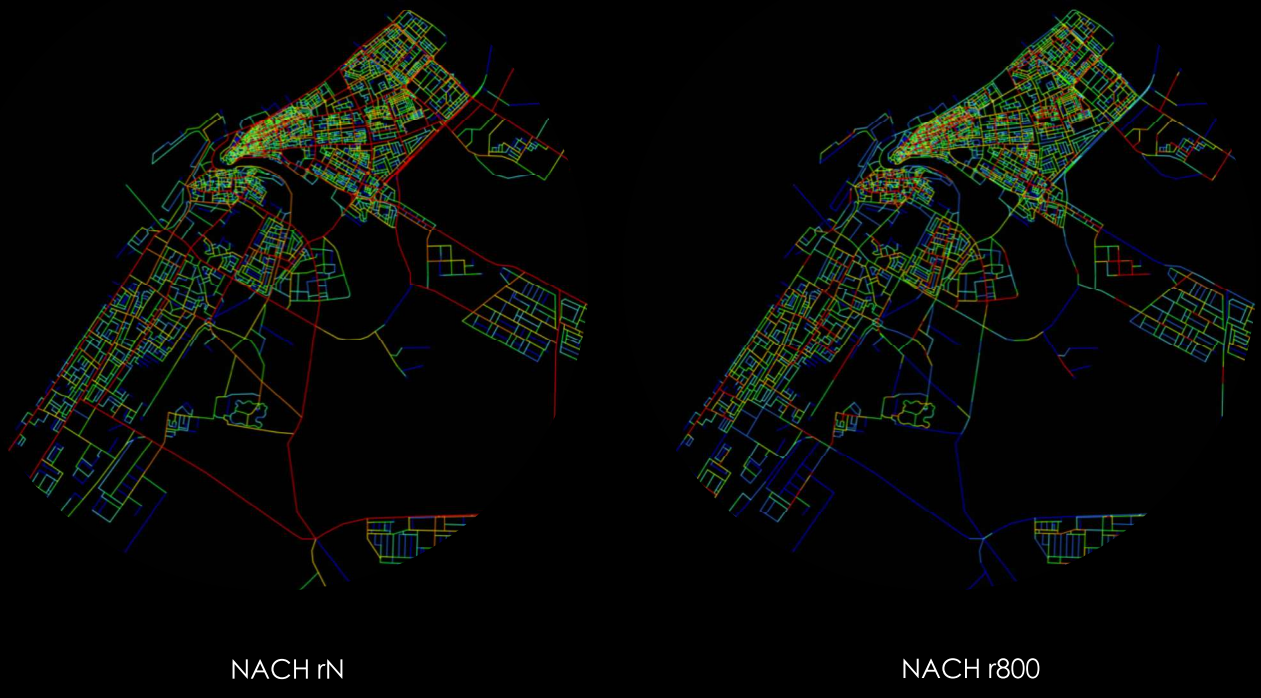


Figure 39: Betweenness Centrality [Choice], Angular Segment Analysis in metric radius N, NACH rN for Dubai in 1985

Figure 40: Angular Segment Analysis depicting choice, NACH rN(left) and NACH r800 for Dubai in 1985



In the 1990s, Sheikh Zayed Road became the major growth corridor by connecting Jebel Ali in the west end to the historic centre in the east. High-rise office and hotel buildings came up along the road to the west, starting from the Dubai World Trade Centre. The residences in these buildings and adjacent developments could only be afforded by middle-high-income expatriates of mixed ethnicities. It was during this period that the development began to be called 'iconic' featuring the Emirates towers, Burj Al Arab, Burj Khalifa and Palm Island as isolated developments between deserted land. The normalised global integration model [NAIN rN] in 2001 shows the centrality growing from the historic centre along the major arterial roads including Sheikh Zayed Road and the emergence of peripheral developments such as Ras al Khor and Rashidiya which are comparatively segregated (Fig. 41).

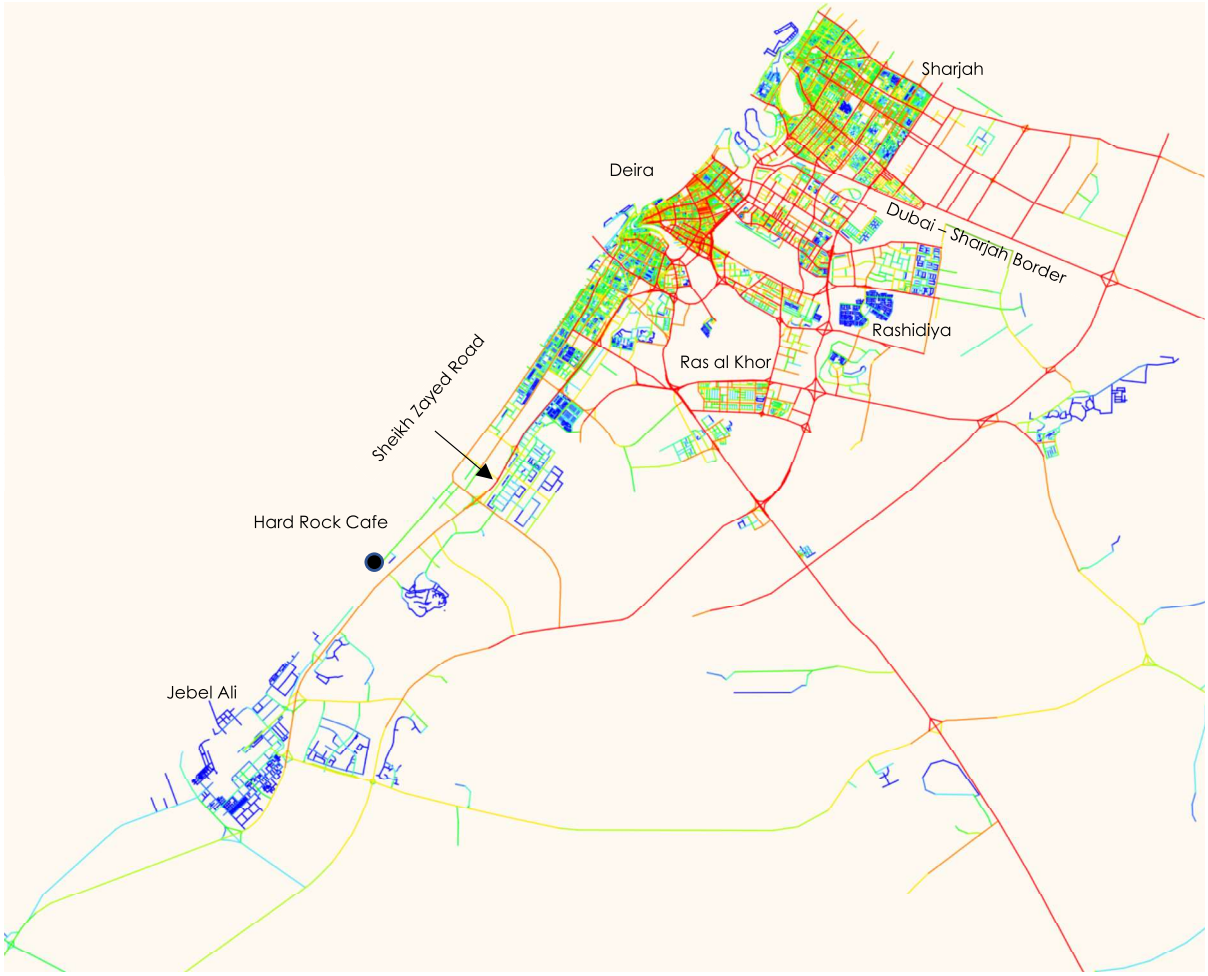


Figure 41: Closeness Centrality [Integration], NAIN rN for Dubai in 2001

The establishment of Hard Rock Café in 1996 was the marking of a new Western (European and American) community nucleus (Fig. 41). Hard Rock Café was a chain bar restaurant founded in London. In Dubai, it became a cultural symbol, characterised by two huge, crossed Guitars in

front and a vital gathering space on Sheikh Zayed Road (Fig. 42). At that time, it was on the outskirts of the city and nothing much was developed around it. Later, the Dubai Internet City containing IT companies, American University and Dubai Marina, a luxurious water-front development started developing (Fig. 43) (Elsheshtawy, 2009: 102).

