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URBAN FORM INTERRELATIONS TO SOCIAL BEHAVIOUR;
TOWARD HUMANIZING RAMALLAH CITY CENTRE

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STATUTORY DECLARATION

I, Yazeed Elrifai, declare that I have authored this thesis independently, that I have not used other than the declared sources/resources, and that I have explicitly marked all material which has been quoted either literally or by content from the used source.

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ABSTRACT:

Rapid transformations on the city structure have become a crucial matter that impacts the human life in our modern cities. Planners have adopted techniques to deal with this dilemma, which are derived from socio-economic and diagrammatic divergence, and which overlook the form-image affirmations and its essentiality for the human integration. Consequently, urban form theories have been outlined in order to enrich planning decisions with aspect that directly influence the human sensuous relationship to the city. In this rubric, these theories attempt at extensively inquiring the human-environment relationship attribute, which is vital for understanding the form-image aspect and thus elevating architecture to the larger scale level as part of the planning decision process.

Due to socio-political and economical consequences, Ramallah City has encountered rapid transformations on its city structure and urban form. As the core area of the development process, Ramallah City Center has been highly impacted by these transformations. It has witnessed rapid alterations on its urban form elements and spatial structure components. This has negatively influenced the social communications, the feeling of belonging and the human relationships with the place.

The dissertation aims at revitalizing the decline of Ramallah City Center urban form, through extensive analysis of the urban form's two components. The dissertation aims at building an urban form analytical model that is capable of enhancing the planning decisions and enriching the aspects that really influence and target human beings regarding the center's urban form and that can be a basic step for the area urban design. It eventually elevates architectural theory to contribute into the large city scale level. From a different view, the study aims at bringing further insights on the theoretical level, regarding the implementation of such a model in areas with a rapidly transformed character like Ramallah City Center.

Theoretically, two urban form analytical theories have been adopted in order to address the research's main dilemma; Kevin Lynch's Mental Mapping method and Bill Hillier's Space Syntax Analysis. Significantly, the study goes beyond the other attempts of combining the two theories by shifting this combination from the theoretical sphere into the application level, and confining it within areas that have faced rapid transformations on their urban form and spatial structure.

The study seeks mental maps at Ramallah City Center and confronts the results of this stage with the outcome of the Depth Map Space Syntax Analysis of the same area. It has come up with remarkable insights on both the application and theoretical levels. The area has been marked as low legible and highly intelligible. The organizational pattern of the center has been marked with a triangular core area surrounded with outskirt area and divided into six main zones. Almanara roundabout has been denoted as the highest intelligible and legible zone, while the other zones have different levels of legibility and intelligibility. On the theoretical level, a strong relationship in the level of understanding and justifying the urban settings in areas with rapid transformed structures can be strongly achieved by employing such model of analysis. However, the relationships between these two theories are not always analogous. Based on the outcome, within areas with rapid transformations; places with high legibility should be marked with high intelligibility, while places with high Intelligibility are not necessarily denoted as a high legible places.

Keywords: Human-Environment Relationship; Mental Mapping; Legibility; Space Syntax; Intelligibility.

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ACRONYMS

ARIJ	The Applied Research Institute Jerusalem
CEP	Center for Engineering & Planning
J-GRAPH	Justify Graph-It is a visual way of capturing some of the key characters of any spatial pattern
MOPIC	Palestinian Ministry of Planning & International Cooperation
PCPS	Palestinian Central Bureau of Statistics
RIWAQ	Center for Architectural Conservation
VGA	Visibility Graph Analysis

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Figure Billow; Down-The impact of the rapid transformation on the city spatial structure and urban form as a global problem (source; "We Must Recognize That Our World Has Changed Dramatically", Kwillmorth 2008, at: http://kwillmorth.wordpress.com, revised on 12 October, 2009). Up- Almanara roundabout urban transformations between two eras. (Source; to the right researcher 2008 & to the left Ramallah Municipality 2008)

AN INTRODUCTION TO THE RESEARCH

PROLOGUE

CHAPTER ONE- PROLOGUE;

AN INTRODUCTION TO THE RESEARCH; PROLOGUE

" For purposes of empirical research: creativity is that process which results in a novel work that is accepted as a tenable or useful or satisfying by a group at some point in time"

(Morris Stein 1953: 311)

Architecture is creative work that aims at bringing new interpretations into reality and going beyond the limited boundaries of the buildings into the city level design. Fundamentally, without a achieving a well-developed body of theory there is no branch of science can go beyond the primitive level of achievements, in this regards research is used to deduce theories as bases for creative architectural design (Montgomery 1984: 66). The creativity of any architectural work lies on the process and the outcome result, therefore the research that feeds back the design process is essential for such achievement "*it is our position that research about the design process can help inform the design process itself*" (Groat 2002: 107). This dissertation research is an effort that aims at a achieving a well-developed body of theory that can enhance architecture with means for achieving a creative architectural design work, noting that the dissertation explores architecture within a large-scale context rather than a limited context work.

This prologue is outlined in order to bring a clear conception about the dissertation inceptions and the motivations, which direct for this doctoral research work. The chapter is highlighting the main theoretical sphere within which the dilemma emerges; it goes beyond that by defining and associating the case study problem within this sphere. It introduces the initiators of the dissertation main questions. Furthermore, the chapter illustrates the scope, aim, and significance of this dissertation work. Eventually, the chapter elucidates the employed methods in a comprehended commentary, where much deep clarification about the method is going to be included in the upcoming chapters.

1.1 INTRODUCTION TO THE RESEARCH PROBLEM

Rapid transformations on the city structure impact the urban form and human activities that take place within it. The city, which has been defined as physical and social unit of civilization becomes a subject of influence under the rapid urbanization and the high population growth rates (Davis 1955: 429). These influences have direct impact on the environmental image, which is represented through urban form and perceived by the human being; this is essential in defining the city sensuous form relationships, human-environment relationship (Lynch 1960). Such relationship has been adopted by a trend of theorists in order to bring more human attentions on the city design level through incorporating urban designers within planning process, thus bridge the proclaimed gap between planners and designers

(Hillier 1996). It eventually brings architecture into the city scale design level that adopts the definition "*urban design as large scale architecture*" (Lynch 1985: 254). Crucially, this has been a huge challenge for cities in the developing countries; as they have been seeking clear visions of urban form development in this regard. Hence, Palestinian cities are not an exception; they have been subject of these urban form transformations. A number of these enormous challenges manifested by the high population growth rates, scarcity of land, rapid urbanization, and political challenges, turnout the Palestinian cities' structures and change their images (Shaheen 2006: 73). Under the influence of these factors, Palestinian cities' urban form development veered from its traditional roots and suffered greatly since the middle of the twentieth century (Khamaisi 2006: 1).

The establishment of any state results in the creation of the core that will include the representative political institutions (Khamaisi 2006: 2), and Ramallah City has been chosen to be the temporary centre of the Palestinian state. The subsequent establishments of official institutions and international economic agencies have led to drastic alteration on the city's urban structure. These factors, which influence the social and economical life in Ramallah City, are associated with other factors on the political level. Under the impact of these factors, the city in general and its centre in specific have developed tremendously. Planning processes have taken place in order to cope with these new circumstances. These processes that have started in 1997; they have tackled the city in a comprehensive manner, without giving enough attention to urban form and the city's local scale (Khamaisi 2006:11). In order to cope with these changes, the centre, which is now considered the economic, symbolic and social core of the urbanized area, has witnessed radical changes on its urban form that impact the life quality there. This has been associated with a number of observations such as the evolution of crowded areas and mixed used centre, the lack of social spaces and green areas, in addition to transportation problems due to heavy traffic congestion in the centre.

Theoretically, planners, in order to share their images and construct representations of a new reality, attempt to handle approaches and comprehend dimensions that are not yet generally understood in the realm of urban design and the city form. On the other hand, urban designers through their intensive concern with the city form, aim at concretizing concepts of its physical environment and spatial structure that are widely perceived. Consequently, an apparent split emerged between those who preoccupied themselves with the analysis of the socio-economic process that animate the city: known as planners, and those who concern themselves with the physical and spatial synthesis of the city; known as urban designers

(Hillier 1996: 111). Urban theories and methods have been conceptualized in order to overcome this discursive gap. Such theories attempt to outline general architectural theory of the city form emanating from a deep understanding of the contextual settings of the city's physical environment and spatial structure and building a concrete body of knowledge about it "*It surprises no one to hear that it is impossible to explain how a city should be, without understanding how it is*" (Lynch 1981: 39). This rigorous analysis of the city determines the spatial qualities of the city form within a human-environment relationship framework which is driven from socio-economic initiations "*Spatial quality cannot be discussed without reference to the many social, cultural, and psychological factors involved in the man-environment interaction*" (Rapoport 1970: 90). Hence, it aims at improving the existing conditions for more pleasurable and better qualities.

This dissertation is concerned with the impact of the urban form transformations on the people's evaluation of the place in Ramallah City Centre, and thus bringing more architectural insights on the city level scale. It starts with the question of how people in Ramallah City Center evaluate the physical context after the tremendous alterations on its urban form. Other sub-questions, which fall under this broad question, would be; what urban form aspects are significant for the users of the centre? Which elements/ spaces do they consider meaningful? Is there a need for new visions and policies toward changing the urban form? Is it useful to incorporate urban form analysis into the city scale design? Hence, these questions revolve around the users' recognition and understanding of their environment; therefore the dissertation is oriented towards enriching the human dimension in Ramallah City Centre.

Nevertheless, the dissertation adapts an analytical approach mapping the physical transformations of the city centre. It explores Ramallah City Center users' visions and needs after these transformations, through adopting two urban form theories that will examine the place Legibility and Intelligibility. Hence, Mental Mapping and Space Syntax Analysis are going to be employed for that purpose. The two theories that have been synthesis as methods of inquiring human-environment relationships are going to be combined into one urban design model. The dissertation is going to test the compatibility of this model as urban form analytical model at Ramallah City Centre in particular and bring projections and open thoughts about it is suitability within areas with a rapid transformed urban form character in general.

1.2 THE PROBLEM STATEMENT

The center as a core area for future development, according to Ramallah Outline Plan 1999 (Khamaisi 2006: 15), suffers from the urban form deteriorations; gaining negative influences on the quality of life in the city. The visual disturbance, the unorganized functions, the feeling of mixed identities and the insecure spatial experience, are results of the transformations, which took place on the urban form components. These transformations took place on the following levels:

- Spatial structure alterations- transformations took place on the spatial level, such as the mixed-use functional center, the lack of open spaces, and the insecure experience within the space.
- Urban physical form transformations- alterations on positive and negative forms in the center, which have resulted due to the building unplanned expansions. The emergence of unplanned and chaotic elements.

The transformations of the city's urban form influence the environmental image, which is perceived by users and the way their mental map is constructed. These transformations manipulate negatively Ramallah's City Center quality, through its direct impacts on the center's Legibility and Intelligibility qualities, which are vital components for the feeling of belonging, the social communication, and the deep experience in the places.

1.3 THE SCOPE OF THE STUDY

Ramallah City, which is located in the central part of the Palestinian territories (figure 1-1), presents the Palestinian life temporary center. This study of Ramallah City Center aims to understand the consequences of the urban form alterations on the people's relation to the center, through the extensive analysis of the center urban form. Based on site observations, the center has witnessed tremendous transformations on its urban form components: space, structure and architectural style; which have impacts on the place quality of life.

Figure 1-1: To the left-West Bank within the regional map. To the right- Ramallah City location in the center of Palestinian areas. (Source; www.usaid.gov/wbg/maps.htm, *revised on 15 November, 2007*)

1.4 THE AIM OF THE STUDY

This study, aims to develop theoretical bases for revitalizing the decline of the center of Ramallah. This will be done through extensive analysis of urban form transformations and its consequences on environmental behavior. The analysis aims to understanding the current complexity and dynamism of the center of Ramallah. It aspires to come up with visions and strategies for improving the sensuous environment of the city center, as well as enhancing the Legibility and Intelligibility dimensions there. Furthermore, the study aims at bringing a

theoretical urban form analytical model and tests its validity in areas such Ramallah's character, as a step to enhance planning process with design methods and bring architecture into the large-scale context. This has been accomplished through the following stages:

- Evaluation- highlighting the influence of urban form transformations, in Ramallah City Center, and define the way people interact and evaluate their built environment, human-environment relationship at Ramallah City Center.
- Building a model- bringing a theoretical model that can be applicable on Ramallah City Center case, and can be extended into farther similar cases.

The dissertation will come out with theoretical argument guidelines that outline the general ideas and aspects that are significant and substantial for the center users regarding the urban form. This will establish the concrete base for the city planners and urban designers so that they can depend on it in order to develop the center and other spaces for a significant human place.

1.5 THE SIGNIFICANCE OF THE STUDY

On the local level, the center is significant due to its location as a core area for development process in the city, it represents a symbolic, cultural, political and services center for the Palestinian life. The dissertation is concerned with the impact of the urban form transformations in the City Center on the people recognition for the place. Since the drastic transformations on the urban form evolved in many Palestinian cities, this study can be considered as exemplification for them. The dissertation will focus on Ramallah's built environment's importance to its users and inhabitants, as well as their satisfaction with what the center provides for them, starting with their basic daily needs and ending with the aesthetic value. In this manner, it links the micro scale (architecture), and the mezzo scale (urban design) as important components of the planning process.

Tracing the studies that have already targeted Ramallah City in general and the center in specific, this research is the first of its kind that concentrates on the urban form issues. Some studies have dealt with the city on the macro scale, and others were specific to the Old Center of Ramallah's.

On the theoretical level, this dissertation is bringing new idea of matching between two theories into one urban form analytical model; Mental Mapping and Space Syntax. It brings a model combined between both the Legibility and Intelligibility and finds the relation between them. Significantly, few studies have brought the two methods together "*To our knowledge, only one study has explored this and found a positive relationship between intelligibility and legibility in the urban environment*" (Long et al 2007: 129-03). Yet, it is crucial here to note that this dissertation is going farther step by associating and inquiring such relationship into areas with a rapid transformed character like Ramallah City Center. The significance of this point based on the assumption that any sudden changes on the physical structure will dramatically replaced the people image and evaluation about their places. Furthermore, these changes will impact the way the people leave their traces within their physical environment.

1.6 RESEARCH DESIGN & METHODS OF INQUIRY

In order to understand the mechanism of this dissertation, the following sections indicate the research approach, design and tools of data collection:

1.6.1 RESEARCH APPROACH

The dissertation is oriented in order to bring up new insights that could contribute to the theory of architecture as a part of city design and widen the creative borders of design process. The main concern of the dissertation is based on dealing with analytical mode of theory. The dissertation attempts to go forward enriching the relation between theory and application by outlining theoretical models for analyzing physical environment and then feeding back design process with enough knowledge about the context it is going to interact with. The research is based on the middle range theoretical mode. It adopts architectural interpretation approaches, where diagnostic methods are implemented in order to understand and analyze the problem's different components; and hit upon the relations between these aspects. From the research theoretical stance, the dramatic changes on Ramallah urban form have led for altering the environmental image, which consequently alter the human-environment relationship in the area of study. The changes on the urban form hypothetically impact the people's evaluation of the place negatively. The following diagram explains the research theoretical structure (figure 1-3).

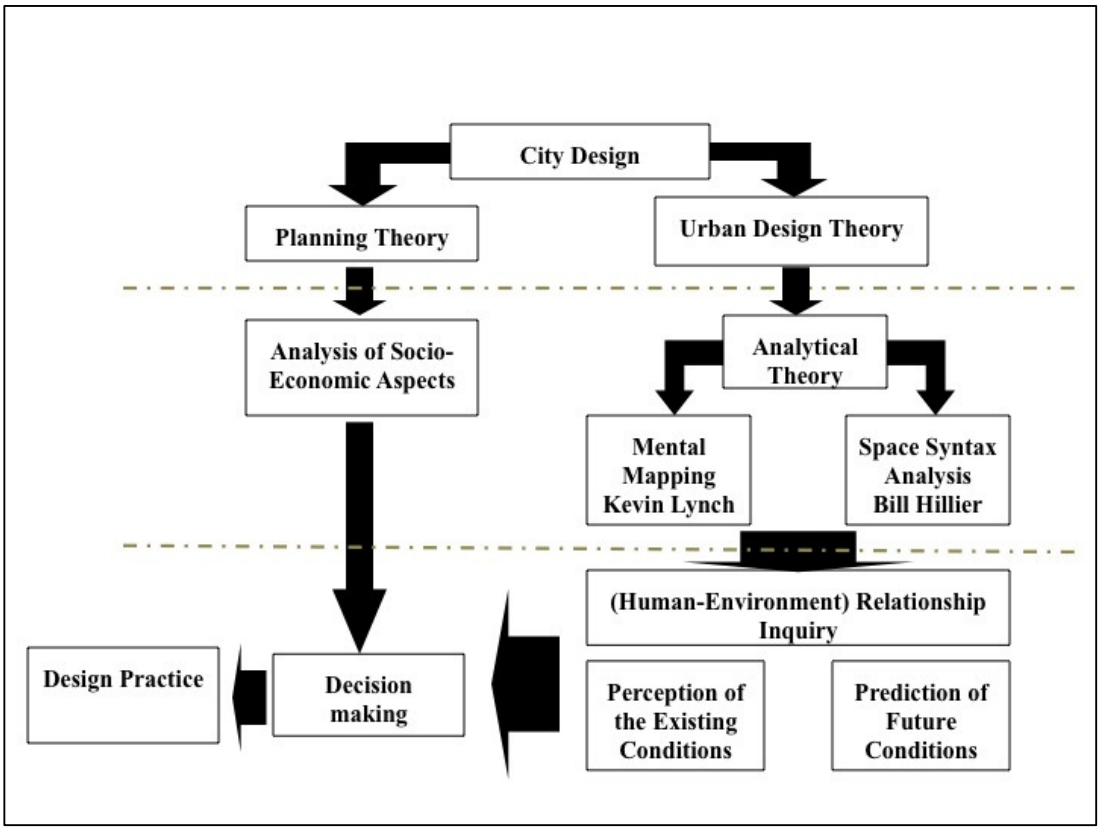


Figure 1-2: Research theoretical approach structure. (Source, researcher)

1.6.2 RESEARCH DESIGN

The research as an empirical explicit study adopts the exploratory case study method. Ramallah City Center will be analyzed extensively in order to study the transformations that took place on the center, and its consequences on the users' evaluation and thus social behavior within the center, then to make a kind of generalization on the case applicable level and the theoretical level too. Therefore, the study is based on the architectural interpretation approach. Accordingly, the aim is to layout a theoretical basis that presents itself on the mental perception "*To interpret is to lay out in thought and words what presents itself in sensory or mental perception, with the aim of directing observation to those details and interrelationships within the object itself which a less skilled, less attentive, less determined gaze might not otherwise detect*" (Child 1965: 4). The following diagram explains the research design mode (figure 1-4):

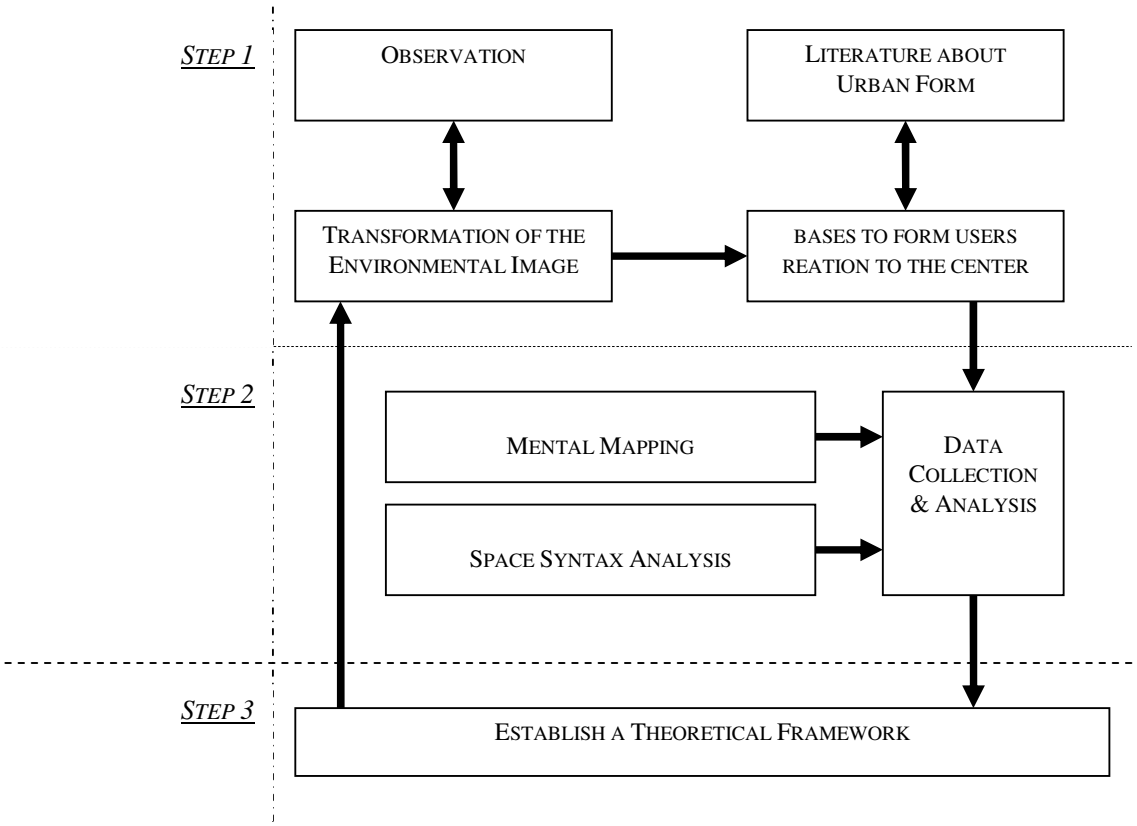


Figure 1-3: Research design mode structure. (Source; researcher)

1.6.3 TOOLS OF DATA COLLECTION

The study investigates the urban form physical elements at Ramallah City Center, and its spatial structural relations through examining the perceptual qualities of urban form values, Legibility and Intelligibility. This will be done by adapting qualitative methods of analysis that are based on obtaining people's visions and needs. Furthermore, the study brings the outcome of this analytical stage into a theoretical level of debate that can bring new insights regarding urban form in rapid transformed areas. This takes place through the following steps:

- Analyzing urban form physical elements- through adopting Mental Mapping method for inquiring the physical form and the way people evaluate it. It brings insights on the place vividness, rigidity, density and distinctive elements. Mental Maps are going to be divided into two parts:

1. Sketch map- Diagrammatic part- ask the users to draw the mental map in order to investigate:

    - The visual quality and the apparent clarity of the center.
    - The significant places in the center.
    - The regularity of pathways.

2. Verbal Recall- Colored part- this method helps in obtaining:

    - Descriptive evaluation of the positive and negative elements in the center; using verbal description and imaginary trip.
    - Evaluation of the aesthetic dimensions of the center.

    In order to determine the Legibility of the environmental image, the Mental Mapping analysis and evaluation will be based on analyzing the city elements (nodes, paths, landmarks, edges, and districts). It will be analyzed in terms of; Identity, structure, and meaning.

- Analyzing the urban spatial structural relations- through adopting Space Syntax Analysis method. The method brings insights about both the spatial Connectivity and Integration values, which are essentials for bringing spatial interrelationships between the micro and macro city scale.
- Bringing the outcome of the prior two methods employments at Ramallah City Center into one complementary model. And establish theoretical debate regarding these results. This is in order to bring a model of insights regarding the urban form revitalization at Ramallah City Center on the one hand. On the other hand, these results are going to be generalized into the theoretical level.

Figure Billow: *Ramallah City Aerial Photo- The city center area with the surrounded zones. (Source; Ramallah Municipality 2002)*

CHAPTER TWO- CASE STUDY;

RAMALLAH CITY CENTER URBAN FABRIC & CONTEXT

"Ramallah of the cypresses and the pine trees, the swinging slops of the hills, the green that speaks in twenty languages of beauty"

(Murid Barghouti 200)

Ramallah, the city which has increasingly witnessed vast growth rates due to the establishment of the Palestinian Authority, is considered the temporary center of the Palestinian State. This has led for the attraction of new economic activities and organic development. Consequently; the shifting of the urban structure and the rapid change on the small City Center impacted the city urban form and the people relationship with it. Ramallah was chosen as the case for this research for many reasons; the physical conditions that Ramallah City Center clearly demonstrates such as the visual disturbance, the crowded urban form, the chaotic spatial structure, and the insecure spatial experience... In fact, these circumstances are also found in other Palestinian cities; accordingly, Ramallah can give a kind of exemplification of arguments on the other Palestinian cities. In addition, the following factors represent the significance of Ramallah City as a main case of the study:

- The political role; due to the postponing of Jerusalem case, Ramallah City represents the temporary center of the Palestinian State.
- The administrative and economical role; the city has become the administrative and economic hub of Palestinian life.
- The inherent location of the center as the core of urbanized area; according to Ramallah outline plan (Khamaisi 2006: 15).

These reasons have influenced the city's urban structure, and have led for transforming the urban form in a sudden manner. The transformation of the city's urban form is highly evident in the central area, where negative impacts on social communications and feeling of belonging have become an issue. Therefore, Ramallah City Center is considered a good example for studying the interrelations between urban form and social behavior.

In order to handle an extensive analysis of the urban form within human-environment relationship in Ramallah City Center, the focus of this chapter is to give a general overview of the city; its physical and temporary dimensions, highlighting the transformations that took place on the urban form. This chapter shall come up with a general outline of the problems that take place in the Center.

2.1 NATURAL CIRCUMSTANCES & GEOGRAPHICAL DESCRIPTIONS

In order to understand the physical and geographical settings that have been incorporated in formulating the urban form and spatial structure at Ramallah City Center, this section provides an overview about the city and its center locations and settings.

