The Hubs of Probabilistic Encounter

An Analytical Exploration of Beirut Digital District

by

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Supervisor: **Dr. Kayvan Karimi**

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An Analytical Exploration of Beirut Digital District

Abstract

The analysis of the socio-spatial impact of innovation districts is vital as their emergence proved to be a double-edged sword. In fact, while linked to economic growth, they also contribute at times to a process of gentrification. With the incessant unrest in Beirut's modern history, Beirut's only innovation district gives a glimpse of hope to its youth actively seeking to work in the country. By studying the knowledge economy through the prism of probabilistic encounters and the linkages between different areas, this study addresses the impact of BDD on the urban regeneration process of its adjacent areas with varying socio-economic backgrounds. Following the general understanding of its dense history, the background and strategic location of the case study, the research explores two of the three main assets of the innovation ecosystem: the physical and networking ones (Hanna, 2016). Space Syntax theories and methods combine the analysis of the spatial morphology with the patterns of human activity. To this end, observational and spatial analysis were conducted such as the integration and intelligibility of its networks, land use analysis and visual analysis amongst many others. The study assessed the district from the perspective of linkages between its various adjacent areas, and then concentrated on the masterplan of BDD itself and its potential to promote encounters. The ciscoveries led the research to suggest that although the district does encourage social interactions, they remain restricted to its periphery caused by both visible barriers such as the motorways disconnecting the areas and invisible barricades like the socio-political differences. The district has tremendous potential to act as a link between the various areas, but critical exploration of the next phases should be undertaken to shift the perception from gentrification to urban regeneration. To this end, suggestions are formulated in an attempt to mend the broken urban fabric that created disconnected micro-centres.

Keywords: Space Syntax, innovation district, knowledge economy, co-presence, probabilistic encounters, anti-social behaviour, public spaces, urban regeneration, gentrification, Beirut Digital District, Observational analysis, Spatial Analysis.

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Abbreviations

BDD	Beirut Digital District
BCD	Beirut Central District
BK	Bechara el Khoury Road
FC	Fouad Chehab Road
VGA	Visual Graph Analysis
NACH	Normalised Angular Choice
NAIN	Normalised Angular Integration

Chapter 1 | Introduction

1.1. Background and context

The global decline of traditional sectors and the 1990s economic transition gave rise to innovation districts; areas in which mixed functions merge together under the umbrella of the knowledge economy - a system of production dependent on high skill levels and intellectual capital (Moretti 2021). These districts, originally intended for regeneration purposes, can usually be found in or around underprivileged areas and in close proximity to the city centre. However, the phenomenon of innovation districts has proven to be a double-edged sword – on one hand boosting the economy by integrating new activity but on the other contributing to the displacement of the underprivileged class (Katz and Wagner 2014); rendering the analysis of their socio-spatial impact crucial. In fact, by investigating their raison d'etre and their effect on the spatial morphology and social composition researchers have attempted to assess the consequences of a knowledge-based district.

The study at hand focuses on the socio-spatial impact of a single innovation district located in the heart of Beirut, the capital of Lebanon - a country that has witnessed lengthy periods of turmoil since the 70s. This middle-eastern country's complex history acted as a catalyst for the population's compartmentalisation, "dividing the country into a mosaic of areas dominated by different communities." (Bernier, 2010, 34). In fact, one of Beirut's major turning points occurred in 1975, during its civil war in which the capital was partitioned by the demarcation line between the Christian and Muslim population (Fig.1.1).

Since October 2019, the country has witnessed the worst economic crisis in its modern history marking the second major turning point in its evolution. This escalation coupled with the August 4 Beirut explosion in 2020, devastating an entire city centre and its surrounding areas, amplified the 'intra-urban inequalities' even further (Aouad, 2021). In fact, areas found on a higher economic scale witnessed a speedier reconstruction process than impoverished surrounding districts (Fig.1.2). To this day, residue of the blast and the destruction it brought along with it remains visible in underprivileged areas.

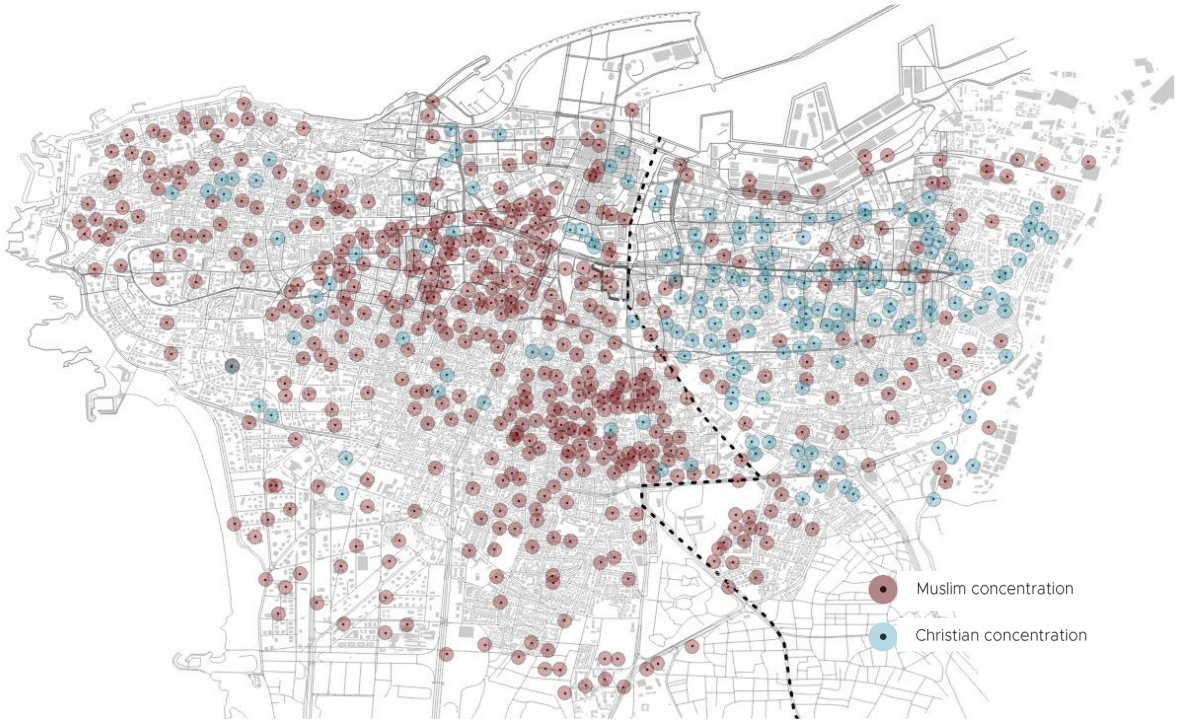


Figure1.1. The religious distribution of the communities within Beirut.
Redrawn and analysed by author. - Original Source: Doueihy, 2007

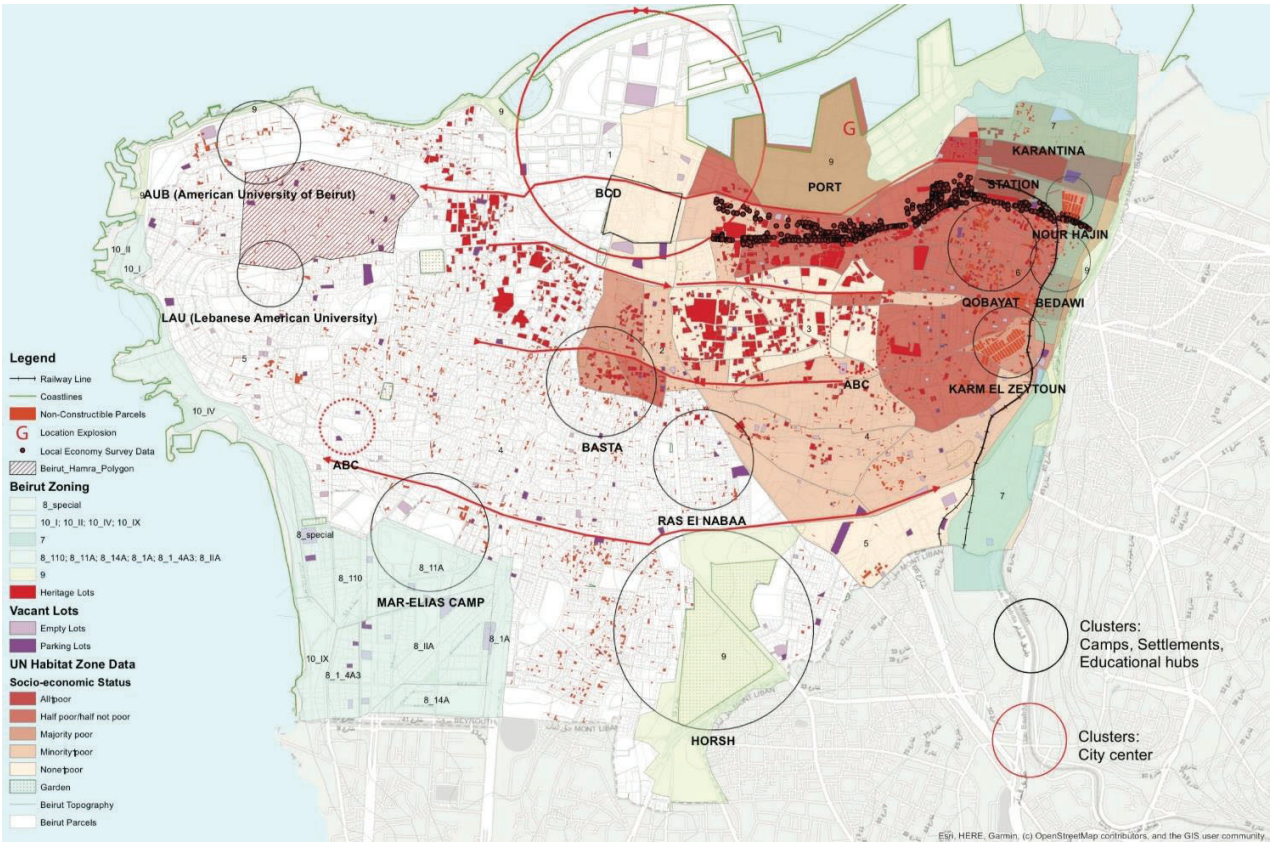


Figure1.2. Urban Consequences of the Divisions in Beirut | *Source: Aouad, 2022*

Amidst the ongoing chaos, Beirut Digital District (BDD), the only innovation district in Lebanon still stands strong. By bringing together a cluster of companies, the aim of BDD is to prioritise innovation - whether in the creative field or the economic one. The construction of the district's first stages launched in 2012 with the aim of creating a self-sustainable neighbourhood bringing together both individuals and companies in order to expand on the knowledge-economy. This case study was selected due to its strategic location in Beirut; located in Bachoura, a rather impoverished area, BDD is adjacent to Beirut Central District (BCD) on the north side representing the heart of the city, and to Ashrafieh on the north-east side, a long standing residential and commercial hub (Fig1.3). Due to its location, numerous academics criticised BDD's inception in Bachoura by portraying it as the start of a gentrification project (Darwich, 2020). Often, analyses on innovation distr cts have tackled tne social impact separately from the spatial implication - this study deems it crucial to combine the two types of analyses in order to create an in-depth analytical layer that aims to visualise and investigate their impact on a socio-spatial level and their potential of urban regeneration.

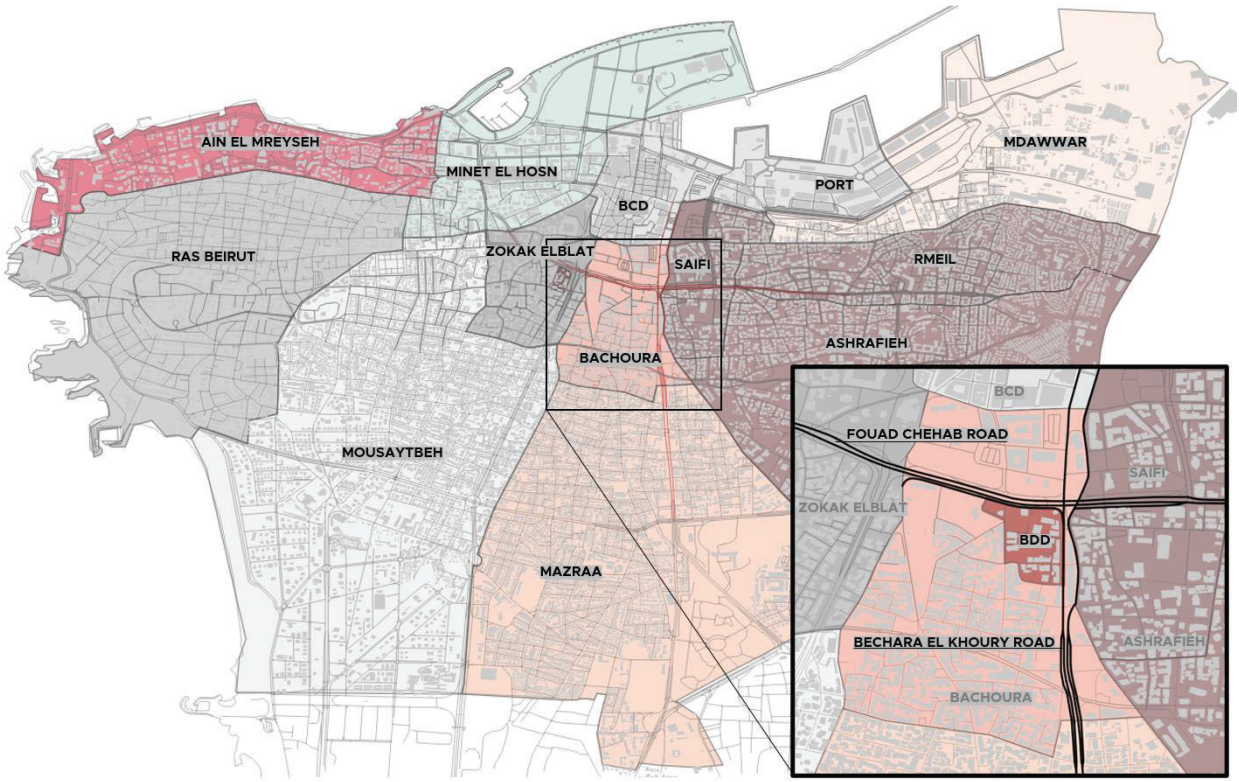


Figure1.3. Locating BDD in the urban realm

1.2. Aim and Scope of the research

The research's aim is to explore the ability of innovation districts to connect different areas with their surroundings and investigate the potential social encounters that it would generate or, at times, even discourage. By analysing BDD, the study explores the difference between projects of urban regeneration and those that fall under gentrification. The case study allows this analysis to explore possible solutions aiming to heal the potential socio-spatial problems and the capability to bridge different parts of the city together.

1.3. Research Questions

This study investigates the impact of an innovation district, in this case Beirut Digital District, on the urban regeneration process of the surrounding areas. In order to explore that connection, two sub-fields were identified, the first tackles spatial linkages between the different areas and communities and the second underpins the exploration of probabilistic social encounters within and around BDD.

As such, the main research question is:

What is the impact of Beirut Digital District, an innovation hub, on the urban regeneration process of its adjacent areas with varying socio-economic backgrounds?

This question extends to two main fields:

To what degree does BDD act as a conduit between the various areas with socio-economic backgrounds?

In which ways does the masterplan of BDD promote or limit social encounters within and around the physical limitation of the district?