Figure 42: Old Hard Rock Cafe in Sheikh Zayed Road in 2000s. Source: The National

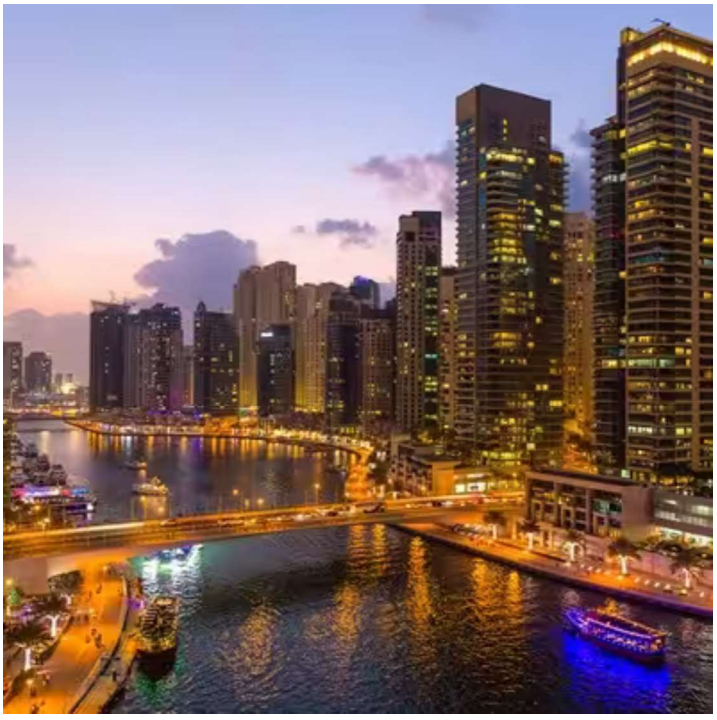


Figure 43: Dubai Marina Development in the present

While the master plans were focused on improving the economy by utilising the commercial benefits of petroleum, most of the development targeted middle to high-income expatriates. However, there grew a demand for lower-income expatriates for the construction and maintenance sector. The influx of expatriates, the rising cost of living, and rental prices in Dubai led to urban sprawl in the nearby cities of Sharjah and Ajman. The integration model of 2001 shows a strengthened foreground network towards Sharjah. The growth of global betweenness centrality (choice) is also attributed to the introduction of new motorways due to the increase in vehicular traffic during peak hours as an effect of growth and urban sprawl. The radial pattern of development in Deira was restricted by the airport, adjacent industrial activities and the political boundary between Dubai and Sharjah. The pattern transformed into a grid network towards the northeast (Fig. 44).

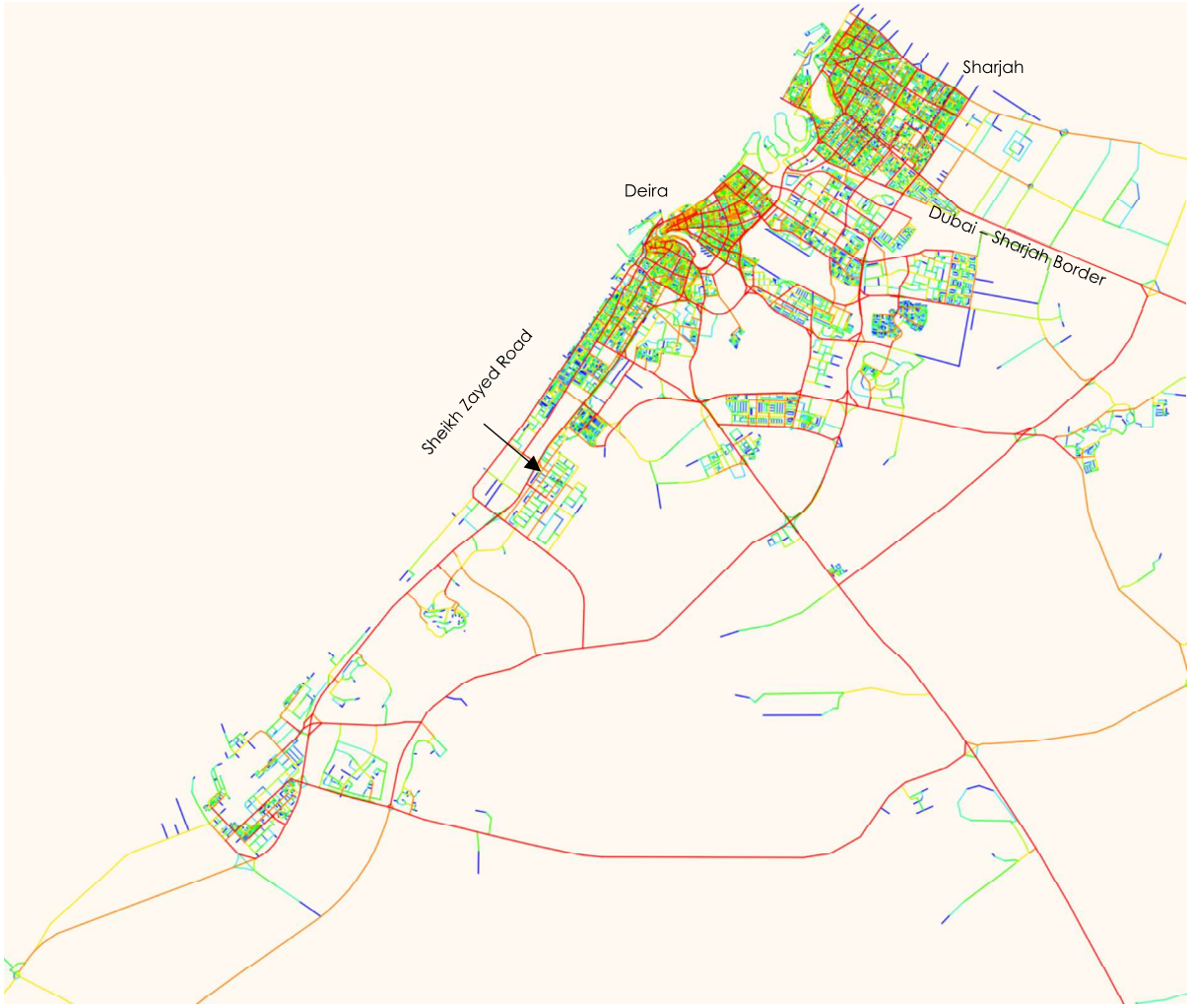
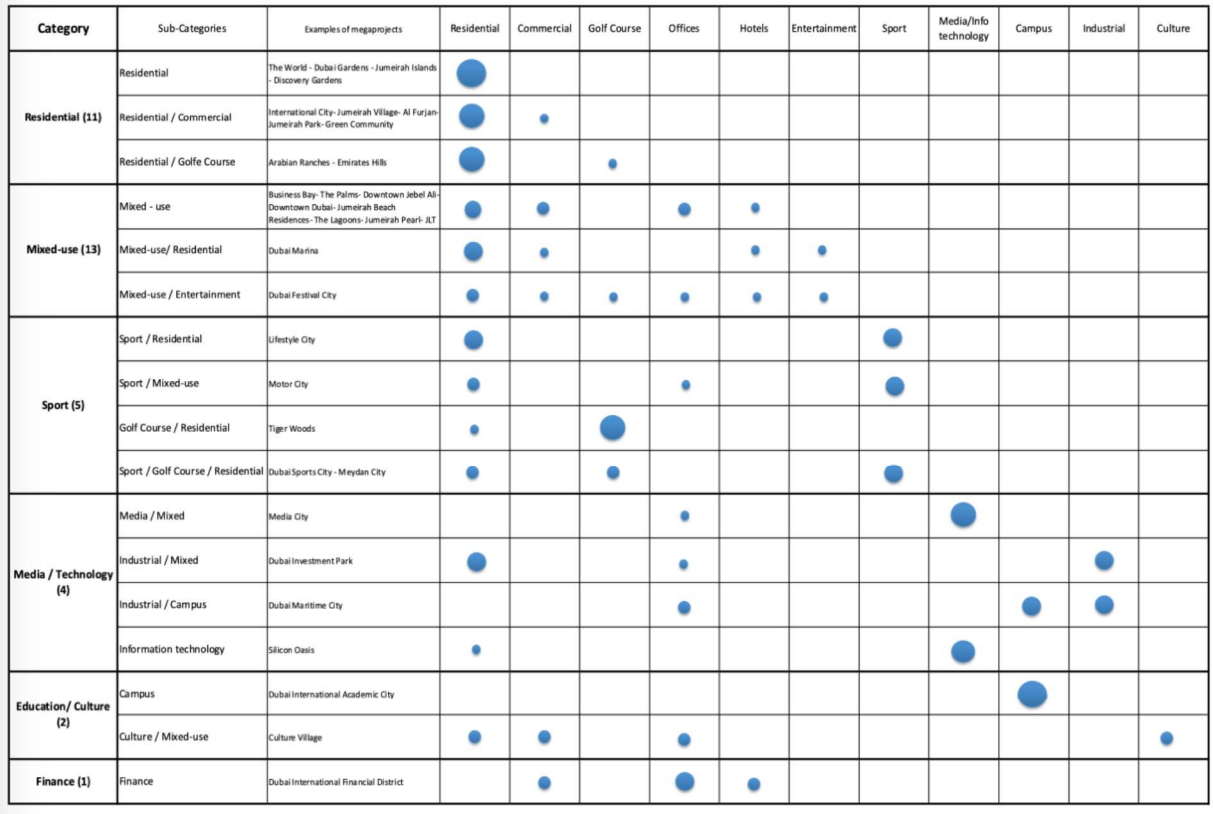


Figure 44: Betweenness Centrality [Choice], NACH rN for Dubai in 2001

The next phase of rapid growth was characterised by the Dubai Urban Area Strategic Plan 1993–2012 which included many Urban Mega Projects (UMPs) also called 'cities within cities'. There were blocks that prioritised one land use, with its adjacent commercial and residential allocations (Fig. 45) (Aoun, 2016: 117-118). Despite all the UMPS being connected to the foreground network of high-speed vehicular roads, their super grid morphology internalised the integration within blocks which is explained in the next chapter. On a global scale, the integration model highlights the vehicular roads, but on a radius of 1200, the integrated local centres are within blocks (Fig. 46)



Category	Sub-Categories	Examples of megaprojects	Residential	Commercial	Golf Course	Offices	Hotels	Entertainment	Sport	Media/Info technology	Campus	Industrial	Culture
Residential (11)	Residential	The World - Dubai Gardens - Jumeirah Islands - Discovery Gardens	●										
	Residential / Commercial	International City- Jumeirah Village- Al Furjan- Jumeirah Park- Green Community	●	●									
	Residential / Golfe Course	Arabian Ranches - Emirates Hills	●		●								
Mixed-use (13)	Mixed - use	Business Bay- The Palms- Downtown Jebel Ali- Downtown Dubai- Jumeirah Beach Residences- The Lagoons- Jumeirah Pearl- JLT	●	●		●	●						
	Mixed-use/ Residential	Dubai Marina	●	●			●	●					
	Mixed-use / Entertainment	Dubai Festival City	●	●	●	●	●	●					
Sport (5)	Sport / Residential	Lifestyle City	●						●				
	Sport / Mixed-use	Motor City	●			●			●				
	Golf Course / Residential	Tiger Woods	●		●								
	Sport / Golf Course / Residential	Dubai Sports City - Meydan City	●		●				●				
Media / Technology (4)	Media / Mixed	Media City				●				●			
	Industrial / Mixed	Dubai Investment Park	●			●						●	
	Industrial / Campus	Dubai Maritime City				●					●	●	
	Information technology	Silicon Oasis	●							●			
Education/ Culture (2)	Campus	Dubai International Academic City									●		
	Culture / Mixed-use	Culture Village	●	●		●							●
Finance (1)	Finance	Dubai International Financial District		●		●	●						

Figure 45: Distribution of land uses in surveyed Megaprojects.