2.1.1 RAMALLAH CITY GEOGRAPHY

Ramallah City is located approximately in the middle of the West Bank, between N31 53- N31 56 longitudinally, and E35 09- E35 14 literally. The city is considered as the center of Ramallah and Albireh District, which measures approximately 843.621Km, 14% of the West Bank Area (CEP 1995). The city lays 12km to the north of Jerusalem City and as part of the mountains chain extending from Jerusalem in the south, to Nablus in the north, and from Jericho in the east toward the green line in the west. The city is attached from its east side to Albireh City and both formulate a twin city. It is located on a flat plateau, approximately lifted around 880 meters above see level, and is surrounded by steep valleys. The urbanized areas has covered the flat area and later expanded into the steep slope areas, which exceed 20%. This kind of urban settings and geographical conditions influence the city urban form, and impact its spatial structure organization (ARIJ 1996) (figure 2-1, & figure 2-2).

The urbanized areas of the city have continuously expanded and have become attached with Qalandia and Kufor Aquab in the South, and with Baytonia in the West, in high densities and abrupt manner. The city is located about 12km north from Jerusalem city center, 52 Km west north from the Dead Sea, 3km from Jerusalem International Airport in Qalandia, and About 50 Km south from Nablus City (Shaheen 2006: 94). The city is located on historical regional and religious axes that link the south areas of historical Palestine, towards its northern areas.

According to Palestinian Central Bureau of Statistics PCBS (2005), the twin cities Ramallah and Albireh host 68,143 citizens, of which 27, 315 citizens live in Ramallah City. In terms of area, Ramallah City is located on about 370 Hectares, where around 40% of this area is used for residential purposes, 10% commercial, 2% industrial, 5% agricultural, 22% transport, and 16% for future development (Musleh 2006: XIV). The city is well known by it is Mediterranean climate; rainy winters and dry summers (ARIJ 2005).

2.1.2 AREA OF STUDY; RAMALLAH CITY CENTER

Ramallah City Center is located to the North East edge of Ramallah City, on the top of a hill, which nearly becomes a flat area. The center consists of its hub, Almanara roundabout,

which opens up on six main roads, and the second main square Alsa'a square (figure 2-3). The center is considered a joint that link Ramallah City to its attached twin, Albireh City. Historically, the two cities have grown around their individual cores, and later were attached in Almanara roundabout, which is the heart of both cities. The center represents a regional node, where many regional roads are interconnected, and are dominated by commercial activities, thus less residential, educational and services facilities. The City Center is dominated by multi story buildings, which are located within a very congested traffic fabric. The area is highly dense; the open space areas and green zones are sporadic.

The study focuses on the central area within the City Center, the area is estimated to be around 40 Hectares, and it extends from the mid of Alirsal street in the east toward the end of Rokab street on the west including Almanara roundabout, and from the mid of Alquds street in the south toward the mid of Almahkamah Street in the north (figure 2-4). The area of study will also include Alsa'a square as part of the study area (figure 2-5). The argument for choosing these boundaries is based on the topographical declines from the west and the north, where new urban settings start to be approached. In addition to the alteration of the urban identity due to the land use changes from the south between the commercial and residential, as well as the transformation of the building capacity from the east side of the center.

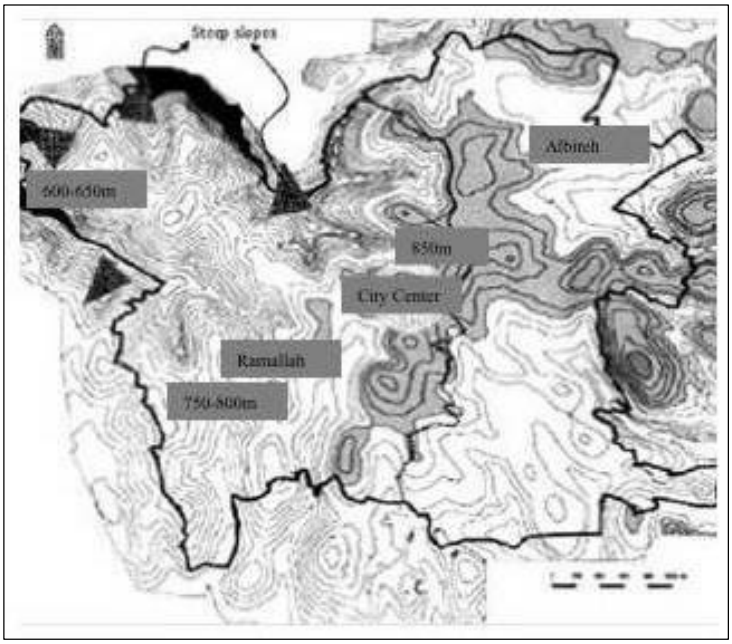


Figure 2-1: Ramallah & Albireh cities topography. (Source; MOPIC 1999-edited by researcher)

Figure 2-2: Ramallah & Albireh as one unified city and the City Center in their heart, marked with blue. (Source; Ramallah Municipality 2008- edited by researcher)

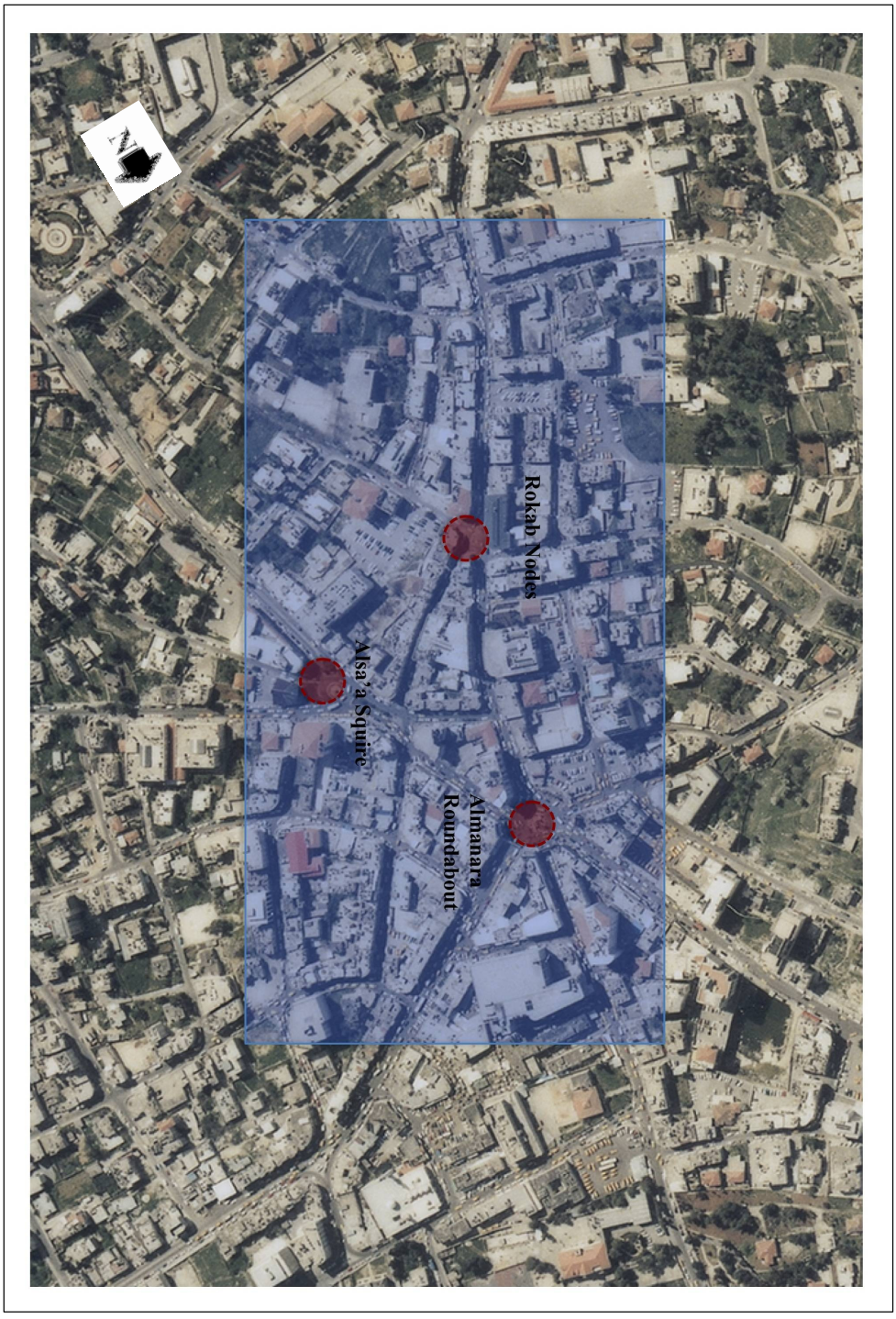


Figure 2-3: Area of study. (Source; Ramallah Municipality 2008-edited by researcher)

Figure 2-4: Almanara roundabout. (Source; to the left- researcher 2008. To the right-Ramallah Municipality 2008- edited by researcher)

Figure 2-5: Alsa'a squire. (Source; to the left- research 2008. To the right-Ramallah Municipality 2008- edited by researcher)

2.2 SOCIO-ECONOMIC OVERVIEW

Understanding the socio-economic conditions at Ramallah will feed back the dissertation with the general circumstances that have been associated with the rapid changes on the city urban form. Therefore, the next section is bringing a brief view about these conditions.

2.2.1 POPULATION & DEMOGRAPHY

Shifting the spatial structure and transforming the urban form in Ramallah City have become subjects of influence under the drastic changes on the demographical level. Examining the demographical factor, the city is described as normal dense area; where the population density is 1,598 per square kilometer (Musleh 2006: 6, PCPS 2005). Yet, there is a dramatic demographical change in the city, which is due to the political alterations and the economical conditions the city have gone through.

According to the analytical study by Khalil Amro (2005), tracing the population growth rates between 1931 and 2005, it is evident that the city faced a low population growth rates in the era between 1961 and 1997. This is due to the political crises the city had gone through, presented through the policies imposed by the Israeli occupation; such as the expulsion of the inhabitants in the war of 1967 (Shaheen 2006: 95). On the other hand, an increase in the population growth rates took place after 1997. The establishment of the Palestinian Authority and choosing Ramallah City as the temporary center of the Palestinian State has led for the internal migration toward the city (table 2-1). According to this, dramatic increases in the population growth rates took place in the city from 3.53% to 3.97% (Amro 2005).

The changes on the population growth rates had a direct influence on the quality of the physical environment of the city. This is considered a direct result of the infrequent need of expanding the development area, and the rapid increase of the population rates within a limited development area, in a way placed high pressure on the city's facilities and services. Consequently, the city's urban structure has shifted and its urban form directly transformed.

Population between 1931- 2005	
Year	Population
1931	4,286
1961	14,759
1997	18,016
2005	26,104
Population Growth Rate	
1931- 1961	4.21
1961- 1997	0,56
1997- 2005	3.97

Table 2-1: Population in Ramallah City between 1931-2005 & the average growth rates. (Source; Amro 2005)

2.2.2 SOCIAL FABRIC

Originally, Ramallah City society had been considered a homogeneous society, which was composed from seven original Christian families. The social characteristics of the city were as similar as the characteristics of the general Palestinian society. Changes on the social structure toward more heterogeneous society took place during the first half of the twentieth century, through the different migration waves the city has witnessed. This had started with the refugee waves who hosted the city after 1948 war, and were estimated according to ALJoubeh (2002) about 8500 people. Other migration waves that influenced the city structure were the returnees and the local immigrants to the city after the establishment of the Palestinian Authority in 1994, which rose up the annual population rates to 4% (Khamaisi 1998), and which changed the social structure in the city. Accordingly the city's social structure in relation to the inhabitant's origins can be classified as:

- Ramallah's Original Inhabitants.
- Refugees.
- Local Immigrants.
- Returnees.

The City's different neighborhoods division concept is based on cultural and economical foundation, and not on tribal basis (Shaheen 2006: 96), therefore the urban fabric is considered heterogeneous. This has a direct influence on the City's social and cultural

activities and its urban distribution. These listed characteristics enriched the position of Ramallah City as a central hub of the district offering services and infrastructural needs to the surrounded villages and towns.

2.2.3 ECONOMICAL PROFILE

Economically, Ramallah City has witnessed alterations in the last two decades due to the establishment of the Palestinian Authority. Basically, choosing Ramallah City as the temporary center of the Palestinian State has led to motivate new economical transformation stage of the city. The city had switched in the early stages of its history, from agricultural based economy into more industrial and trade economy (Shaheen 2006: 97). Lately, it started to rely on the services and the construction sectors. The new status of the city created opportunities for the allocation of new establishments, where a number of NGO's, official institutions, enterprises, banks…etc were located. Consequently, the economical factor under the political and administrative dimensions has led toward changing Ramallah City into a more dynamic and dense areas, in a way that cause a kind of construction booming that influence the city spatial structure and its urban form.

As a direct economical influence for the allocation of the great number of establishments in Ramallah City, an extensive number of careers and job opportunities have been offered. There are about (2,758) establishments located in Ramallah City, where about (44%) in wholesales, retail and repair, the main economic sectors in the City, followed by the real estate, renting and business activities sectors, and the manufacturing sector, which construct 12% and 11% respectively (Shaheen 2006: 97).

This economical influx enhanced the private investments on Ramallah City; many investors attempt to set up their private businesses, throughout the establishment of the private enterprises and the construction of the commercial centers and housing projects. In spite of the negative debate on the planning and urban design level, these situations are considered as income generators for many people. Tracing the labor force in comparison to the West Bank as a whole, it is obvious that the concentration takes place in the construction and services sectors, which were developed under the new political conditions (table 2-2).

Sector	% Ramallah & Albireh District	% West Bank
Agriculture & Forestry	6.0	16.9
Manufacturing & Quarrying	16.5	14.0
Construction	17.4	13.0
Trade, Hotels & Restaurants	19.5	20.9
Transportation & Communication	5.7	5.7
Services & Others	34.9	29.4
Total	100	100

Table 2-2: Distribution of labor force in Ramallah & Albireh district according to the main sectors in comparison to the West bank. (Source; PCBS 2004)

2.3 HISTORICAL DEVELOPMENT OF RAMALLAH CITY URBAN FORM

Historically, Ramallah City established on a site, which is located to the south west of the current center, and that's nowadays known as the Old Core. The city, which was originally, a small agricultural village, inhabited by Haddaden family, passed through different stages that had a direct impact on its physical structure and urban form. The different stages that Ramallah City has passed through were influenced by political, administrative and economical factors.

In general, the first settlement in Ramallah goes back to 640 A.D where it was considered as important cross roads and was inhabited by the Aramaic (ARIJ 1996). Afterwards, the city went through different significant eras that had various impacts on the growth of its urban structure. This can be noticed through many issues such as the role of the city as a crusaders military base (ALJoubeh & Basharah 2002:), or through the Ottoman governor of Jerusalem declaration in 1902, to decree the city as the administrative center, which comprises of more than 30 neighboring villages (Shibli 2006: 2). In spite of the considerable conditions Ramallah City had gone through during these eras, the city was still formed with a vernacular urban pattern and architecture style, where the housing units had become scattered arbitrarily taking into consideration the social privacy and the topographical and climatic conditions. In this manner, the city was formed according to "Ahwash"[1] urban organization system, where the place was divided into different zones according to kinship,

[1] *Ahwash*; internal courts within the vernacular pattern in the Arabic villages. This is constructed as enclosed space within the edges of the surrounded building. The space is characterized with it is organic shape, and significant with it is level of privacy.

privacy, and public social relations. The buildings were located around the central church, along the narrow paths "Alkasaba"[2] which were lead to the agricultural areas (figure 2-6).

The significance and substantial development of Ramallah City's structure and urban form had taken place since the twentieth century through the different eras. In order to study the city's urban form and its consequences to environmental behavior, it is essential to review the city's historical development throughout these stages, based on the form and structural development concerns.

2.3.1 BRITISH MANDATE PERIOD

The beginning of the twentieth century witnessed remarkable actions on Ramallah City status. This had started with the establishment of Ramallah City municipality in 1908, the Christian predicator missions who had participated in constructing new schools and public buildings, the immigration waves to the United States which motivated the development of the construction's sector, and finally the decree of the city as Ottoman administrative core. Under the impacts of these factors, new shifts on the city's structure took place, primitive commercial facilities started to appear. Nevertheless, the city had continually expanded naturally without having a clear outline plan.

The principal concerns in the city's organization and form development were sited in the British Mandate era, were a new trend of planning and architecture was highlighted. The British mandate which came to Palestine in 1917, implied a distinctive architectural style in Ramallah City influenced by the colonial visions (Shaheen 2006: 100). This style was distinguished by the separate villa topology, which was typified with the luxurious ornamentation (figure 2-7) and proportions, and where the buildings were surrounded by well organized gardens. The colonial style had extended into the public buildings as well; additional buildings like the municipality building, Almokataa building and other schools that based on these colonial visions have been emerged. These buildings with their unique style, theoretically demonstrates the colonial perception and then representation of the local architecture, which has deeply influenced with the oriental concepts about the east. Significantly, during the British Mandate, the municipality of Ramallah played a major role

[2] *Alkasaba*; The broken axial paths which is located in the vernacular pattern in the Arabic villages and which links the main public spaces to the semi public areas.

in improving the city's landscape through adapting strategic policies, which increased the green built over the cityscape.

On the planning level, the British Mandate was concerned with planning aspects; it provided along with the municipality of Ramallah structural plans for the city. The first structural plan of the city was completed in 1940, but was implemented several years later (Qasem 2006: 101). The British Mandate cooperated with Ramallah municipality in preparing a proposal for city regulations and suggestions, but this proposal didn't see the light of day due to the political circumstances (Shaheen 2006: 100). Significantly, Ramallah City has been described during this era, as a garden city due to the arranged spaces and green yards inside the city, and the surrounding nature outside the city (Qadura 1999).

The current center of Ramallah City has emerged during the British Mandate in 1935 (figure 2-8), on the location of a regional road that links Jerusalem with Nabluse. The Municipality of Ramallah placed an electrical pole in joint area between Ramallah City and its twin Albireh city, and therefore was called "Almanara" (Shibli 2006: 3). The city started to expand toward Almanara roundabout due to the returned money from the immigrants to United States, the location of some important public organizations like the Friends school, the construction of the British administrative offices "Almokataa" on a site near to Almanara, and the importance of the regional road.

2.3.2 JORDANIAN PERIOD

The impact on urban development and city structure during the Jordanian period characterized with two main aspects. Massive changes on the population structure and social component took place; they had led for rapid expansion and the evolution of new life spots inside the city from one hand. On the other hand, and with the fact of adopting the British outline plan, limited efforts had been spent in preparing new development plans. Considerable transformation on the demographical aspect in Ramallah City took place after the 1948 war due to the refugee waves that invaded the city. According to Shaheen (2006), the number of population in Ramallah City was about 5,080 in 1945, and rose up in 1952 to 17,145. This changed the status of Ramallah from a small town into being a city. The new status of Ramallah City entailed the need for housing and social services, it required for urban expansion, which typifies with two forms (Shaheen 2006: 101):

- The emergence of refugee camps-, which are the residence spots for the refugees after 1948 war. Ramallah city hosts three main refugee camps, AlAm'ari, Kadora and Aljalazon. The three camps are distributed among the surrounding neighborhoods of the city toward the center, despite their incompatible urban structures and living conditions; they now consist and overlapped with some parts of Ramallah City Center's urban structure (figure 2-9).
- The spread of the urban neighborhoods in arbitrary circular pattern around the Old City of Ramallah. This later took a linier urban pattern development direction toward the new center of Ramallah City Almanara roundabout. Commercial facilities developed along the way, it finally led for shifting the City Center from the Old Core into Almanara roundabout (figure 2-10).

After the development of Almanara as a New City Center, work was completed in 1951 on a monument to replace the old "Almanara" pole, which became unnecessary with the central street lighting (Shibli 2006: 4). It is a significant fact that the shift on the city structure interpreted a new architectural style, which was evident in the residential building. This was implemented in order for the building to host the low- income residents.

2.3.3 ISRAELI OCCUPATION PERIOD

Tracing the urban development during the late sixties and seventies, Ramallah City expansion started to fill the areas around the Old Core and Almanara roundabout (Shaheen 2006: 101). The city development witnessed urban expansion toward the west side of the city after the construction of the industrial area in 1973; it became attached with nearby villages, Ein Areek and El-Tirah. Urban expansion broadened to connect the city with Baytonia City from the southwest and with Albireh City from the east, formulating a packed urban fabric (Khamaisi 1998).

Urban development during the eighties and the early nineties was typified with drastic changes that led for identity transformations of the city. The transformations started with destroying the old buildings, which were located around the City Center, and replacing them with multi-story and multi-functional buildings. The urban pattern transformed into a dense urban fabric with the new buildings which fill the empty spots inside the city, and which is combined with urban expansion into three directions:

- To the north long Alirsal road toward Birzeit village.
- To the southeast toward Ein Areek and El-Tireh villages.
- To the west toward Baytonia city along Jaffa street.

In general, Ramallah City expanded in linear pattern toward the east and the west; the urban structure had been transformed into compacted urban pattern, through the construction of buildings, which fill the remaining open spaces. During this period, Israeli occupation influenced the city structure, urban development orientation and spatial pattern of the city through a number of actions, which took place in form of (Shaheen 2006: 103):

- The limitations and restrictions in issuing building permits, which abstracted the city development.
- Military orders toward confiscating lands for constructing settlements. This led to the disjunction of the city with its neighboring villages.
- The negative impact on the economical life, which causes the immigration of the inhabitants.

The impact of the Israeli occupation on the City Center area was significant. In 1982, during the administration of Moshe Biton, a decree was issued to demolish Almanara Square and replace it with traffic lights that will control the area traffic flow. The traffic lights were never installed due to security reasons (Shibli 2006: 5) (figure 2-11).

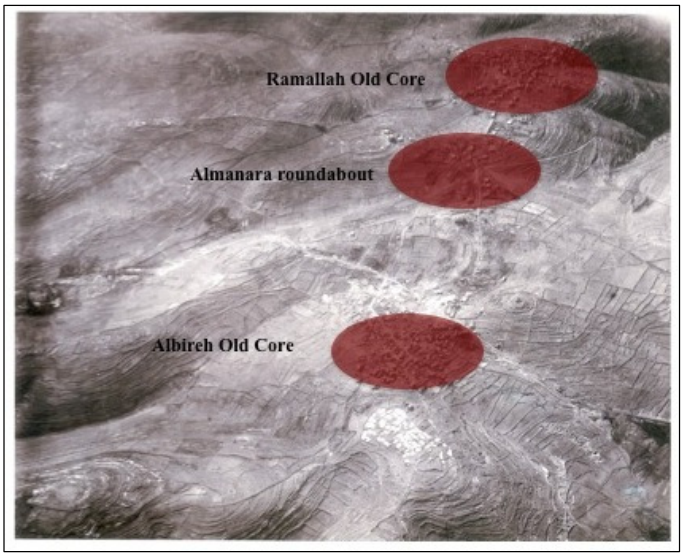


Figure 2-6: Ramallah & Albireh towns in 1918. (Source; www.palestineremember.com- *revised on 15 March, 2008*-edited by researcher)

Figure 2-7: Colonial villa style at Ramallah City. (Source; www.palestineremember.com- *revised on 20 Novembers, 2008*)

Figure 2-8: Ramallah during the British Mandate, the emergence of new City Center. (Source; www.palestineremember.com, *revised on 15 March, 2008*- edited by researcher)

Figure 2-9: Refugees camps in Ramallah. (Source; researcher 2009)

Figure 2-10: Almanara roundabout during the Jordanian period. (Source; www.palestineremember.com, *revised on 15 March, 2008*)

Figure 2-11: Almanara roundabout during Israeli occupation, late 1980's. (Source; Yaser 2009: 19)

2.4 RAMALLAH CITY URBAN TRANSFORMATIONS

Drastic transformations on Ramallah City spatial structure and urban form took place after the agreement of Oslo accords in 1994 and the establishment of the Palestinian Authority. As a result of this political agreement, Ramallah City has been chosen as the temporary national core of the Palestinian Authority. Consequently, this resulted in the homecoming of the returnees and the influx of the city by many financial investments and resources, which have influence both the economical and social structures within the city. Thus, a huge construction movement, beside development and business projects had taken place on the city.

The sensibility of this drastic change is due to the fact that the city is still encountering the consequences of this shift on its development process, beside the expectations, which assume the occurrence of similar developmental booming as soon as the political situations improve (Shaheen 2006: 103). Studying the urban transformations in the city depends on analyzing the political, economical, social and geographical factors that led for these transformations, besides illustrating the physical transformations through the city spatial structure and urban form.

2.4.1 REASONS OF URBAN TRANSFORMATIONS

Evidently, the development of Ramallah City to cope as the temporal core of Palestinian Authority has created new situations that have influenced the country in general and the city in specific with many substantial changes that were associated with the development that took place on the different levels. Deteriorations on the city structure and its urban environment emerged by the dramatic changes on the political, social, economical and institutional aspects which were headed with the lack of any strategies that could adapt such a change.

Significant impacts on the political aspect played a major role in transforming the physical context and changing the social life quality of the city. Establishing the Palestinian Authority has resulted in changing the city's status into the temporary center of the Palestinian life. This led to the centralization of the main headquarters and ministries building offices, the location of many international representative offices and diplomatic missions, and the broad impacts on socio- economic life of the city. On the same level, Israeli occupation restrictions have impacted negatively the city structure and its urban image through three significant narratives (Khamaisi 2006: 11):

- The Israeli control over the Palestinian areas- this limited the accessibility and mobility between the Palestinian localities and the increasing development of the colonies, which isolated and limited the expansion of the city.
- Controlling the development and the national recourses- this is due to the political classification of the Palestinian areas to area A, B and C. Most of the national resources and the potential land are located in area -C- where any development process carried out by the Palestinian authorities there, should be authorized and coordinated with Israeli military, according to the Oslo records. C areas consisted of barriers impeding the development of judicators of all the directions.
- The postponing of Jerusalem Case- since the Palestinian assertion of considering Jerusalem as the permanent capital of Palestinian state, and the Israeli segregation of the city through the construction of the wall. This has risen up the pressure over Ramallah City.