1.4. Limitations of the study

Throughout this study, four main limitations were registered. As Lebanon suffers from data scarcity and inaccuracy in terms of maps, the scope of the study required redrawing maps and validating data which translated into on site observations. The second limitation relates to the observational data: the duration of the observations conducted, which lasted for a period of 10 days; in other words, with longer observations, the radius of the analysis could have been expanded on. The third limitation is due to the limited number of responses to the

questionnaire – representing less than 10% of BDD's community. And the final limitation relates to access to the floor plans of certain BDD buildings and the ability to conduct observations within the buildings.

1.5. Structure of the research

Following the study's introduction, the second chapter tackles the literature review aiming to understand the concepts of innovation districts, the difference between gentrification and regeneration and to include the relationship between society and space using the research conducted by academics within the field of space syntax. The first section of Chapter 3 delves deeper into Beirut and specifically Bachoura's historical urban evolution whereas the second one discusses the implementation of BDD within the area, its strategic location and the structure of the district. Chapter 4 focuses on the methodology used in conducting observations and analysing findings. As for Chapter 5, it explores to which extent BDD acts as a link between its surrounding areas. Moving on to Chapter 6, in which social encounters are analysed within and around BDD based on observations and analytical exploration. Chapter 7 brings together the findings of the analytical chapters into a discussion and concludes on the study in an attempt to answer the main research question. In the epilogue, solutions are proposed to enhance the relationship between the district and its surroundings on an urban and masterplan scale.

Chapter 2 | Literature review

The literature review focuses on the impact of an innovation district on various scales - ranging from the relationship between the district and its surrounding areas to the potential encounters within its periphery. To understand its influence, the study primarily tackles the knowledge economy through the concept of urban regeneration by understanding its potential dark side linked to gentrification. The concept of urban revitalisation has to be investigated through the effect of spatial changes on a socio-economic level. To understand this mechanism, the study explores a review of a theory that underpins the logic of society through the analysis of its spatial form. Space Syntax was established to link space and society through an understanding of co-presence, differentiated solidarities, natural movement or the movement economy. The research delves into the probability of social encounters that would occur in and around areas impacted by a regeneration process. And finally, the literature assesses the likelihood of utilising co-presence as a protective layer against anti-social behaviour.

2.1. Innovation districts and urban regeneration

2.1.1. Innovation districts and the knowledge economy

Innovation districts, which came to prominence following the economic transitions of the 90s, are comprised of offices working to attract start-ups, entrepreneurs and business incubators - and mixed-use developments that cluster in cities with the specific aim of acting as urban regenerators for underperforming areas around the centre of the city (Katz and Wagner 2014).

According to Hanna (2016), in order to achieve a productive knowledge economy three main capitals are to be considered - the human capital - in which skilled individuals are a crucial aspect, the physical - a space in which ideas can be developed, and the financial - an investment, whether private or public, in the previous two. In the case of the new age workforce, millennials tend to require a sense of place - embodying proximity and a work-life balance (Todorovic 2016). Hanna (2016) identifies three types of clusters that can be understood by their permeability index: 'embedded', in which the district is a part of the existing urban fabric; 'cluster', an area that has shared facilities with the urban environment and 'campus', a completely isolated district from the public realm. According to Katz and Wagner (2014), there are three components to innovations districts: the economic assets, which refer to the groups and organisations that support the growth of the area; the physical

assets, which denote both the private and public areas making up the district; and finally the networking ones, which form the relations between different organisations within the district. These types of districts promote employment opportunities, economic spill-overs and create shared assets (Hanna 2016). For this inclusivity to be achieved, good governance should be coupled with a thought through design approach and masterplan. In order to assess innovation districts' impact, three main aspects are usually examined: the geographic placement of the district, the displacement of the inhabitants of an area and the impact the growth has on the existing social patterns (Katz and Wagner, 2014). From the perspective of space syntax, the ideal design should concentrate on the configurational relations of the space to the whole urban grid in which it is located (Hillier et al 1992).
Many scholars criticised the contribution of innovation districts and linked it to gentrification - on both a social and economic scale (Florida 2017) - claiming an undemocratic favouritism towards the upper class (Acemoglu and Autor 2011; Moulaert 2000). While most innovation hubs promote an "inclusive and community-led knowledge economy" (Morisson and Bevilacqua 2019, 474), scholars have pointed out these market-led districts have caused an increase in real estate prices causing an economic polarisation in the affected areas.

2.1.2. Gentrification and urban regeneration

Urban regeneration and gentrification are two terms referring to the same process of modifying a decaying area in order to create opportunities for new developments (Finio 2022). While both fall under the same umbrella, the latter is linked with negative connotations, whereas the former usually entails positive change. Gentrification, a term first coined by Glass (1964), is often employed to describe the dark side of urban regeneration resulting in urban inequality (Slater 2009). However, with each study, the term itself witnesses minor alterations in its definition, a fact which lead to discrepancies in its measurement for urban studies. On a social level, one of its major negative aspects relates to the displacement of residents of lower income areas creating an imbalance and a shift in the financial and cultural capital (ibid). According to Atkinson (2004), the impact of gentrification goes beyond the relocation of the initial inhabitants of the area. The lack of affordable housing in the city and the identity shift of the area caused by the absence of social and cultural diversity are amongst the consequences of gentrification (Hyra 2017). That said, when the term 'urban regeneration' is used in lieu of gentrification an increase in the value of properties is entailed coupled with a positive income influx to the city and an encouragement for further developments to occur.

The social and spatial outcomes of regeneration projects have been widely studied separately, a useful way of looking at their impact would be to study the relationship between urban form and society. As such, space syntax, which combines qualitative and quantitative analytical tools, explores the spatial morphology through the understanding and

consequences of social behaviour. This theory could be applied to study the potential for an area to be revitalised all while maintaining its cultural identity and maximising its growth - creating a positive contamination (Gonçalves 2013).

2.2. Space and society

2.2.1. Revitalisation through space syntax

Urban conservation and regeneration projects should not rely solely on maintaining the heritage-built fabric but also the spatial configuration and organisation of the city in order to build on the 'spatial spirit' that it holds (Karimi 2000). Accessibility, connectedness, vitality, visibility and identity are amongst the key aspects that need to be considered to achieve a positive outcome of regenerating areas (Van Nes 2013). To understand these concepts through space syntax, measures of integration and choice need to be evaluated - indicating the patterns of potential movement within the studied area. The former indicates to-movement by measuring the accessibility of one point to all others in the urban grid whereas the latter indicates the probability of a point to be passed through (Hillier et al 1987). The concept of centrality, referring to the concentration of mixed functions and activity within a prominent location in the city, is another aspect which should be evaluated. Hillier argues that centrality is not stagnant but rather a process (Hillier 1999). That said, the location and impact of the high street should be considered while revitalising an area as well as the foreground, a space generating movement and encounters, and background networks, formed of the residential area (Hillier 2009). Finally, the visibility linked to public spaces and frontages indicate the ease of movement in the area and the portrayed character and identity.

By revitalising areas, planners and designers act as masters of encounters and interactions. The relation between the spatial dimension and the sociological one has been "lost and found" since Durkheim introduced his theory in the 60s. By reconsidering the intrinsic relationship between space and society through the works of Hillier and Hanson, Space syntax brought back Durkheim's ideas to the forefront. In fact, they translated and further developed the French sociologist's concept of "social morphology" (Durkheim 1984) – which refers to the materiality of society - into spatial theories, relating to movement, to the economy and to encounters induced by the spatial configuration (Hillier 2008, Hillier 2010, Hillier et al 1987, Hillier and Hanson 1984, Hillier and Netto 2002). Hillier and Hanson evolved the connection between space and society into the importance of spatial and transpatial relations. The latter was defined as an interdependence through differentiation, a heterogeneous, conceptual and weakly programmed spatial relation. These social ties could relate back to the networking assets Hanna (2016) introduced for the innovation districts - where 'strong ties' refer to

collaborations within the sectors - relating to Hillier's spatial relations - and weak ties would rather refer to the transpatial ones.

The urban grid's spatial configuration acts as a main driver for movement patterns, what is referred to as natural movement (Hillier et al 1993). When the urban configuration is segregated and the design is localised, a disruption occurs in the natural movement causing the space to be underused (Hillier et al 1987). For instance, this interruption could be caused by the implementation of freeways causing vehicular traffic and interrupting the natural pedestrian flow (Psarra et al, 2013). In the case of innovation districts, this could be compared to the campus layout (Hanna, 2016). By combining the analysis of the network's integration and choice with that of the land uses', the importance of attractors within the urban configuration is showcased. The relation of the physical city - the space, network and infrastructure - to the functional one - economy, society and culture, gives rise to the theory of the movement economy (Hillier 1996). Based on natural movement and through the analysis of the network patterns, the movement economy suggests that the spatial organisation of an area impacts its land use and the development of the area consequently creates multiplier effects (ibid).

2.2.2. Probabilistic encounters and anti-social behaviour

On the one hand, the relation between space and society was underpinned and on the other, the one between space and movement. This leads the literature to review the link between these patterns of movement and society. Through natural movement, different interfaces are created between a variety of people in the urban grid - what is referred to as a field of probabilistic encounters (Hillier et al 1993). According to Hillier et al (1987, 238), "integration leads to intelligibility and intelligibility leads to a stronger movement interface between inhabitants and strangers". Intelligibility implies that "the whole can be read from the parts" (ibid, 237). The users of a common space, who do not necessarily need to be acquainted, form co-present individuals (Hillier 1996). This awareness of the possibility of spatial patterns to form interactions and encounters, creates what is known as the 'virtual community' which becomes denser the more integrated the streets are (Palaiologou, Griffiths and Vaughan, 2016). Marcus and Legeby (2013) highlight the importance of 'co-presence' in understanding urban complexity arguing that contact between the inhabitants and visitors is impacted by the urban context of which they find themselves in. The patterns of co-presence affected by the physical conditions of a space form a pre-condition for social interactions to occur. Going back to the concept of social physiology which refers to society's "collective consciousness" - the complex physiological and functional aspects of social life (Durkeim 2005) - Liebst and Griffiths (2019, 16) would argue that space syntax does not delve deep into this 'micro-wing' "providing an adequate account of why such morphological variations promote solidarity".

After establishing these various relations between space, movement and society, the review is directed towards understanding anti-social behaviour (ASB) that could occur between spaces with varying socio-economic backgrounds. Due to its subjective nature, ASB is not as easily defined and is dependent on the observer's background sitting between normal and criminal behaviour (Friedrich, Hillier and Chiaradia 2009). To prevent this type of behaviour, Jacobs (1961) argues for mixed-use functions and an 'eye on the street' to establish the desired sense of safety. Meanwhile, other scholars have advocated for a closed community - in line with the concept of 'Defensible Space' (Newman 1972); stating that urban design and planning is the main factor for the protection of its users (Sennett 1986). According to Legeby (2013, 97), "as people are exposed to differences, there is a chance that gradually they become used to them and thus, they will no longer be unfamiliar or provocative." Taking the example of Izmir, 'in-between' spaces create the potential for socio-cultural interactions to emerge - and the lack there of would limit the possibility. That said, contact is not the only factor that plays a role in creating a sense of community – requiring further studies to merge urban theories with behavioural ones (Can and Heath 2015).

2.3. Conclusion

To conclude, innovation districts are the subjects of controversy in research and practical fields. Although they have been mostly linked to gentrification by many scholars, others argued that they are catalysts for positive change and should therefore be classified under urban revitalisation. The most flagrant aspect that has been analysed for years when it comes to gentrification has been the displacement of the inhabitants; through this literature review, it was argued that there are consequences transcending the displacement and relating to the spatial and social integration of the district within the urban fabric. Through space syntax, natural movement and probabilistic encounters could be two of methods used in analysing the other ways districts have impacted the urban morphology.

Chapter 3 | Historical Evolution & Case Study Description

3.1. Historical urban evolution

3.1.1. From its formation until 1920

In orcer to understand the morphological evolution of Beirut, the study explores its elaborate history. The spatial configuration of the city has evolved through time beginning with the Phoenicians in 1200 BC to the mosaic of our current times - being subjected to several occupations that transformed the urban fabric (Fig.3.1).

Figure3.1. Historical evolution of the urban morphology of Beirut
Redrawn by author. - Original Source: Farhat, 2005

Under the Roman rule, (64B.C - 560 A.D.), a structured grid known for its two main axes - Cardo Maximus (North-South) and Decumanus Maximus (East-West) - was constructed, connecting the centre to the Roman Necropolis on one end and to Damascus on the other (Paturel, 2019). Between 551 and 560, an earthquake and the great fire of Beirut destroyed this settlement and left archaeological sites still explored to this day (Fig.3.2a). In 634, an organic growth within a walled city took place due to the Islamic Empire, which was taken over by the Crusaders and later, in the 12th century, by the early Ottoman Empire who

developed on this urban growth (Yassin, 2012) (Fig.3.2b). In 1841, routes were created to connect the city centre to the agricultural areas. During the late Ottoman Era (1849-1920), the urban growth adopted an outward looking approach and utilised the roads as major axes which drove an expansion beyond the intra-mural city, expanding slowly towards the agricultural lands and creating peri-central areas like Bachoura (Chedid et al, 2012).

Figure3.2. Archaeological ruins in Beirut today speculated from the Roman times (A) and from the Ottoman times (B). *Source: Beirutreport, nytimes, Alamy*

3.1.2. World War One and the French Mandate

Following the WWI, Lebanon became part of the French colonial empire which exerted drastic changes onto the urban fabric of the capital. These changes set the peri-central districts as integral locations to the city centre (Chedid et al, 2012) and the expansion itself led to the relocation of the 'bourgeois' population to the Bachoura neighbourhood (Yasmine & Hammoud, 2014). Throughout the 19th century, the Christian community immigrated from Mount Lebanon and sought asylum in the Bachoura area. In 1883, they marked their presence in the area by constructing the St. Georges Church (Oztürk, 2006) (Fig.3.3). After 1920, rural migrant Shiaa workers began settling in the southern part of the area which is in close proximity to the jobs offered in the city. With time, this migration formed a new urban typology in Bachoura which contradicted the previous 'urban elites' villas with gardens (Boekelo, 2016). In the second half of the 19th century, three main roads were constructed to connect the centre to its outskirts: Beirut Damascus Road, on the eastern edge of Bachoura; Basta Street on its western edge and Tayan Street located within Bachoura (Kassir, 2003) along with the tramway system of 1906 (Gavin & Maluf, 1996).

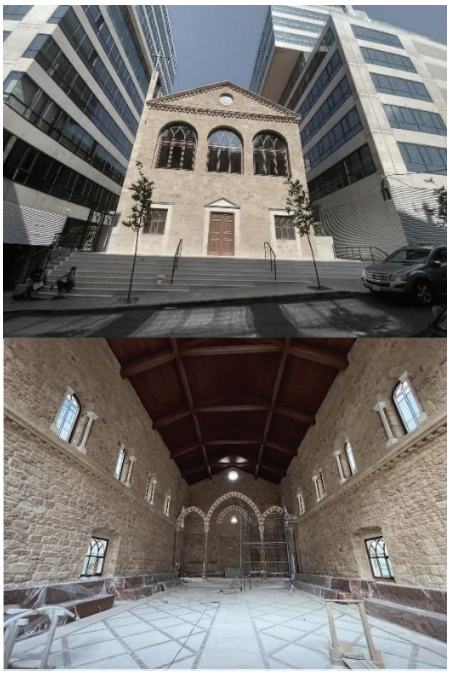


Figure3.3. St George Church in 2021.