Elsheshtawy argues that this 'boom' can only be described as 'transient' as many residents believe that these developments were not geared for them, and that the entire city was being created or remodelled for foreigners. Political scientists also believed that it was good for the city to slow down and preserve its identity. According to Richard Sennett, this decreased liveability, fostering no sense of attachment (Alawadi, 2017) (Sennett, 2021: 293).

The structure plan suggested that residential areas around Ras Al Khor, Jumeirah and Um Sequim have a 75:25 local/expatriate mix and also suggests that nationals should be encouraged to re-locate to inner-city areas such as Satwa and Al Hamriya to avoid their suburbanisation.

Figure 46: Closeness Centrality [Integration], NAIN rN for Dubai in 2012

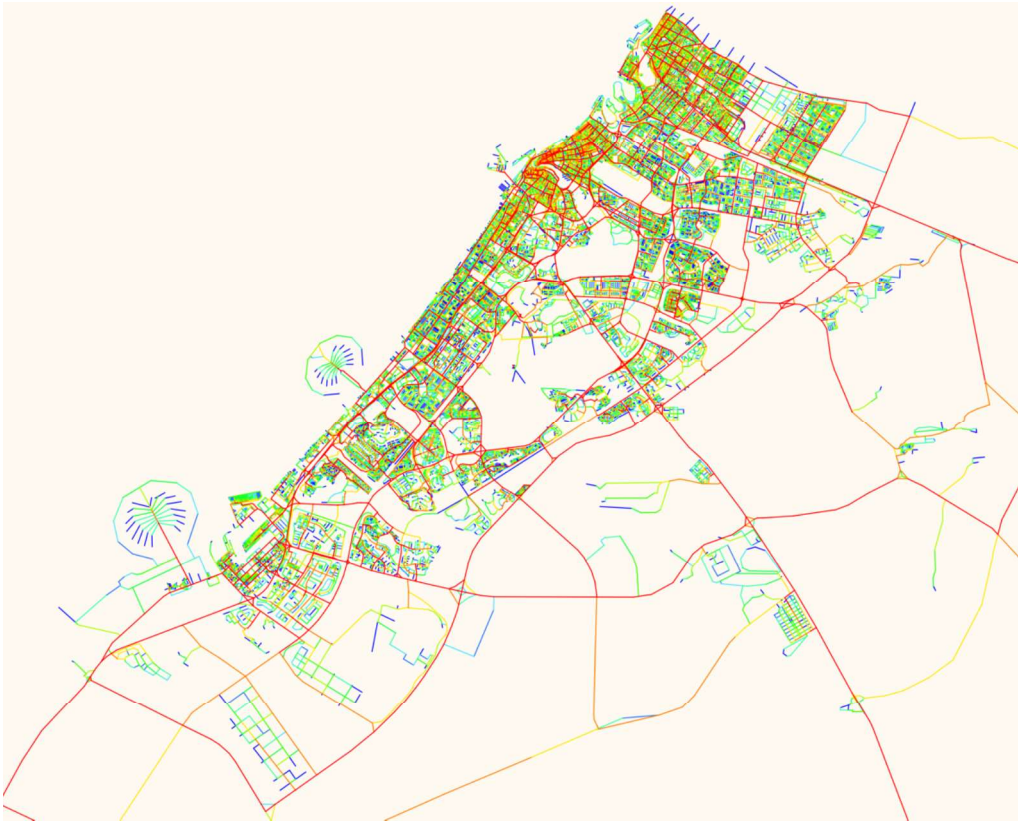


Figure 47: Betweenness Centrality [Choice], NACH rN for Dubai in 2012

It is considered by the urban strategy report as an ‘unhealthy trend which alienates nationals from their own city’ (Municipality, 1995: 115). Plans were made to completely demolish Satwa, now sandwiched in between the luxurious Trade Centre stretch and Jumeirah. This was to be replaced by an upscale residential complex called ‘Jumeirah Garden’ (Fig. 48). However, due to the economic recession and resistance from the residents, the project is yet to commence.

The newer developments had a mix of middle to wealthier populations of mixed ethnicities, usually people living to be closer to work or other services. Al Quoz industrial area was an exception within the new development where lower-income people lived adjacent to industrial activity. The integration and choice models show that peripheral developments and new luxury residential areas were more segregated, and the centrality shifted from the historic centre to the vehicular network. However, there seems to be a certain harmony in the co-existence of communities in the historic centre comprising mainly male population and street activity, especially around Nasser Square which was an important and possibly the only public square during that period (Fig. 49).

Figure 48: Jumeirah Gardens master plan, by Meraas real estate development. Source: Meraas

Figure 49: Al Nasser Square in 1990. Source: Gulf News Archive

4.3 Social Demographic of the Present

The city developed extensively from the period of 2001 – 2012 and then the scale of development reduced and shifted to infill pattern and densification. This section tries to understand where the different socio-economic demographics reside in Dubai currently based on the evidence collected from above mentioned historical records and other literature and map them intuitively. A spatial model of economic classification produced by Elsheshtawy is also used to support this. (Fig. 50). This classification was based on a few factors including density, housing conditions, land use, and character of population.

Figure 50: Map of economic classification in Old Dubai. Source: Dubai: Behind and Urban Spectacle

Most part of the historic centre on the west of the creek, now called Bur Dubai, is occupied by South Asians (Indians, Pakistanis, and Bangladeshis) and Filipinos, although the former dominate. Areas from Deira to Sharjah, including Al Nahda, and Al Qusais are mainly composed of South Asian communities. The trade centre area (Dubai International Financial Centre) is occupied by mixed ethnic communities of middle-to-low-income populations. Towards the west, a dominant European population can be seen in Internet City, Dubai marina area. Adjacent to it, Al Barsha has South Asian, Filipino, African, and Egyptian communities. The Al Quoz industrial area also has many South Asian and African communities. Further to the west, Discovery Garden, Investment Park and Jebel Ali have mixed populations. The peripheries have an Emirati

population in Rashidiya, Al Khawaneej, Al Warqa and Emirates Hills. There is a high Western population in Dubai Hills, Emirates Hills, and Al Barari. There are also mixed and middle-class South Asian populations in the peripheral International City and Silicon Oasis. Low-income groups live in the peripheral areas by partitioning houses and sharing rooms (Fig. 51 and 52).