The political factor played a major role correspondently with other factors on the socio-economic level in transforming the city structure. The establishment of Palestinian Authority caused the return of many Palestinians from exile; this resulted in increasing the construction activities. Due to the same reason, donations from the international community have poured into the Palestinian areas aiming to hold up the establishment of Palestinian Authority. Accordingly, new public and private investment have been established in the city, in addition to the emergence of new job opportunities. The homecoming of the Palestinian returnees, along with the internal migration caused changes on the demographical aspect and instigated social incoherency in Ramallah City.

Another influential transitional point on the city structure is the beginning of the second "Intifada" in September 2000. Obvious declination on the development process has taken place, the violence; insecurity and instability reduced the construction and investment activities. (Table 2-3) explains the number of the building licenses issued since the beginning of the second "Intifada" and gives a general idea on this declination:

Year	No. of building licenses
1994	125
1995	119
1996	120
1997	195
1998	207
1999	198
2000	205
2001	139
2002	86
2003	169
2004	149

Table 2-3: Comparision of number of issued building licenses between 1994-2004. (Source; Shaheen 2006:105)

2.4.2 POINTS OF URBAN TRANSFORMATIONS

The dramatic consequences Ramallah City has witnessed post the Oslo agreement were projected by transformations on the physical dimension of the city. These transformations have taken place into two levels; the two-dimensional level, where the structural and the spatial organizational level have shifted, and the three dimensional level, where the alterations presented through the architectural style, the city image and the overall physical

composition. The transformations on the city's physical appearance have been carried out through two main groups; the planners and architects, through planning policies and regulations, and the non-planners, represented by the arbitrary development and chaotic alterations on the city structural organization and form.

Laying out planning strategies for the city structure in its macro scale level started in 1997, in order to prepare a general outline plan, the plan named later as Ramallah incremental outline plan 2005. The municipality requested from the planning committee to work on the unplanned area, and decided not to disrupt the status quo of the City Center; it was a major target to avoid creating new center (Khamaisi 2006: 14). Now a day, the municipality established new planning section that aims at developing and utilizing the past experiences in order to structure a new outline plan for the city (Ramallah Municipality 2008).

In order to understand the existing city structure and changes that took place on both the two dimensional organizational level, and the three dimensional level, it is necessary to illustrate the urban transformations on these sections, pointing out the evolution of these transformations through the planning and non-planning actors.

2.4.2.1 LAND USE TRANSFORMATIONS

Rapid urban development and the sudden population growth are main aspects that impact the land use. These, combined with other factors such as the land ownership status and the scarcity of land for development, played a role in transforming the urban settings in the case of Ramallah City. Since most of the lands are privately owned, most of the main developments and constructions are often done by the landowners themselves for private uses and investments, accordingly, the dedications of land for the public use is difficult (Shaheen 2006: 111). In addition to this, the Israeli actions on ground restrict the development area within limited boundaries; this has limited the land use to certain boundaries. Based on Ramallah land use plan (figure 2-12), the city land uses and the transformations on its structure can be described as the following (Shaheen 2006:111-114):

- *The residential Neighborhoods*- The residential areas are distributed among the city structure in high density; this is due to the drastic change on the demographical level. These areas can be classified according to the master plan and the regulation classification, where the building heights, surrounding plot areas and materials are

determined by these regulations. An obvious transformation on the housing style has taken place due to the drastic demographical and socio-economic changes. The building regulations obligate toward constructing multi-story residential buildings, instead of the single family-detached houses, which is considered as the traditional housing style in the city. The new housing areas are varied in its quality. The multi-story building which is mostly inhabited by middle and low-income families, construct a very dense area like Um Elsharait (figure 2-13), on the other hand some areas witness the evolution of single villas style like Alteera area. In addition to the crowdedness, the residential areas suffer form deterioration of its image quality and the lack of open spaces.

- *City's Commercial Center*- The City Center developed around Almanara roundabout, it construct a joint that links both Ramallah City and Albireh. According to the land use plan, the City Center evolves mixed-use facilities dominated by the commercial activities; other activities are included like residential, educational and services. The City Center, which is characterized with the chaotic conditions, is dominated by high dense structures and multi-story buildings, and suffers from the lack of green and open spaces.
- *The Industrial Area*- The industrial area is located to the southwest of the city; it constructs a joint that links both Ramallah city and Baytonia city. Due to the unplanned expansion of both Ramallah and Baytonia cities, the land use transformed to present an industrial-residential mixed land use. In addition to its crowdedness and mixed-use negative impact, this area causes negative environmental impacts on its surrounding context in specific and to the rest of the city in general. This is due to the insufficient infrastructure and location problem, where the area is located inappropriately regarding the wind direction.
- *Green Zones*- Ramallah City hosts two types of green zones; the green spaces between the buildings, which exist as a result of implementing the British regulations, and the open lands that surround the city. Due to the demographical influx, and the scarcity of land, residents have started to replace the green areas with new massing in both, the internal and the external green levels.

According to the previous description, land use in Ramallah City faces many conflicts due to the insufficient planning efforts, the landowner ship, and the political conditions. As a result, many problems appear on the land use level such as; the scarcity of land for development, the mixed-land use, the inappropriate industrial area location, and the lack of areas for public use.

2.4.2.2 BUILT UP STRUCTURE & URBAN DENSITY TRANSFORMATIONS

Spatial transformation on the macro scale, which is clearly represented through the changes in spatial organizational shape on the city scale, can be understood through analyzing both the urban structure and the urban density. In Ramallah City, the factors of urban transformations play role in shaping the current position of these two aspects as follows:

- *The Built Up Structure*- Historically, Ramallah City's built up horizontal structure followed a centralized pattern, that preliminary was composed around the old core and later had been shifted toward the commercial City Center Almanara roundabout. Due to the different factors which impact the city post to Oslo agreement, as listed previously, new commercial, institutional and residential activities have emerged along side four prominent axes of the city. From the north side toward Birzeit town, from the southern side toward Rafat village, from the southwestern side toward Baytonia city and from the northwestern side toward Ein Quinia village (figure 2-14). The expansion of the city's urban fabric in this manner manipulates a radial urban structural pattern, opposes that of the planning of the city to enrich the center.
- *The Urban Density*- Urban transformation factors; the political, the demographical and the economical, increase the urban density in Ramallah City. According to PCBS (2000) statistical data, the total built up area of Ramallah City is approximately 6,756 km², where the total administrative area is 14,706 km². During the period between 1988 and 1994, the increase in built up area was estimated by 16.1%, with an annual area of expansion of 0.397 km², while due to the demographical change in the city, the increase in the total built up area between 1994 and 2000, was estimated about 24.5% and an annual area of expansion at 0.585m² (ARIJ 2005). A remarkable construction movement emerged during this period consequently with the rapid increase in the number of population and the new political development movement in the city. Since the city boundaries are limited within the outline plan area, and expansion is not allowed due to political constraints, the new construction trend has been oriented toward intensifying the city structure, which became a high dense structure in comparison with the city structure before 1997 (table 2- 4).

Year	Population	Total City Area (km²)	Built- up Area (km²)	Gross Density (per./ km²)	Net Density (Per./ km²)
1997	18,017	14.706	5.909576	1,225.2	3,048.8
2000	21,488	14.706	6.756184	1,672.7	3,180.5

Table 2-4: Ramallah city gross and net densities in 1997 and 2000. (Source; Shaheen 2006)

2.4.2.3 GREEN STRUCTURES & OPEN SPACES TRANSFORMATIONS

Ramallah City was known as the "bride of Palestine" because of its inherent location, significant weather and green open areas (figure 2-15), *"Ramallah of the cypresses and the pine trees, the swinging slops of the hills, the green that speaks in twenty languages of beauty"* (Barghouti 2003). However, this poetic green image of Ramallah City has changed with time, nowadays; the green olive terraces, the internal social open spaces and the well distributed green zones were replaced with huge stone masses, which were typified with relatively high building images and soled edges that aggressively fill the negative space within the city (figure 2-16).

In spite of the availability of some green areas and open spaces inside and around the city, the absence of a planning visions that can feed back the urban form and spatial structural levels has had impacts on the affordability and presence of green open spaces. Public open and green spaces are not considered seriously. According to Shaheen (2006), remaining green areas in Ramallah city can be classified as the following:

- *Gardens and parks*- On the public level, there are no public green parks which can offer communal interaction on the city scale level, except Ramallah Municipality Park, which is considered a small green zone. On the micro interactive level, green open spaces are afforded around the old houses, which still preserve their traditional image, and around the new emerged villas, which are relatively limited in comparison to the huge constructions, which replace the city open spaces.
- *Roadside vegetations*- where the municipality equipped some roads with green areas for beatification purposes.
- *Empty lands inside the city and open landscapes in the city fringes*- the vacant undeveloped lots also contribute to the city green and open structures. Obviously, the new expansion of the city impact these areas, its image with green open spaces has been destructed.

According to this classification, the green and open structures of Ramallah City are threatened under the absence of the planning efforts toward reserving and maintaining these areas, in addition to the attack to replace these zones with the new aggressive masses, which represent the new investment and development orientations of the city.

2.4.2.4 TRANSFORMATIONS OF RAMALLAH CITY ARCHITECTURAL IMAGE

An urban form transformation deals with the changes on different city levels. As well as the organizational transformations, alterations on the three dimensional level in Ramallah City have taken place under the impact of the same factors. The challenge of the three dimensional structure is a considerable concern since it has direct consequences on the city's symbolic meaning, identity and quality of life. The three dimensional transformations can be understood through three aspects as follows:

- *Spatial Structure Transformations*- The new attitude toward building horizontal unplanned expansion impacts the negative space compassion, which refers to the direct relation between the positive forms, buildings, and it is surrounding space, and the interrelations between the different spaces, which gives a sort of comprehensive vision for all the spatial relationships within the context. The transformations of the spatial component guided into converting Ramallah City's spatial identity from vernacular open green spaces into compacted unplanned spatial patterns. The original spatial identity was dominated with negative space, connected to each other by sequential clear and direct joints that make the space represented in the large urban pattern as a whole unity manifested with visual and functional codes. The alterations on the spatial component are results of the lack of planning strategies, which tackle the space design organization, and planning, beside the aggressive attack from the residents on the open spaces that represent the new meaning of interest toward investment.
- *Massing vertical structure transformations*- Another impact of the urban new expansion on the massing and the spatial structure is the vertical building addition, which is a result of different changes on the city life that obligates the need for development within restricted limited areas, and the existence of the planning regulations. The old vernacular image of the city, with its limited building heights has been replaced with pyramid shape vertical structures, which gradually shifted from the City Center and along the main roads (figure 2-17).
- *Architecture Identity transformations*- the changes on the spatial compassion and the massing structures were developed correspondently with the emergence of new building styles. This kind of coordination imposes a new architectural style in Ramallah City, which is not compatible with the genuine vernacular image of

Ramallah City. The new architectural styles typify with the solid-mass buildings, with relatively high expansion and commercialized quality. This architectural style is apparent in the new emerged neighborhoods like Um Elsharait; and many other old places of the city like the City Center experiences this through modern commercial and office buildings. It is important to mention another building style, which emerged in some residential neighborhoods, like Alteera, which are characterized by the single-family villas, with limited heights and more designed spaces.

The alterations on these three components impact directly Ramallah City image and identity. The three components have mechanized together in transforming the spatial experience. The change in the building heights with the spatial impact on the space size, shape and clearance influence the city spatial scale and proportions, gives a new dimension of the feeling of enclosure and the clearance of movement which changed the clarity of the space sequences.

2.5 SUMMERY; RAMALLAH CITY CENTER URBAN FORM TENDENCIES

Urban transformation factors have manipulated Ramallah City's form and structure on different levels; macro and micro, through shifting the spatial structure, as discussed previously, and through new representations in the city's different neighborhoods. These transformations have consequential impacts on the City Center, Almanara roundabout area. Since the center is considered the core area for the city life in both, planning and communal daily life, manifested changes on the structure and the shape of the center have been represented. The consideration of such changes is important due to the position of the center as the basic essential point of planning development (Khamaisi 2006: 15), and its significant role in representing the new transformations on the city's general status. Studying the urban transformations in the center, based on analyzing the center urban form, through the transformations that have taken place on its different components.

2.5.1 SPATIAL EXPERIENCE ALTERATION

Building expansions in both, horizontal and vertical dimensions, the crowded center with the multi-functional overloaded facilities, the insufficient sidewalks and the narrow streets, have led for altering the space organization of Ramallah City Center and the movement within it. Observing the dilemma from different views, the new buildings expansions have changed the spaces enclosure proportions and thus the visual and access relations between these spaces (figure 2-18). Some spaces have been occupied with huge

masses, and others have been replaced with huge buildings that dominate the original buildings proportions that traditionally characterized with small masses and remained spaces around it (figure 2-19). These changes have altered the spatial codes and their relationships in Ramallah City Center. Buildings have expanded arbitrarily without conforming to specific regulations, which accommodate the need for open spaces. Accordingly, the center suffers from the lack of open spaces, the shortage of green areas and the inappropriate settings for the remaining open spaces. The changes on the positive and negative setting of the area have promoted the crowdedness of the area, and changed the old settings of the space enclosure there.

2.5.2 URBAN PHYSICAL STRUCTURE TRANSFORMATIONS

The new multi-buildings styles that have emerged in the center, the chaotic distribution for the elements there, and the huge massing the have been allocated; have imposed an overwhelmed environmental image in Ramallah City Center. Multi-functional buildings with different buildings appearances and styles have been constructed (figure 2-20). Huge masses have replaced the green elements and features. Overcrowded signs, canopies and other townscape elements have been scattered everywhere in the center (figure 2-21).

Transforming Ramallah City Center urban form through its two components has direct consequences on the environmental image and its projections on the people's relation to the place, human-environment relationship. The transformations influenced both: the movement system, the array of centers, and the pattern of the open spaces. This has a crucial influence on the way the people perceive the center. It is the way that determines how people act, interact and react within this environment. Relatively, these transformations have impacts on the quality of life within the center; the total structure suffers nowadays form-disorganized conditions. Efforts for understanding this dilemma will enrich planning decision with farther human character.

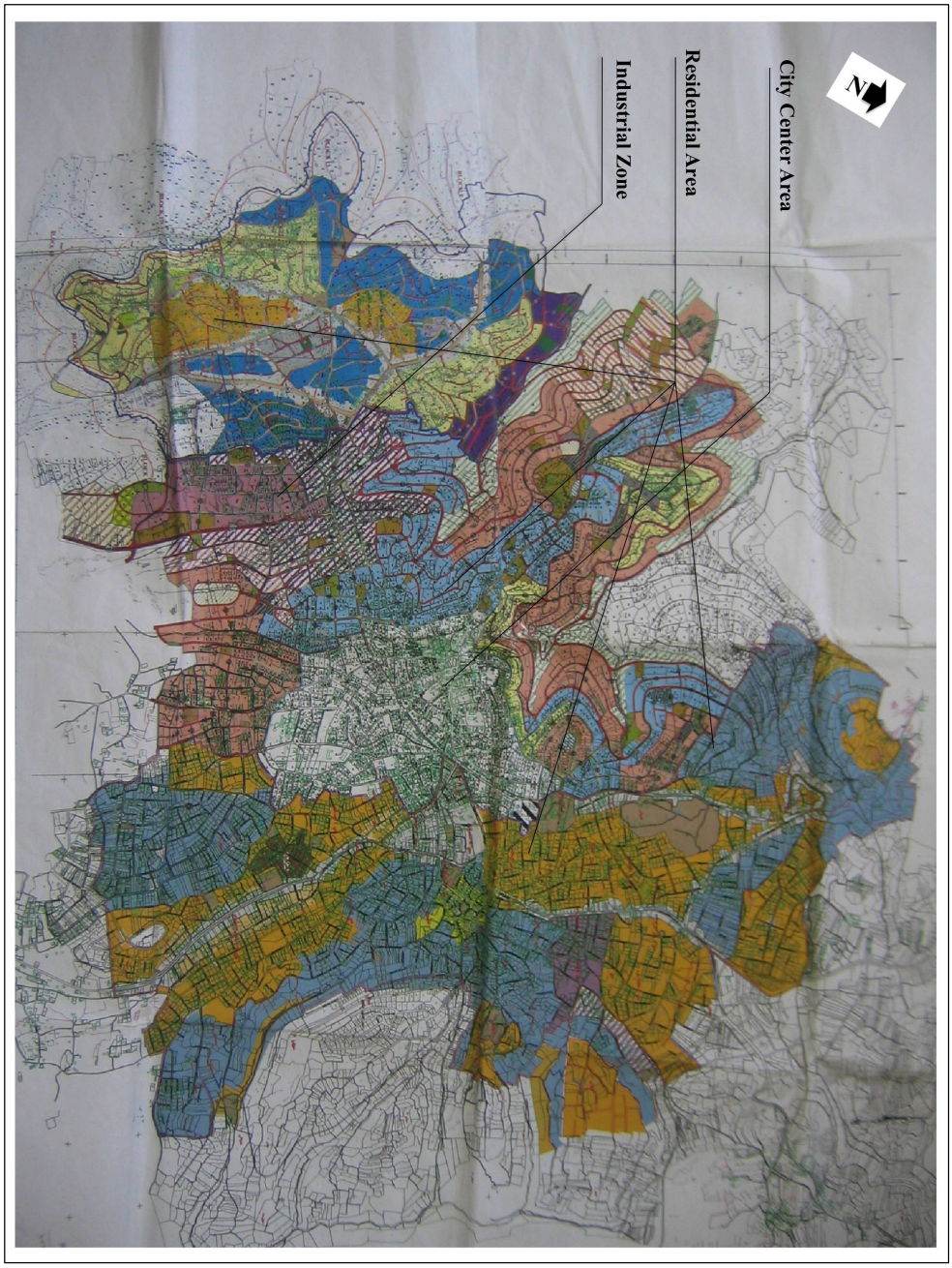


Figure 2-12: Ramallah land use plan 1999. (Source; Ramallah Municipality 2008- edited by researcher)

Figure 2-13: Emerged residential areas in Ramallah City. (Source; researcher 2008)

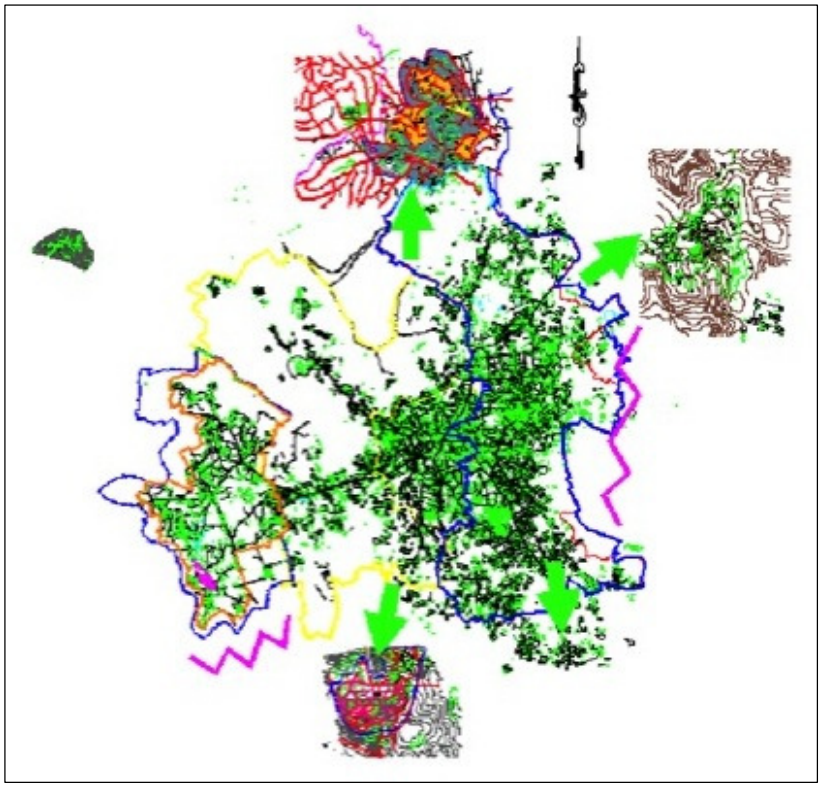


Figure 2-14: Ramallah City built up structure expansion. (Source; Ramallah Municipality 2008)

Figure 2-15: Ramallah City View in 1945. (Source; www.palestineremembered.com, *revised on 15 March, 2008*)

Figure 2-16: New multi-story buildings occupied the open spaces in Ramallah City. (Source; www.palestineremembered.com, *revised on 15 March, 2008*)

Figure 2-17: New building style appears in Ramallah City that veers from the city architectural style routs. (Source; researcher 2008)

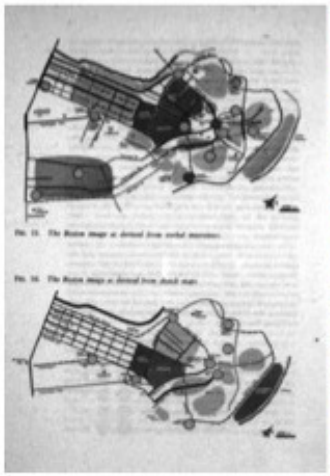
Figure 2-18: Changing the spatial proportions in Ramallah City Center. (Source; researcher 2008)

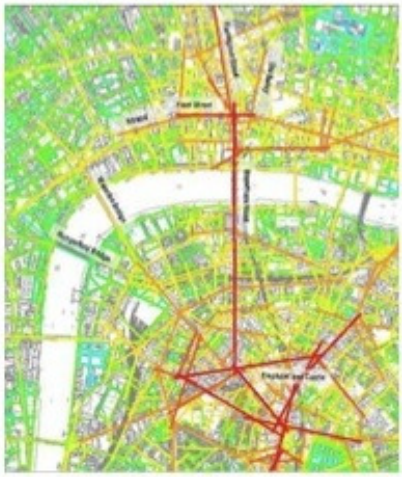
Figure 2-19: Huge masses have occupied some spaces or replaced the small proportioned traditional buildings. (Source; researcher 2008)

Figure 2-20: Multi-buildings style has emerged in Ramallah City Centero-. (Source; researcher 2008)

Figure 2-21: Overwhelmed center. (Source; researcher 2008)

Figure Billow; To the left- Kevin Lynch Mental Mapping Analysis, Boston city. (Source; Lynch 1960). To the right- Bill Hillier Space Syntax Analysis, London city. (Source; Hillier 1996)





OUTLINING URBAN FORM ANALYTICAL

THEORY

CHAPTER THREE- THEORETICAL VIEW;

OUTLINING URBAN FORM ANALYTICAL THEORY

"The human understanding is of its own nature prone to suppose the existence of more order and regularity in the world than it finds"

(Frances Bacon, Aphorism XLV: 50)

Planners, in order to share their images and construct representations of a new reality, attempt to handle approaches and comprehend dimensions that are not yet generally understood in the realm of urban design and the city form. On the other hand, urban designers through their intensive concern with the city form, aim at concretizing concepts of its physical environment and spatial structure that are widely perceived. Consequently, an apparent split emerged between those who preoccupied themselves with the analysis of the socio-economic process that animates the city: known as planners, and those who concern themselves with the physical and spatial synthesis of the city; known as urban designers (Hillier 1996: 111). Urban theories and methods have been conceptualized in order to overcome this discursive gap. Such theories attempt to outline general architectural theory of the city form emanating from a deep understanding of the contextual settings of the city's physical environment and spatial structure and building a concrete body of knowledge about it *"It surprises no one to hear that it is impossible to explain how a city should be, without understanding how it is"* (Lynch 1981: 39). This rigorous analysis of the city determines the spatial qualities of the city form within a *human-environment* relationship framework which is driven from socio-economic initiations "*Spatial quality cannot be discussed without reference to the many social, cultural, and psychological factors involved in the man-environment interaction*" (Rapoport 1970: 90). Hence, it aims at improving the existing conditions for more pleasurable and better qualities.

This chapter draws attention to the urban theories, which depart from the analysis and understanding of urban form and its interrelations to human behavior as an elementary step for urban design. The chapter is concerned with the different modes of thought that generate such theories. Furthermore, an extensive study of two methods that can be implemented as one model on Ramallah City Center for analyzing its urban form is going to be conducted. The chapter tracks the interrelations between these methods and the urban form theories, which they have been extracted from. It lists a comprehensive argumentation for illuminating the vitality of these methods as a primary stage for urban design process.

3.1 TOWARD EVALUATIVE ANALYSIS OF URBAN FORM

Urban form theories aim at conveying a dynamic relation between what is actual and what is possible since detachment between actuality and possibility is considered as a split between thought and action. Accordingly, profound understanding of the existing physical surrounding is the substantial for a concrete urban design *"There must be a vital and mutual*

relation between the desired and the existing reality, between goals and facts" (Giedion 1952: 605). Basically, there are means-ends systems; means is the analytical understanding of the contextual statuses and ends are the actualization of design. The aim of any urban model is to develop a structural relation between cities' means-ends systems within decision-making frameworks, and this has become a critical weakness (Hillier 1996: 112). The primary concern of the urban planner is to understand the physical environment and help shape it to serve the community, accordingly, the interrelations between urban forms and the human objectives seems to lie in the heart of the city planning processes. However, in reality this is not the case, city planners' claim of developing a relation between objectives, reality, decisions and designs, yet, the rare analysis of the forms and their effectiveness in achieving the original determined objectives lead to confusing the planning goals. The mass efforts of the city planners have been dedicated for the blind understanding of the infrastructural issues, housing adequacy, separating land uses or traffic functions. While the perception of the urban form on the city scale and its interrelations to social behavior have become static and fragmented "*Unless planners can devise more powerful ideas for understanding and controlling the physical environment, they are not likely, and perhaps do not deserve, to be treated as more than lackeys for the performance of routing cores"* (Lynch 1958: 356).