3.1.3. Post-independence and the Civil War

Once Lebanon declared its independence in 1943, Beirut was dubbed in the public memoire as the 'Paris of the Middle East' - making the city centre of Beirut, a melting pot for the region. During this rapid urbanisation, several proposals were put forward by various planners to control the urban spread. Parts of Ecochard's masterplan eventually prevailed and in the 1960s, two main avenues were expanded: Fouad Chehab and Bechara el Khoury which created a significant disconnection between peri-central areas and BCD. By 1970, Bachoura was surrounded by four main streets creating an island (El-Oraiby 2014) (Fig.3.4).

Figure3.4. The construction of freeways obstructing mobility around Bachoura and isolating the neighbourhood. *Source: Dibo 2016*

The civil war that erupted in 1975 between Christians and Muslims resulted in a physical separation from the city towards the south of Damascus known as the green line, which stood on the Bechara el Khoury road, the eastern edge of Bachoura (Fig.3.5a). In consequence, it impacted the land-use of the various areas, creating inevitable sectarian communities and divided clusters; the Christian community within Bachoura, found itself on the 'West' side and had to relocate to the 'Eastern' side of the demarcation line (Fig.3.5b). The war had dramatic consequences on the socio-political and spatial identity of the area - the Christian quarter became a 'no-man's land' whereas the south-west side maintained the socio-political identity which existed before the war (Brones, 2010).

Figure3.5.a. The Green line.
Source: Sinno, 2020.

Figure3.5.b. Beirut before and after the civil war. *Source: the961; thenationalnews*

At the end of the war, a controversial agreement was decided on and resulted in the reconstruction of the city centre by the government in collaboration with Solidere, a private real estate holding company (Mango, 2004). This agreement impacted the northern section of Bachoura which inevitably led to a market-led gentrification of the central district (Nasr & Verdeil, 2008). It created an 'island' out of BCD which led to further isolation of the surrounding areas due to the widening of the adjacent street as part of the elaborate Solidere plan.

3.2. BDD and its strategic location

3.2.1. BDD's implementation in Bachoura

Up until 2010, the district of Bachoura, excluded from the Solidere plan, remained the poster city of the civil war. On the north-eastern edge, known once as the 'Christian neighbourhood', squatters resided in the abandoned homes and were eventually evicted by the ministry of Displaced (Boekelo, 2016). This led BDD's developers to buy most of the lands in that area from different property owners; most of whom were already looking to sell due to the districts socio-political affiliation with the Amal and Hezbollah parties (Brones, 2010). BDD was launched in 2012 by private and public sectors initiatives such as Berytech, a technology incubator, ZRE, a real estate firm, the Ministry of telecommunication and supported by the Central Bank (Nabbout, 2012). Although its inception was not conducted in the same manner as Solidere, the current pace in which BDD is expanding into Bachoura could lead to gentrification (Whiting, 2012). According to Bou Akar (2018, 145), "The planner working in the context of Beirut's peripheries had become a technician, in the service of a compartmentalised political order, rather than a valued, and independent, social reformers." From the clear East-West religious division that materialised by the demarcation line, Beirut today finds itself following innumerable invisible lines that are materialised through people's identity and attachment to their 'micro-lands' (Aouad, 2021, Bollens, 2012).

3.2.2. BDD's strategic location

Looking into BDD's periphery, a sectarian division is evident on its edges. Regardless of Bachoura's proximity to BCD, its socio-spatial conditions differ tremendously from its north and east neighbours and to BDD itself. The large scale BDD introduced into the area contradicts the surrounding urban morphology and land-use typology with Bachoura being mainly an impoverishec residential area. Whereas the former rests on a non-sectarian approach, the latter is publicly known as one of the most politically affiliated areas in Lebanon. While the district attempted to bridge the gap between the masterplan and the local community, the efforts were in vain. Besides its controversial location, BDD is a short walk away from both BCD and Achrafieh but the infrastructure led to its inevitable island and inward-looking perspective (Fig.3.6). Due to the current socio-political climate in Lebanon, BCD was inactive only to later become the hub of the revolution. That said, its cultural, political and economic importance remains undisputable. As for Achrafieh, it is formed of a main foreground network that hosts high streets, commercial and educational hubs and, in its background, lies the residential area.

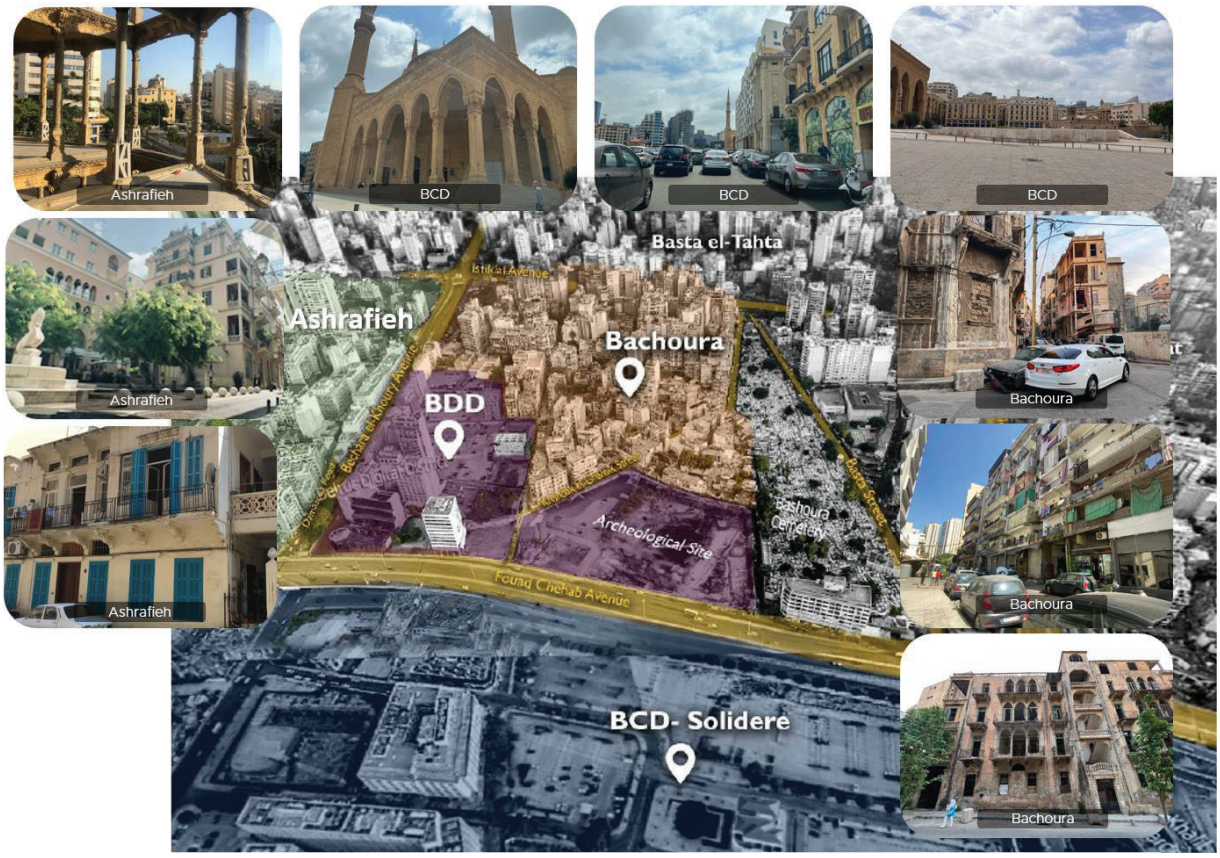


Figure 3.6. BDD and its surrounding districts. *Edited by author. – Based original Source: Darwich, 2020*

3.2.3. BDD's structure and masterplan

Zooming into BDD which forms a community of over 2000 members in 130 companies located across 35,000sqm; comprised of 56% start-ups, 23% large companies and 21% of NGOs. The district spans over 12 buildings, 8 meeting and training rooms, 3 event spaces, 4 co-working spaces, 3 eateries, 2 gardens, a gym and sport court and various parking plots underground and overground (Fig.3.7). This innovation district is established in collaboration with universities, incubators and venture capitalists to improve opportunities for growth within the innovation sectors. It claims to be based on 5 main pillars: community, sharing economy, smart design, sustainability and social wellbeing. BDD was set to be built in 4 different phases over the span of 10 years to ensure its organic growth (BDD, 2022) starting with the office buildings as phases A and B and including high rise buildings such as hotel, a residential complex and additional communal areas in phases C and D (Fig.3.8). The plan was disrupted due to the collapsing Lebanese economy which forced BDD to stop at phase B.

Figure 3.7. BDD's masterplan

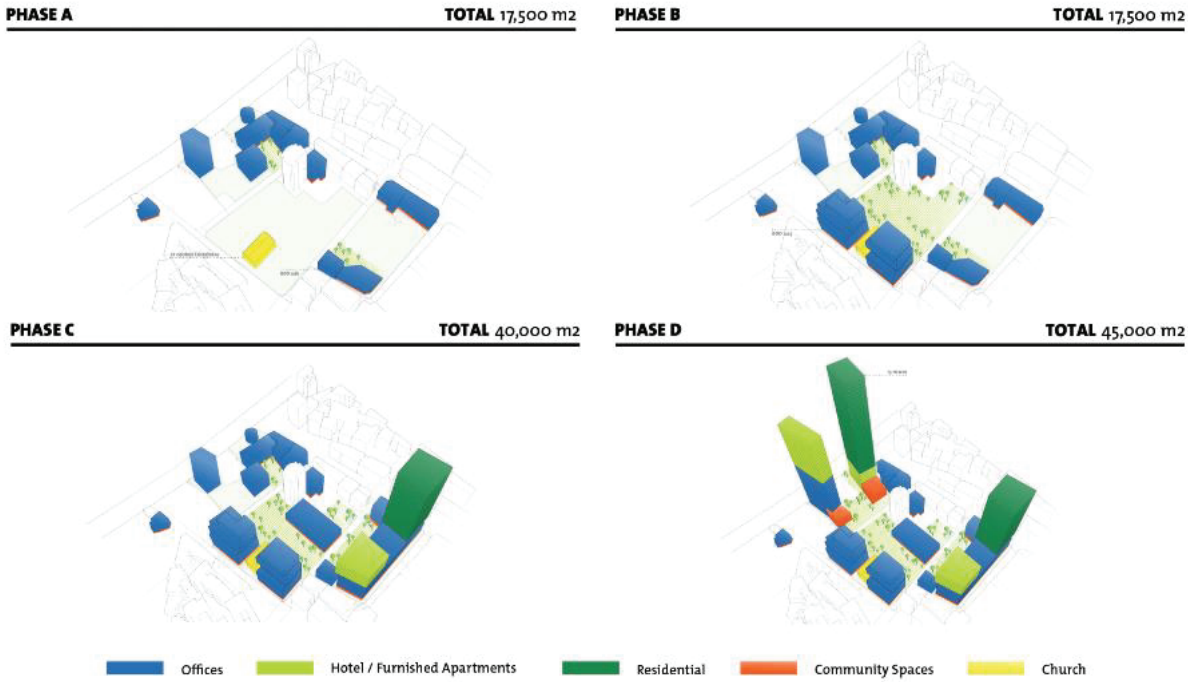


Figure 3.8. The 4 phases of BDD's masterplan - *Original Source: BDD*

3.3. Conclusion

The extensive historical urban evolution of Beirut led to the isolation of Bachoura, one of its peri-central areas, delimited by transport edges. In 2012, BDD established its ground in the abandoned 'Old Christian Neighbourhood' of the impoverished area. Besides its strategic location and proximity to the city centre, the innovation district's values are strongly associated with the social wellbeing and the importance of community. That said, looking at BDD's surroundings, the social-political and even spatial setting differs tremendously from its neighbours.

Chapter 4 | Methodology

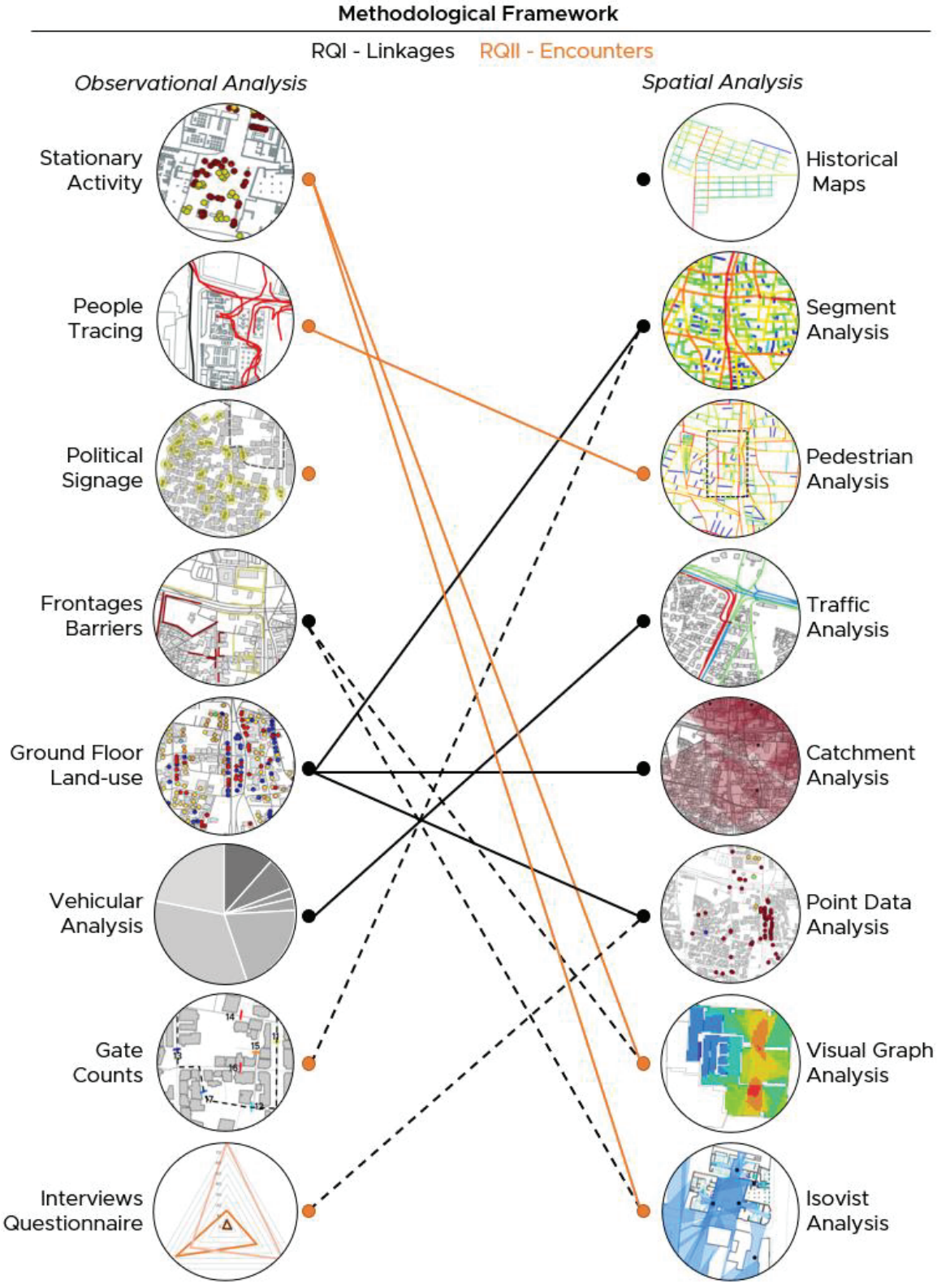


Figure 4.1. Methodological framework

4.1. Methodological framework

The methodological framework shown above (Fig.4.1) identifies and links two major methods of analysis used in this study, observational and spatial, to the two fields that are explored - tackling the linkages between BDD and its surrounding areas and identifying social encounters within the district (Fig.4.1). By using spatial analysis, the two fields can be explored in terms of quantitative data which would identify the morphological relations and connectivity or lack thereof between the areas. On the other hand, by observing people's behaviours and movement on-site and by mapping the physical quality of the area, an added layer would strengthen the hypotheses set out. They were not only used to validate the previous type of analysis but also to question discrepancies and allow further exploration of the cause behind them. The combination of the two allowed the study to answer the research questions tackling linkages and encounters with the use of programs such as QGIS, Depthmap, Isovist.org, Autocad, SPSS and excel.