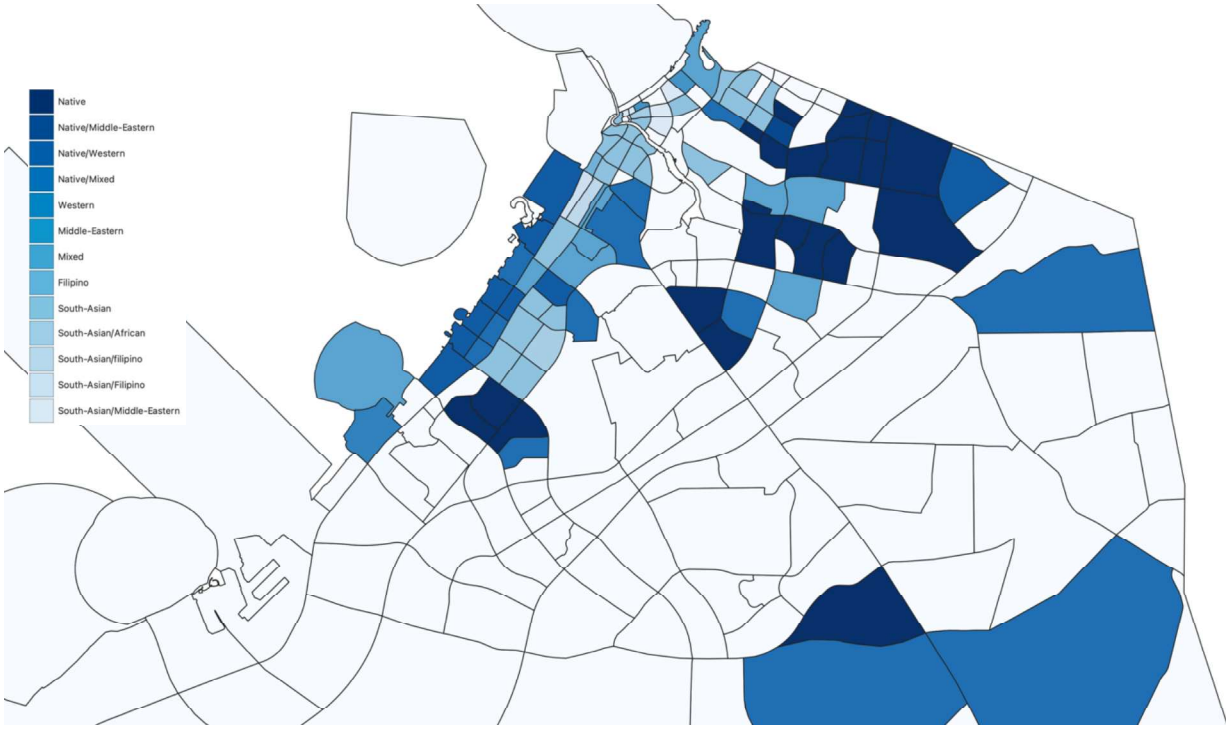


Figure 51: Classification of areas based on ethnic communities

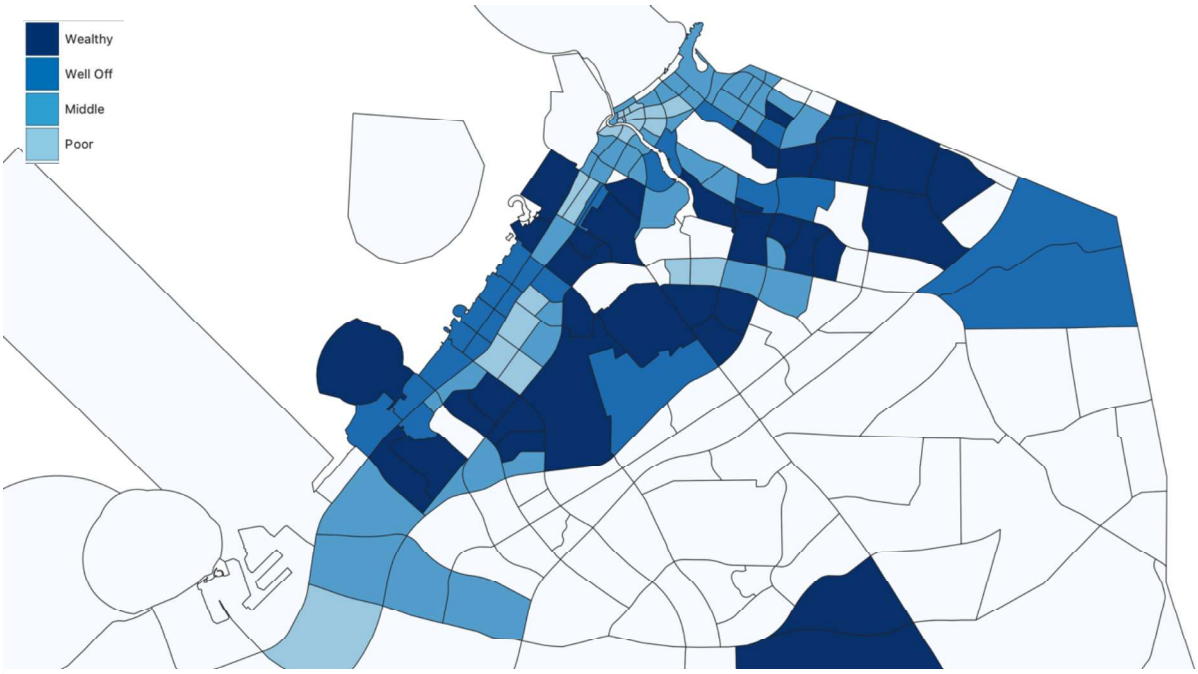


Figure 52: Classification of areas based on economic status

Even though housing needs for low-income expatriates have been discussed, the problem has not been addressed by policymakers. Amendments in the law prohibit low-income expatriates from sponsoring visas for their families, hence leading to a considerable increase in single-person accommodation. The state has not made any provisions for this, leaving it in the hands of the private developers, who have also not addressed it. This has led to a lot of partitioned residences and room sharing, with denser living conditions.

Figure 53: Closeness Centrality [Integration], NAIN rN for Dubai in the present

The normalised global integration model in the present is much like the model in 2012, except that areas have densified (Fig. 53). By analysing it with the economic and ethnicity classification, it can be interestingly noted that the highly connected areas are home to low and middle-income populations of South Asians, Filipinos, and Middle-Easterners, with the exceptions of areas like Rashidiya and Jumeriah which were developed during the 1970s and therefore have a different grid pattern (further discussed in the next chapter). The segregated peripheral areas and new developments, which have a very internal, segregated pattern only connected to the whole configuration by highly integrated vehicular roads externally are mostly occupied by wealthy Emirati or Western population, who often prefer privacy and spacious residential areas (Fig. 54). To substantiate the pattern of correlation between economic and ethnic classifications, hypothetical values were assigned to ethnic classes and a high correlation was found between

Emirati-wealthy; western-well off; and South Asian/Filipino–middle/poor combinations (Fig. 55). However, considering that the global model highlights the major motorways, it is questionable how the city would be accessible to someone who does not own or cannot afford a private vehicle which will be discussed in the next chapter.

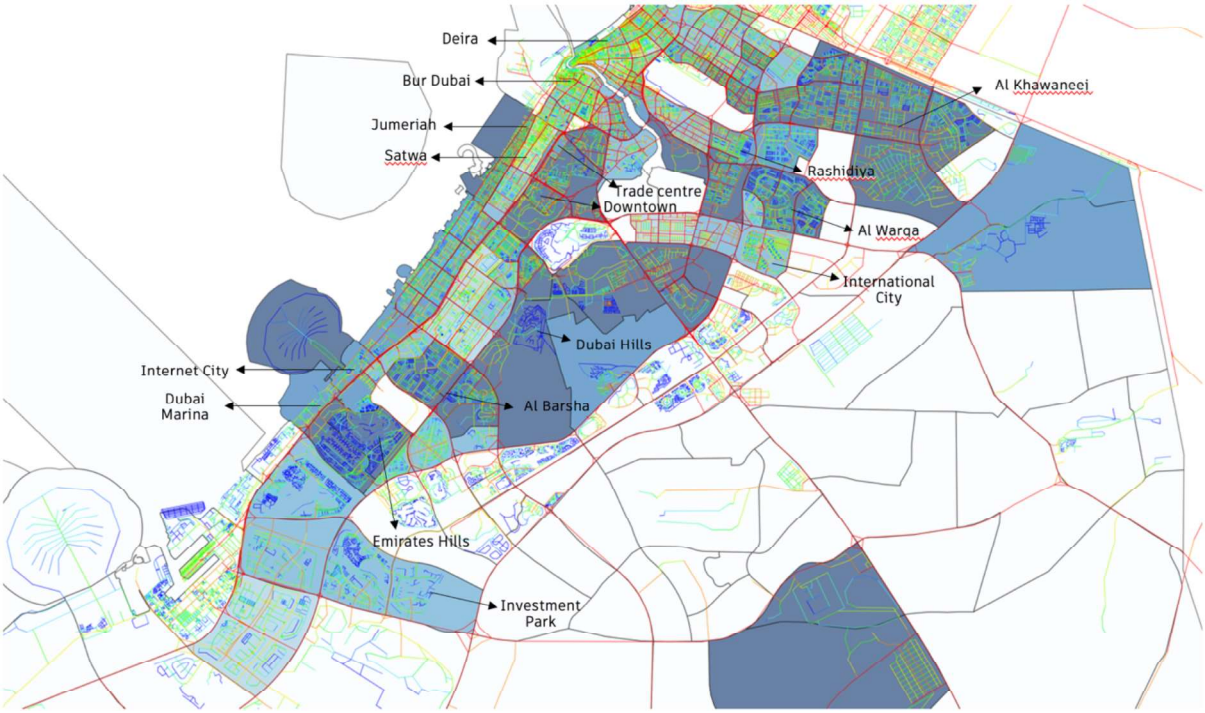


Figure 54: Normalised global integration model [NAINrN] combined with economic classification

Correlations

		Ethnicity	Economic
Ethnicity	Pearson Correlation	1	.879**
	Sig. (2-tailed)		<.001
	N	91	91
Economic	Pearson Correlation	.879**	1
	Sig. (2-tailed)	<.001	
	N	91	91

**. Correlation is significant at the 0.01 level (2-tailed).

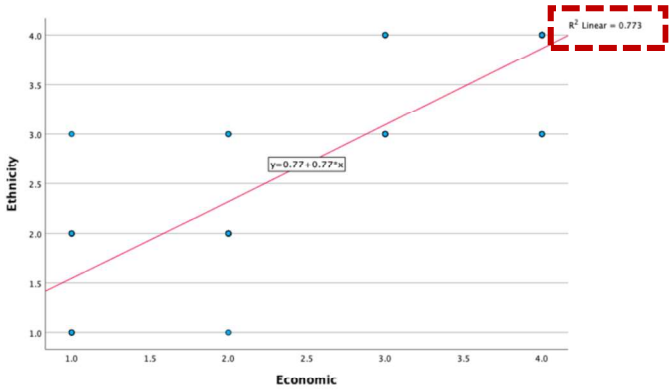


Figure 55: Correlation of Ethnic and Economic combinations

CHAPTER 5

5.0 Accessibility for Pedestrians and Vehicle Users

5.1 Economic Disparity Between *Drivers* and *Walkers*

The vehicular model is very similar to the strategic model presented in the previous chapter, and normalised integration picks up the major vehicular roads (Fig. 56). Among these, the main arterial roads spanning the linearity of the northeast-southwest direction are high-speed vehicular roads, which were built primarily with the intention of connecting Dubai to Sharjah, Abu Dhabi, Fujairah, and Alain City. However, since these are integral growth corridors (particularly Sheikh Zayed Road and Al Khail Road) connecting the different community divisions or urban megaproject superblocks, it is important for them to integrate pedestrians as well for the walkability and functioning of the city.