Based on this theoretical argument, this study elevates the necessity for outlining an analytical theory for understanding the urban form that is concerned with the sensual effects of the physical form of the city, and brings architecture into the big city scale level. It excludes the direct planning functional effects, such as job security, social groups, family structure, good housing…etc. This leads to demonstrating the gulf between the planners and what is planned by handling human-environment studies that are very essential as part of the planning process, and hence this leads to setting policy recommendations and strategies.

3.1.1 URBAN FORM ANALYTICAL THEORY

Urban design theories have been constituted in order to fill the planning-design gap and bring more sensual human relation to the city. Many o f these theories adopted the human-environment investigations as the main pillar for overcoming this dilemma "*For the most part, however, the applicability gap is slowly but surely being bridged by those who study the design alternatives for specific types of places for particular groups*" (Russell & Ward 1982: 679). From John Zeisel (1981) theoretical view, designers can basically bridge this gap by thinking of design as research (Zeisel 1981: 250). This sort of research thinking about human-

environment studies has significant contribution to urban designers' fundamental concerns of humanizing the cities.

Theoretically, from a similar standing point, John Lang (1987) intends at outlining an urban design theory based on human-environment relationship framework. His point of departure emanates from the need for urban design that is based on the knowledge of the natural environment. Lang asserts, "*Positive theory in design field, as for other applied decision-making fields, consists of two components, substantive theory and procedural theory*" (Lang 1987: 18). Lang's (1987) main concern is the introduction of analytical (positive) theory that is intended to build a base of knowledge about the three-dimensional layout of the environment and what it offers for the different organisms and their habits. The need for analytical theory can be further manifested in the weakness of architectural theory for generally being normative and less analytical "*The most common problem of architectural theories is that they have too often been strongly normative and weakly analytic*" (Hillier 1996: 2). Normative theory demonstrates how to reach to the design; while analytical theory is basically concerned with how the design will work (Hillier 1996: 47). Accordingly, Lang's (1987) notion brings up the essentiality for a theory that is based on analytical, positive, mode of thinking, which is intended to research the human-environment statuses as main concerns that associate city design with more human applicable solutions.

The study of Ramallah City Center aims at researching the human-environment relationship component as a main concern for humanizing the place. It can be considered as an attempt for enriching the planning decisions with more applicable visions that can bridge any expected gap between planners and designers. Therefore, the research has accommodated an analytical theory. Many methods can be classified within this approach, yet the study adapts two basic methods that can together facilitate approaching the dilemma of Ramallah City Center.

3.1.2 URBAN FORM ANALYTICAL APPROACHES

Kevin Lynch (1960) sets up the bases for environmental cognitive theory in relation to the city form. His theory can be understood as an attempt of matching the image-human understanding for the existing physical environment, and then, posits new solutions for the environmental quality conditions. His speculation stands on investigating the spatial sequence and significance of the physical elements of the urban environment through his Mental

Mapping Method. Lynch (1960) asserts that building a good base of understanding for the physical environment and its image-human relationship is the main purpose of his analytical theory. From the same theoretical stance, Bill Hillier (1996) states the need for new design theory based on building a concrete understanding of what is existing as a preliminary step for a significant design. Since designers in general don't use theory, however they are influenced by it; Hillier elevates the need for a design theory that aids the design process, and helps predict a certain design performance "*a complete account of the designers operations during design would still not tell us where the solution came from*" (Hillier 1984: 253). The persistent critique of other urban theories for being determinative, along with the dichotomy between the subject and the object, escalates the need for a new form of theory that attempts to analyze the context based on considering the interrelations between subject and object (Hillier 1984: 6). This analytical theory attempts at analyzing the context in order to define the way the environment exists through finding out the configurational[3] relations between space and behavior *"If there are no objective regularities in the real world of architectural form and space, linking the configurational aspects of form and space with behavioral and experiential outcome, then there are no grounds whatsoever for seeking to build and an analytical theory"* (Hillier 1996: 59). The theory brings up the notion of social-spatial as alternative for human–environment study, which is basically confined to the aim of humanizing the city. Significantly, the recent researches demonstrate the applicability of Space Syntax on the level of human-environment.

Apparently, Space Syntax Analysis highlights space as the main facet of understanding the city form for more sustainable and better quality settings, while Mental Mapping is committed to the physical elements as main components for structuring and building the urban form and its enclave space. Both of the two methods outlining an analytical positive theory aims at building a base of knowledge about the city's physical form and its relation to human beings; a human-environment relationship understanding. Therefore, both theories attempt to bridge the gap between planning and designers, and enriching planning decisions with more specific goals about the physical status for humanizing the city.

The study aims at implementing the two theories on Ramallah City Center as methods of analysis and understanding of its contextual settings. In spite of the different theories and methods that have tackled the urban form and aim at bridging the proclaimed gap, the

[3] For farther understanding, see definition section (3.3.3.1)

dissertation intents at adopting these two theories and skip the others for two main reasons. The nature of the problem at Ramallah City Center, for being from one side associated with the physical elements of the environment, and Mental Mapping is powerful to cover, and on the other side for being spatial, where Hillier's Space Syntax is highly potential tackled. The other reason is due to the core attempt of the dissertation for humanizing Ramallah City Center based on human-environment relationship, and where these two theories are core influential in. Eventually, it is important to mention that the significance of Lynch's Mental Mapping emanates from being the first pioneer work aiming at analyzing the physical settings of the city within an environmental cognition standpoint, while Hillier's Space Syntax Analysis is one of the most recent up to date attempts of urban design analysis.

3.2 ENVIRONMENTAL COGNITION APPROACH

Environmental cognition is the scientific study of the cognitive mapping process, which investigates the process in which humans acquire data from their surroundings, according to Edward Tolaman (1949)*"Cognitive mapping is the processes whereby people acquire, code, and decode information about the relative location and attributes of the physical environment"* (Lang 1987: 135). Environmental cognition is identified firmly as a subfield of the area of environmental psychology, which is interconnected to various fields such as geography, architecture and planning. The main concern of environmental psychology is the study of the interrelations between human and environment "*Environmental psychology is that branch with psychology concerned with providing a systematic account of the relationship between person and environment*" (Russell & Ward 1982: 652). Under the rubric of human-environment relationship, environmental psychology can be defined as the "*psychological study of behavior as it relates to the everyday physical environment*" (Craik 1970: 15). This extends the boundaries of psychology to include the study of behavior as an organized action of humans in a large-scale environment. Hence, environmental cognition occurs to be a significant segment of the psychological study of behavior "*Human spatial behavior is dependent on the individual's cognitive map of the spatial environment*" (Downs & Stea 1973: 9).

Epistemologically, Golledge (1987) asserts that environmental cognition field has been influenced (philosophically) by positivism, since the heart of positivist thought was the search for a process theory, and this became the case on the environmental cognitive field (Golledge 1987: 133). This search was conducted through a hypothesis-testing procedure (or methodology) that insisted on reliable and publicly verifiable results "*In particular, the use of*

logico-mathematical languages and reasoning processes, the need for public verifiability of results, and the search for generalization are essential components of much experimental research in environmental cognition" (Couclelis & Golledge, 1983: 331-339). Environmental cognition field in its early stages had been deeply influenced by the Kantian theory that assumes human beings as the fundamental resource of understanding nature "*there is no way to comprehend the nature of reality except through the human being*" (Golledge 1987: 133). Accordingly, reality in general and environment in particular are grasped through the mind efforts and its interaction to the environment, and human behavior should be examined in the context of an organism-in-environment situation and as a function of the ongoing transaction between the two (Golledge 1987: 134). Human-internationalists, such as phenomenologist, have as well a significant traces on environmental cognition field due to the critical account that has been confined to the positivist concepts about the passive observer and the given objective reality "*The continued debate between humanist (e.g., phenomenologist) and analytical (e.g., positivist) researchers is primarily of limited academic interest, but the fact the debate occurs at all is evidence of a growing concern for a wider epistemological base for continued environmental cognition research*" (Seamon 1982: 2119-2140). Nowadays, cognitive mapping is considered a scientific field that is based on a phenomenological basis, where the relation between both human and his environment is investigated on the basis of human experience within the environment.

Significantly, environmental cognition is concerned with the interrelations between human and his environment; this has to do with both the terrestrial and cultural environment. Within this realm, architectural environment rises up as a main constituent of the whole environment, it consists the physical components, as well as being interconnected to the sensual components of the environment. The human-environment study confines the design field with environmental cognition studies. It brings up the notion that any change in the layout of the environment will lead to a change on the aesthetic values of people involved. This is called environmental determinism, which is a core idea in the environmental design literature and aims to concentrate on both environment and human beings at the same level. Yet, environmental cognition within its phenomenological background still focuses on the human aspect and the experience within the environment rather than the both sides.

Kevin Lynch (1960) focuses his pioneer thesis on environmental cognition and mental mapping. His work aims at studying people's mental images of their places as a basic step of

evaluation, analysis and then design "*…the aim was to clarify some vague notions about the visual qualities of large environments, and particularly to show that you cannot evaluate place, and should not plan for it, until you know how its residents see it and how they value it*" (Lynch ---: 239). Lynch's theory has been extended later; different methods have adopted the theory as a fundamental base in environmental cognition theory. The theory is the first to address the implications of the environmental cognition on the design field.

3.2.1 ENVIRONMENTAL COGNITION THEORETICAL BACKGROUND

Theoretically, mental mapping introduced by Lynch (1960) was inspired by Kenneth Boulding's (1956) book "*The Image"*. Boulding's thesis introduces human behavior as a prediction based on an image related to his mental image, rather than on the objective reality, of the external world. The study elevates the concept of the image that a person holds as a core issue that constructs his subjective knowledge and the way he judges in. Boulding's work's influence is not constrained to the environmental cognition sphere; its impacts exceed the whole branch of environmental psychology (Russell & Ward 1982: 655). Miller, Galanter and Pribram (1960) argue that the image plays a central role in what can be defined as the central concern of Environmental Psychology, which is the organization of behavior in space and time (Miller et al. 1960: 226).

Since the image is what determines a person's knowledge, Downs and Stea (1977) distinguish two broad classes of such knowledge; locational (where something is) and nonlocational (what it is) (Downs & Stea 1977). In this regards, Lynch's method can be considered as a study that matches both classes; Kevin Lynch (1960: 4) asserts the vitality of studying the person's mental image as a central aspect for improving and developing urban spaces by indicating the important elements for the person in space, and then defining its location. According to Lynch (1972), space planning is all about the management of change (Lynch 1972: 1), building concepts for the future should be based on the person's past experience that defines significant elements of space and constructs the mental image and its location "*Our Power of creating a mental future lies in our ability to imagine the remote consequences of present are acts, to create new compensations of act and consequence, to connect present motives to those consequences…*"(Lynch 1972: 91).

Lynch (1960) defines three main components of analyzing the environmental image; identity, structure and meaning. Since his thesis is concerned with the visual clarity of the built

environment, Imageablity[4], he deals with both, identity and structure, while he doesn't give a lot of attention to the meaning dimension (Lynch 1960: 9). Departing from this point, Carl Steinitz (1968) extends Lynch's work through mapping the connotative meaning[5] by obtained public judgments of the type, intensity, and significance of places in relation to activities (Steinitz 1968: 233-247). Peter Gould (1973) took into consideration the meaning dimension within environmental cognition one step farther by putting the responses on spatial map form, at both national and international scales (Gould 1973: 182-222). Other researchers have assessed connotative meaning, Donald Appleyard (1976) in his work, *Planning a Pluralistic City,* attempts to report the connotative meaning by obtaining the opinions and evaluations of several buildings, he concludes that "*Buildings were usually viewed in an evaluative manner*"(Appleyard 1976: 98). Recently, the idea of evaluative image, which defines the connotative meaning, has been developed within Jack Nasar's (1998) study of the city's image. In his book, *The Evaluative Image of the City*, Nasar introduces the term Likability as a complementary term to Lynch's (1960) Imageablity. His idea of Likability is concerned with connotative meaning and refers to "*the probability that the environment will evoke a strong and favorable evaluation response among the public experiencing it*" (Nasar 1998: 3). From a psychological point of view, the idea of mapping the mental image has been developed by the psychologist Stanly Milgram (1976) in his work on Paris, where he attempts to obtain several psychological maps of the city (Milgram & Jodelet 1976: 104-124). Milgram's idea is based on determining which areas form the psychological core of the city, it is considered by most people to represent the essence of the city "*If we wanted to be even more precise we could construct a cognitive map that would not only show the symbols of the city but would measure the precise degree of cognitive significance of any given point in the city relative to any other*" (Milgram 1970: 1467).

As has been discussed, the study aims at analyzing Ramallah City Center urban form as a primary step for the area urban design. The environmental cognition approach is adopted as one of two methods for illustrating and evaluating the center. Specifically, the study attempts to comply with Kevin Lynch fundamental thesis that deals with the visual appearance of the city. The argument behind ignoring the extensions of Lynch work and focusing only on the primary theory is based on two aspects; the nature of the research dilemma from one hand and its theoretical framework on the other. The research deals with the visual qualities, defined as the

[4] For further understanding, see section (3.2.2.1)

[5] According to Amos Rapoport (1990); connotative meaning is the second level meaning, which is concerned with the values lays on the environment and influences its evaluations.

Imageablity, this lies in the heart of Lynch's first thesis proposition. Subsequent attempts of extending Lynch work have basically dealt with the connotative meaning and the psychological and emotional aspects. All the methods that have extended Lynch's thesis in this regard are concerned with the meaning aspect more than the environmental structure itself. Their surveys have been designed to measure the Likability and the emotional aspects, whereas this study is concerned with the structural influence of the urban environment, which is the core matter of Lynch's study. On the other hand, Lynch's method considers the problem of a world city by being concerned with three points for improving the environmental quality, and then influence the large-scale environment; the movement system, the array of centers, and the pattern of the open spaces (Lynch 1965: 94). Considering Ramallah City Center problems, the research aims at addressing these aspects, which are as well the same aspects that the other adopted method, Space Syntax Analysis, intends to deal with. Both theories hypothesize that the city as a discourse embraces human activities; this is presented through its structure "*Lynch's research from the semantic point of view remains ambiguous: on one hand there is a whole vocabulary of signification in his work (e.g. readability of the city), and as a good semanticist he has discrete units"* (Barthes 1967: 414).

The other reason for choosing Lynch's theory is due to the study's theoretical framework that attempts to check the validity of such theories to be implemented as part of the planning process in Ramallah City. Most of the other environmental cognition studies have employed the same familiar method; mapping, description, behavioral observation, verbal evaluation and so on, which have been extracted from the Lynch's original theory. These methods have been modified and used in different ways as they measure different matters (Lynch -----: 242). Accordingly, going back to the origins of the theory, will give the opportunity of testing the capability of implementing it on Ramallah City. Therefore, Kevin Lynch's (1960) thesis on environmental cognition is going to formulate the first pillar of the study analytical approach.

3.2.2 MENTAL MAPPING METHOD

Based on the analysis of existing form and its effects on humans as a fundamental cornerstone for city design, Kevin Lynch (1960) develops his Mental Mapping method so that it accommodates the sensuous analysis of place as essential aspect for space understanding and use "*the sensuous function is as important as the demands of circulation or of use*" (Lynch 1962: 55). Lynch's framework is introduced in his *The Image of the City* (1960); he sets up the output of his endeavor study and analysis for three American cities Boston, New Jersey, and

Los Angelus. The proposition of the method is motivated in order to lead for a possible connection between psychology and urban environment, and then influence planners to pay more attention through their decisions for those who live in the place (Lynch 1985: 247). Windley and Weisman (1977) assure the importance of mental mapping in planning for its aptitude of bridging the gap between design and research. In general, Designers prefer to deal with visual-abstracted data and mental maps offer the actual concrete data in a visual way (Windley & Weisman 1977: 17)

Basically, Lynch (1960) asserts orientation as a fundamental function for body and an image of one's environment. Accordingly, the mental map becomes a prerequisite for the development of any higher emotions (Gotsch 2001: 6). The ability of constructing a clear mental map for the urban surrounding creates a pleasurable influence on the person who uses the space "*There is a positive pleasure in being able to recognize the urban scene and to fit it together*" (Appleyard 1973: 16). From Lynch's point of view, movement is the core aspect of experiencing and then recognizing the space. James Gibson (1986) clarifies the role of movement in perceiving the environment; he asserts that we make sense of the world by the way we relate our movement to what he calls invariant pattern in the environment (Gibson 1986). Lynch's (1960) study is concerned with the effects of physical perceived objects, according to him, the perceived objects compose the environmental image (Lynch 1960: 6).

3.2.2.1 THREE CITIES APPROACH

The principal concern of Lynch's (1960) thesis, *The Image of the City*, is the basic determinism of the role of analyzing urban form and its effects on citizens as one of the fundamental stones of city design. Lynch (1960) limits his study to three American cities, Boston, New Jersey, and Los Angeles. The study that was launched on 1956, aimed at seeking the mental maps of a selected sample, and then compared it together in order to extract the users' public image. The covered samples varied between the three cities; thirty persons were interviewed in Boston, while fifteen persons in the other two cities, New Jersey and Los Angeles (Lynch 1960:15). The interviewees were users, residents or workers who knew the area well. Lynch's (1960) method is divided into two basic steps; the systematic field reconnaissance of the area that has been made on foot by trainers, who mapped the existed elements, their visibility, image strength and connections, and the long interview, where questions regarding the descriptions, locations and sketches are asked (Lynch 1960: 15). Interestingly, the survey came up with the following observations (Lynch 1960: 16-43):

- In Boston; the reason for choosing the city is due to the rather unusual characteristics of the area. The chosen sample mentioned to the city as a structural city that almost understood by people. It was described as an unmistakable place with plenty of green open spaces and full of associations.
- In New Jersey; the city was chosen for its appearance as a place to pass through rather than live in. The interviewees showed the image of the city as a place on the edge of something else, however, it has been noted that the city has more shape than the outsider may think.
- In Los Angeles; the city's clear structure was the fundamental aspect of selecting the city. Significantly, the people only mentioned two landmarks, which haven't been described positively.

The study came up with remarkable results regarding the environmental physical form and the people's evaluations. It has been noted that the people adjust to their surrounding and extract the structure and identity out of the materials at hand (Lynch 1960: 43). An interesting outcome was the term remarkable, according to the study; remarkable wasn't confined to the pleasant feeling of the elements. Furthermore, the most significant environmental elements that have been noted with care and pleasure were the vegetation and the water (Lynch 1960: 44). Theoretically, Lynch's (1960) thesis came up with essential principles and criteria regarding the city form and its interrelations to human cognition that can be summarized by the concepts of Environmental Legibility and Mental Maps.

3.2.2.2 ENVIRONMENTAL LEGIBILITY

In his work, Lynch (1960) introduces the term Legibility as a crucial caption in understanding environmental setting and rebuilding today's cities "*…Legibility is by no means the only important property of a beautiful city*" (Lynch 1960: 3). The term refers to the apparent clarity of the cityscape, According to Lynch (1960); Legibility is simply the way within which the cityscape parts can be recognized and organized in a coherent pattern (Lynch 1960: 2-3). Simultaneously, Lynch (1960) mentioned another term, Imageablity, as another substantial concept of analyzing and understanding the physical context. The term refers to the color, shape or arrangement which facilitates the making of vivid, powerful structure *"Imageablity; that quality in a physical object which gives it a high probability of evoking a strong image in any given observer"* (Lynch 1960: 9). At a certain level, both terms refer to the

same idea which can be pointed through *Visibility* and *Apparence*, and that is vital for constructing a useful mental image about the environment.

As has been discussed, Lynch (1960) limits his analysis of the environmental image to both; structure and identity. In this regard, structure can be measured through the relationship between the Imageable elements, which contributes to the place's Legibility (Nasar 1998). Amos Rapoport (1990) assures the importance of recognition to distinguish between both identity and structure *"Object recognition, which depends on distinction or a noticeable difference, represents identity. Recognizing the pattern of relationships the objects represents the structur,*" (Rapoport 1990). Legible images can be recognized and distinct more than others; therefore, Legibility is a fundamental issue for people's structuring, organizing and evaluating their environment and finding their way around it (Kaplan & Kaplan 1989; Ulrich 1983; Wohlwill 1982).

Significantly, way finding is a vital process within environmental Legibility. Environmental image constructs the strategic link within this process; it represents the generalized mental picture of the exterior world that is held by individuals (Lynch 1960: 4). This image is produced by both the immediate sensation and the experience of the past *"We recall places about which we have strong feelings, and we will more likely have feelings about and appearance with the recalled (Imageable) parts of the city"* (Rapoport 1970:).

Mental mapping aims at evaluating the clarity of the environmental image, Legibility. According to Lynch (1960), the clear environmental image is considered a useful basis for individual growth, it is an essential aspect that facilitates social communication, and enforces the feeling of belonging, "*The positive values of legible surroundings are missing: the emotional satisfaction, the framework for communication or conceptual organization, the new depth it may bring to everyday experience"* (Lynch 1977: 355). Hence, this creates a major problem that confronts measuring the social content within the built environment (Russell 1981: 2). Therefore, environmental Legibility demonstrates a strong relationship that ties both, the physical urban form and the human behavior, a human-environment relationship. It should be comprehended by planners and urban designers in order to bridge the gap between both disciplines *"We asserted that the quality of the city image was important to well-being and should be considered in designing or modifying any locality. Thus, orientation had been expanded into a general method of analyzing place, and vivid and coherent mental image had been elevated to a general principle of city design*" (Lynch 1985: 248).

3.2.2.3 SEEKING MENTAL MAPS

In general, environmental image, represented as a Mental Map, plays a major role in measuring a place's Legibility. Since people share the same common Mental Map about their cities, they normally depend on this image for defining their function and developing their emotional belongings "*People had relative coherent and detailed mental image of their city, which had been created in an interaction between self and place, and that this image was both essential to their actual function, and also important to their emotional well-being*" (Lynch 1985: 248). According to Golledge (1987), Mental Mapping has been developed as a reference to the individual internal representation of the world, and it demonstrates the spatial information with what has been called Mental Maps. The process of mental mapping includes a set of operations that lead to code and decode the environment, it changes and develops by age, and finally leads to generating social behavior "*Cognitive mapping is an abstraction covering those cognitive or mental abilities that enable us to calculate, organize, store, recall, and manipulate information about the spatial environment. This ability changes with age (or development) and use (or learning). Above all cognitive mapping refers to a process of doing: it is an activity that we engage in rather than an object we have*" (Downs & Stea 1977: 6).

Although there is no perfect agreement among people's mental images, there are general overlaps in the images they have, which leads to generating the term Public Image that mental mapping normally seeks. Public Image is the common mental picture that is carried by large number of city inhabitants and users; it is an abstracted representation of the overlaps of many individuals' images (Lynch 1960: 7). The slight variety in mental maps is due to people's socio-cultural conditions that help formulate their personal stands (Rapoport 1977), however, environmental image is a result of a two-way process where the environment suggests distinctions which users adapt in the light of their personal stands (Lynch 1960: 6).

In Mental Mapping, the produced mental maps can never be an exact replacement of realty but rather than a model of reality. This process of replacing reality with a model of reality, is an important process for social creation, it is basically the main generator of social and spatial communication (Lynch 1976: 233). Users' spatial behavior depends on the images they have of the structure of the environment, as they decide to act and find their way through the environment according to the images they have (Lang 1987: 135). Furthermore, their images of the reality are flexible enough that they are capable of coping with the environmental changes whether the changes are temporal or permanent (Downs & Stea 1977: 70).

Accordingly, studying mental maps and analyzing the Public Image are essential aspects that can be implemented on the research analysis of Ramallah City Center; this will lead to the users' evaluation and view of the center. Moreover, this kind of analysis will come up with a set of recommendations that present the users' needs and will assist in building a more sustainable and vivid center.

3.2.2.4 Evaluative Criteria; Signified City Elements

Cognitive mapping approach assumes the necessity for visible organized and sharply identified environment as a prerequisite for true remarkable and unmistakable place. The city can be defined as a fabric formed not of equal elements whose functions can be inventoried, but of strong and non-marked elements (Barthes 1967: 414). Kevin Lynch's (1960) study aims at determining the signified elements that construct the visible sharp environment. As a fundamental outcome, Lynch (1960) concludes that the strong image of the visible sharp environment could be distinguished according to the dense, rigid, and vivid degrees of its elements and the structural qualities between them "*One might infer from this that the images of greatest value are those which most closely approach a strong total field: dense, rigid, and vivid*" (Lynch 1960: 90). Vivid has been noted for the dynamism of the elements and use, while rigid refers to the elements interrelations to each others, finally dense is a direct indicator of the capacity and intensity of the elements themselves.

Lynch's (1960) thesis comes up with a set of elements that identify the city's structure, these elements are; Landmarks, Paths, Nodes, Edges, and Districts (Lynch 1960: 47-48). According to the same study, these elements are normally identified as parts but operate as a whole system; therefore they perform as a group of mass information (Lynch 1960: 109). Other studies confirm the validity of f these five elements like Appleyard (1970), and Aragones & Arredondo (1985). Eventually, Lynch's (1960) study concludes that the singularity of these signified elements, which can be realized by the Vividness, Rigidity, and Density besides the coherent relation between the elements, single out as being a crucial condition for the enjoyment and use of the city (Lynch 1960: 105).