4.2. Spatial and morphological data mapping and analysis

Within the spatial analysis, several studies were conducted: the road network data including the historical maps and the current segment map, traffic analysis, the pedestrian segment maps, visual graph analysis and isovist maps.

The historical maps were extracted from diverselevant.org and georeferenced on QGIS to create the segment maps. The cartographic redrawing of 5 different timeframes - 550 B.C, 1560, 1880, 1920, 1980 - indicates the years in which the urban structure of the city was modified. The analysis was conducted on Beirut's city centre and its direct peri-central areas using normalised global integration and choice (Chapter.2) on RN to visualise and quantify the growth of the city. The average integration of three separate roads was extracted from QGIS to compare their evolution - Fouad Chehab road, Bechara el Khoury and Tyane road.

Using a previous axial map of Beirut based on 2019, the segment map of the 2022 road network was adapted using OSM from which some roads were added and others deleted. The choice values extracted from the current segment analysis was studied on various radii - RN, R2000, R1200, R800. Following the analysis, the average choice values of Beirut as a district was compared to the studied. To understand the intelligibility of the area, the integration values were extracted from QGIS and using SPSS, a scatterplot was created to visualise the correlation between global and local integration.

Using google maps, traffic data was extracted and inputted into QGIS under three main attributes: Heavy traffic, mild traffic and moving well. The visualisation was conducted for all

days of the week at 1pm and at 5pm. Since google maps gives a typical traffic rate with a margin of error, vehicular counts were conducted on the two roads of interest, FC and BK, to primarily determine the validity of the data (section 4.3).

Using the space syntax toolkit on QGIS, two types of pedestrian segment maps were drawn and analysed - a formal one following the pavements and an informal one depending on where people were observed crossing the streets and added based on the snapshots conducted throughout the 10-day observation period. The analysis was conducted based on choice values on various radii (R100, R200, R400, R800). For most of the study, the informal map was used as the main pedestrian model. Additionally, the normalised choice values on R100 and on R800 were correlated to identify the intelligibility of the area (Fig.4.2).

Figure 4.2. Formal and informal pedestrian maps

The catchment analysis was conducted based on certain functions from the ground floor land use analysis (Section 4.3), specifically restaurants on a R200 and attractors (based on cultural buildings and public squares) on R400 to establish their proximity to BDD. Point data on vacant plots and on restaurants was joined to the pecestrian informal segment map and analysed on NACH400 to establish the through movement and the location of these plots within the network.

Visual graph analyses were conducted on both the masterplan and building scale. Using depthmap, and by correlating the visual connectivity with the visual integration of each building separately, the intelligibility of the studied area is found from which the R-squared values were extracted to get the average intelligibility of BDD's buildings. As for the scale of the masterplan, the same correlation was done to get the intelligibility of the whole area. To further understand the accessibility and visibility in the area, isovist points were set on the entrances of each building within the masterplan and covered a 30deg orientation to determine all accessible routes. And finally, the visual step depth set in the BDD garden, one of the main squares of BDD, follows the shortest visual accessible path from a selected point to all other points in the masterplan to determine the proximity of BDD to the surrounding area.

4.3. Manual data collection and observational analysis

For 10 consecutive days, data was collected on site to understand the surrounding land use, the pedestrian movement – people tracing, gate counts and snapshots including stationary activity, political signage and frontage analysis. Additionally, interviews were held and a google form questionnaire was sent out to determine a qualitative layer to the analysis.

Ground floor land-use analysis was extracted from "my maps" on google where various locations were pinpointed based on function – restaurants, bars, retail, offices, cultural, official and religious. Due to the constant changes in function and places closing down in the recent years resulting in inaccurate data, as such the points were validated by on-site observations where residential and vacant functions were added.

After determining similar traffic rates during weekdays, the observations were based on the data extracted for Wednesday and Saturday. For the duration of 15 minutes, at 1pm and at 5pm on Wednesday and Saturday the count of the different types of transport were categorised under private cars, public transport, taxis, trucks and motorbikes.

As for the stationary activity, two different types of observations were made: the different activities conducted (standing or sitting) and the functions of people in these areas (Bachoura residents, security guards originating from Bachoura or BDD employees). This differentiation was clear mostly due to the nature of people's attires and the conversations taking place.

To understand the pedestrian movement, 15 gates were set in and around. These gate counts were differentiating between women and men. These values were then inputted in QGIS and correlated with the choice values to determine if there is a relationship between the integration of the street and the gate counts. Additionally, 26 people were traced from origin

to destination in and around BDD, for a better understanding of locals' behaviours in the area - 18 of which were BDD employees and 8 Bachoura residents. These movements were then mapped on QGIS.

A general mapping of the area's conditions determined the character around BDD. In order to showcase the politically affiliated nature of Bachoura, photos of different types of political signages – posters, flags, pictures, graffiti - were taken and mapped on QGIS. The same analysis was done for BCD and Ashrafieh and categorized into three political parties: Amal and Hezbollah party, the Kataeb and Lebanese Forces party and signs of 17 October revolution. Additionally, an identifiable edge was mapped out – formed of parking plots, abandoned building and garbage disposal areas. While walking around the area, different types of barricades limited movement. As such, they were categorised under three types of frontages: hard front - which generally refers to walls, visually accessible barriers - referring to fences, and soft barriers - which refer to posters and billboards blocking access and visibility but however could easily be removed.

A series of informal interviews were held with 30 Bachoura residents focusing on two main questions - 'Do you live here?' and 'Do you go to BDD?'. A google form cuestionnaire was created, distributed and filled out by 169 BDD employees (forming 9% of the community) in an attempt to identify the intention of the employees and their behaviour with the surrounding areas. The first section tackled: areas of home residences, means of transportation, BDD buildings they work from, and spaces they interact with. The second section focused on the likelihood of interacting with the Bachoura area and its residents and subsequent spaces of interaction. The third section examined the safety of pedestrian crossing towards BCD and Ashrafieh as well as activities conducted on breaks whether in or outside of BDD. The questionnaire was linked to various strands of analysis to determine if it coincides with the analytical findings and if not, the reasons behind the discrepancy. The questionnaire's responses were turned into diagrams to illustrate the findings.

Further details on the methodological approach can be found in Appendix A.

Chapter 5 | BDD: A spatial conduit or a physical barrier?

In this chapter, the study explores the extent of which BDD acts as a conduit between various adjacent areas: looking into Bachoura, Achrafieh and BCD. To do so, a historic analysis was conducted based on the evolution of its network, followed by the intelligibility and the state of its current urban structure. The study then concentrates on the land-use surrounding BDD and the latter's proximity to attractors and other functions.

5.1. Looking through a historic lens

To better understand the roads surrounding the Bachcura area, this section tackles the evolution of Beirut's urban morphology from an analytical point based on the global choice and integration values. It examines different historical timeframes: the roman era (64 B.C. - 560 B.C), the medieval times (1300-1840), the expansion beyond the walls (1845-1920) and the impact of the French mandate (1920-1950). Respectively, the normalised integration and choice maps on Radius N describe specific dates in each era (Fig5.1), their values were extracted to compare the different timeframes (tab.5.1). The study excludes the maps between 1975 to 1990 due to the fact that the main Bechara El Khoury, which is of interest to this study, was transformed into the green line dividing the city into two sections.

Three main roads were selected for the analysis, known today as General Fouad Chehab road (FC), Bechara el Khoury road (BK) and the internal Tyane street within Bachoura (located on Fig.5.1). By examining the results, the study determines that all three roads were more integrated than the average integration throughout the years. As the segment count intensified, a steady increase in the integration values is observed from 1880 until 1920. Following the transformation of roads surrounding BDD into motorways, the analysis in 1970 illustrates a decrease in integration by 13.6% for FC, 10% for BK and 11% for the internal road (Fig5.2).

Year	550	1560	1880	1920	1980
NACH min	0.2033	0.1652	0.1768	0.1287	0.1614
NACH max	1.4686	1.4714	1.5248	1.5146	1.4916
NAIN min	0.8524	0.6255	0.6116	0.8008	0.6082
NAIN max	1.9341	1.207	1.204	1.596	1.527

Table.5.1. Comparison of NAIN and NACH min and max values on RN through the years.

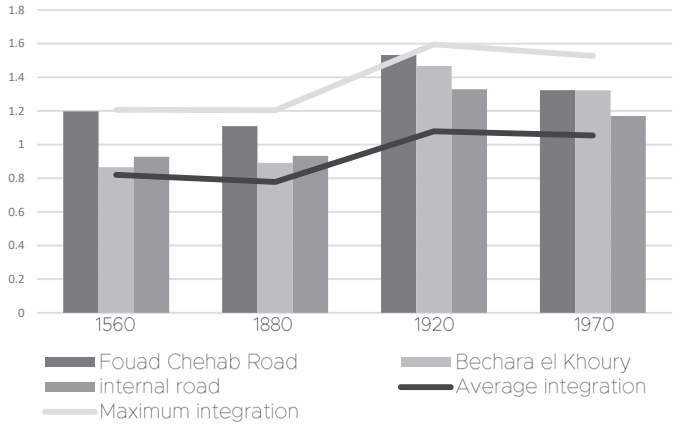


Figure5.2. Comparison for NAIN on RN through the years of the surroundings roads.

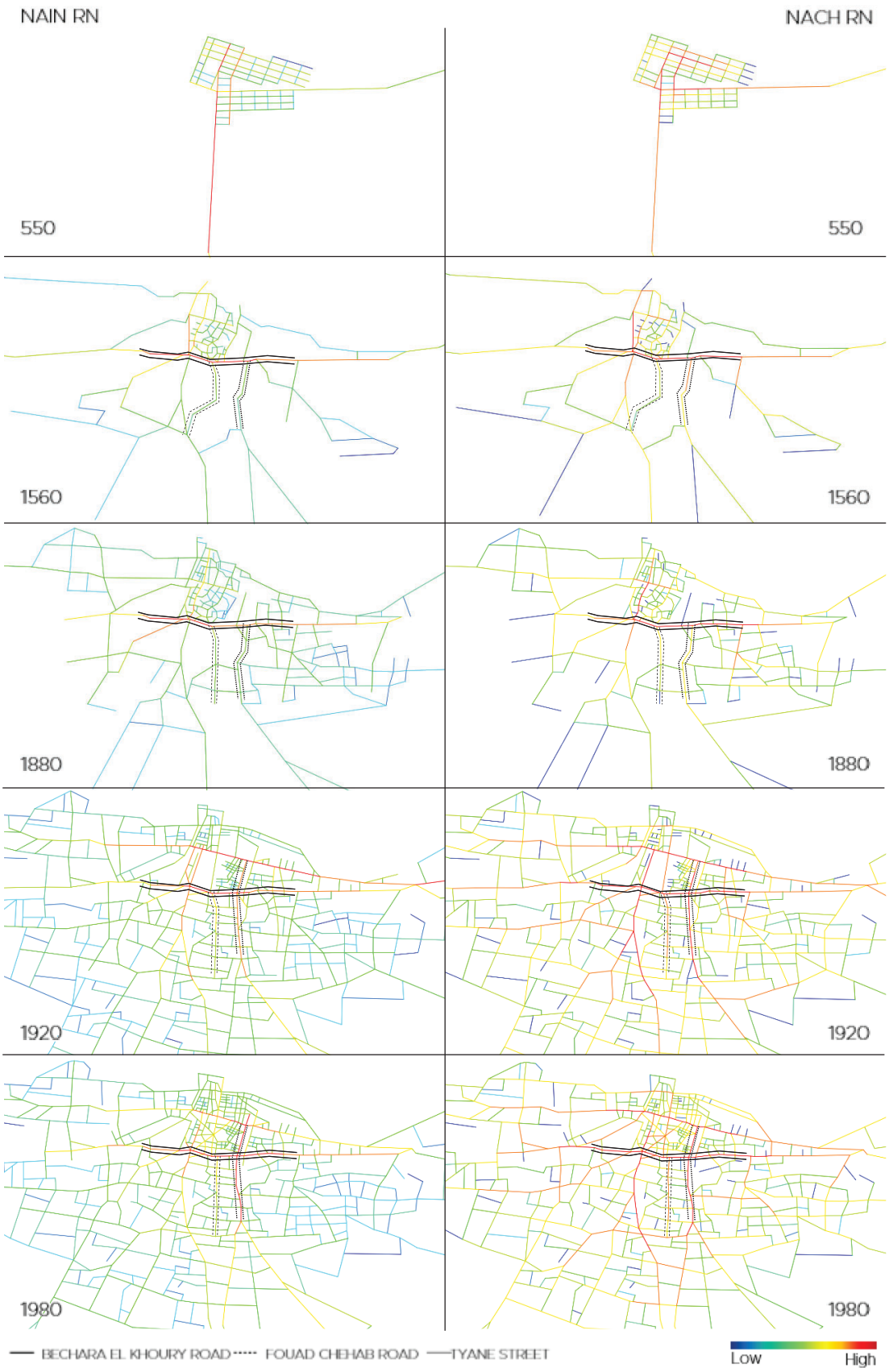


Figure5.1. Historical analysis of NAIN & NACH on RN throughout the years

5.2. The urban network of Beirut

By conducting the global choice analysis on the current street segment map, the study compares the general average choice and the one pertaining to the 600m radius around BDD (803700 sqm). On R2000, the average choice value within the studied areas (1.01) scored higher than the whole (0.92) by 7.1% (Fig5.3).