The most striking finding from the NAINrN analysis of the pedestrian model is the formation of islands that are totally cut off from the network, particularly in the peripheral areas (Fig. 57). People living in these areas have to rely fully on private vehicles for transport due to the limited number of bus stops. Metro stations mostly span only along the Sheikh Zayed Road. It is interesting to note that the islands are areas inhabited by mostly wealthy communities that want to be segregated from the busy city centres.

The pedestrian model also shows that the historic centre and surrounding areas of Deira and Bur Dubai are well connected even without vehicular access. Development along Sheikh Zayed Road is also not much affected, as it has service roads on the side that are pedestrian accessible to the different commercial developments. It also has metro stations for transport, which also act as pedestrian bridges across the 14-16 lane road. Considering the harsh climatic conditions, walkability further decreases. Also, the grid pattern of planning each community division as a superblock has a certain characteristic of internal planning.

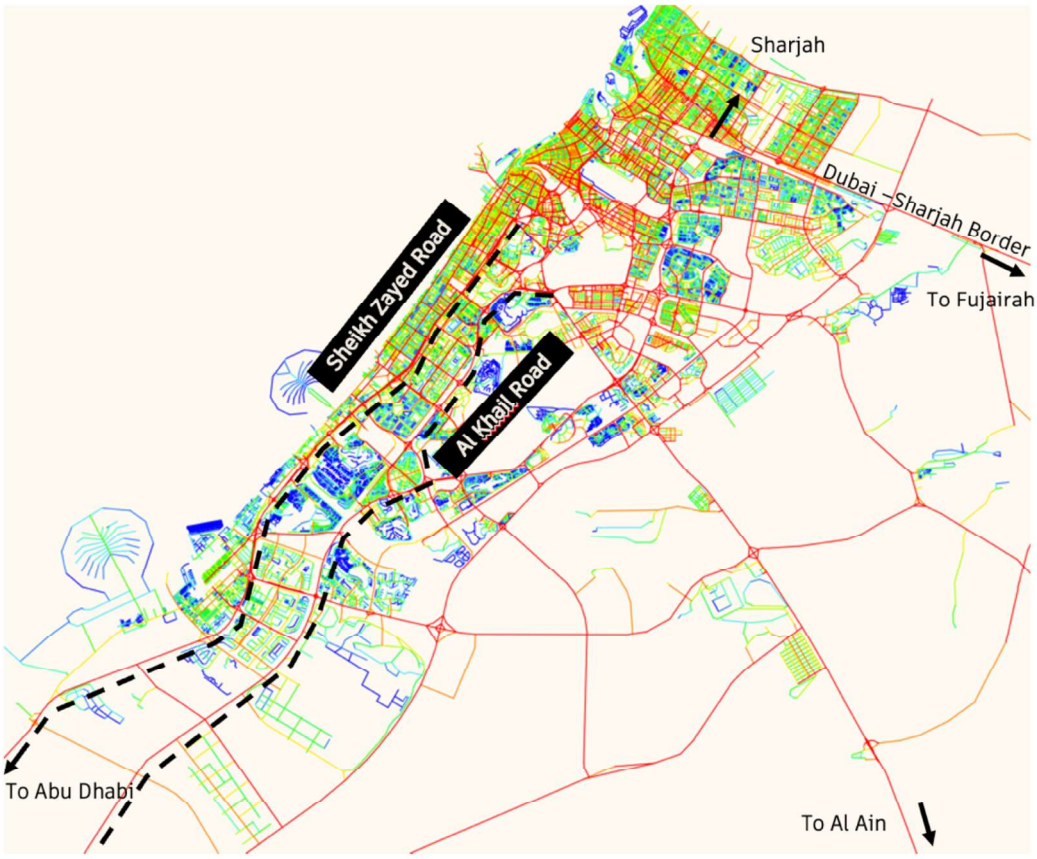


Figure 56: Normalised Global Integration [NAINrN] for Vehicular Model

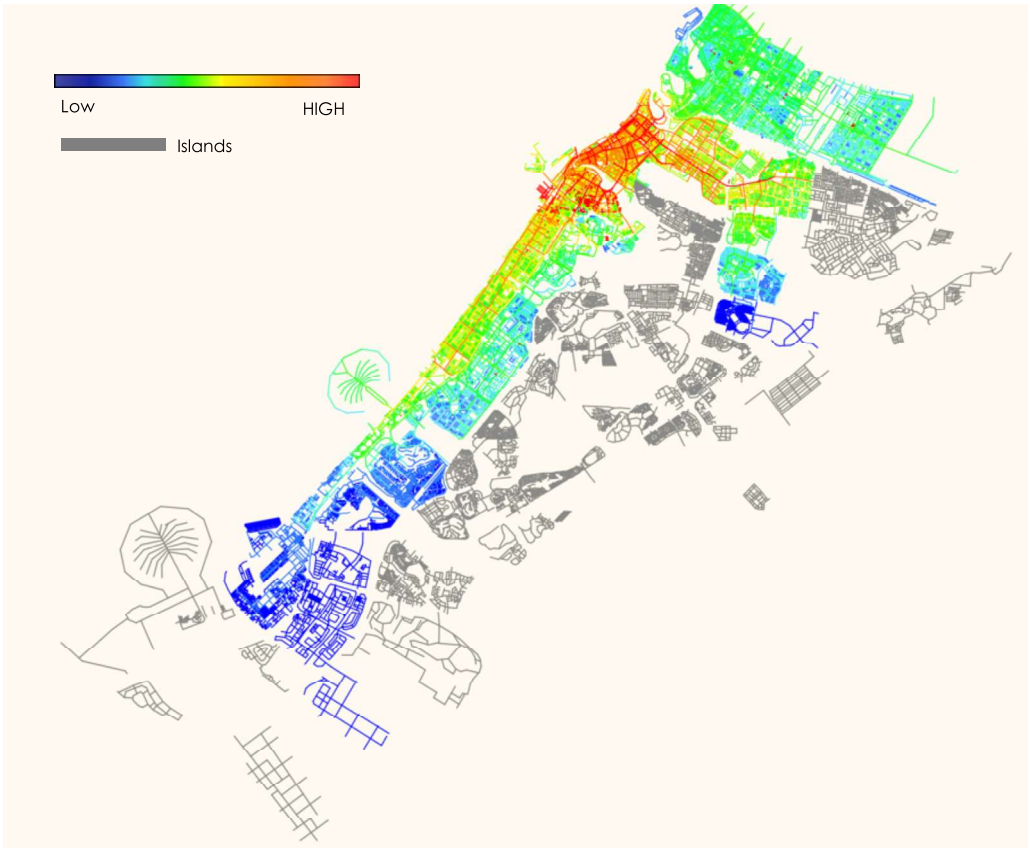


Figure 57: Normalised Global Integration [NAINrN] for Pedestrian Model

5.2 Dubai Run

It is worth mentioning the Dubai Run, an annual marathon held during the winter month of November. Sheikh Zayed Road is blocked for vehicles and is open for pedestrians to run (Fig. 58). This is an interesting event for the citizens in regard to health awareness, but it is also special for the residents to be able to experience this integral part of the city through the act of walking. It is also a reminder of the potential of this major corridor of growth to bring people together.

Figure 58: Photograph of the Dubai Run Event. Source: The National Newspaper.

5.3 The Super Grid Block

A lot more can be understood about the disparity in connectivity between pedestrians and vehicle users by taking a closer look at the morphological structure of blocks. This requires a detailed understanding of the types of superblocks and their impacts. However, this section tries to cover an overview of the grid planning in Dubai.

The network layouts can be categorised into three types, supported by the study of Khaled Alawadi (Alawadi et al., 2020). Figure 59 shows the different identified types with the period of their development. The historic centre of Bur Dubai built in the 1950 - 1960s has an organic pattern of streets of varied sizes arranged in a kind of *deformed grid* pattern which can also be relative to the British influence during the period. This provides good local connectivity (Fig. 60) and often becomes the centre of commercial activity (Hillier, 1999). The development during the pre-suburban phase (the 1970s-1980s) as seen in Al Satwa, Rashidiya and Nad Al Hammar, has a grid-iron pattern which can be traced to the American grid-iron city planning like in Detroit and

Manhattan (Fig. 61) and also the British deformed grids. This also allows for strong local integration as seen in Figure 60.