3.2.2.5 Critical View on Lynch's Work

In spite of the high appreciation on Lynch's (1960) work, many researchers in the field of environmental cognition have criticized his thesis from the same point of view. Primarily, as a

core critic, and despite his acknowledgment of the role of identity, structure, and meaning as main components of analyzing the environmental image, Lynch (1960) emphasizes the terms Legibility and Imageablity, which vent less consideration for the impact of meaning *"Kevin Lynch was merely interested in the functional and pragmatic aspects of the mental representation; his concept of the 'Imageablity' referred to the capacity of urban artifacts to imprint the observers mental map with a vivid, strong image. The identity or cultural significance of the image was not the main focus of his investigations"* (Sulsters 2005: 2). Jack Nasar (1997) argues that in order to shape the city's appearance, knowledge about identity and structure, which can be measured by Imageablity, is not enough "*Imageablity is not enough. The maps have a second component beyond Imageablity: emotional meaning (likeability)*" (Nasar 1997). However, Lynch emphasizes the essentiality of measuring the city Imageablity and Legibility as a fundamental way of preserving the emotional feelings and functional mechanism within places "*A third reason of distress in our cities is their illegibility. In order to feel at home and to function easily we must be able to read the environment as a system of signs*" (Lynch 1965: 90). Lynch further clarifies that the way of achieving the purpose of building cities for the enjoyment of vast number of people of widely diverse background, should concentrate on the physical clarity of the image and allow meaning to be developed without our direct guidance (Lynch 1977: 358). It means that preserving the physical structure, which is the container of people's emotions and signs, will immediately impact the cultural and social meanings.

Farther critiques, which have been partially reconsidered by Lynch, have targeted his thesis. Consistently; the work has been consistently judged for the chosen sample, due to the small size and the lack of diversity "*There were a number of faults with these data. The sample were quite small, and were larger made up of middle class professionals*"(Lynch ----: 240). Methodologically, some have evaluated the adaptation of photos and maps as an inadequate and misleading method. Lynch draws attention to the designers' fear of the method, since they have a feeling of sizing their territory, he further argues *"But their fear was quite unfounded. Analysis can describe a present situation and its consequences of some altered arrangements, but it is powerless to generate new possibilities*" (Lynch 1985: 250).

Lynch defends his work in his last publications; he defines the aim of his experiment as an attempt of examining his thesis and proving his proposition. He acknowledges the work of *The Image of the City*, as a method rather than a given static conclusion about urban structure

elements. In fact he criticizes the static view of his method and limiting it to the five elements of the urban structure as the core output of his cognitive mapping study, rather than understanding the method itself "*The static view is mistaken not only as a matter of understanding, but also as a matter of value. We are pattern makers, not pattern worshipers. Unless we are mentally at risk, our great pleasure is to create order….. This is the pleasure those designers so enjoy A valuable city is not an ordered one, but one that can be ordered…"* (Lynch 1985: 252).

3.3 SPACE SYNTAX ANALYSIS APPROACH

Space Syntax Analysis is a recent technique that explores social processes by measuring the interrelationships of space structures. The method has been developed by Bill Hillier and his colleagues in the University College of London, and has been introduced through *The Social Logic of Space*, Hillier and Hanson (1984) and *Space is the Machine*, Hillier (1996). According to Ruth Van Dyke (1999), *Space Syntax Analysis* is "*a set of techniques for quantifying and comparing access patterns in built space*." (Van Dyke 1999: 461), it is that operation which aims at employing a series of rules for controlling the manner in which people segregate and connect built space (Shapiro 1998: 288). Inward, the primary concerned publication with *Space Syntax Analysis*, *The Social Logic of Space,* Hillier and Hanson (1984) elucidate their attempts to "*begin with architecture and to outline a new theory and method for the investigation of the society-space relation which takes account of these underlying difficulties*" (Hillier & Hanson 1984: X). This has been characterized with their intentions of building a conceptual model within which interrelations can be measured on the basis of social content of spatial pattern and the spatial content of the social pattern, and the purpose of establishing a method of analysis of spatial pattern that can be a primary analytical technique for architecture and urban design (Hillier & Hanson: X-XI).

The method provides new schema for studying the society-space relationship, as a basic step for urban form design. The basic argument of the method is based on the role of architecture in structuring the systems of spaces where people live that it provides through the visual style and the level of appearance; a social life system. In other words, the method brings up the importance of conducting a profound study of the structure of space in order to understand the way of movement then the preoccupied way of life, as essential matter for better design "*It has become clear that a lack of understanding of the precise nature of the relation*

between spatial organization and social life is the chief obstacle to better design" (Hillier & Hanson: X).

In the discourse of analyzing the interrelations between social patterns and environmental structure, human-environment relationship, many architectural form methods have been constructed. In this regards, Hillier attempts at overcoming the central dilemma that has characterized all these methods, and which according to him is represented through their enduring intentions of analyzing the spatial organization's relation to social life into a determinative manner (Hillier & Hanson: IX). The point has been argued here is the approach of distinguishing the environment as an object that has been structured according to human subjects rather than an actor that has an interrelational impacts with people "*In spite of considerable divergences, these approaches all seem to sidestep the central problem of buildings in the sense that we have described it: They don't first conceptualize buildings as carrying social determination through their very form as subjects"* (Hillier & Hanson: 8). Accordingly, Hillier and colleagues intend to build architectural theory based on society-space relationship, departing from the conception that theories with the same intentions have two fundamental difficulties. First, there is no consistent descriptive account of the morphological features of manmade space that can be determined by social structure. Second, there is no descriptive account of the morphological features of societies that could require a certain kind of spatial organization than other (Hillier & Hanson: X). Based on this critical stance, Hillier and Hanson (1984) aren't concerned with the former architectural form methods as a basis to build their analytical theory.

Within the same critical stance, the controversy in approaching the problem, Space Syntax Analysis apparently differs from Cognitive Mapping studies. In spite of the high appreciation, Hillier and Hanson (1984) have criticized the cognitive approach for its analytical dependency on the environment that relies on people's minds, rather than on the physical environment itself "*The order that is being sought lies in the mind and not in the physical environment itself, and certainly not in the social structuring of the physical environment. Cognitive studies provide us, therefore, with a useful method, but not with a theoretical starting point for an inquiry into social logic of space itself*" (Hillier & Hanson: 7). This is decisive for the deterministic character of Cognitive Mapping, which constructs the basic departure point of its analytical method. Space Syntax Analysis aims at getting closer to the reality through its direct concern on analyzing the physical context of the real world itself.

Space Syntax Analysis, from Hillier and Hanson's (1984) point of view, attempts at going farther steps in the field of real world analysis than Cognitive Mapping approach has claim. Implementing the method in Ramallah City Center should enrich the research with more significant open results for understanding the context there and felling the analysis gaps. This implementation has to depart form the theoretical sphere for understanding the method as analytical theory, and it is social-spatial character. Furthermore, the applications of the theory should base on the realization of the interrelations of the technical aspects of the method with its theoretical stands and its relation to city structure.

3.3.1 SPACE SYNTAX ANALYSIS; THEORETICAL SPHERE

As has been introduced, Hillier and Hanson (1984), attempt at building a socio-spatial architectural theory that supposedly inspects the real conditions of the city and consequently leads for developing a better architectural phenomenon and how it affects people's lives. Their basic concerns have been dominated by their fundamental critic on architectural theory. Firstly, for being strongly normative and weakly analytical[6], and secondly, for its historical tendency of borrowing ideas from different disciplines in a way that has limited the attention for the internal development of the architectural theory itself (Hillier 1996: 2). Theoretically, Space Syntax Analysis has been developed according to the structuralism mode of thinking, where the general model is built of the abstract principles of a system and generates only spatio-temporal events. Such kind of knowledge, according to Hillier (1996), is known as Social Knowledge, and its main purpose is to create order and make the spatio-temporal events intelligible through which we recognize the presence of culture in everyday life (Hillier 1996: 29). The adaptation of such mode of thinking is regarded for the problematic nature of the architectural theory. According to Hillier (1996), the normative character of the architectural theory, aims at investigating the environment for how it should be, rather than what is existing. While the analytical approach is capable of enriching the theory with the existing component, and structuralism's mode of thinking is useful for its nature of dealing with existing conditions from within perspective.

Based on structuralism point of view, Hillier attempts to find the link between spatio-temporal events and the abstract (culture) through what he calls configuration. Configuration is the way of putting relationships together; it is about the way things are put together (Hillier

[6] See section (3.1.1)

1996: 1)[7]. For Hillier (1996), culture transmitted through artifacts, and this transmission occurs largely through the configurational aspects of space and form (Hillier 1996: 30). He proposes a spatial configuration relationship with social behavioral outcome as the basic foundation for seeking analytical theory, for him the configuration of space is the core aspect of space analysis "*If there are no objective regularities in the real world of architectural form and space, linking the configurational aspects of form and space with behavioral and experiential outcome, then there are no grounds whatsoever for seeking to build and an analytical theory*"(Hillier 1996: 59).

As for the cognitive mapping, some critics associate Space Syntax within the phenomenological mode of thinking. David Seamon (2007) demonstrates the relationship between Merleau-Ponty's phenomenological definition of movement and Space Syntax Analysis understanding of configuration. Merleau-Ponty's asserts, "*Consciousness is being toward the thing through the intermediary of the body. A movement is learned when the body has understood it, that is, when it has incorporated it into its 'world', and to move one's body is to aim at things through it; it is to allow oneself to respond to their call*" (Merleau-Ponty 1962: 138-139). From Seamon's (2007) point of view, this definition brings up the idea of place ballet that elaborates the familiarity with space through routine. The space routine defines regular actions of individuals meeting together in space, which become a place of familiarity and attachment (Seamon 2007: 4). Seamon suggests that the relationship between Merleau-Ponty's idea of movement and the space ballet character, and Hillier's understanding of movement through configuration is the main post for the Space Syntax relationship to phenomenology "*Although Hillier And colleagues had no intentional aim to make links with a phenomenological perspective; I immediately recognized significant parallels, since space syntax appeared to demonstrate conclusively that human movements are always integrally enmeshed in the world, particularly through the particular configurational structure of a pathway network*" (Seamon 2007: 5).

Hillier (2005) admires the relationship between Space Syntax Analysis and phenomenology. He argues that in spite of the fact that Space Syntax Analysis fundamentally gives a partial and incomplete view of the relationships between humans and their environment, there is still a profound connection to phenomenology, as it is fundamentally concerned with the full richness and diversity of human experience of the environment, and

[7] For farther argumentation see section (3.3.3.1)

what Space Syntax normally does is show the two-way structural links between humans and environments (Hillier 2005: 12). Furthermore, he admires the relationship to Merleau-Ponty's work "*Moreover, we have learned these irreducible abstractions by acting bodily in the world and experiencing the effects, and then converting these into abstract principles. In this sense, the Heideggerian and Merleau-Pontian programs also seem to be satisfied*" (Hillier 2005: 12). Interestingly, Hillier (2005) argues that it is difficult to distinguish between phenomenology and structuralism's fundamental core concepts of human-environment relationships "*It is similarly difficult to fully separate Husserl's fundamental concept from the core structuralist notion of the `rule governed creativity' through which the great variety of human cultural behavior and experience are linked by generic abstract forms which have their ultimate origin in the nature of the human brain and the way it shapes the world which human beings create, and interpret the world given to them by nature*" (Hillier 2005: 10). In spite of this, he elevates approachal differences between the two theories, which guide him to establishing a theory that can be considered to match between the two. His intentions to overcome the global-physical concerns of the structuralism theory, leads him to cover some experiential, local-human issues, through configuration. This theoretical debate that partially matches between Space Syntax Analysis and phenomenology proposes an intersecting connection to Cognitive Mapping, for its phenomenological inspiration.

According to this theoretical debate, configuration is the main aspect that associates the social behavior with space structure, and movement is the central idea that enriches. Hillier and Hanson have adapted Durkheimmian notions of social organization, That has been listed in Durkheim (1964) book *The Division of Labor in Society,* in order to interpret the results of their proposed spatial analysis (Van Dyke 1999: 462). Their intentions of understanding the social-physical city, has been the core aspect that structures their theoretical framework. Accordingly, it is an essential matter to get further understanding of the society-space idea of Space Syntax, as a central concept of the same approach.

3.3.2 SPACE SYNTAX AND SOCIAL SPACE

Since Space Syntax Analysis attempts at redefining the problem of space, which is according to Hillier and Hanson (1984), the matter of finding the connection between '*Social Structure*' and '*Spatial Structure*' (Hillier & Hanson 1984: 26), the society-space relation has formulated the fundamental aspect for understanding Space Syntax Analysis. Theoretically, most studies that deal with this subject are concerned with one side of the phenomenon rather

than both. From one side, social science studies commonly focus on the social and cultural issues without giving parallel consideration for the city as an object; on the other hand, architecture takes the physical city as the core issue of study, but somehow simplifies the human and social aspect (Hillier 2005: 3). From Hillier's (2005) point of view, approaching this problem from one side is inadequate; this approach of the theory of the city should have a two sided view, which he describes as "*the view from the bridge*" and simply constructs the historical aim of Space Syntax Analysis "*Historically, the aim of space syntax was to construct a bridge between the human and physical city*" (Hillier 2005: 3-4).

This mutual relation between social and spatial is the fundamental inference that directs the theory into covering further aspects than what structuralism and phenomenology normally accomplish. Hillier (2005) argues that structuralist have their own way of seeing the city as the main aspect for acquiring the human behavior, while phenomenologist have a different way of understanding the physical city as something reflected through the human experience. They both have defined the bridge, but in extremely opposite ways; they have their own way of viewing the bridge (Hillier 2005: 4). Furthermore, Space Syntax Analysis has another contradiction, to these two opposite urban theories, that influences how it adapts its analytical approach. While structuralist and phenomenologist are based on a similar assumption, for their deterministic understanding of the role of human behavior as a main generator of the physical environment, Space Syntax Analysis makes no assumptions in this regard. Space Syntax Analysis intends to analyze the objects searching for any evidence that could be a result of human behavior, without making any assumption about whom or what generates the other. In this form, it offers a mutual relation that leaves the door open "*In contrast to both, space syntax starts with the object and examines it for evidence of order resulting from human behavior. It therefore makes no assumptions about human behavior but looks for evidence of human behavior in the object*" (Hillier 2005: 7).

This proposition departs from the fact that *"Society can only have lawful relations to space if society already possesses its own intersect spatial dimension; and likewise space can only be lawfully related to society if it can carry those social dimensions in its very form"* (Hillier & Hanson 1984: 26). This mutual relation assumes an interfersal influence between space and society in the process of creating the space, where the building is the core actor. From Hillier's point of view, the drawing of any boundary will directly produce a space separation and a social separation, any constructed building becomes a social-spatial significant

fact in two ways; by defining the space as social pattern that generates some social sanction, and looking at the physical form as patterns that cultural and social sanction identity are expressed (Hillier 1996: 16). Accordingly, Hillier elevates the notion of the building as a social construct that has a social symbolic function, and is associated with space as a way to deliver the meaning through "*It is a fact of space that creates the special relation between function and social meaning in buildings. The ordering of space in buildings is really about the ordering of relations between people*" (Hillier & Hanson 1984: 2). Within this framework, spatial order appears as a part of culture, and reading the space will lead for anticipating a lifestyle.

Based on this debate, Space Syntax Analysis is considered a social theory that dealing with the issue of society-space relation in a mutual manner and has adopted the experience of space as the fundamental aspect of spatio-temporal knowledge. Hillier and Hanson (1984) formulate their theory on a mathematical system basis that is capable of representing and analyzing the abstract properties of space in a comprehensive way (Hillier & Hanson 1984: 30). Any space problem appears as an abstract thought; it is all attached to spatio-temporal facts, and it is not just confined to the philosophical sphere "*The spatial problem of the discrete system is not a philosophical problem but a scientific one"* (Hillier & Hanson 1984: 33). Therefore the use of a mathematical theory can assists in understanding and analyzing space properties.

3.3.3 SPACE SYNTAX; ANALYTICAL CONCEPTS

Every urban system, through its spaces, represents a certain degree of order that is associated with the whole system for getting a particular type of global pattern (Hillier & Hanson 1984: 11). Space Syntax Analysis proposes a mathematical inquiry approach, which normally searches for the abstract relations within the whole system; it attempts to investigate the number or relationships in any system that had to be controlled in order to arrive at the particular global pattern. The method is not an abstracted mathematical system or composed of giving mathematical details. It focuses on investigating the similarities of the space within a mathematical framework that leads to qualitative information "*This is not, of course, a mathematical system, and even more empirically it is not a mathematical enumeration. It is an attempt to capture the fundamental similarities and differences of real space form in as economical way as possible*" (Hillier & Hanson 1984: 12). The basic consideration that formulates the early steps in building Space Syntax Analysis method came from a purely formalistic consideration of randomness and form (Hillier & Hanson 1984: 9). This plays a

significant role since it brings up the notion of local rules in defining the global form, and so, the impact of randomness in conceptualizing structure. In this form, the urban structure is composed from a set of random cells that formulate the whole structure, and is based on a relation that matches between each particular cell and others (Hillier & Hanson 1984: 13). These sets of relationships are the subject of inquiry that the method attempts to investigate mathematically.

The common relations between the set of cells that eventually manipulate the whole pattern is normally called *Genotype*. Genotype is not a definition of the surface appearance of forms but of the deep structures underlying the spatial configurations and their relation to the living patterns (Hillier 1996: 27). Space genotype represents a set of proportional relations that link random characterized cells into a whole pattern and expresses culture and society, then it is apparently that genotype normally imposes its characters mathematically through architecture "*There are the genotypical invariants by which each society and each function in society seeks to express itself through architecture"* (Hillier 1996: 60). The concept of genotype leads to mathematical explanation of the space that should be associated with a description discourse. This aspect is essential for understanding the potentials that lie on the object itself, and then, the characteristics of the pattern system that bring the whole together. This inquiry represents a relation between object and system, which is a relation between *Semantic* and *Syntax*. According to Hillier and Hanson (1984) this relation is a continuum relation, rather than antithetical category (Hillier & Hanson 1984: 13). *Semantic* has to do with the object properties, while *Syntax* is concerned with the interrelations. From Hillier & Hanson's (1984) point of view, investigating the *Semantic* is not enough, while the *Syntax* is essential to develop deep understanding of the whole (Hillier & Hanson 1984: 13).

Dealing with both *Syntax* and *Semantic* in one model leads to a unified phenomenon; this is the main purpose of Space Syntax Analysis (Hillier & Hanson 1984: 16). The model is based on two parts, first, the quantitative analysis for investigating functional aspects and social relations, and then a qualitative description for the social interpretation of the results (Hillier & Hanson 1984: 16). Hillier and Hanson (1984) assert that "*The measurement of relations had become possible because the spatial structure of a building could be reduced to a graph, and in turn was possible because, by and large, a building consists of a set of well-defined spaces with well-defined links from one to another.*" (Hillier & Hanson 1984: 16), this emphasizes the

idea of configuration as a core aspect for investigating and then representing, using the graph, and then evaluating it according to the *Intelligibility* criteria of space.

3.3.3.1 SPATIAL CONFIGURATION

Configuration is concerned with the interrelations between objects, spatial pattern and social pattern on both local and global scales. Space Syntax Analysis is concerned with configurational analysis since it proposes that the relation between people and space is founded at the level of configuration of space rather than the individual space. Hillier (1996) sees that Space Syntax Analysis is most powerful in detecting formal and functional regularities in real systems due to three reasons; first, its quantitative 'mathematical' method in measuring the spatial configuration, which leads to simple results, second, the analysis of the configuration within a theoretical attention to the representation of the spatial formal system, and third, the strong graphic representation of the results of the mathematical analysis of the spatial configuration, which makes this data easy to interpret into society-space manner (Hillier 1996: 70). This interpretation based on reading the j-graph is a representation of the depths distributions that underlie both architecture and geometric effects and is in fact the most fundamental idea of quantifying the configurational properties of space.

3.3.3.2 SPACE INTELLIGIBILITY

The interpretation of the j-graph leads to understanding space configuration properties. Hillier (1996) introduces the concept of Intelligibility as the main parameter for picturing the configurational aspect through constructing a relation between the parts and the whole and in a way that is associated with movement "*Intelligibility has something to do with the way in which a picture of the whole urban system can be built up from its parts, and more specifically, from moving around from one part to another*" (Hillier 1996: 94). For Hillier (1996), Intelligibility is what can be seen from the space and that makes up the whole system, it is a connection between Connectivity and Integration (Hillier 1996: 94). Connectivity is the direct elaboration of clarity, while Integration represents the interrelations between spaces. Connectivity is a property that everyone can investigate within any space; it shows the number of connected neighborhood spaces to the same space. While Integration cannot be seen from the space since it is concerned with the measurement of the relations between each space

through its depth from others (Hillier 1996: 94). Measuring space Intelligibility indicates two spatio-temporal relations, the local and the global, which are essential in formulating the whole urban pattern and city structure "*Space was intelligible if it was understood as being determined by two kinds of relations, rather than one: the relations among the occupants and the relation between occupants and outsiders*" (Hillier & Hanson 1984: 15).

3.3.4 SPACE SYNTAX & CITY STRUCTURE

Space, from Space Syntax theoretical stance, is the main entity constituting city structure through a set of interrelations between all local spaces that match together in order to build the whole global system. Based on this point, Space Syntax starts its analytical understanding of the city structure by inquiring the space itself as a key issue. Hillier (2007) argues that space is not a background of any activity but rather an entity that has an interrelated power to human activities and that performs on a whole city pattern (Hillier 2007: 184). Space plays the key role in the existential signature of the city; it normally matches between form and function, and consequently imposes a distinctive pattern of life and experience (Hillier 2007: 183). Understanding space properties based on inquiring its configuration results in a comprehensive understanding of the whole city structure "*These 'effects of space' arise largely from space configuration, defining this as a way of looking at space in which space affects all the others*" (Hillier 2007: 184).

As has been explored, Space Syntax Analysis aims at researching and testing existing conditions as a fundamental step for city design. From Space Syntax point of view, cities normally make places, in this regards, the theory unfolds the vitality of understanding the whole city's physical structure in order to make right places "*They are moments in large- scale things, the large scale things we call cities. Places do not make cities. It is cities that make places. The distinction is vital. We cannot make places without understanding cities"* (Hillier 1996: 112). By focusing on the city structure within the urban model (planning-design) discourse, the aim of any urban model is to *"bring the structural and dynamic complexes of cities as means-ends systems within the scope of reasoned decision-making about physical and spatial interventions*" (Hillier 1996: 112). This has been considered as a point of weakness in the whole urban model, since it defines a kind of disciplinary apartheid where two main consequences can be discussed; a form-function gap, and a scale gap. The first problem, which is about those who analyze urban function, cannot basically conceptualize design, while those who can conceptualize design normally speculate function. The second is the part-whole

problem, or the place-city problem (Hillier 1996: 113). These two problems are relevant; they are both confined to form-function relation, and this relation passes through space *"These elementary relationships between the form and the space and its use suggest that the proper way to formulate the relation is to say that space is given to us as a set of potentials and those we exploit these potentials as individuals and collectivities in using the space"* (Hillier 1996: 115).

Cities are generated by a dual process; a public space process within which the city is derived from the influence of micro-economic factors, and the background residential space process that the socio-cultural factors emerge to make cities (Hillier 2007:). Hillier asserts that socio-economic forces shape the city primarily through the relation between movement and city structure, and is called, Movement Economies (Hillier 1996: 113). Movement is normally generated according to socio-economic needs, and then projects its impacts on the whole city structure. For a profound understanding of how this urban system functions, Integration performs with a great value since it shows how much movement passes through each line in respect to the whole system (Hillier 1996: 119). This leads to the term 'Natural Movement'. Natural Movement is the proportion of movement on each line in relation to the whole urban structure grid, and it is normally influenced by its location in the whole structure (Hillier 1996: 120). Natural Movement is an essential concept for understanding the local-global relation.

Spatial analysis can give true-to-life functional picture, this is due to the powerful influence the Natural Movement has on the urban pattern and its distributions of land use (Hillier 1996: 121). Natural Movement discusses further ideas other than attraction, apparently, functional and formal issues attract people for certain activities, but they cannot change the Integrative value of any line, therefore, the question still is; what makes these attractive functions located on this line? From Hillier's (1996) point view, some locations have more potential than others to have more by-products that eventually depend on the structure of the grid and how they are related to it. This idea has direct impact on land use and building densities, and is finally reflected on the movement system *"Land uses and building density follow movement in the grid, both adapting to and multiplying its effects…… movement economy is the fundamental source of the multifunctional that gives life to cities"* (Hillier 1996: 127).

Eventually, and in order to understand Ramallah City Center urban form dilemma, the research adopts Space Syntax Analysis as a second method of analysis. This is basically based

on inquiring the whole center spatial structure, through testing the spatial configuration, which is going to be associated to the two spatial properties; Integration and Connectivity. The fundamental proposition adopts movement as the main generator of the whole system, and is derived from socio-economic influences, Movement of Economy. The space is the issue of analysis in this case; it supposedly minimizes the whole urban model gaps; the form-function gap, and the local-global gap.

3.4 TWO-METHODS APPROACH

In spite of the apparent dissimilarity that characterizes the two methods and the way they have tackled the problem, both, Lynch and Hillier, depart from analogous intentions that have major impacts on both fields *"Although the areas of overlap may not be broad, I would argue that they are frequently highly pertinent and, indeed, central to both fields"* (Conroy Dalton & Hölscher 2006: 6), Tuncer further (2007) argues *"Spatial syntax of configuration in real environments and spatial syntax of cognitive maps in spatial cognition are closely related"* (Tuncer 2007: 127-01). Apparently, each one of them introduces a different way of understanding the urban form. Kevin Lynch attempts to investigate the urban form as a "Physical Environment" that is realized through its three-dimensional components "*Settlement form, usually referred to by the term "physical environment", is normally taken to be the spatial pattern of the large, inert, permanent physical object in a city: buildings, streets, utilities, hills, rivers, perhaps the trees*" (Lynch 1981: 47). Urban form according to Hillier is demonstrated by the space structure. He attempts to investigate the space itself and its comprehensive interrelations (configuration) by using a graph based method.