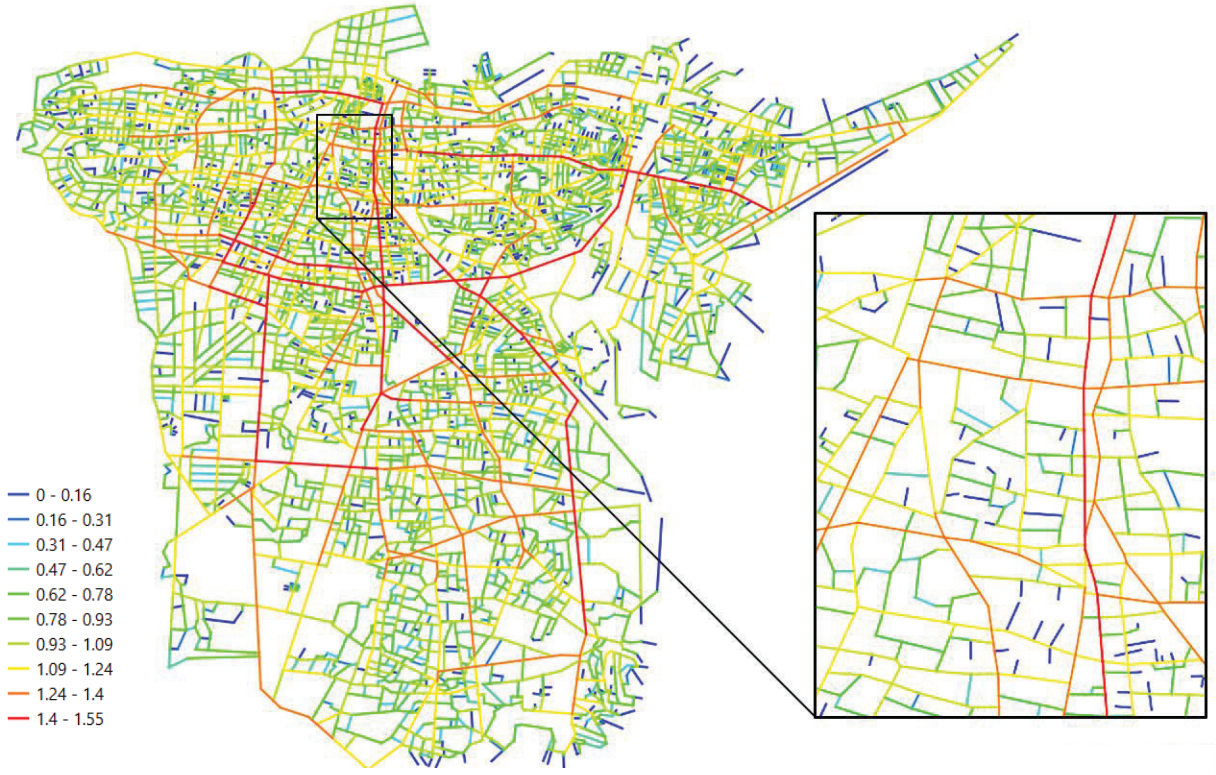
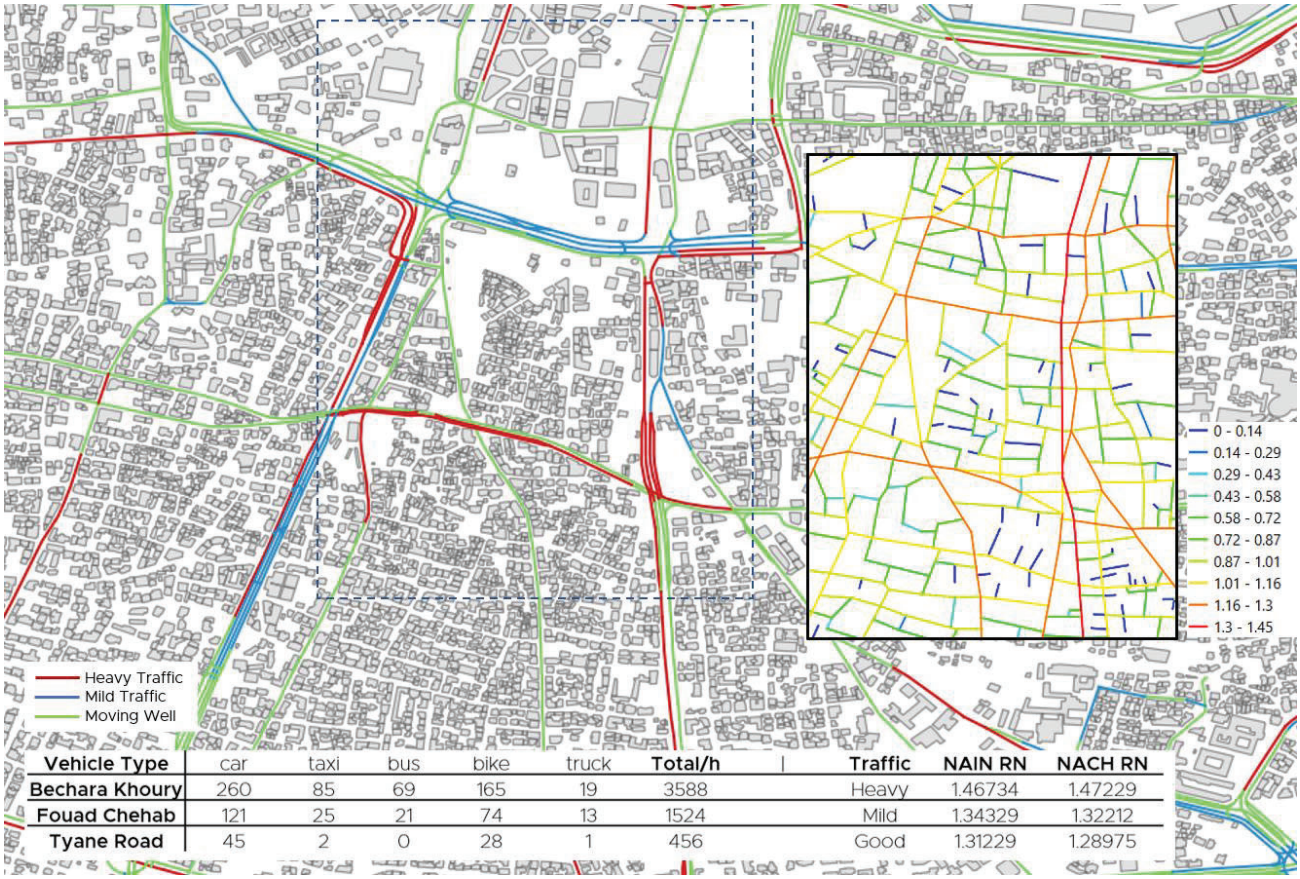


Figure5.3. NACH RN | Segment Map Analysis

Through the traffic data analysis, it was highlighted that the roads surrounding BDD on its northern and eastern edge had mild traffic on FC and heavy traffic of BK on weekdays at 1pm. By superimposing the traffic analysis with the choice value of these roads, the study found that FC and BK are highly integrated on a R2000 scoring respectively 32.7% and 39.5% higher than the average integration which of 0.89 (Fig.5.4). That said, by correlating the global and local integration, the intelligibility of the studied area was rather low where R^2 was 0.424 (Fig.5.5).



Vehicle Type	car	taxi	bus	bike	truck	Total/h	Traffic	NAIN RN	NACH RN
Bechara Khoury	260	85	69	165	19	3588	Heavy	1.46734	1.47229
Fouad Chehab	121	25	21	74	13	1524	Mild	1.34329	1.32212
Tyane Road	45	2	0	28	1	456	Good	1.31229	1.28975

Figure5.4. Weekend traffic Analysis | NACH R2000

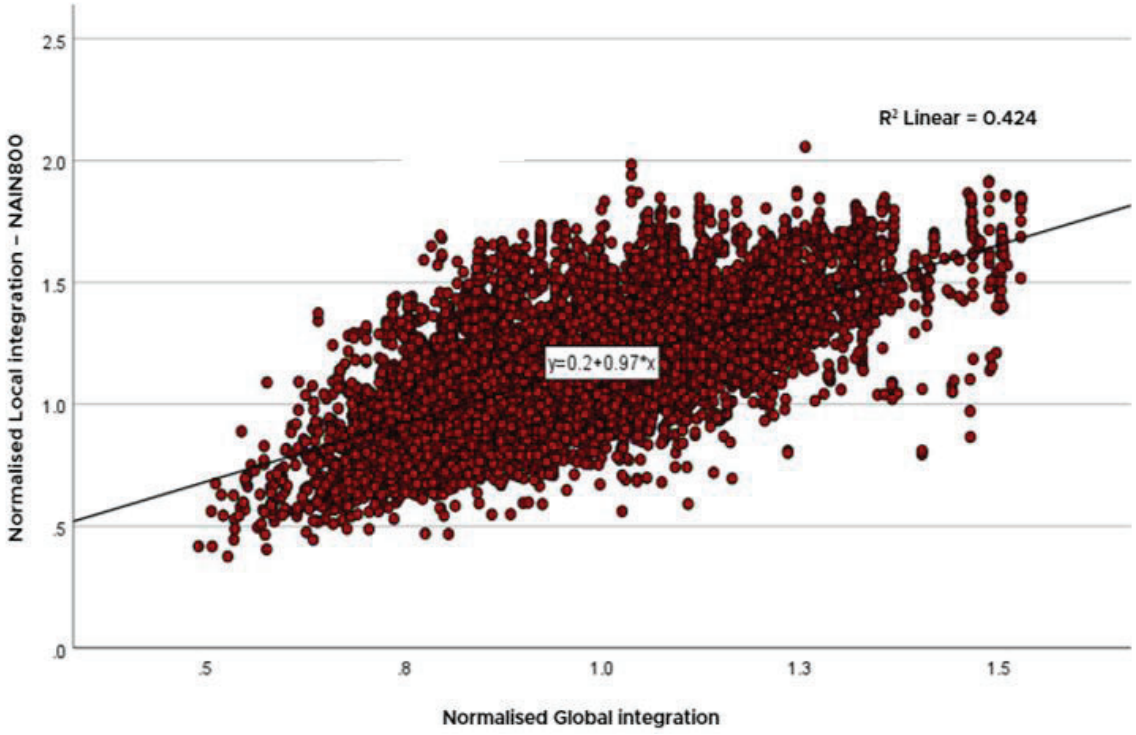


Figure5.5. Integration intelligibility | Correlating NAIN800 with global integration

5.3. Land use analysis

The land-use analysis concentrated on BDD and its direct surrounding areas – parts of BCD, Ashrafieh and Bachoura - as well as the two main roads around it, BK and FC (Fig.5.6). Within the studied area around BDD, the most prominent function was residential at 33%, followed by retail and restaurants at respectively 21% and 22% and the vacant ground floor at 11% (Fig.5.7). The analysis found that Bachoura had the highest number of residential land use on its ground floor, whereas to the east of it, Achrafieh had a combination of residential, restaurants and retail ground floors with the independence road acting as a high street.

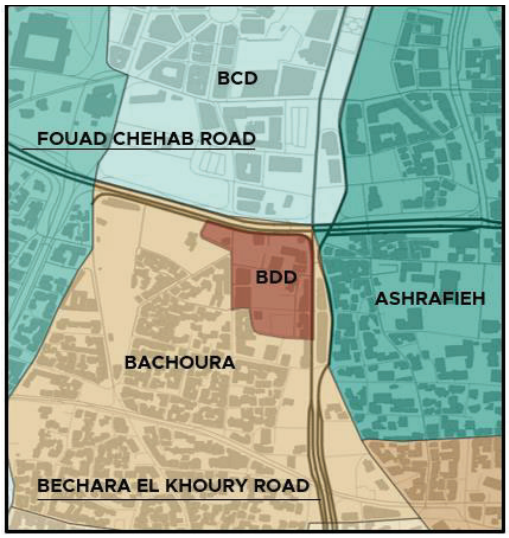


Figure5.6. Areas and streets considered for the analysis

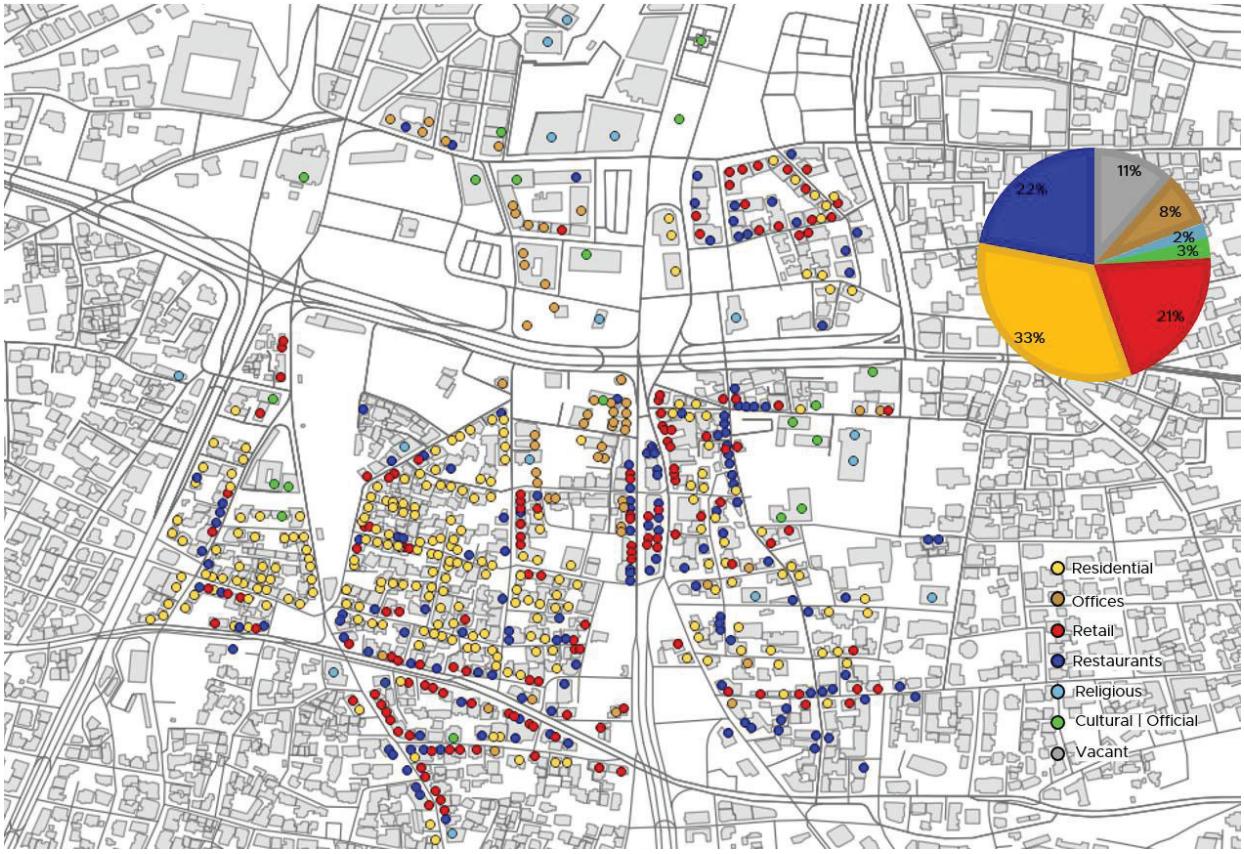


Figure5.7. Ground Floor Land-use point data analysis

As for BDD, it is primarily formed of offices with the exception of 2 restaurants and 4 vacant plots on the ground floors. The adjacent part of BCD is mostly grouped vacant plots, cultural landmarks and religious buildings with a few retail functions (Fig.5.8). The lack of diversity within BDD suggests the need for a link to be established between the different areas. That said, through the questionnaire, only 10% of BDD's employees stated exiting the district during their breaks (Fig.5.9).