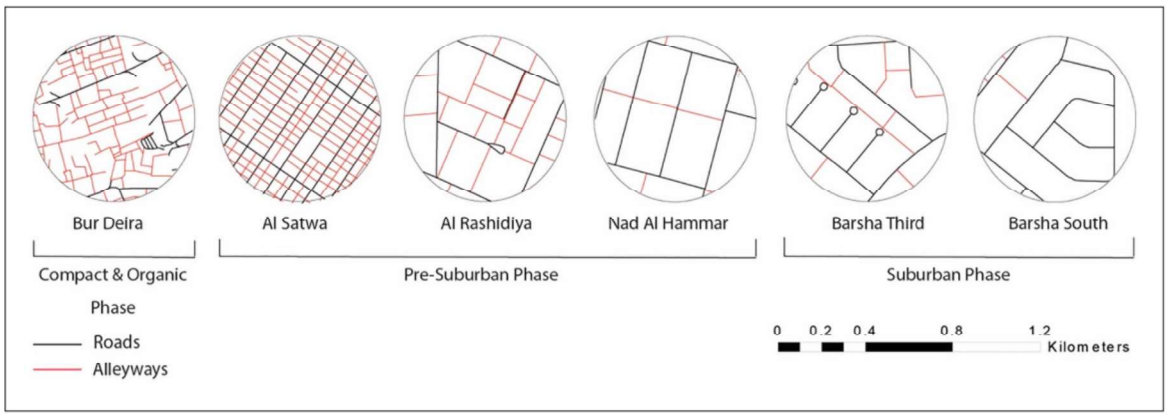
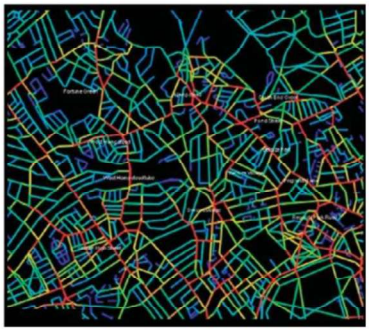


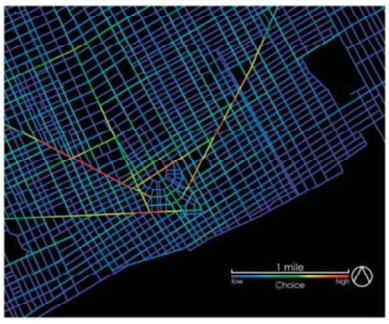
Figure 59: The types of superblock street networks. Figure by Khaled Alawadi.

Figure 60: Normalised Integration in radius 800 [NAINr800] for Bur Dubai, Al Satwa and Al Barsha Third

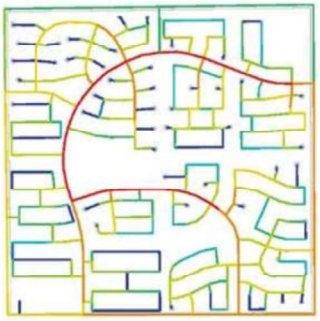
The later phases of rapid urban growth depict a transition to the American suburban pattern of planning which currently covers most of the urban area. This model of planning favours vehicular transportation and increases car dependency; the blocks face internally, and internal spaces are more segregated, becoming part of the background network. This is relative to the *asymmetrical regularity* type of suburban layout in American cities (Fig. 61). Parallel or perpendicular streets and circular roads have a clearly obvious geometric logic in this layout because it was planned using order notions, but they are not well tied to the large-scale grid logic of the surrounding urban context, especially in terms of connectivity. As a result, there is an uneven link between the macro and micro levels of the geometric logic in the urban grid (Major, 2018: 102-103). This layout generates more segregated internal streets that provide privacy as depicted in Al Barsha 3 (Fig. 60).



Hampstead Heath in London by Hillier



Detroit by Psarra et al., 2013



Pheonix suburb by Peponis et al. 2017.

Figure 61: Examples of organic, grid-iron and American suburban layouts

CHAPTER 6

6.0 ACTIVITY AND USAGE

6.1 Potential and Actual Movement

This section explores and examines the differences in activity and usage in the old part of Dubai and the new part of Dubai. The areas selected are 3.5 km to the east and west of the Trade Centre roundabout, where the stark distinction between old and new can be identified (Fig. 62). The visibility graph analysis of the selected areas shows that the main road (Sheikh Zayed Road) has good visibility as expected and poses good potential for pedestrian movement (Fig. 63). The new Dubai Road has more linearity of visibility, lined by skyscrapers, whereas the visibility on the old Dubai Road permeates into the side roads of the neighbourhood. However, the movement counts of pedestrians show that there is more pedestrian activity in the old Dubai, particularly in the Burjuman area (Fig. 64). There are also significant pedestrians in the Emirates Towers and Financial Centre metro stations. However, that diminishes at the weekend, which indicates that it is mostly for work (Fig. 65).

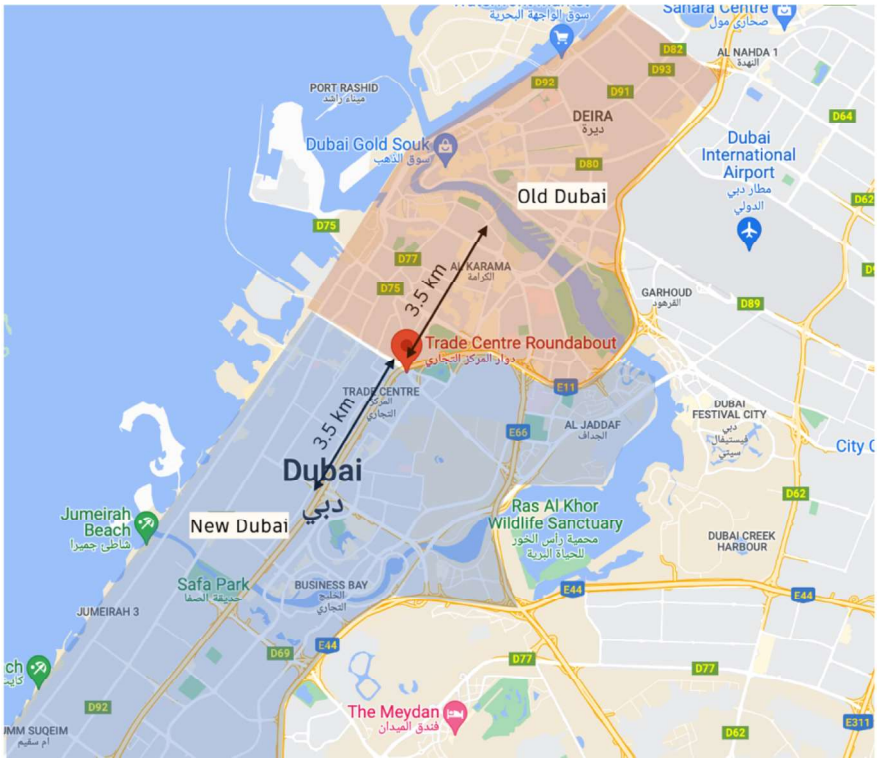


Figure 62: Selected 3.5 km stretch in Old and New Dubai

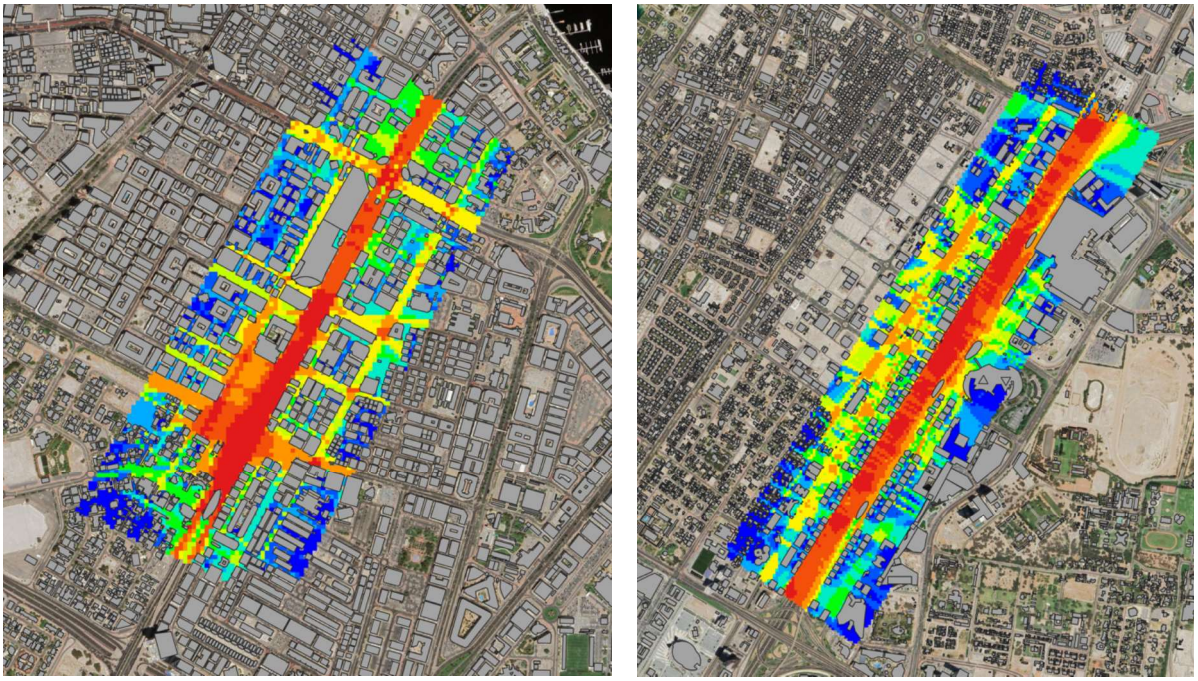


Figure 63: Integration [HH] Value of Visibility Graph Analysis of Old Dubai (left) and New Dubai (right)

Figure 64: Pedestrian Movement Count on a Weekday in Old Dubai (left) and New Dubai (right)

Figure 65: Pedestrian Movement Count on a Weekend in Old Dubai (left) and New Dubai (right)

6.2 Spatial Qualities of the Road

While comparing the two stretches of roads, it is important to note the different morphological qualities of the two stretches. Although they both were originally one route, during the developmental boom and the introduction of new Dubai, the old part of the road was planned to retain the width and spatial qualities of the surrounding buildings. However, the new Sheikh Zayed Road was planned to be a modern vehicular road surrounded by skyscrapers. Figure 66 and 67 shows the sectional differences between the two roads. The new Sheikh Zayed Road is a 14-16 lane, high-speed road with service roads on either side lined by sidewalks. Pedestrians can only cross this road at the metro station bridges. The old road is only a 6-to 8-lane, moderate-speed road where pedestrians can easily cross at crossings.