This research adopts both methods in order to analyze Ramallah City Center urban form. Hypothetically, adopting a dual technique assists in bridging the gap that each theory seeks to fill independently through their high capability of bringing extensive insights on the man-environment relationship "*Also, the finding of this positive association between internalized representations of spatial configuration allowed for the theoretical and methodological progress in investigating the man-environment relation, providing empirical links between the cognition and behavior in the built environment*" (Woo Yun & Ook Kim 2007: 049-12). Theoretically, environmental cognition in general and mental mapping in specific are confronted by a critical dilemma as they define and observe the relationship between human beings and the physical environment due to their deterministic character. Based on its phenomenological origins the theory attempts to observe the problem from human point more

than physical environment point. Yet, it still sees the other side, but from one side this restricts its ability to measure the physical environment's natural potentials, and from the other side it offers a distorted image about reality. In this discourse, Space Syntax Analysis attempts to observe the problem from the both sides "*Historically, the aim of space syntax was to construct a bridge between the human and physical city"* (Hillier 2005: 3-4). The structural basis of the theory enables the understanding of the physical environment conditions; it gives a closer picture of the real world. Although the theory can justify the existing reality in relation to people's needs, cognitive mapping has more ability to humanize this picture.

Based on Ramallah City Center dilemma, the nature of this problem is characterized by two basic aspects; the physical elements composing the center that's a three dimensional issue, and the spatial structure that connects and gathers these elements into a whole that is a two dimensional issue. The mental mapping method is concerned with two kinds of image knowledge; locational and non-locational[8]. The data is established according to the phenomenological sphere that shapes the theory and assumes spatial experience as the main aspect of constructing and measuring the people's knowledge about their environment. This sort of knowledge is local; it is confined to the elements and its potential rather than the global level. It actually represents a significant understanding of the semiotic aspect of space without considering the syntactic component that structures the city as a whole. However, Space Syntax Analysis gives a high intention for the syntactic aspect that structures the whole city "*The conclusion is that configurations of spaces have not only a grammar, but also a 'syntax': the pattern of relationships between spaces*" (Conroy Dalton & Hölscher 2006: 3). The theory manipulates methods of measuring the spatial structure and the interrelations that form the whole city. Therefore, The two theories together help orchestrate the research problem and address it comprehensively.

Furthermore, and in terms of three dimensional characteristics, and since urban design in some parts based on the three dimensional analysis "*At least the phrase "urban design" does somehow conjure up the sense of the city as a complex thing which must be dealt with in three dimensions, not two*" (Alexander et al 1987: 3), Mental Mapping is a powerful theory in analyzing the three dimensional component of urban form and overcoming the Space Syntax gap of being confined to the two dimensional analysis "*The three dimensional space syntax*

[8] See section (3.2.1)

integrated with the image of city is different from the traditional syntax that is only limited to non-figurative two-dimensional spatial cognition. It also emphasizes the important influences of the three-dimensional image points on people's behavior in space and it is quite close to the accurate description of "natural movement" (Wang et al 2007: 048-01).

Eventually, the two theories formulate a suitable methodology for investigating the problem of humanizing Ramallah City Center through handling human-environment studies. The two theories are concerned with this aspect in different ways. While Mental Mapping commits its intentions to the human-environment level, Space Syntax Analysis concentrates on social-environment relations "*The original driving force behind space syntax research was prompted by a goal to understand the relationship between space and society (rather than space and an individual subject)"* (Conroy Dalton & Hölscher: 2). The study endeavors to investigate the different ways in which we can comprehend and humanize our cities.

3.5 RELEVANT STUDIES

Recent studies associate Mental Mapping to Space Syntax research. Basically, these studies depart from the ability of Mental Mapping to represent the people's way of reading the configuration meaning "*It is this pattern of spatial relations that permit configurations to be meaningful and it is hypothesized that people have an innate ability to 'read' or comprehend these meanings. It is this aspect of attempting to understand how the meaning of spatial environments is communicated that connects space syntax to other academic fields interested in environmental cognition"* (Conroy Dalton & Hölscher 2006: 3). The central question that arises is "*What can we learn of the human mind by examining its products?*" (Hillier 2006: 11). This question has shifted the central emphasis of Space Syntax research from society as a whole (society-space relationship) to the individual (human-environment relationship). It also brings new intentions on the level of the physical environment. Significantly, other studies have demonstrated the capability of mental Space Syntax in addressing the limitations of Lynchs Mental Mapping approach (Kim & Penn 2004; Penn 2003; Kim 2001).

The first significant attempt that associates both theories together was a published paper in the journal of Environmental and Behavior, in 1990, that had a title of *Finding the Building in Wayfinding* by Peponis, Zimring and Chi. The paper presents results of an experiment that adopts a classical wayfinding technique and evaluates it against spatial analysis experiment settings (Peponis et al. 1990). Another milestone is the 2001, or Third, International Space

Syntax Symposium (Conroy Dalton & Hölscher 2006: 4). At this symposium there was a clear and identifiable group of papers, that engage with spatial cognition and have been revised and re-published as a special issue of Environment and Behavior, edited by Conroy Dalton and Zimring (Issue 1, 2003). The ongoing meeting between spatial cognition and space syntax took place again in the fourth symposium of space syntax in London (2003). Hillier and Lida (2005) wrote a significant paper on spatial cognition*, Network and psychological effects in urban movement.* They came up to a conclusion that the mathematical correlations of space happened on the level of cognitive basis (Hillier & Lida 2005: 475-490). A one-day workshop formed an opening session of the Space Syntax 2006 conference in Bremen, German. The theme of the workshop was space syntax and spatial cognition (Conroy Dalton & Hölscher 2006: 1). Significantly, the sixth International Space Syntax Symposium in Istanbul (2007), brought more contributions that matches between the two theories on the same basis that have been discussed.

The mass researches that intend to congregate spatial cognition and space syntax together bring a lot of overlap between the two theories that allow for the research to meet between them. It brings up the idea that people in fact use a non-local internal representation of space network to recognize their context. It demonstrates the meeting of both theories as a way of going from rout knowledge (j-graph) to map knowledge (the graph) "*This makes the line graph easier to transform to see other viewpoints, and it is perhaps this transformability that permits the passage from an egocentric to an allocentric model*" (Hillier 2006: 28). Apparently, the argument still articulates around the way Space Syntax uses Mental Mapping for justifying its output, which is considered as a debate on the theoretical level, or the capability of Space Syntax in addressing the limitations of Lynchs work. Yet, studying Ramallah City Center urban form is the first study that brings both theories together for different concerns. The study aims at bringing the two theories together as a basic technique for researching people's views of their environment. This attempt matches between the two theories on the application level through proposing urban form analytical model that matches between them. This model supposedly leads to humanizing the environment and implies more pleasurable parameters and visions. Furthermore, this intends aim at bringing insights of applying the theory in a specific context that is characterized as rapid transformed urban form area like Ramallah City Center.

3.6 SUMMARY

This chapter points out the notion of urban design analytical theory as a basic tool for bringing architectural theory to the large-scale city design level, and thus bridging the proclaimed gap between planners and designers. From the study theoretical point of view, adopting analytical urban design theory, which aims at analyzing and understanding the human-environment relationship, will feedback the planning decisions with ideas that really matter designers and architects regarding the human sensuous relationship to the city physical form. It eventually leads for building a good base of knowledge, regarding the human-environment relationship that will lead for humanizing our cities. The study brings up two analytical theories into one proposed urban analysis model; Kevin Lynch's (1960) Mental Mapping, and Bill Hillier's (1996) Space Syntax Analysis. The dissertation suggests a fundamental relationship between the two theories on the application level that eventually guides toward suggesting this model. According to this model, the established relationship between Legibility and Intelligibility brings a deeper understanding of the urban physical form component in relation to the spatial structure. Furthermore, the comparative relationship between Mental Mapping criteria (distinction, vividness, rigidity and density), and Space Syntax parameters (connectivity and integration), enriches the inquiry of these two components on the specific local level. Therefore, according to the proposed model, the comparison between the two theories will give a deeper elaboration about the human-environment relationship into more local-global and physical-spatial structure levels (figure 3-1).

The next two chapters discuss the implementation of each of these two theories at Ramallah City Center independently. They demonstrate the main issues that each of the two theories brings up in understanding the urban form and its human-environment relationship at the center, into the local and theoretical levels, as a primary issue for humanizing the area. The last chapter brings the two theories together into one model showing the way the two theories orchestrate together in inquiring the urban form issues at Ramallah City Center.

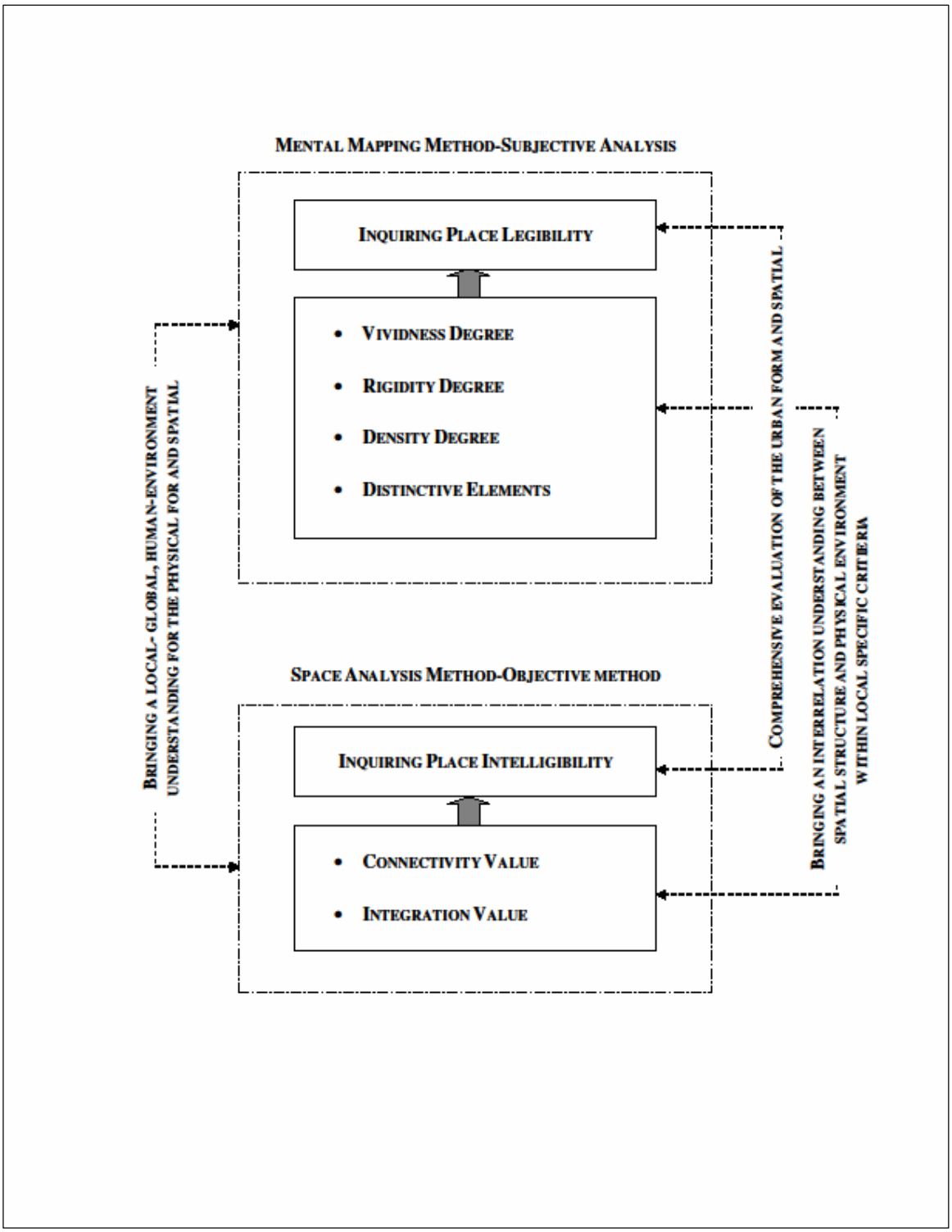


Figure 3-1: Theoretical framework, proposed urban analytical model

Figure Billow; Vladimir Tamari Painting the music of MENDELSSOHNE where un-consciously, resembles the Jabal El-Tawil hills-Ramallah City. (Source: www.ne.jp/asahi/tamari/ vladimir/paintmusic1.html, *revised on 20 August, 2009)*

RAMALLAH CITY CENTER MENTAL MAPPING

METHOD & ANALYSIS

CHAPTER FOUR- EMPLOYED METHOD & PROBLEM ANALYSIS;

RAMALLAH CITY CENTER MENTAL MAPPING METHOD & ANALYSIS

"Language and science are the two main processes by which we ascertain and determine our concepts of the external world"

(Ernest Cassirer 1944: 152)

Good city appearance cannot be considered an abstract phenomenon, rather an outcome that can be evaluated according to people who regularly experience it. In this regard, Kevin Lynch has adopted the notion of urban appearance, which is normally associated with the visual form at the urban scale, as a fundamental concept for city design "*City; should be guided by a 'visual' plan: a set of recommendations and controls… concerns with the visual form of the urban scale*" (Lynch 1960). Such a plan, from Lynch's (1960) point of view, is based on grasping the mental images of the people who normally live and experience the space. This will lead to establishing a profound idea about the human-environment relation for the concerned area, and hence will lead to enhancing the city design decisions with human evaluative view. Therefore, acquiring mental images is considered as a fundamental approach for humanizing our cities, and this is what Ramallah City Center study attempts to do.

This chapter is concerned with the implementation of mental mapping process in Ramallah City Center. It demonstrates the adopted method of obtaining the sketch maps as a data collection tool at the area of study. Furthermore, the chapter manifests a comprehensive debate and analysis of the collected data; it eventually arises with results regarding the people's evaluation of Ramallah City Center urban form, which is based on the mental mapping process and the generalization of these outcomes on the theoretical level.

4.1 THE USE OF THE METHOD

As a first step of analyzing Ramallah City Center urban form, the study adopts Lynch's (1960) Mental Mapping method for investigating the human-environment relation and thus humanizing the center's urban context. In spite of the critical stands and the ongoing progress of the method by other urban theorists, the research attempts at coping with the same techniques and steps that Lynch has manifested. The reason for choosing the same techniques is due to the status of the method as the pioneer study in the field of cognitive mapping, and its flexibility as a technical method for understanding the different pattern settings rather than generating new urban models on the one hand (Lynch 1985: 252). On the other hand, Lynch's technique differs from the other techniques since it is dedicated to the physical appearance of urban settings Imageablity, where the three dimensional image, and the meaning and values are already included, and this is what the study of Ramallah City Center urban form intends to examine.

For a deeper understanding of the implementation of Lynch's method at the level of study area the next two sections will introduce important technical preferences and the data collections tools that have been used in the case of Ramallah City Center.

4.1.1 MENTAL MAPPING METHOD IN RAMALLAH CITY CENTER

Acquiring users' mental maps at Ramallah City Center follows the same steps that Lynch (1960) has adopted. Therefore, the study aims at measuring the place Legibility through identifying three main components; *Vividness, Density* and *Rigidity,* which are defined by outlining and examining the area's distinctive elements. The study of the area's mental map has been divided into two steps: first, the systematic examination of the environmental image evoked in experts' observations, and secondly, interviewing a defined sample of users in order to grasp their mental image about the study area. According to Lynch, these two steps have been compared to each other in order to realize the similarities and differences between the users' images and what is really exists. This will significantly show the degree of distortion between mental images and the existing reality, it will also define the areas where the structures are not well perceived.

The first step of the field mental mapping analysis is based on understanding the existing conditions of the center's urban form and its physical context. Primarily, the study adopts an aerial photo of the center, which was issued in 2007, as a base map for the area survey (figure 4-1). Two trained experts observed the existing conditions for fifteen working days and conducted a thorough survey of the area. This step aims to define the existing urban structure elements that Lynch has introduced and mentioned, as the basic elements the people mainly perceive in their surroundings. The survey does not attempt to classify or even evaluate the value of these urban elements rather it simply denote it on the base map in order to compare it to the people's mental images that will be concluded in the second part of this analytical inquiry. The survey is concluded by a base map where the urban structure elements are marked down and a comprehensive map that shows the whole elements in relation to each other.

As has been mentioned the second step of the mental mapping survey includes the users' mental maps of the area. This is achieved by conducting a series of interviews with the users of the area. The interviews, which follow the interviews designed by Lynch (1960) (appendix 1), are directed in order to tackle three main issues; first to establish a drawing that represents the common sketch map of the area users by asking every respondent to sketch his/her mental

image, second to investigate the more dense places by asking the respondents to describe an imaginary trip, and the third is to write a list of the city elements that are distinctive and meaningful for respondents.

A critical issue that has outlined the nature of the interviews is the sample size and character. This is very decisive matter as it represents one of the core issues that Lynch's study has been criticized for; the small sample that he has adopted[9]. Even though this study uses a sample of thirty respondents, it is 10 persons more than that of Lynch's maximum sample. The reasons behind skipping the new mental mapping expanded sample are due to two main reasons; the nature of the study as a qualitative study rather than quantitative. Basically the study proposed the investigation of the urban analysis of the area for examining the quality of the place and proposing future visions rather than providing absolute results about the area's conditions or building a static model. The other factor of choosing such a sample is due to the time limit and the logistics that minimized the ability to introduce a large sample of users.

The sample is characterized with educated people that are able to deal with the interview's sophisticated parts especially the sketch map. It distributed between students, employees and residents. About 40% of the interviewees were females while 60% were males. Most of the interviews lasted between 45 to 90 minutes. Based on a previous study that has been conducted by the researcher in Moserhofgasse area in Graz, as a pilot study, that applied the same method of analysis (appendix 3); the interviews were conducted in sessions out of the area of study in order to avoid the place bias[10]. Furthermore, the interviews avoided any explanation that might guide the respondents' answers or influence them.

4.1.2 TECHNICAL PREFERENCES & ORIENTATIONS

The first part of the field study, attempts at composing a base map for analysis. The base map is performed as the reference base where all the mental maps are going to be evaluated accordingly. The observers attempt at surveying the center based on Lynchs five elements that construct the urban structure and are perceived by human being: nodes, paths, landmarks, edges and districts. They avoid any classification or ranking of these elements and their

[9] See section (3.2.2.5)
[10] The pilot study shows that the respondents were influenced by the place they were introduced in. They normally mentioned the interview place as the most distinctive place and they always tried to look around in order to remember the place

importance. This minimizes the subjectivity of the observers and keeps their contribution as a reality-copying contribution.

The second part of the analysis is based on the sketch map, while the narrative descriptions by the respondents are complementary to the research. Apparently, the interviewees in the case of Moserhofgasse were uncomfortable with the idea of sketching, since they are unfamiliar with such tool. In this sense, the study at Ramallah City Center attempts to avoid this dilemma by explaining that there is no need for accurate drawings since the study is not about the respondents sketching capabilities. It also gives them the option to draw what they remember rather than obligate themselves to figure out the missing parts of their mental maps. Eventually, many users refuse to participate in the survey due to the length of the interview or the uncertainty of sketching as a tool. The distribution of the sample between students, employees, workers, residents, males, females and different ages aims at getting a more comprehensive sample of the area. For the controversial relation between the aim of the study of evaluating the urban form into the bases of social behavior, and the development theory, the study overlooks interviewing children respondents. According to Blaut and Stea (1971), humans develop their mental mapping abilities within the course of age, and that the humans in their primarily life age depend on the geographical and their personal view, which is different than the way things are founded in, while later on, they started to build their mental maps according to the surrounding in relation to social fabric "*Our findings suggest that geographic learning is clearly if not completely distinguishable from social learning*" (Blaut & Stea 1971: 393).

The two-step analysis will lead to a comparison between what exists and what people grasp in their minds about reality. It will assist in measuring the Imageablity and Legibility of Ramallah City Center as a basic step for analyzing its urban form within human-environment relation mode. Measuring a place's Legibility is based on three components: the place's vividness, density and rigidity. Comparing both the sketch maps and the narrative imaginary trip to the obtained base map will conclude which places that are denser than others. While, comparing the narrative answers about the significant and meaningful elements to the base map will elevate the more vivid places than others. Fundamentally, the comparison of the common image that overlaps with the whole mental images, and the base map, will demonstrate the place's rigidity. The key elements that are used on the analysis of the maps are: the frequency of labeling elements, and their location or degree of distortions.

4.2 A VIEW ON RAMALLAH CITY CENTER MENTAL MAP

The aim of the two-step investigation is to compare the mental sketches with real context and then set up the differences, distortions and missing parts in the way people perceive and construct their feelings and emotions about the place. Eventually, this analytical comparison will allow the research to come up with specific speculations about the vivid, rigid, dense areas and significant elements. These speculations are important for investigating the center's Legibility, and thus understanding the current conditions of the center based on the issues that really matter to its users, a human-environment relationship understanding. The analysis starts with introducing the systematic survey of the center, where maps about the place landmarks, nodes, and paths are introduced. Then, it presents the users mental sketches in relation to the survey.

4.2.1 THE SYSTEMATIC OBSERVATION OF THE AREA

The observation of the abstracted reality in Ramallah City Center sets up the primary step for inquiring and analyzing the users' mental maps. This step attempts at setting down the elements that constitute the urban image. The study adopts the first three elements of lynch's five introduced elements as the main basis of the inquiry which are: Landmarks, Nodes and Paths. Edges are already mentioned and included in the paths analysis since people cannot distinguish, graphic wise, between paths and edges, as for the districts, they should be brought up during the analysis of the area. This stage comes up with three maps, which sequentially describe the existing landmarks, nodes and paths; additionally the fourth map presents a comprehensive view of all the elements' settings and the interrelations between them as observed by the trained experts.

Landmarks have been distinguished by their significant architectural properties or its historical and locational standing. Monumental buildings, unique style elements, symbolic and meaningful structures, and apparent statues have been noted as the area's distinguished landmarks by the observers. Derived from the survey map that has been prepared by the trained experts (figure 4-2), the landmarks are scattered all over the area. Apparently, the center embraces two significant statues that can be considered as landmarks, Almanara statue (the lion statue) and Alsa'a (clock) square statue. The two statues have historical and symbolic indications for the users of the area. Structures with huge proportion masses, like the Car Parking Building, are also perceived as landmarks as they can be noticed from different parts

of the city. While buildings like the Quakers Center and Al-Quds Bank, which have functional and historical importance, are also expected to perform as important landmarks. The trained experts noted a number of commercial buildings, with new architectural style and huge proportions, as anticipated landmarks of the area. These buildings are denoted on (figure 4-2) and, and significantly led by the City Center Commercial Building.

The second element that structures the city's image is the areas nodes. The nodes are represented on the nodes maps (figure 4-3). Nodes can be defined as the area formed between the intersection of two paths or more, which sometimes incorporates human interaction and other times functions as a movement junction. Based on the experts' survey, six places are expected to perform as the area nodes; Almanara roundabout, Alsa'a square, the Red Rose shop intersection, Rokab intersection, Alnasra intersection, and the Farmers' Market node (figure 4-3). Paths have been ranked into two levels based on their width, since it is a major issue for analyzing the way the people perceive paths. The classification has been divided into; red marked paths that demonstrate the wide paths, and yellow marked paths that that represent the narrow paths. Paths like Alirsal, Rokab, Farmers market (Alhesbeh), Parking building (Almojama'a), Alsa'a and Almahkamah, have departed and intersected with Almanara Square, are characterized as wide red paths. While other paths which are located in the other areas are noted as less width yellow paths (figure 4-4).

The three elements have been summarized on one map that demonstrates the relationship between these elements altogether (figure 4-5). Remarkable observations regarding the area's urban space and form have been noted down by the trained experts. Some areas like Alhesbeh Street; have been described as very dense areas, which perform as service and movement area. Whereas Rokab Street was described as a very vivid path that hosts different means of public interaction. From the expert's point of view, the area's urban form is exhausted by the commercial sign distribution and overwhelming masses, which all compete with the urban form and space structure.