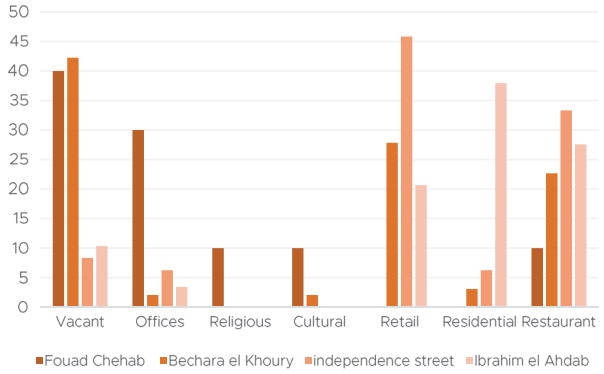


Figure5.8. Land-use data based on area

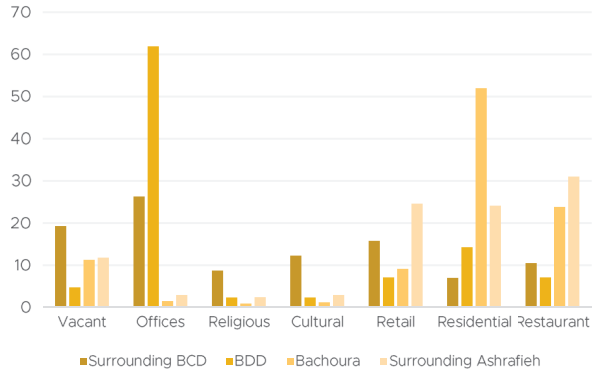


Figure5.9. Land-use data based on street

The above findings led the study to explore the location of the vacant plots. By joining the choice values of R800 from the pedestrian segment map to the vacant plots, the analysis found that they were located on highly integrated streets, such as BK road separating Bachoura from Achrafieh (Fig.5.10). As for the road separating BDD with BCD, the edge was predominately filled with vacant plots and parking areas. By comparing the two radii (1300m and 600m), the study determined that parking areas on the larger radius formed 5.6% of the whole area while buildings formed 32% - leaving 62.4% of the area for streets and vacant plots. As for the studied area, parking spaces were found at 10.9% and buildings were 31%. Subsequently, the parking area doubled within the studied area (Fig.5.11).

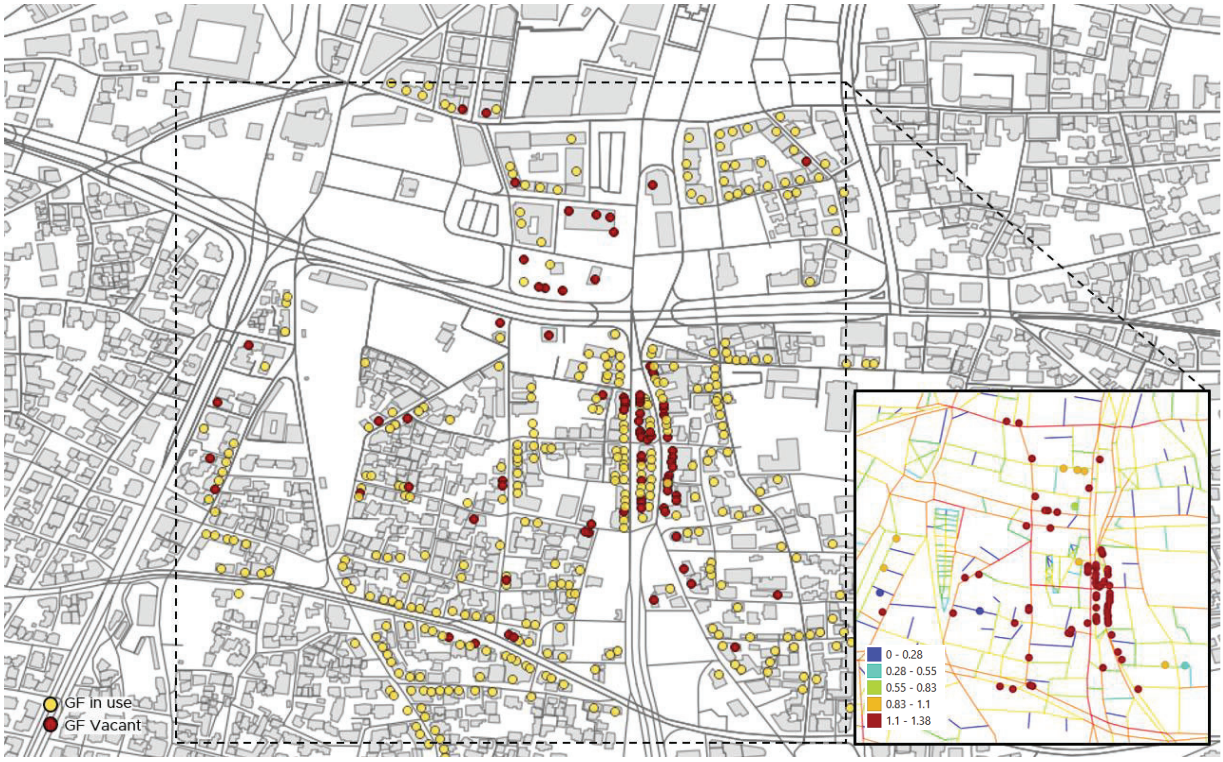


Figure5.10. Vacant vs Retail/Restaurants GF land-use | Vacant plots joined with NACH R800

Figure5.11. Comparison between parking areas within two radii

5.4. Proximity to the innovation district

By examining the catchment analysis of cultural landmarks, highstreets and surrounding attractors, the study found that on a R400, BDD is in close proximity to the attractors within the area – including the surrounding public spaces such as martyr square, Place de l'étoile and the Saifi park (Fig.5.12a). However no attractors exist on the South West side of BDD, a reality further confirmed by the responses to the questionnaire when asked "why would you not visit Bachoura?" with 68% of the responses stating 'there's nothing there' or 'why would I' whereas the remaining 32% were mainly due to security issues which relate to the socio-political composition of the area tackled in the following chapter (appendix B). As for restaurants and retail, it appeared that on a R200, BDD is in very close proximity to the surrounding functions (Fig.5.12b).

Figure5.12.a. Catchment analysis based on attractors R400

Figure5.12.b. Catchment analysis based on restaurants R200

That said, the results of the questionnaire showcased that 62% and 40% of employees have never walked to respectively the Achrafieh or the Downtown areas which are less than 200m and 400m away. More than 86% of employees deemed the pedestrian crossings to these areas relatively to highly dangerous (Fig.5.13).

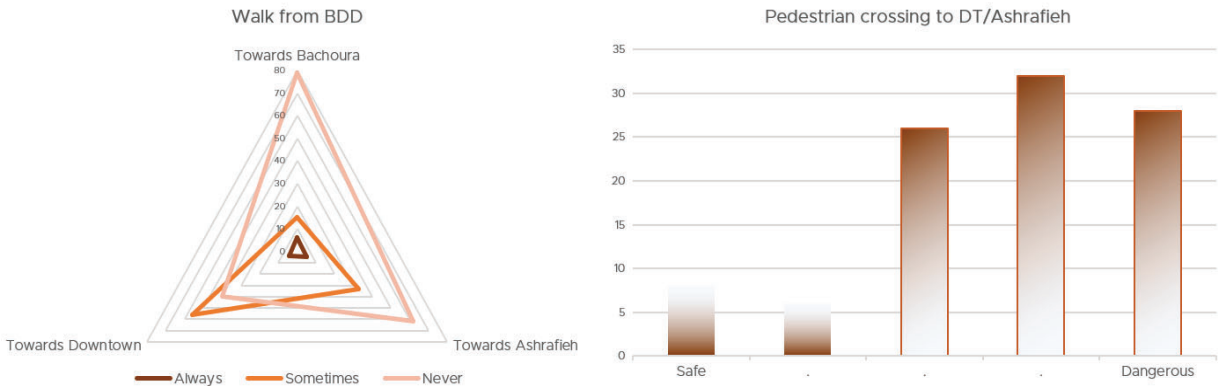


Figure.5.13. Results derived from the questionnaire – Walk from BDD | Pedestrian crossings based on safety

To add to the reasons behind this pedestrian separation, the analysis of the frontages was divided into 3 types that illustrated a physical barrier. Hard frontages formed 420m within the studied area, fences were at 242m and scft frontages at 137m. Additionally, the walk towards the downtown area proved to be unappealing due to the fences along the BK road (Fig.5.14).

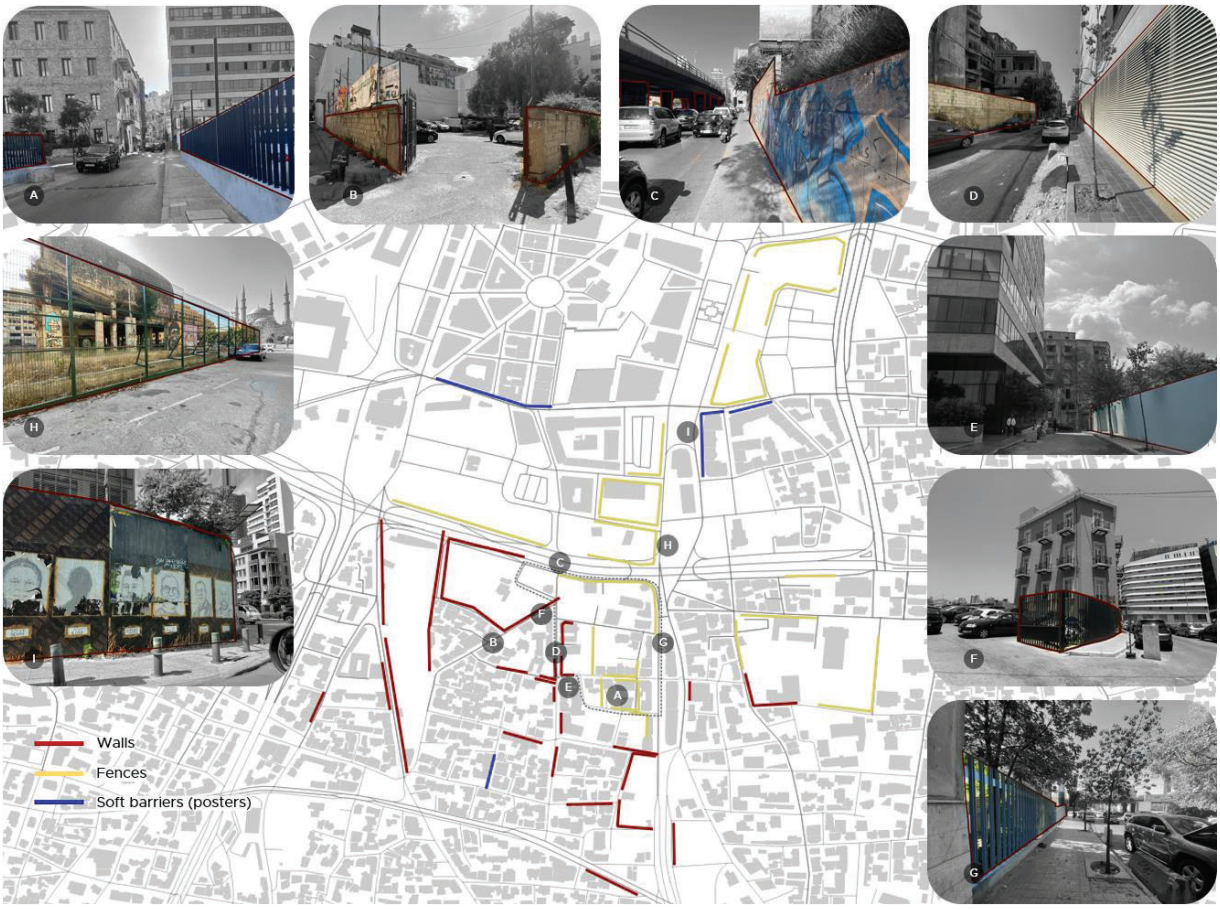


Figure.5.14. Frontages around BDD | Walls, fences and soft barriers

5.5. Conclusion

In conclusion, although BDD's location on the outskirts of BCD and Achrafieh should be a driver for the district to act as a conduit between its various areas, it however seems to be delimited by various barriers (Section.5.1). The construction of the motorways in the late 60s led the surrounding streets of BDD to isolate the district on its 4 edges. Looking into the traffic analysis and NACH2000, the study found that there is a high volume of cars on the BK road making it difficult for pedestrians to safely cross the road (Section.5.2). Through the land-use analysis and catchment, BDD seems to require the functions in the surrounding districts which are at close proximity but the district is blocked off on BK road by a street filled with vacant plots and on FC by empty lands and parking areas (Section.5.3). The responses to the questionnaire made it evident that BDD employees rarely cross the district's periphery and one of the main reasons being the danger of the pedestrian crossings. Another layer that adds to these barriers would be the different types of frontages that make accessibility to the surroundings difficult (Section.5.4).

Chapter 6 | BDD: A place of enhanced social interactions or a Space of Restricted Encounters?

In this section, the study will focus on social encounters that take place within the masterplan of BDD – fixating on BDD employees and Bachoura residents. The analysis will attempt to understand the movement and behaviour of the different users on a pedestrian scale. By mapping the encounters between the employees and the residents, the study underpins the spaces of encounter within the masterplan. And finally, it investigates the social demographic and the built fabric of the surrounding area which has led to BDD's inward looking perspective.

6.1. Understanding the pedestrian movement

As a primary approach, in order to understand people's behaviour, the study investigates the pedestrian segment analysis as both formal and informal crossings. Naturally, the informal crossings had a higher average integration: the formal segment angular and metric integration at R800 is 0.996 whereas when combined with the informal crossings, the integration value reached 1.104, increasing by 10.8% (Fig.6.1).

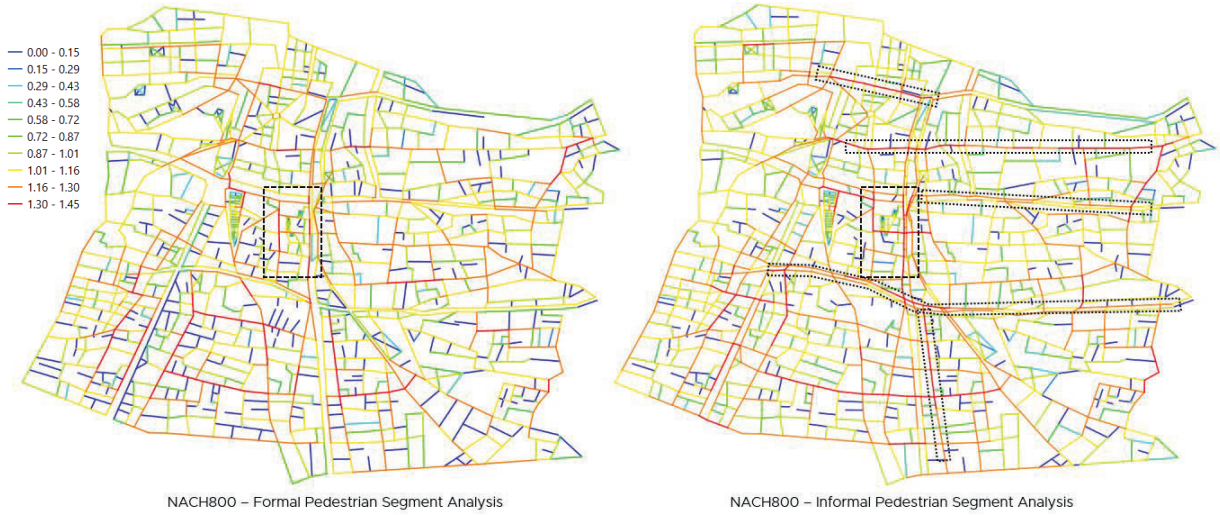


Figure.6.1. Comparing formal and informal pedestrian segment analysis on NACH R800

For the remainder of the study, the analysis will consider the pedestrian map with informal crossings. On R800, BDD appears to be an area that is isolated and surrounded by highly integrated streets – such as BK and FC roads – but on R100, BDD's public areas act as islands of micro-centres within the city (Fig6.2) similarly to the cemetery on the west side of Bachoura, the pedestrian central square in BCD and the communal area in Saifi, Ashrafieh. Consequently, the choice values on BK and FC dropped respectively by 31%, 82% and 70% and the communal areas within BDD rose by 28% and 25% (Fig.6.3).