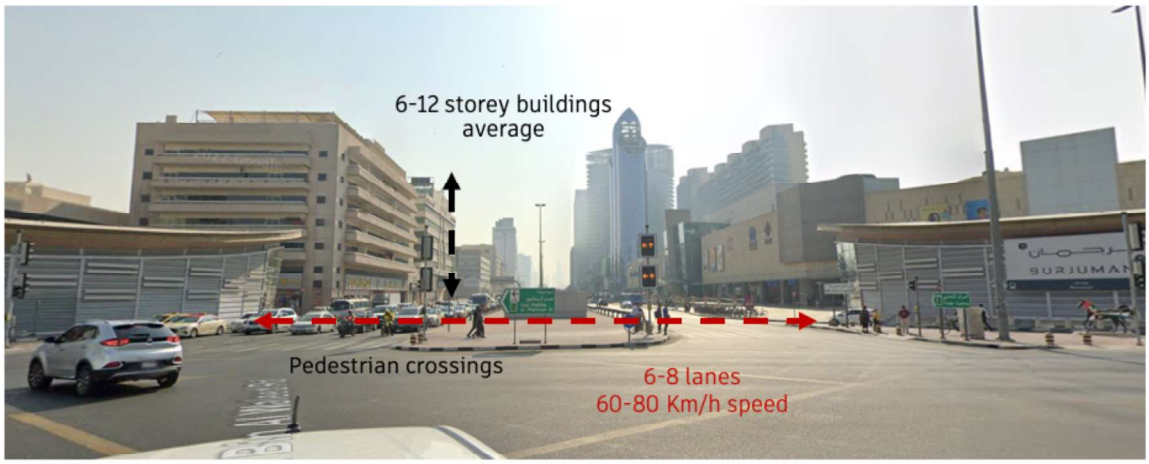


Figure 66: Schematic section of Old Dubai Road depicting spatial qualities

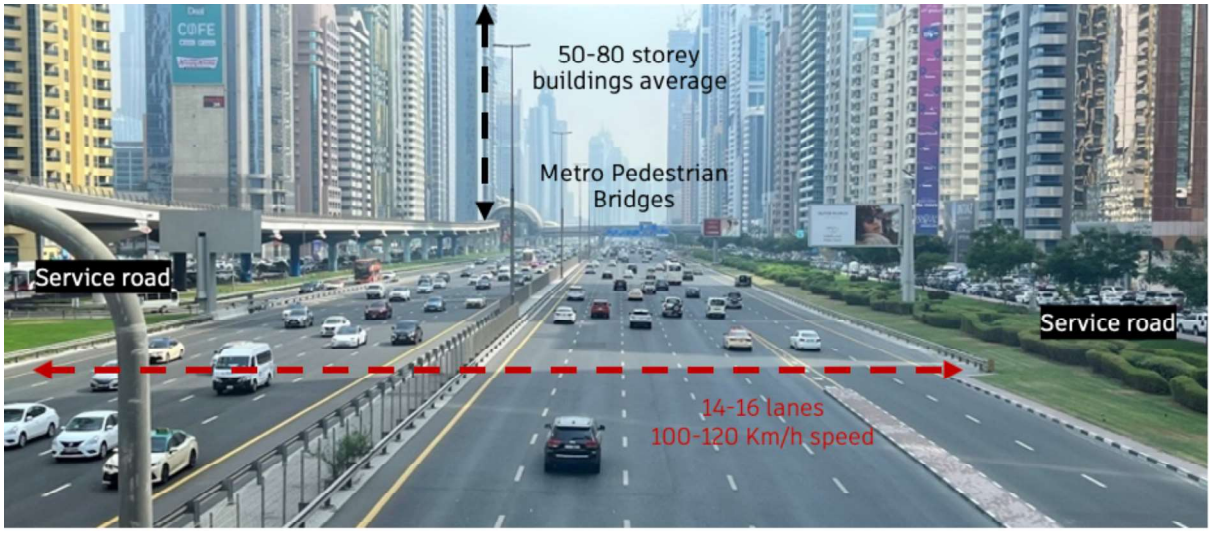


Figure 67: Schematic section of New Dubai Road depicting spatial qualities

The impact of the high-speed, heavy traffic road on the surrounding neighbourhood can be explained by the concept of *transport-related community severance* or the *barrier effect* (Mindell and Karlsen, 2012). It can be defined as the negative impact caused by motorized traffic and its infrastructure on the well-being of people who use the surrounding areas or need to cross or walk along the infrastructure. The impacts include the use of streets as social space and the formation of social ties (Anciaes, 2015) (Vaughan et al., 2020).

Although the normalised global integration value increases over the years for both roads, figure 68 shows the shift of centrality from the Old Dubai Road to the New Dubai Road. Figure 69 shows the change in integration value from a local to a global scale, which is also higher for the new Dubai Road.

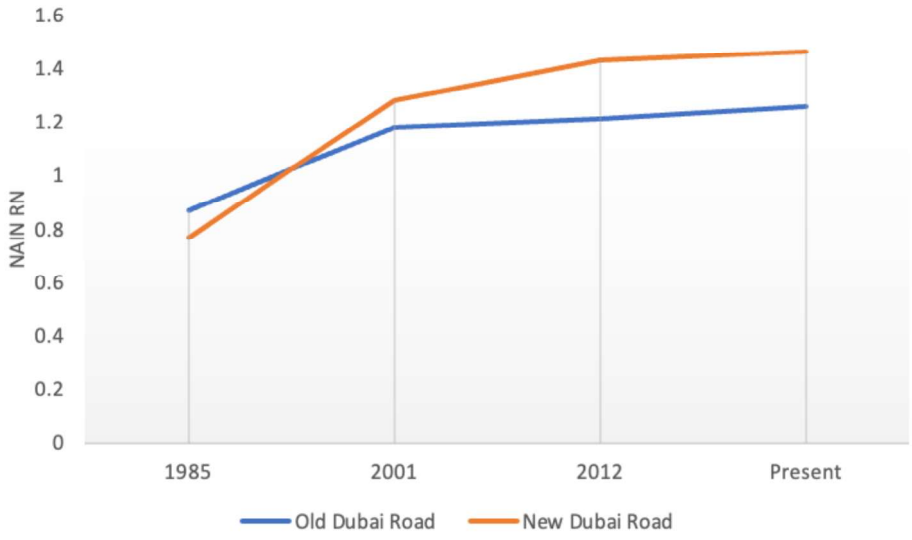


Figure 68: Change in NAINrN value for Old Dubai and New Dubai Roads over the years

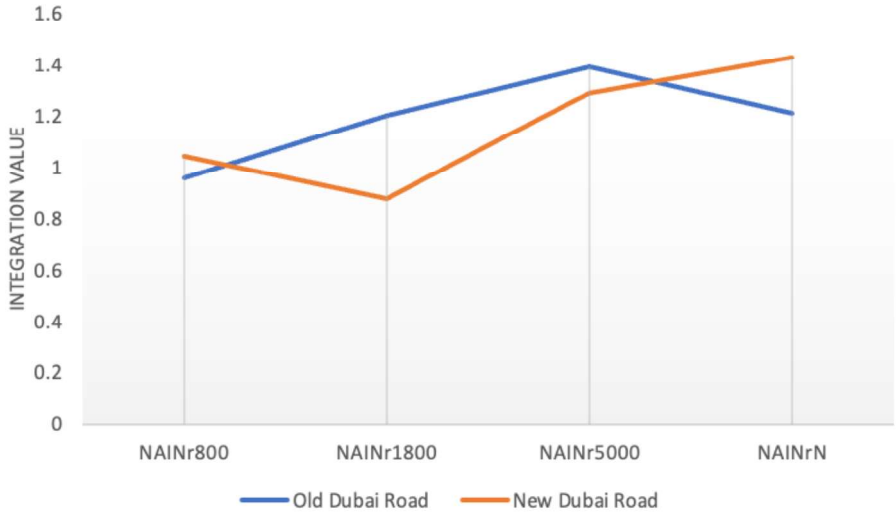


Figure 69: Change in integration value for Old Dubai and New Dubai Roads over different metric radii

6.3 Activity and Social Space

The questionnaire and short interviews conducted in both areas revealed the nature of social activities and use of public space in Old and New Dubai. Chapter 2 of this study glanced through the different authors who talk about 'creating life' in an urban environment. Michael De Certeau should also be discussed in this regard. He says, "The act of walking is to the urban system what the speech act is to language or to the statements uttered. It is a tactic and act of appropriation" (Certeau, 1984: 98). He suggests that walking is an important act in creating spatial cultures.

Figure 70: Photograph Montage of New Dubai areas. Figures by author and Google street view.