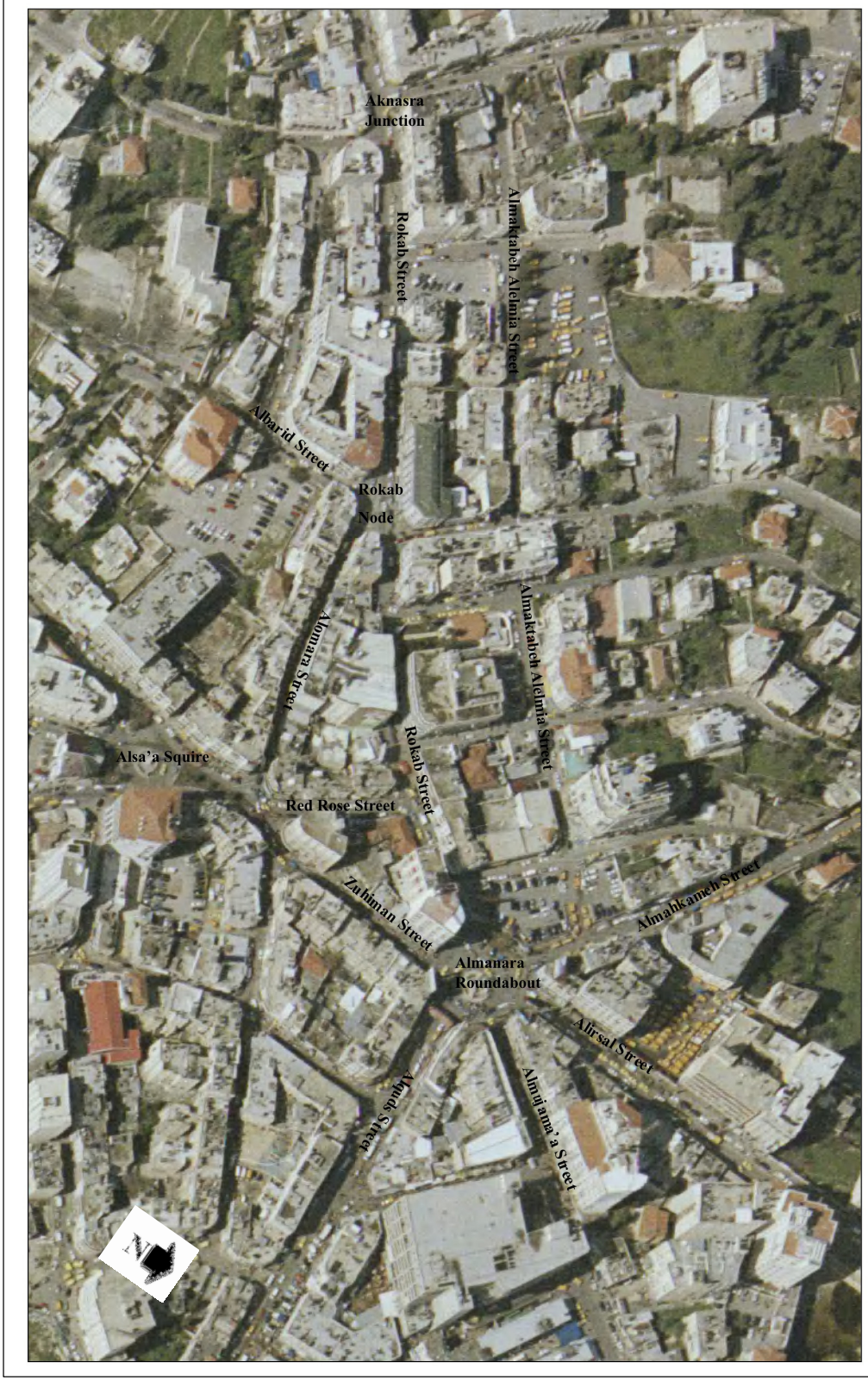


Figure 4-1: Trained experts survey base map. (Source; Ramallah Municipality 2008- edited by researcher)

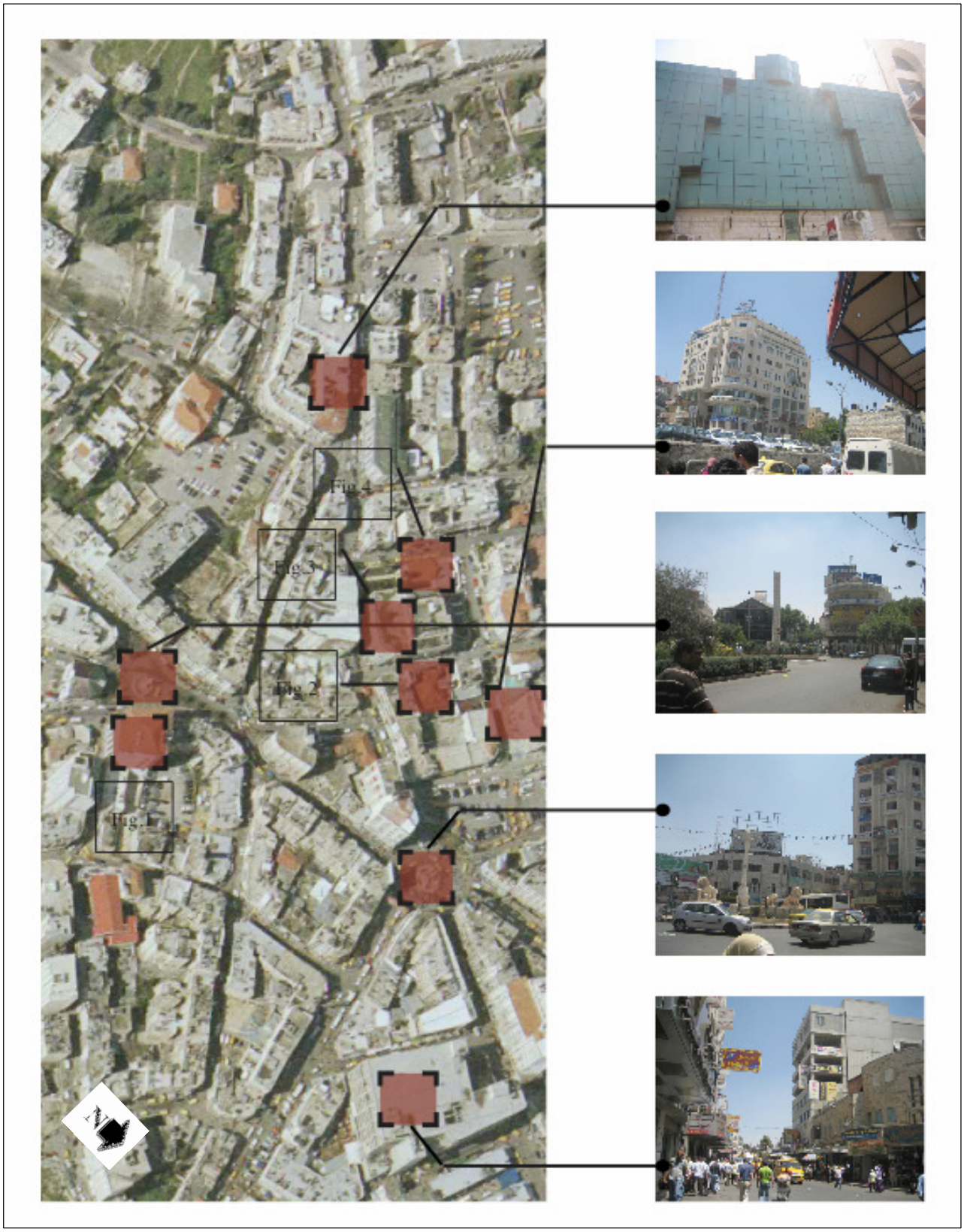


Figure 4-2: Trained experts survey Landmarks map. (Source: researcher)

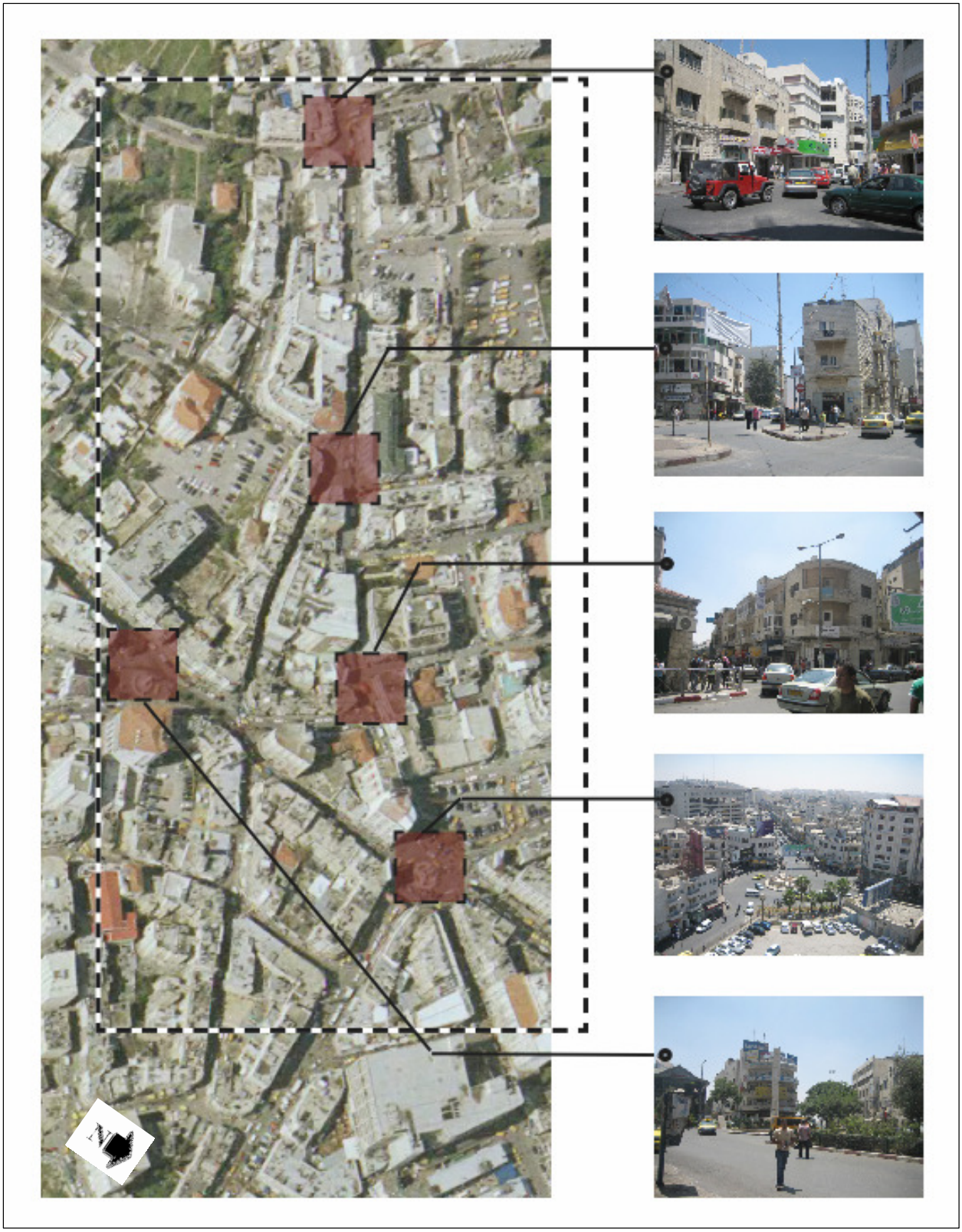


Figure 4-3: Trained experts survey Node map. (Source: researcher)

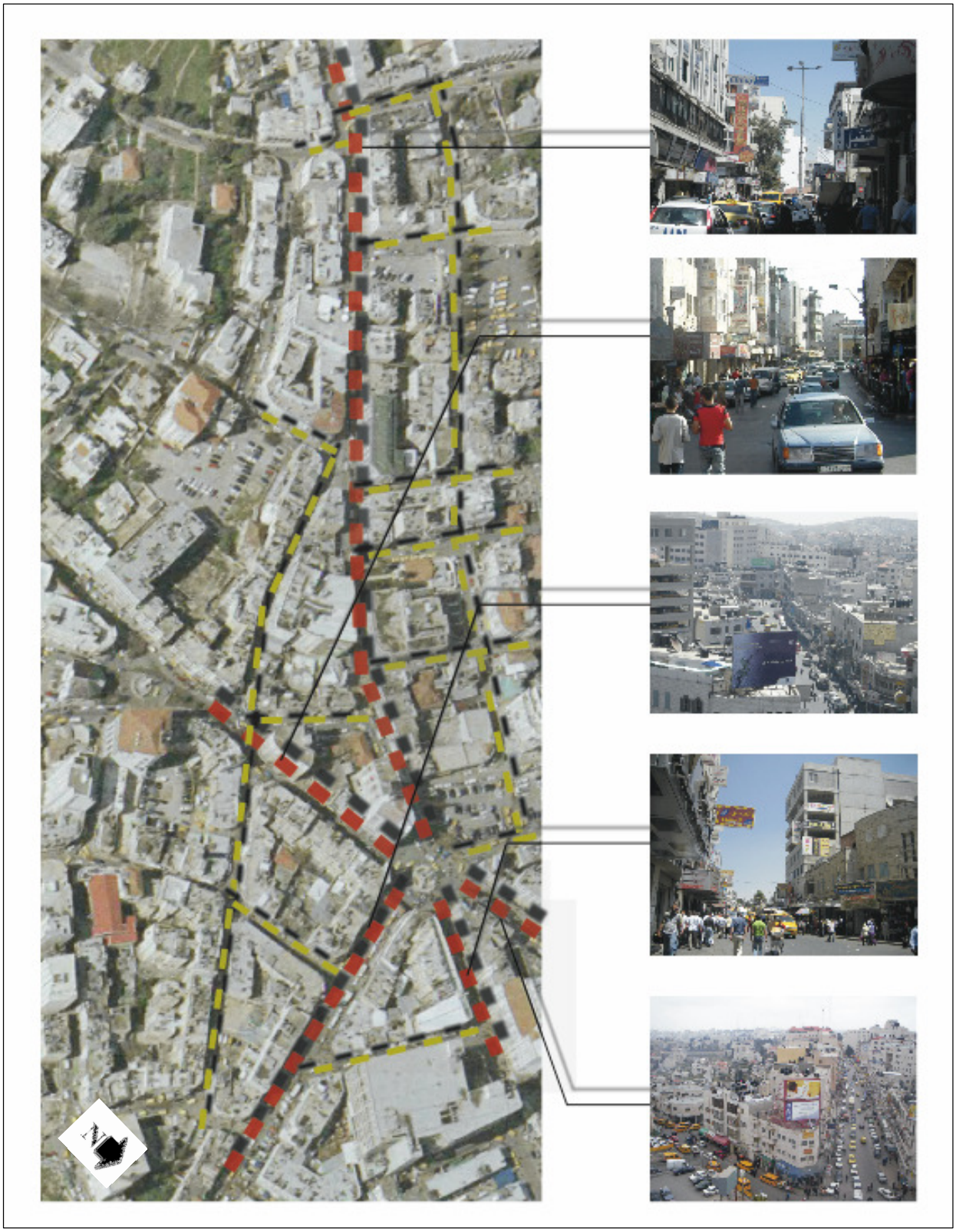


Figure 4-4: Trained experts survey Paths map. (Source: researcher)

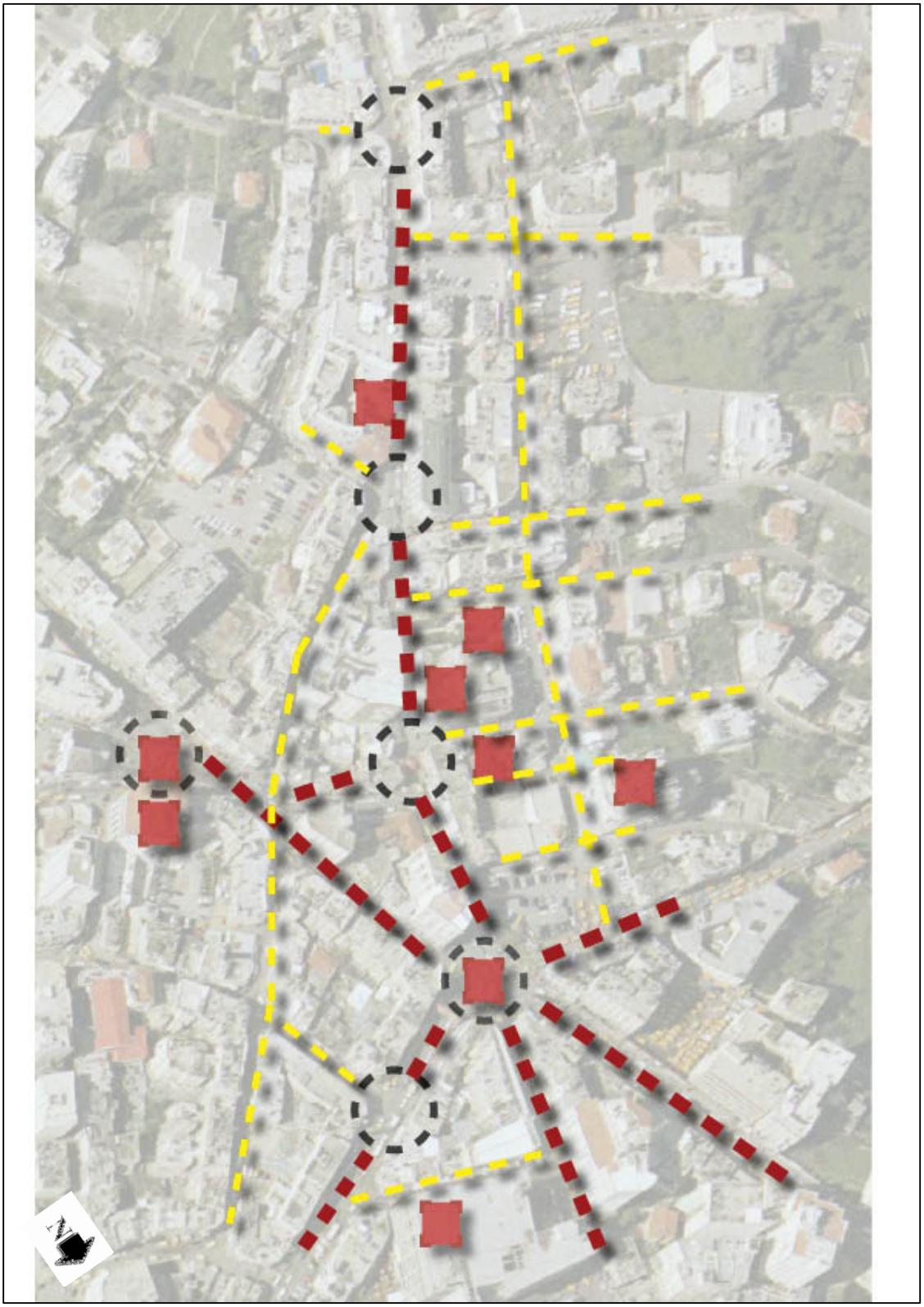


Figure 4-5: Trained expert's survey Comprehensive map. (Source: researcher)

4.2.2 EXAMINATION OF RAMALLAH CITY CENTER MENTAL MAP

The second phase of analyzing Ramallah City Center mental map looks into the users' cognitive images. This phase is divided into two directions; the visual recall that aims at drawing the area's whole image from users' perception and the narrative recall that aims at highlighting the important and significant issues that matter the area users in the same regard. The expected outcome of this stage is going to be compared with the findings of first phase, the field survey, in order to come up with analytical visions that summarize the area vivid, rigid and dense zones, besides labeling the most distinguished elements there.

4.2.2.1 RAMALLAH CITY CENTER MENTAL MAP

The extensive examination of Ramallah City Center users' mental image departs from the visual part, which has been performed parallel to the verbal recall part. The applied questionnaire starts with a general question that aims at approaching the respondents with the questionnaire topic and notifies them with the nature of the upcoming questions in addition building a general idea about how the users of the center view the whole area (appendix 1). The second question urges the respondents to sketch a map of the area on an A4 given sheet (appendix 2), where a reference point, the Arab Bank, has been pointed. The area boundaries have been described for all the respondents. Significantly, the thirty sketch maps of the area have been projected into one map that represents the common mental image of the area based on abstracted base map (figure 4-6). The first part of the map represents the respondent's common mental image about the area's landmarks (figure 4-7), the second represents the respondent's common mental image about the area's nodes (figure 4-8), and the third represents the respondent's common image about the area's paths (figure 4-9). The maps have been compared to the first phase maps, the trained expert's survey maps, in order to note the differences and distortions between users' image and reality. The first two maps, landmarks and nodes, have been analyzed for elements labeling and location, while the paths map has been analyzed for elements labeling and width. The common mental map of Ramallah City Center, with its three parts, can be described as the following:

- THE LANDMARKS MAP (FIGURE 4-7): the site landmarks have been classified within three categories; red, green and yellow. The red points represent the significant landmarks in terms of architectural, symbolic and historical importance. The yellow points denote the meaningful landmarks that have been labeled by the respondents. While the green ones

refer to the landmarks with functional importance. Blue points have been used to refer to the users' labeled landmarks; it has been attached, with a direct line to the original landmark at the site showing the distortion between labeled and original. In terms of locational distortions, colored circles have been used in reference to the standing of each monument; the blue circles refer to the landmarks with no distortions, the green ones show the landmarks with low distortions; the yellow ones highlight the landmarks with slight distortions, and the red circles define landmarks with high distortions (figure 4-7).

In terms of the number of people that have labeled each landmark, and as shown in (figure 4-7) and (table 4-1), Almanara monument headed all the other landmarks on the site where all the 30 respondents have labeled it on their mental maps. Significantly, Alsa'a square has been labeled as the second important landmark with 24 respondents. Since more than 80% of the interviewed sample identified the two statues in their sketch maps, it can be argued that these elements normally perform as intended landmarks in the center. The number of respondents dramatically decreased for the other landmarks likes the City Center commercial Building, Alnatsha and Tannos commercial Buildings, Alsa'a commercial Building and the farmers market. The number of respondents that have stated these places as landmarks ranged between 8-11 respondents which represent 25-50% of the sample. Accordingly, it can be argued that these landmarks perform as low-labeled landmarks in the center. According to the survey, less than 25% of the sample has labeled other landmarks like the Car Parking Building, the lo'loa' (pearl) Commercial Building Diamonds Restaurant and Alkasaba theatre. Some other shops and restaurant, like Alnasra restaurant and Heliopolis, were mentioned by less than 6% of the sample. These elements can be considered as weak landmarks in the area. Some elements that have been denoted on the maps by the trained experts were not labeled or mentioned by the respondents at all.

The second parameter that has been measured is the degree of distortion for the labeled landmarks. This assists in measuring the rigidity of the area. The closer we get to the central area, Almanara monument, as the more accurate the elements are positioned, with a low-distortion degree. Whereas, elements scattered to the edges of the area of study, Like Alkasaba theatre, the Farmers Market, the Rokab Area, these elements have been labeled within slight-distorted degree areas. However, the elements positioned within the area that is extended between Alsa'a square and the area between Almanara and Rokab, are located within a high-distorted area.

ELEMENT	RESPONDENTS	PERCENTAGE
Almanara monument	30	100%
Alsa'a square	24	80%
Tannos & Alnatsha Buildings	11	36%
City Center Buildings	10	33.3%
Rokab Building	10	33.3%
Farmers Market	8	26.7%
Car Parking Building	7	23.3%
Lolo's Building	6	20%
Diamonds Restaurant	5	16.6%
Alkasaba theatre	3	10%
Other	≤2	≤6%

Table 4-1: Labeled landmarks in Ramallah City Center with the number of respondents who labeled it and the percentage

- THE NODES MAP (FIGURE 4-8): The selected nodes by the trained experts have been labeled with orange circles, while the respondents labeled Nodes have been circled by blue. The study has also adopted the same masked color circles to demonstrate the degree of distortion between the real positions of labeled node and those of the respondents.

  Apparently, a number of 30 respondents have labeled Almanara Roundabout on their mental maps, whereas 24 of them have labeled Alsa'a Roundabout. This number of respondents identically matches with the number of respondents that have labeled the two statues, which are located within these two nodes. 11 and 10 respondents have pointed Rokab and the red rose nodes sequentially; accordingly it can be argued that these two Nodes are low labeled by users. Eventually, 5 and 4 respondents have mentioned Alnasra and the Farmers Market nodes. These two elements are hardly recognized by the area users.

  In terms of positional distortion degree, Almanara square has been labeled as a node by the whole sample without any distortion in its position. While the two other nodes, Alnasra and the Farmers Market were located with low distortion. The remaining Nodes; Alsa'a square, the Red Rose Junction and Rokab Junction were denoted with high locational distortion.

- THE PATHS MAP (FIGURE 4-9): The paths map has been analyzed according to two criteria; the number of people that has labeled each element and the variance of width between the indicated paths on the sketch maps and the real maps. The number of respondents that have labeled each path has been shown near to the paths map (figure 4-9), and has been associated to the percentage ratio in (table 4-2). While the variance width degree has been expressed through the arrow size that represents the respondents' perception of the width of the area paths in relation to each other, and the arrow color that indicates the difference between indicated width and the real one.

Apparently, and as demonstrated in (figure 4-9) and (table 4-2), all the articulated paths around Almanara square have been labeled by a high number of respondents. More than 80% of the respondents have mentioned these paths, whereas 100% of the respondents have marked Rokab Street in their mental map sketches. Other streets like Albarid (the Post) Street, the Red Rose, Almaktaba Alelmia Streets, and the other sub-streets have been labeled by 36-50% respondents. While about 23% mentioned for Alnasra Street, and less than 16% for the other streets.

In terms of paths' width analysis, and as mentioned before, the paths' width has been analyzed for two attributes, the relative width that demonstrates the variance width of the paths as outlined by respondents, and the significant width that represents the difference between the outlined width and realty. Significantly, Rokab Street scored the highest Relative Width Ratio with 5 points out of 5, since most of the respondents mentioned it as the widest street in the area. In the second place and with a 2 points difference came the other streets that are articulated around Almanara Circle, in addition to the Red Rose Street. Both of Albarid, Almaktaba Alelmia, and Alnasra Streets came in the third place with 2 points, while the other sub-streets came in the fourth place with a score of 1 point score or less.

Comparing the street outlined width with reality, the significant width, the western part of Rokab Street, the Red Rose Street and one of the sub-streets (the connection between Alsa'a and Rokab) have been outlined larger than reality in the respondents' sketches. However the rest of Rokab Street and Albarid Street have been defined similar with their real width, while the other streets that have been marked with the green color (Figure 4-9) have been drawn smaller than reality.

ELEMENT	NO. OF RESPONDENTS	PERCENTAGE	RELATIVE WIDTH
ROKAB	30	100%	5
ALIRSAL	29	96%	3
ALSA'A	29	96%	3
ALMAHKAMAH	28	93%	3
ALQUDS	27	90%	3
ALMOJAMA'A	24	80%	3
ALBARID	14	46%	2
RED ROSE	12	40%	3
ALMAKTABA ALELMIA	11	36%	2
ALNASRA	7	23%	2
SUB-STREETS	11-15	36-50%	1
OTHER	≤5	≤16%	0.5

Table 4-2: Labeled paths in the Ramallah City Center showing the number of respondents who labeled each element, the percentage and the relative width out of 5

4.2.2.2 NARRATIVE DESCRIPTION OF RAMALLAH CITY CENTER

The second part of acquiring Ramallah City Center users' mental map is the narrative part, which was conducted parallel to the visual recall part. It is composed of several questions that have been divided into three main orientations. The first question gives a general insight about how the users describe the study area; it offers a fundamental base for understanding the way people recognize the area. While the second question is concerned with the visual recall part, the third question offers a comprehensive perception about the vivid and dense areas within the center and whether these areas are vivid or dense from the users' mental recognition stance. Questions four and five, with their three sections, are oriented for inquiring the distinctive elements and bringing up a quality description that determines the feelings of the users for these places, whether positive or negative. These questions should be compared to the verbal recall part in order to get more extensive and deep definition for these areas mental quality parameters.