Figure.6.2. NACH R100 showcasing the microcenters and the drop of the main surrounding streets

Figure.6.3. Comparing designated areas on NACH100 and NACH800

Analysing the gate counts, gates 14, 15 and 16 located within BDD witnessed the most footfall during peak hours (Fig.6.4). Following 26 people traces (Chap.4), it became clear that BDD employees would manoeuvre within the edge of the district - with one person going out towards the downtown area through EK. By tracking Bachoura residents, it was equally apparent that they would walk on the edge of BDD with no attractors or reasons to go into the site (Fig.6.5).

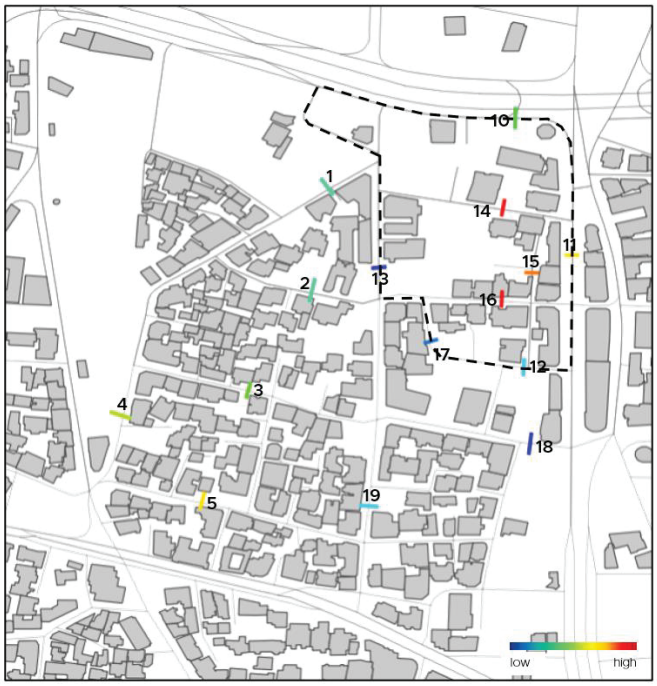


Figure.6.4. Gate counts based on footfall during peak hours

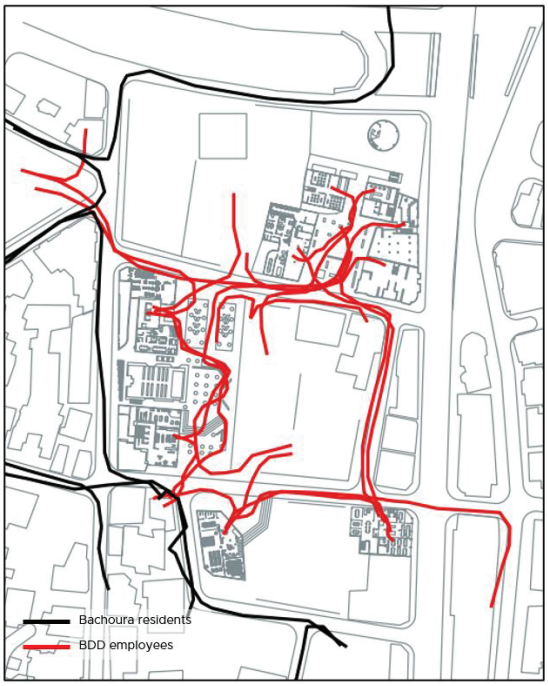


Figure.6.5. People tracing | BDD employees and Bachoura residents

By comparing the location of the gates to the choice values of the pedestrian segment map, at R100 the gates seem to be located in the integrated areas whereas at R800 the footfall no longer relates to the choice values (Fig.6.6). A comparison of women and men which crossed the gates showcased that, on average, men constituted 79% of the people crossing during peak hours in Bachoura, 64% of the ones of BDD's northern and eastern edge and 51% within BDD showing a clear male pedestrian predominance in the streets surrounding BDD (Fig.6.7).

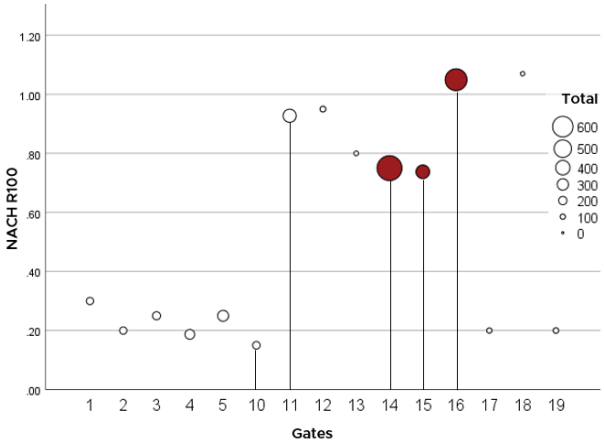


Figure.6.6. NACH100 by total gate counts based on gates

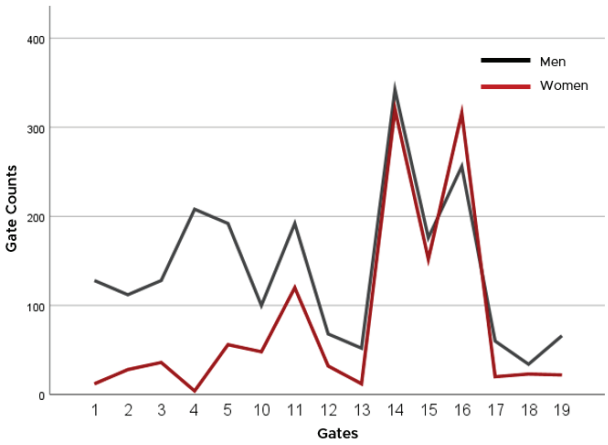


Figure.6.7. Men vs Women gate counts based on gates

6.2. Mapping encounters

Through the questionnaire, four different main spaces of interaction were identified within BDD's area which serve its community: 20% claimed to interact in front of the office buildings, 18% in the BDD garden 19% in café Younes, a restaurant on the premises, 25% stayed within their office buildings and 10% claimed to spend their time outside of BDD (Fig.6.8). The results of the questionnaire showed that people interacted with different buildings due to the power of attractors which are the communal areas. The employees in the buildings most interacted with were around the BDD garden (47%) and in café Younes (21%) followed by building 1227 which has a courtyard facing it (14%) (Fig.6.8).

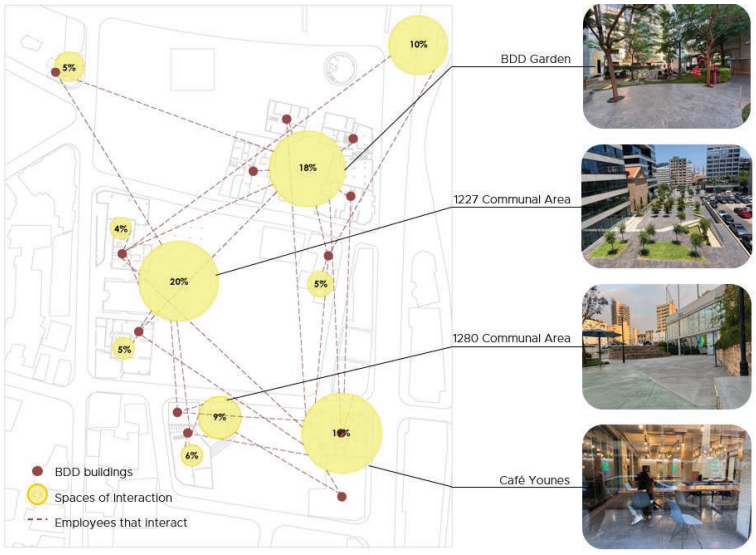


Figure.6.8. Places of interaction for the BDD community

Figure.6.9. Employees from different buildings interaction rate

That said, when the study concentrated on the places of interaction between BDD employees and Bachoura residents, Abu Ali Shop, a convenience store owned by a Bachoura resident, was the main attractor at 52%, followed by around the parking with security personnel at 24%, 14% would interact in front of building 1281 and 10% would interact in front of café Younes (Fig.6.10). Given that the parking on the premises is used by 82% of the BDD community commuting in private cars to reach the district (Fig.6.11), the security guards located on the edges of the parking are a natural interaction. As for the Abu Ali shop, it acts as the sole attractor that does not fall under BDD's jurisdiction.

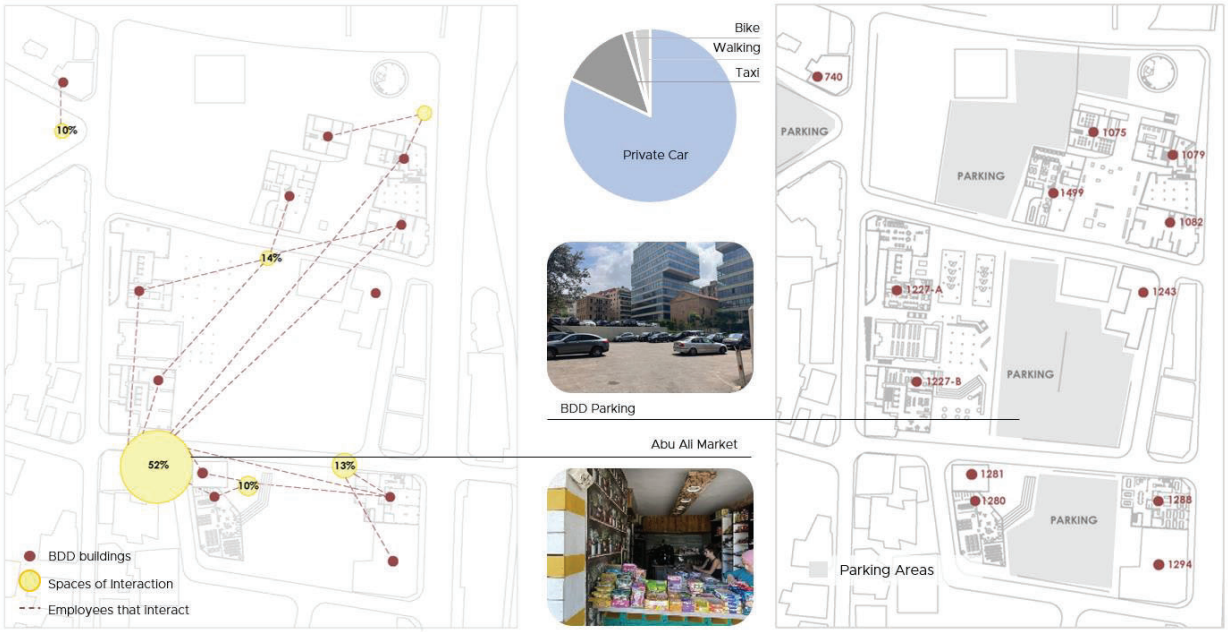


Figure.6.10. Places of interaction between the BDD community and Bachoura residents

Figure.6.11. BDD parking areas

It is worth mentioning here that the general definition of public spaces has been adapted to the understanding and culture of each community. While BDD still conforms to the aspect of squares and communal areas, the rest of the Bachoura streets and 'in-between' spaces have been adapted to be utilised by their local residents. The stationary analysis validates the results of the questionnaire, where by BDD employees spend time in the communal areas with no interaction with the Bachoura residents with the exception of Abu Ali's Shop on the south west edge (Fig.6.12.a). On the Bachoura side, the analysis proved that people were found either sitting or standing on the streets due to a lack of open spaces (Fig.6.12.b). The security guards, originating from Bachoura, are positioned on the edge of the district and in front of main communal areas. By superimposing their positions on the visual control analysis, the study found that most of the guards are positioned in areas that exert high visual control, showing the spaces most 'linked' to various junctions (Fig.6.13).

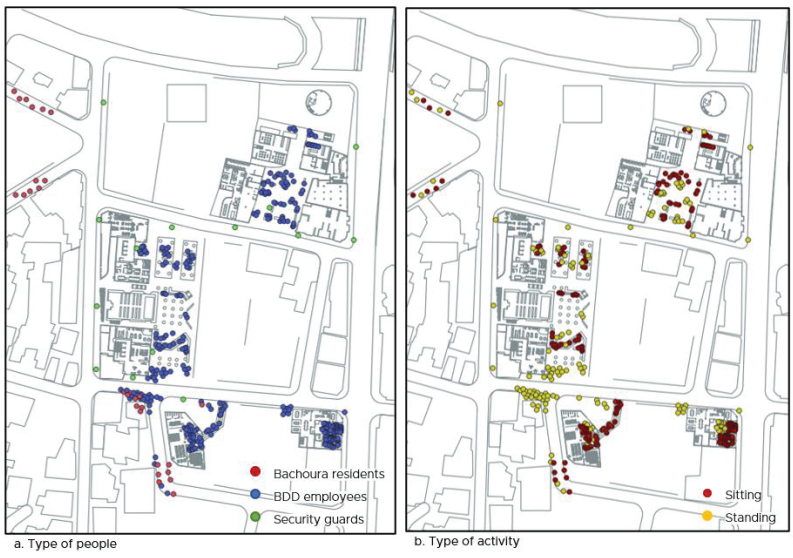


Figure6.12. Stationary activity throughout peak hours

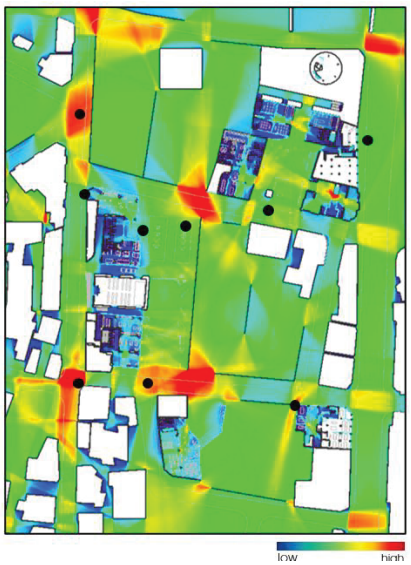


Figure6.13. Visual Control superimposed with Guards location

6.3. An inward-looking perspective

Although BDD adopts a secular approach when it comes to Lebanon's strong political affiliations, it is however located in a highly politicised area. Looking into the signage within the studied area and its surroundings, it is clear that Bachoura has a strong political affiliation with the Amal and Hezbollah parties associated with the Muslim community with billboards, flags and pictures scattered all around the residential area. On the right side and within Ashrafieh, the Kataeb and the Lebanese Forces parties, allied with the Christian community, have established their dominance over the area with flags and various headquarters. And finally, looking into the downtown area, since 2019, the revolution established its presence within BCD that acted as a platform and catalyst for the countless protests it has witnessed (Fig.6.14).