The sample in the new Dubai area was from mixed ethnicities, and most of them stated that going out and socialising was often considered an activity at the weekends rather than a normal act that randomly occurred in their daily practises. In that case, they often choose destinations like cafes or restaurants in Jumeirah or other places that are farther away and require being driven to. Even though the La Mer beach development in Jumeirah is welcomed by all socio-economic sections, the commercial development in this area is quite upscale and creates a psychological barrier for low-income groups to socialise. This contributes to the fact that co-presence and encounters only happen within economic groups.

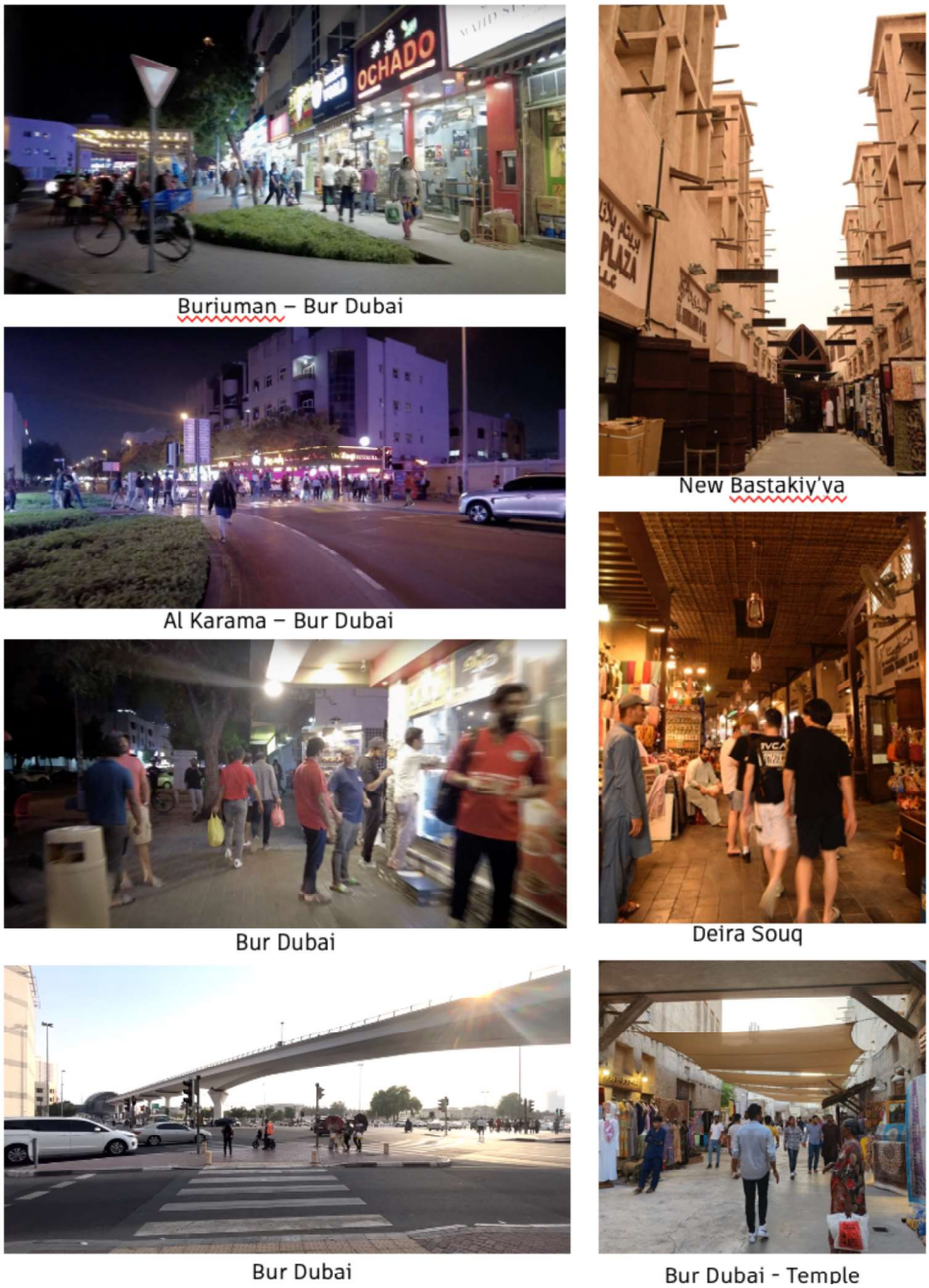


Figure 71: Photograph Montage of New Dubai areas. Figures by author and AN Vlogs

However, Old Dubai is often bustling with pedestrian activity, even though most people reported going out mostly to restaurants, small eateries, and parks. The study shows that people mostly use the urban space for restaurants and sometimes for parks and walking. This shows the commercial nature of social life. There is not much that simply engages pedestrians with the urban environment, like walking to work, urban furniture, and interactive environments. However, in Old Dubai, the restaurants have outdoor seating, which creates some street activity. The increased use of these spaces in old Dubai can be attributed to the affordability, ethnic food for South Asian and Filipino communities and the high number of single residents who are more likely to depend on these restaurants.

CHAPTER 7

7.0 DISCUSSION

Although this research understands that social disparity is a complex subject with many contributing factors, the results show that spatial morphology has a role in how cities can create, aggravate, or inhibit social inequalities. The existing pattern shows that as the spatial morphology evolved over the years, the ambitious rapid development steered by economic growth moved from organic and interconnected networks to a vehicular-centric model that followed American suburban planning. While centrality shifted from local historic centres to heavy traffic and high-speed motorways, the economic centres with an urban social life were also affected. Spacious residential areas were continuously developed in the outskirts for the wealthy populations, and they often seemed luxurious in the utopian image of Dubai. Meanwhile, the denser historic centre with older buildings was left for appropriation by the poorer communities. This is a phenomenon seen in many cities, particularly American cities. Meanwhile, an interesting spatial culture is created in these centres.

Many small activities, including walking, contribute to creating an 'urban life' of broader culture. These activities mostly occur in the 'streets'. Thus, the spatial setting plays an important role in creating a virtual community, with probabilistic encounters and co-presence. This creates spatial non-correspondence, that is, when 'who we are' does not correspond with 'where we are' (Hillier and Hanson, 1984). This is essential for the formation of new community ties based on spatial factors and the creation of neighbourhoods. This is where rapid urbanisation falls short with the lack of temporality. The vehicular-centric planning also did not help in the case of Dubai.

While the vehicular models depict good connectivity along the major arterial roads, in turn connecting the adjacent development, the pedestrian model shows the disparity of movement among vehicle owners and public transport dependents. The social makeup can be more clearly understood from these models. While wealthier car owners can choose to live anywhere depending on proximity to work, education, or other services, people who cannot afford privatised vehicles and solely depend on walking or public transport choose to live in well-connected areas like Deira and Bur Dubai. This is complemented by the rental values in the old developments in these areas. However, travelling from this core to further parts of the city can

be daunting, especially during the harsh summers. This has resulted in the settlement of low-income groups in fringe developments like International City and Al Khail Gate around industrial areas by living in crowded room-sharing and partitioned apartments.

Another issue is the urban megaprojects that concentrate on land use in an internal block surrounded by highways. This causes more demand for vehicular movement as swarms of people need to travel longer distances to get to universities or offices. Diversity in land use is essential for ensuring the regulated movement of people in a city. The internalised planning of superblocks also doesn't help pedestrians access places in the network easily. Since a good portion of the development happened during this phase, most development is in this grid structure compared to the very few organic and grid developments that are more connected.

It is clear that there is a lack of disparity in the provision for choice. While the economically stronger communities have more choices regarding where to live and where to socialise, the economically weaker sections are compelled to adapt to situations based on affordability, access to the public transport system, and community support. Given the consumerist nature of Dubai and its commercial developments, public places are also not welcome for all sections of society to socialise. Even if accessibility and financial barriers can be crossed by poor communities, the psychological barrier of not belonging to the public space is still prevalent. However, the lower-income expatriates reap the benefits of living in an integrated core with a bustling street life.

CHAPTER 8

8.0 CONCLUSION

During the growth of the urban network over the years, it can be seen that the Emirati population has always been the centre of development. In every stage, there seems to be relocation in search of better, more spacious, and more private residential conditions, while the low-income expatriates are left to adapt to the abandoned old areas. Current policies also use strategies like raising rents in low-income areas, thus driving poorer residents away; demolishing poor areas; and so on (Elsheshtawy, 2009: 120). Various measures by the authorities can help in regulating developments across different social classes. Disempowering private real estate companies from developing massive urban projects can be an important step, along with introducing a coherent state-led regulatory body that ensures the cohesion of all urban developments.

This study observes that the spatial network is an instrument for institutionalising power in a social setting. Social disparity is a product that emerges from this intent through urban morphology. De Certeau describes this as a power play between collective institutions and individualistic people. While administrative powers like the government and planners impose strategies to control the usage of space in a specific way, people re-appropriate space in their own way according to their individual tastes using tactics like walking (Certeau 1984, 97). Dubai, in this sense, can be seen as a city implementing vast control over the use of space. From inadequacy of walkability measures to the lack of any form of street furniture highlights this control. This study concludes by quoting an excerpt from Hannah Arendt's book, *The Human Condition* (2013), also mentioned by Kenneth Frampton in his book *Modern Architecture* (2020: 636):

> "The only indispensable material factor in the generation of power is the living together of people. Only when men live so close together that the potentialities of action are always present can power remain with them, and the foundation of cities, which as city-states have remained paradigmatic for all Western political organization, is therefore indeed the most important material prerequisite for power."

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