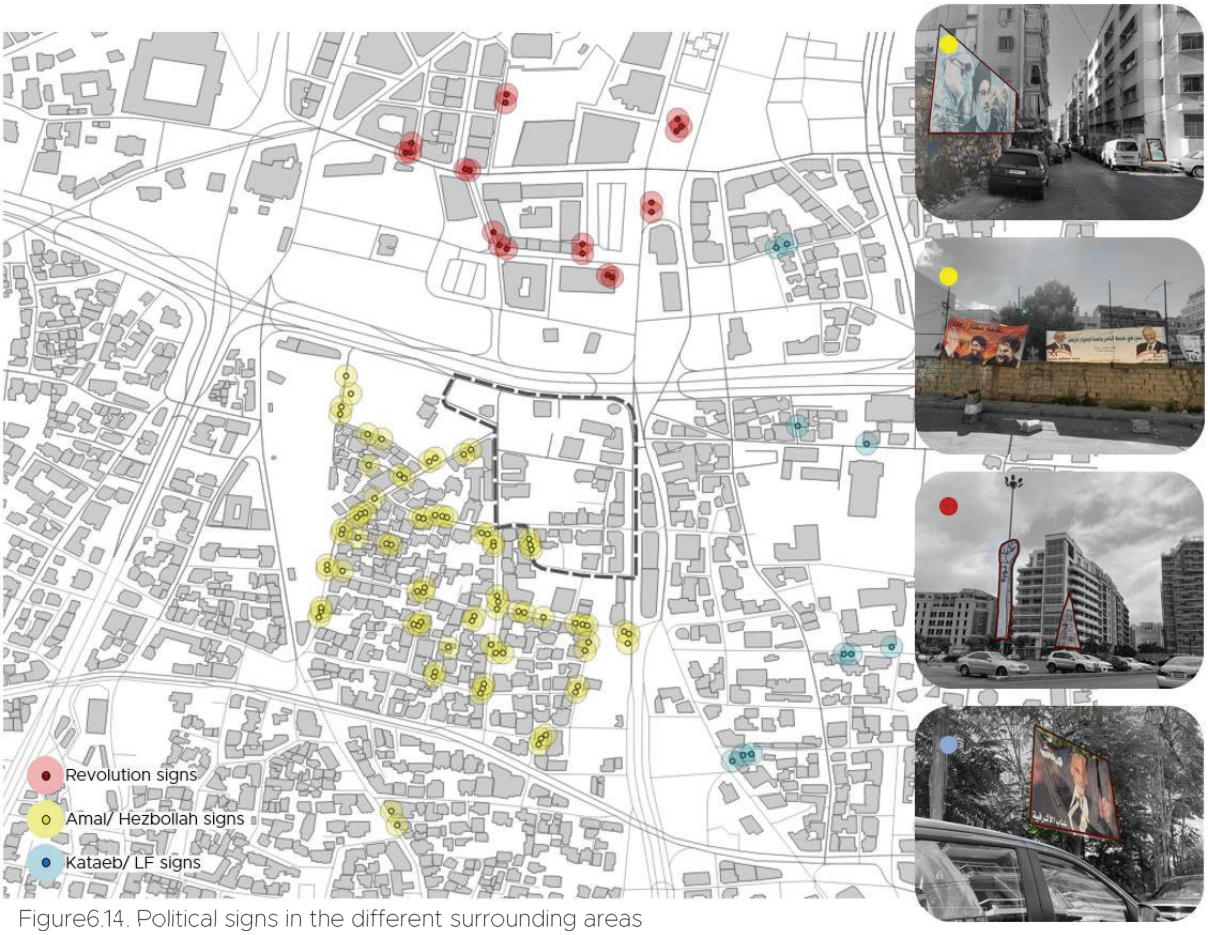


Figure6.14. Political signs in the different surrounding areas

Through the analyses of the visual depth of the masterplan, by placing the origin point on the main square, most functions within BDD seem to be 1 step away, as for BK and FC they are 2 steps and the Bachoura district seems to be the deepest area to reach from 3 to 7 steps (Fig.6.15). Looking at the periphery of BDD, an invisible layer that separates the two communities could relate to the functions and state of the surrounding plots: a garbage dump, vacant plots and 3 abandoned buildings (Fig.6.16). The lack of attractors on its edge led people from both communities to answer in the interviews: "what's the point of going into BDD?" (79% of Bachoura residents) or "there's nothing to do in Bachoura" (62% of BDD employees). Looking at the masterplan and the composition of the district the study found that all entrances to BDD buildings are only accessible from inside the squares pointing towards each other without an outward looking perspective to the surroundings (Fig.6.17).

Figure6.15. Step depth visual analysis from BDD Garden

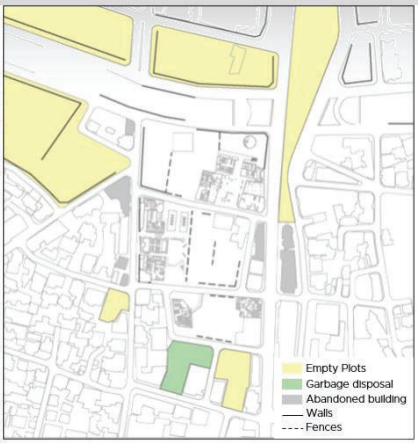
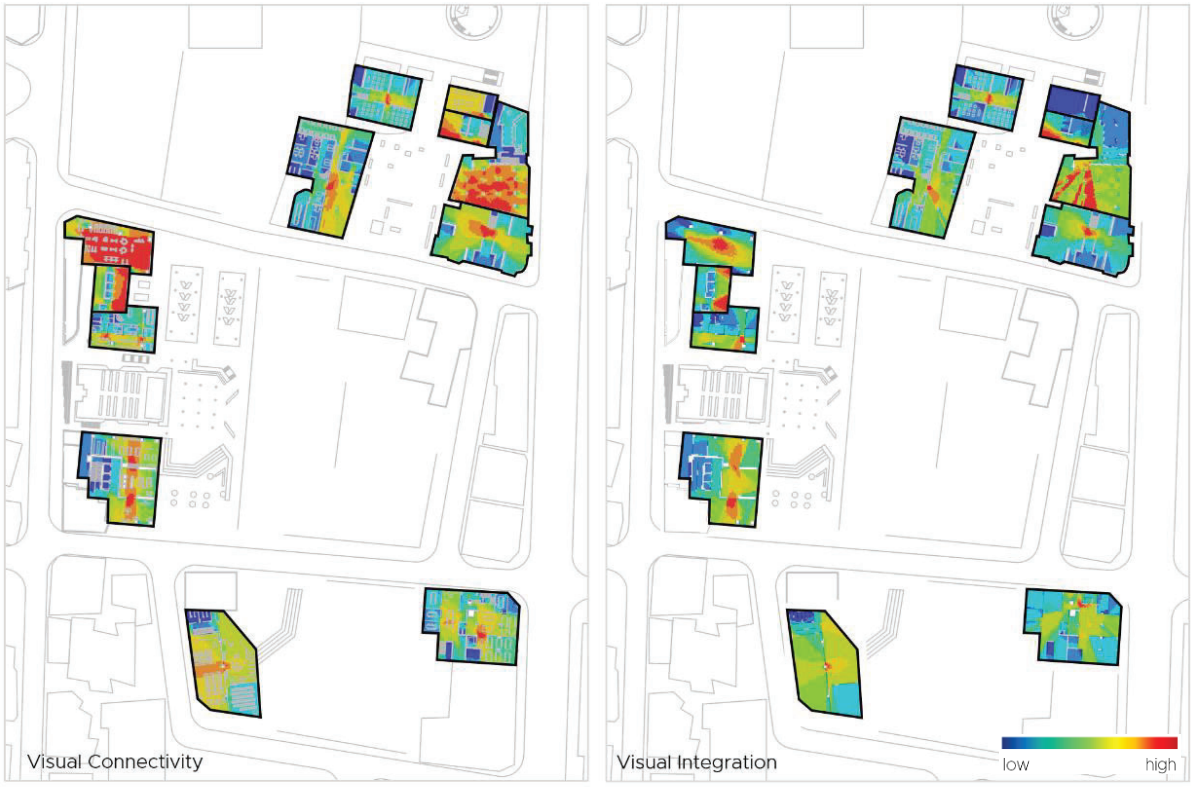


Figure6.16. Character of the surrounding plots

Figure6.17. Isovist from the entrance of BDD buildings

By correlating the visual integration with connectivity for each building, the analysis led to conclude that there's a high average intelligibility with an R-Squared value of 0.762 on the ground floor of the buildings that mostly serve as reception and communal areas (Fig.6.18). When the same study was conducted cn the scale of the masterplan, the intelligibility value was only 0.232 which makes it difficult to understand the movement (Fig.6.19). The hypothesis is that the BDD management is not treating the urban scale of the project as well as it did on an architectural scale favouring again the inward-looking perspective.



Building	1082	1075	1079	1082	1227A	1227B	1288	1280	Average
R-squared	0.717	0.857	0.583	0.871	0.775	0.919	0.591	0.784	**0.7621**

Figure6.18. Visual Connectivity and Integration of each BDD building

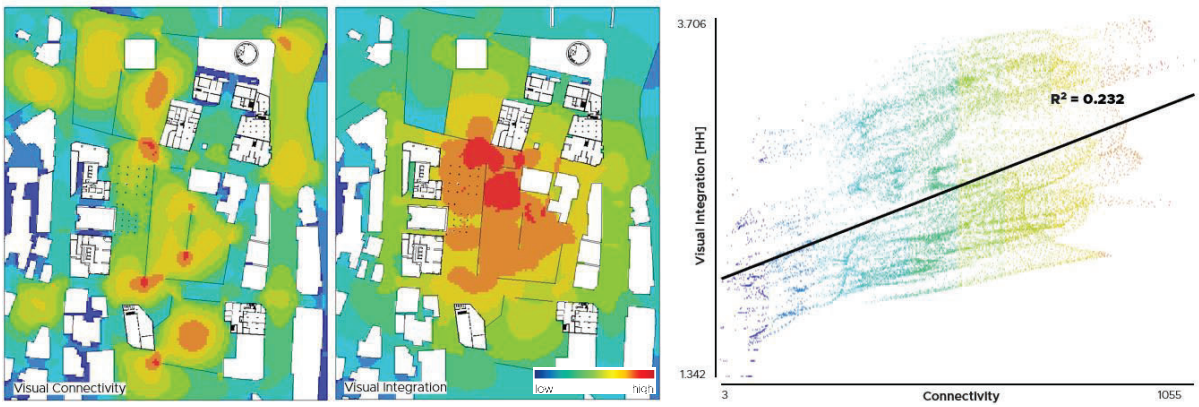


Figure6.19. Visual Connectivity and Integration of the masterplan

6.4. Conclusion

To conclude, the pedestrian segment map on R800 showed clear potential for the main streets to be revived around the area – especially independence street, BK and FC. Looking at R100, micro-centres stood out and amongst them was BDD's core communal areas. Through the gate counts, the study found no correlation between the choice values and the footfall. The hypothesis is that people are following the function rather than the street integration which are blocked off due to the surrounding frontages that stand as barriers and the typology of those integrated roads (Section.6.1). Through mapping the encounters, the analysis found that BDD employees tend to interact with each other based on the location of the common areas whereas interaction with Bachoura residents only occurs on the outskirts of the masterplan – and if within, it's with security guards originating from the area (Section.6.2). This inward-looking perspective was validated through the visual step depth analysis, the entrances that are only accessible from within and the barrier of unappealing functions on its edge. BDD envisioned the interior of the buildings in a way that would promote encounters with a high intelligibility of the space, but failed to do the same with the masterplan (Section.6.3).

Chapter 7 | Discussion and Conclusion

7.1. Discussion and synthesis

In this chapter, the study brings into dialogue the two sub fields analysing linkages and encounters in order to understand the impact of BDD on the urban regeneration process of its surrounding areas with varying socio-economic backgrounds. Based on the analysis, it became clear that the issue falls way beyond the initial aim of the developers and into the urban morphology of the area. The study underpins that visible and invisible barriers limited linkages as well as encounters within and around BDD.

7.1.1. The visible barriers

The historical analysis shed light on the development of the peri-central areas around BCD which led to the growth of the organic mosaic Beirut's morphology portrays today. The construction of the motorways, FC and BK, led to the complete isolation of Bachoura (section.5.1), the island approach that was intensified due to the lack of pedestrian crossings and the fast-vehicular movement surrounding it (section.5.2). Regardless of its proximity to BCD and Achrafieh, BDD is located in the background structure within the residential district of Bachoura where the urban configuration of the street creates a barrier for the encounters and links to occur (section.5.4).

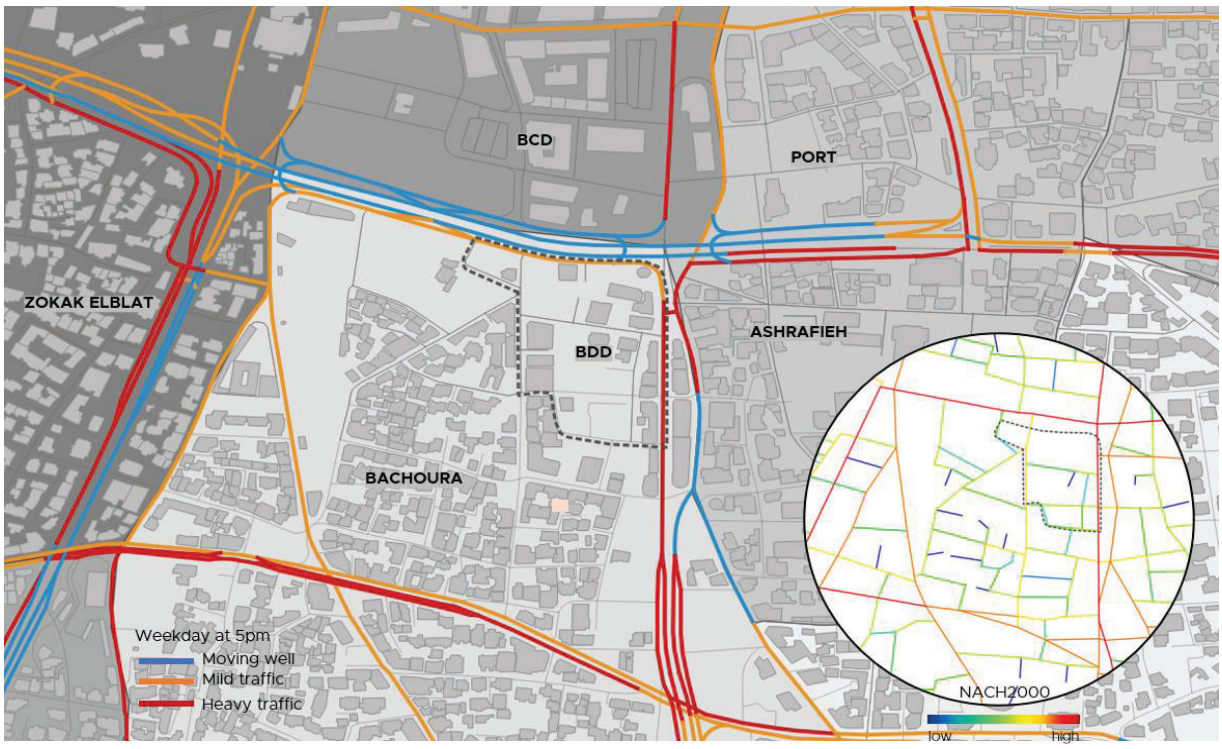


Figure 7.1. BDD within the background of Bachoura delimited by transport links

By analysing the pedestrian scale on R800, the streets surrounding BDD seem to have the potential of becoming high streets however their typology as motorways and the lack of attractors on them are somewhat of a limitation to the capability. On R100, BDD creates a micro-centre that acts within the area with no connection to other micro-centres. That was further proven by the gate counts conducted showcasing that during peak hours, the gates within BDD scored significantly higher than its surrounding 'main' streets (section.6.1).

Within BDD are 3 main public spaces but when comparing them to the Bachoura area, which is 3 times larger, there are no set spaces of interaction – subsequently, the residents developed a habit of placing plastic chairs on the streets and transforming roads and in-between spaces into their definition of public spaces (section.6.2). This disconnection is on one hand due to the hard frontages and the fences surrounding the district – through tracing people in the area, it was made evident that Bachoura residents manoeuvre on the edge of BDD whereas the employees would move within it. Another layer to this isolation could be due to the entrances of the buildings being from within the district rather than facing the surrounding streets (Fig.7.2).

Figure 7.2. BDD's visible barriers