The first question revolves around 'what symbolizes Ramallah City Center?' from the respondents' point of view. It is concerned with the physical description manner (appendix 1). The respondents' answers have varied between two opposing categories; the negative category that mainly symbolizes the area as crowded, chaotic and unorganized, and the positive category that summarized the center as a good organized place. Significantly, a number of 27

respondents have described the area in a negative manner. In addition to the negative descriptions mentioned previously, some of the respondents added more negative descriptions such as; ugly, bad, huge dense and connected buildings, and inhuman. From another standpoint, despite of the negative aspect some of answers have highlighted the significance and importance of the center as the symbolic and cultural center for them. Here are some of the respondents' answers quoted as they are:

> *"A group of human and vehicles traffic jam, crowdedness everywhere, a mixture for uncompleted compositions between ugly modern city and vernacular style, inhuman place where the person's sensuous and cultural needs are not considered"* (Respondent 11)[11]

> "*I feel I am in china, crowdedness, no attention given to the quality of the public physical shape of the place*" (Respondent 16) [12]

> "*A huge mess, unorganized city, has a chaotic style*" (Respondent 23) [13]

> *"When I think of Ramallah city, the scene of the roundabout and the monument jump to mind. It symbolizes the city. It is the center of the city, yet at the same time I feel it is the entrance into the city. Everything starts at the Manara and somehow ends there, it glues the city together. Ramallah is pretty chaotic, and things start with slight order at the Manara but then fall apart the more they move away towards the outskirts of the city."* (Respondent 30)

Contrary to the above descriptions, three respondent's think positively of the area, these answers are as the following:

> "*It is the central area of the city where commercial facilities are handled; the area is beautiful and well organized*" (Respondent 7) [14]

The third question is made up of two branches; the first seeks an imaginary trip description and the second explores the feelings and emotions that are associated with these areas (appendix 1). Every respondent has been asked to narrate an imaginary trip for the

[11] Translated from Arabic
[12] Translated from Arabic
[13] Translated from Arabic
[14] Translated from Arabic

part/parts that he/she often uses to walk through. Furthermore, the respondents have been requested to outline any feelings and emotions they associate with these areas. This question has been analyzed for four attributes; the marked zones, the labeled elements, the sequence of the elements and the feelings of the respondents for these zones. The question's two branches with their four attributes are essential for feeding the research with an outline for the distinguished elements in the center, the clarity of the trip, and the vivid and dense areas in the center. Principally, this part is going to be compared to that of the sketch map. The argument behind handling such a comparison seeks accuracy through using two different tools for gathering data. Sketch mapping is very representative in terms of combining issues from the users' conscious and sub-conscious. However, since people are not very familiar with drawing, narrative answers can provide some parts that respondents miss due to the bias of confusion. The visual part is useful in terms of outlining important elements and dense areas, while the narrative part is efficient in the rubric of defining respondent's emotions and feelings, which is fundamental in classifying areas between vivid and dense.

Based on the described imaginary trip, the respondents have demarcated Ramallah City Center into eight areas. About 17 respondents that make up 57% of the sample have mentioned Almanara area in their imaginary trips, 59% of this group has described it in a negative manner where 35% of them described it positively (table 4-3). An apparent decline in the number of respondents that have marked the other areas can be noticed (table 4-3). Rokab Street Area comes in the second place with eight respondents, a sample that demonstrates 27% of the sample. Significantly, 63% of this sample described the area in a positive manner and 37% of them described it negatively. However, both of Alsa'a and Alirsal areas have been mentioned with the same number of respondents, 7 for each. While 72% of the respondents marked Alsa'a in a negative manner, 57% mentioned Alirsal Street area in a more positive manner. The farmer's market occupies the fourth rank with 20% of the respondents; a majority of 83% described it negatively. Eventually, less than 20% of the respondents mentioned the Car Parking area, City Center Street area, and Rokab's western part area respectively. The first two have been described negatively whereas the last one has been mentioned positively. All the respondents have constructed a correct sequential imaginary trip in the third question, they have all answered positively for their ability to find themselves there. In terms of the labeled elements, Almanara roundabout has been noted as the most significant element with 10 respondents then come Alsa'a square and the farmers market with 6 respondents. In the third place comes the Arab Bank with 5 respondents and then comes elements like Diamond

Building, the City Center Building, and Alsa'a Tower. Observing the second part of the question, 19 of the respondents have expressed negative feelings for their daily trip in the area, while only 6 of them have conveyed positive feelings and emotions for their trips. The remaining interviewees have expressed no feelings for their trips.

Routed Area	No. of Respondents	Percentage	Description					
			Positive		Negative		Neutral	
Almanara Area	17	57%	6	35%	0	59%		6%
Rokab Street Area	8	27%	5	63%	3	37%	-	-
Alsa'a Area	7	23%	1	14%	5	72%	1	14%
Alirsal Street Area	7	23%	4	57%	3	43%	-	-
Farmers Market Area	6	20%	1	17%	5	83%	-	-
Car Parking Area	5	17%	-	-	5	100%	-	-
City Center Area	3	10%	-	-	3	100%	-	-
Rokab western Area	1	3%	1	100%	-	-	-	-

Table 4-3: Question three, narrative description for the routed areas, with the number of respondents that depict it and their percentage. The description of these areas between positive, negative and neutral

The last theme that has been discussed in the questionnaire is demonstrated by the fourth and the fifth questions. The two questions are formulated in order to inquire into the distinctive elements, the reasons for being considered as remarkable, and the feelings and emotions associated with these elements. Question four offers a direct insight about the remarkable elements, while question five outlines a general idea for the way people describe these elements and how they feel about them (appendix 1). Eventually, the questions offer a fundamental base for the way the elements of Ramallah City Center area mechanize in. The outcome of these questions is going to be compared with the mental maps for drawing a clear idea about the distinctive elements and the reasons for such considerations.

Question four required from the respondents to pinpoint the most distinctive element in the area (appendix 1). About 16 respondents out of 40, 37.5% of all given answers, have mentioned Almanara Roundabout as the most distinctive element in the area (table 4-4). In the second place comes the Arab Bank Building, which is located near to Almanara Roundabout, with 6 answers, which make up 15% of the sample. Then come Alsa'a Roundabout, Rokab Building and The City Center Building with 5, 4, and 3 respondents and with sequential percentages of 12.5%, 10%, and 7.5% respectively (table 4-4).

In terms of elements descriptions, Almanara Roundabout has been described physically as huge, visible, and monumental. Most of the answers that have mentioned the element have described it in a positive manner. These descriptions of the element are articulated around the square's convenient location, which makes it accessible, and the important standing of the element as a cultural and original symbol of the city as a whole. While the answers regarding the Arab Bank Building have denoted no feelings for the building itself or the function, the answers present a good statement for locational and accessibility issues of the building. Significantly, the Farmers Market has been described as a chaotic place, where a lot of negative feelings are acknowledged about its physical form. The City Center Building has been characterized as a positive large-scale building with a new style to the city. In terms of locations, all the elements have been located in the right place, relevant to each respondent mental map, except for Alsa'a Roundabout that has been located in a different place.

For having some insights about the users' answers, here are some of them:

> "Almanara is the main node in the city of Ramallah, it is a roundabout and has a statue in its center representing the original families of the city, it is composed of 5 statues of marble lions, and a pole in the middle"…. "My feelings are always mixed, there is some sort of pleasure that I get from this place, and at the same time it gives me a feeling of chaos and disrespect. It can be a very chaotic and unpleasant space a lot of the times." (Respondent 30)"Farmers market (Negative feeling) and Almanara Roundabout (Positive feeling)"…."The farmers market represents the chaos, poverty, density and illegal spatial order while Almanara Roundabout articulates a place with positive life feelings." (Respondent 16)[15]

> "*The Arab Bank Building is located in a significant visible site, where everybody can communicate and reach it easily. The building with the circulation around it manipulates a direct sign for the people's movements around, it is a vivid area."* (Respondent 14)[16]

[15] Translated from Arabic
[16] Translated from Arabic

DISTINCTIVE ELEMENT	NUMBER OF RESPONDENT LABELED THE ELEMENT	PERCENTAGE
Almanara Roundabout	16	37.5%
Arab Bank Building	6	15%
Farmers Market	5	12.5%
Rokab Building	4	10%
City Center Building	3	7.5%
Cars Parking Building	1	2.5%
Alsa'a Roundabout	1	2.5%
Rokab Street	1	2.5%
Alnatsha Building	1	2.5%
Lo'loa Almanara Building	1	2.5%
Alquds Bank	1	2.5%
Albakry	1	2.5%

Table 4-4: Distinctive elements in Ramallah City Center Area, based on question 4

4.3 RESULTS & ARGUMENTATIONS; CITY CENTER MENTAL MAP OUTCOME

Mental mapping analysis has been conducted in order to outline a conceptual understanding about the Imageable and Legible zones in Ramallah City Center and then to define new parameters that could influence the area in specific and the theory in general with a more human dimension based on human-environment foundations. Outlining the Imageablity and Legibility of the study area will be based on defining and determining the distinct elements, and the vivid, rigid and dense zones within the area of study. As has been shown, the analysis of the mental map has been split into two parts; the visual and the narrative answers. The comparison of the two parts together will conclude in a clear vision about the parameters that define the Imageablity and Legible zones. Based on the first question answers, it is apparent that Ramallah City Center users have a negative image about the area's physical conditions. This image is associated with chaos, crowdedness and unorganized character. In spite of the nature of the question as a direct question that manipulates a relative bias, the answers motivate the research hypothesis regarding the negative image that people have about the area and the need to study their mental map for defining new parameters for the new design improvements for the area.

The sketch maps have been divided into three parts; landmarks, nodes and paths maps. In terms of distinctive elements, an apparent relation can be noticed between the three maps. For further clarification (figure 4-10) shows a comprehensive map that represents the overlapping between these three maps. Apparently, the landmarks that have been labeled as the most distinctive landmarks are located within or around the nodes, which have been labeled as the most remarkable. Furthermore, the paths that have been marked as the most distinctive are located or intersected with the distinctive landmarks and nodes (figure 4-10). By focusing on the study area, Ramallah City Center can be divided in terms of distinctive elements into four defined zones, Almanara Roundabout, Alsa'a Roundabout, the Farmers Market and Rokab Area. Almanara Roundabout embraces the most distinctive elements of the area, where the most remarkable landmark, Almanara monument, is located. Other distinctive landmarks, like the City Center Building and the Car Parking Building are located around the same area; these elements remarkably enforce the role of this zone as the most distinctive zone. In terms of path analysis, all the paths around Almanara have been labeled as significant, gradually; these paths are becoming less important. As for Alsa'a Roundabout, elements there can be classified in the second significant level after Almanara Roundabout. In spite of the fact that Alsa'a Roundabout has been labeled as more distinctive than Rokab Building, the path between Almanara Roundabout and Rokab Building has been denoted more distinctive than the path that links Almanara Roundabout with Alsa'a Roundabout. The first path has also been marked wider than its real width and the widest path compared to the other paths, this also brings more attention to the importance of this path in the area's users' cognitive map.

In order to get more interpretations on this aspect, and by comparing these findings with the fourth question answers, an interesting dissimilarity can be noticed. Respondents in question four have considered Rokab Building and the Farmers Market as more distinctive zones than Alsa'a Roundabout zone. The nature of the question differs from the map sketching since it is associated with feelings, while the sketch map is associated with the power and nature of the element. However, Almanara Roundabout, with the surrounding elements there, like the Arab Bank was marked as the most distinctive zone in the area. Significantly respondents describe the distinctive elements at Almanara Roundabout in terms of scale, location, and visibility. These terms have been associated with other negative descriptions like crowdedness and chaos. As for the Farmers Market and Car Parking Building, these elements have been characterized as chaotic, unorganized elements, while issues like good location and scale make it distinctive from the users' point of view. Respondents describe Rokab Building

as a distinctive element for its symbolic role as a site with a collective memory, while Alsa'a Roundabout has been described negatively.

In terms of elements distortions, and in order to define the rigid zones, it can be noticed that the degree of distortion within landmarks and nodes maps are identical. The comprehensive map (figure 4-10) illustrates the degree of distortion in elements locations in terms of zones. Apparently, Almanara Roundabout zone, with the blue color (figure 4-9), is located in the heart of these zones without any distortions at the elements locations. Elements like Almanara Roundabout, Almanara Monument, Arab Bank and Lo'loa Building are located relatively in their right locations. Based on these insights, Almanara Area can be considered as a high rigid area, where the place is well structured and organized. In the second place, with the green mask color, come the areas that have been perceived as edge areas. The Farmer's Market and Alkasaba zones to the south and Rokab zone to the North are marked as low distorted zones in terms of elements locations. Notably, respondents have considered Rokab zone as the northern edge of the area of study, about 21 respondents have mentioned Rokab area as the edge zone, and only 9 of the respondents have extend their mental image to cover Alnasra Restaurant zone. The other core areas are extended as continuous zones, starting from Alsa'a square, Red Rose Street and Rokab Street, and ending by the City Center Building (figure 4-10), and elements within these zones are marked with high distortion in their location. The high-distorted location areas are marked with red and they include Alnasra Restaurant area. The 9 respondents, who have marked this area as significant, have located it with high distortion. Based on these remarks, these areas are unorganized zones and the structures and forms there need to be revisited and reexamined in terms of physical conditions and then restructured or perhaps redesigned.

The remaining two parameters for defining the Imageablity and Legibility of the area are the degree of vividness and density. By comparing the third question to the mental maps, the core area with the highest distinctive elements and highest rigidity degree, Almanara zone has been outlined as the densest area. This justifies the reason why the respondents have labeled the elements there and located them correctly. Hence, people use this area since it attracts them with its rigidity, distinctive elements and meanings. The Rokab area comes in ahead of Alsa'a area.

The analysis of the vivid areas confirms that Rokab zone as the highest vivid area. People who often use this zone mention their experience there with pleasure. This can be justified with

the nature of the area as a vivid and interactive area, whereas the other zones_are very dense zones, like Almanara, Alsa'a and the Farmers Market have been characterized with negative feelings. People use these zones for the functions provided, and circulation needs rather than pleasure and interaction. It is important to note that other zones like Alnasra to the south or City Center Building street have been marked as low density and less vivid zones. Few elements have been marked as distinctive elements there, and fewer feelings have been given to these zones.

In terms of the place legibility and the way finding issues, Almanara Zone and Rokab Zone are associated with high Legibility; people easily distinguished the elements there and sketched clear maps. The same can be considered with Alirsal Street area. The other zones are, like Alsa'a, the Farmers Market, Alnasra and the City Center Building zones have been marked with low Legibility. Ramallah City Center mental map inquiry outcome can be highlighted with two levels of notes as the following:

4.3.1 EMPIRICAL NOTES ABOUT RAMALLAH CITY CENTER URBAN FORM

The whole area has been considered chaotic and crowded, where organization in terms of elements' and zones is highly needed. In spite of the availability of many distinctive elements, these elements don't play a positive role in improving the whole environmental image. The elements are structured abruptly; areas are very dense and less integrated with pleasure feelings. The density of the area is the main reason for choosing elements as distinctive. Most of the respondents have mentioned the functional issues, in this rubric; function plays the core role for the density of the area. Based on the distinctive elements distribution in the area which can be divided into six main zones as the following:

- *Almanara Roundabout zone*; where the elements are very distinctive, specially the main monument. The area has been described as a dense and rigid place. That has been enhanced with a visible location and good functions. The urban form elements at Almanara Roundabout zone have been described as huge, ugly and inhuman. Therefore there is a need to reduce the massing and the overwhelming signs that influence the whole image. In terms of vividness, the area has been described with a low vivid degree. In spite of the high rigidity of the area, that is associated with a relative organized structure, the distinctiveness of the elements there, and the high density, which is enhanced with the location, the area

seeks dynamic, human and meaningful elements that could add more pleasure to the people's experience within this zone.

- *Rokab Building zone*; in spite of the facts that the elements within this zone have less distinctiveness than elements in the other zones, the zone has been considered vivid where users interact with it. Consequently, the zone is highly dense; it represents a positive place for the people of the area. In terms of rigidity, this zone still seeks better organization. This has to do with the structure of the urban form and the improvement of the distinguished elements there.
- *Alsa'a square zone*; in spite of the fact that the elements in this zone have been marked with a high distinctive degree. The zone has been characterized with low rigidity; the place is unorganized and looks chaotic from users' point of view. The area also seeks vividness and attraction, that's why respondents consider the area with a low density.
- *The Farmers Market zone*; in spite of the high density of the area since it embraces an important daily life function, the zone has been described as chaotic, unorganized and filthy. Respondents in this term consider it as a zone with no vivid or rigid character. Elements within this zone point a low degree of distinctiveness as well. The place needs for more organization that brings more tidiness and pleasure.
- *City Center Building zone*; this zone has been marked as something in the backstage of important facility. Respondents use to move within this area just in order to escape form the other area density. This zone has been marked with low density, vividness, and rigidity. There is a need to reconsider these terms in order to integrate it with the whole area.
- *Alnasra Restaurant zone*; this zone seeks distinctive elements, users mention for some functions there. The place is low in rigidity and is not vivid at all. Density within this zone is very low. There is a need to reorganize the place and to restructure competitive elements that can facilitate as distinctive attractive elements.

Some issues are still open and need for further interpretation and justification in order to get a deeper understanding and then assists in reorganizing the area. Significantly, the vividness and distinctiveness of some paths like Rokab and Alirsal more than others like Zohiman, is crucial that needs for investigation. Furthermore, interrelation issues that attract people to use zones more than others, or embrace vividness in zones more than others still need for thorough understanding.

4.3.2 THEORETICAL NOTES ABOUT MENTAL MAPPING PROCESS

In general, it can be agued that the users of Ramallah City Center are able to give a general view about the whole area, which is important for establishing a visual plan that is based on human-environment relation understanding. Basically, the elements that are considered distinctive are located within similar zones; accordingly, the area can be divided into different zones in a way that makes it easier for analysis and understanding. These zones are characterized with different qualities; this brings up many questions that still need for justification in terms of theory. In this regards, the following points have been brought up:

- The method demonstrates high competence for explaining and defining the problem characters of the urban form, which are based on the physical image of the environment. The theory is able to give a clear insight for the existing problems within the area based on human attitude relation to physical environment.
- Almanara and Alsa'a Roundabouts have been distinguished higher than Rokab Building, and the path between Almanara Roundabout and Alsa'a Roundabout (Zohiman Street) has the same width, and equal functional and symbolic significance as the path linking between Almanara Roundabout and Rokab Building (Rokab Street). However, Rokab Street has been marked with higher distinctiveness and more vividness and density than Zohiman Street. Even though it has been pointed with low rigidity.
- Elements within Alsa'a Roundabout have been distinguished better than elements within Rokab Building zone; however, Rokab zone has been considered with higher density and vividness than Alsa'a Roundabout.
- Almanara Roundabout demonstrates a high density despite its low vivid degree and the negative description of the elements within this zone.
- The visual quality of the elements, the symbolic dimension, and the positive feeling are issues, which attract people to certain elements and zones, like Almanara zone. While some zones have sought such character and have been chosen as attractive and vivid zones as well, like Rokab zone.
- Districts have been marked according to spatial division rather than to the blocks distributions. Respondents define districts in their mental maps according to the nodes and the spaces around it rather than the buildings, which have given less importance. This is a critical issue that differs from Lynch's (1960) theory.

Two aspects can be elevated here for justifying these issues; it is either that the place with its character and spatial relations impose different criteria that influence the way people make their decisions about their places, or the rapid transformations within the city structure have imposed a chaotic image that led for such contradictions in the way people perceive and judge their places. Based on this argument, studying the spatial structure of the area, and the hidden interrelations there, will assist in getting a deep understanding of this phenomenon. This will lead to widening the outcome of the analysis process with parameters that should be included in the improvement and redesign of the area.

4.4 SUMMARY

The study adopts mental mapping as the first analytical step for understanding and inquiring the urban form at Ramallah City Center, and brings a deep insight about human-environment relationship at the center. This step is considered an essential step for humanizing the center and bringing human evaluation at the city level. The implementation is based on adopting Kevin Lynch (1960) study similar questions. It has been divided into two parts, the systematic field survey of the center, and inquiring Ramallah City Center users mental images. The comparison between these two parts feedback into the process of analysis with the center degrees of distinction, vividness, rigidity and density. Eventually, these criteria are important for defining the center legibility value and thus building the first step of understanding the human-environment relation with the area. Based on the applications of the method at Ramallah City Center, the center demonstrates a high level of legibility. According to the analysis, the center has been divided into six main areas, where Almanara roundabout denotes the highest degree of legibility and the other zones marks a less degrees of legibility. In terms of distinctive, vividness, rigidity and density, Almanara roundabout denotes a high degree of distinction, rigidity and density; however, the same zone denotes a low degree of vividness. Significantly, Rokab building zone has been denoted as a high vivid and dense zone, with less distinction degree, while the other zones have been varied between middle and low degrees. From a different perspective, the method has demonstrated a high competence for explaining and defining the problem characters of the urban form. Theoretically, a number of contradictions have been denoted; Rokab zone has marked higher legibility value than Alsa'a square in spite of the fact that Alsa'a square denotes a higher degree of distinction. Furthermore, some zones have denoted different contrasted criteria within the same area. Eventually, an important remark has been denoted; respondents have realized zones based on

the spatial division rather than the blocks organization, which is a contrast with what Lynch's theory has addressed.

Employing mental mapping at Ramallah City Center brings up a number of significant remarks that seek farther elaboration. Thus, the outcome of this chapter is going to be compared with the outcome of the next chapter that brings a different view of analyzing the urban form at Ramallah City Center.

Figure 4-6: Mental Mapping analysis base map. (Source: RIWAQ 2006- edited by researcher)

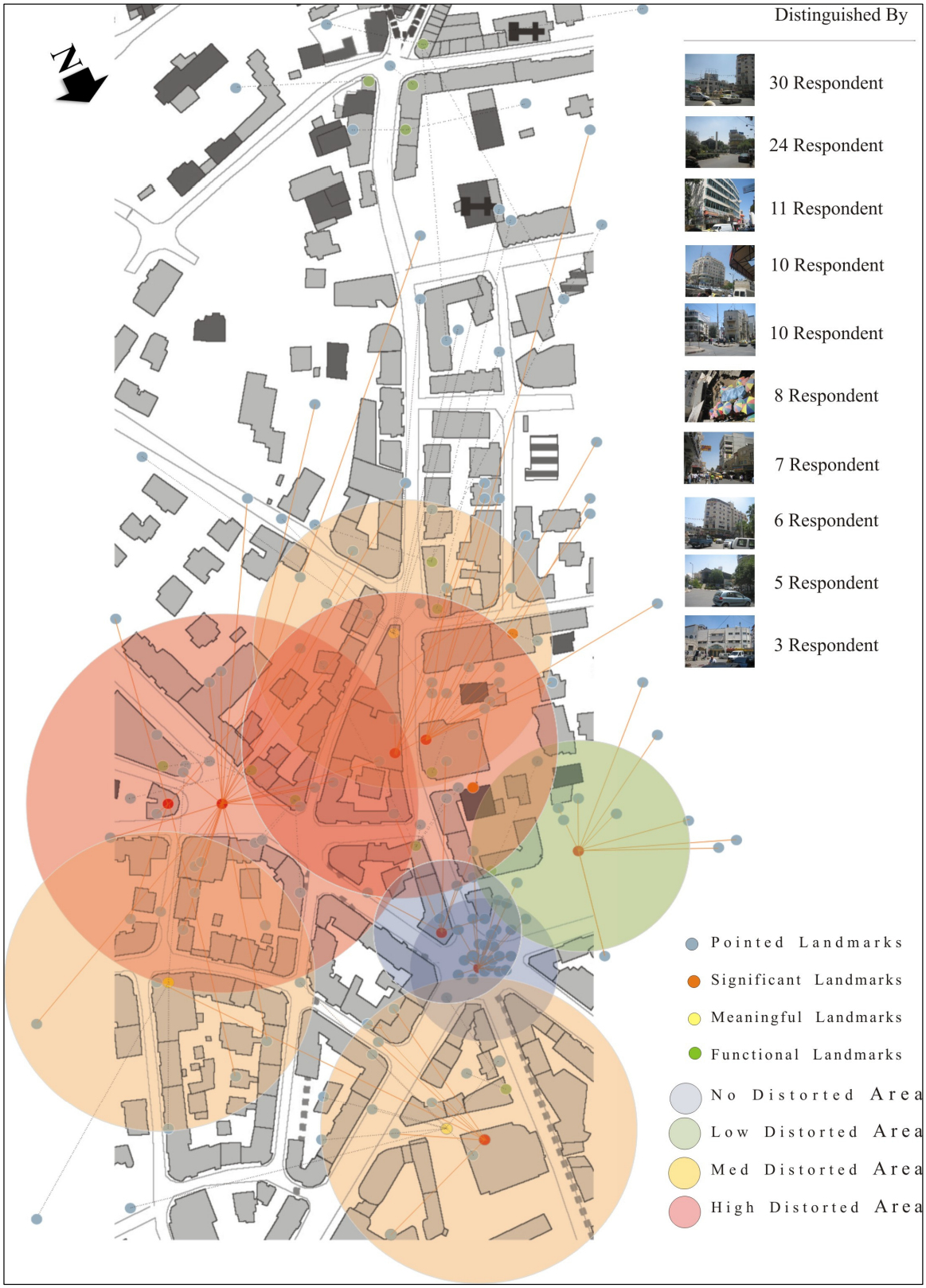


Figure 4-7: Ramallah City Center users' mental map, Indicated landmarks

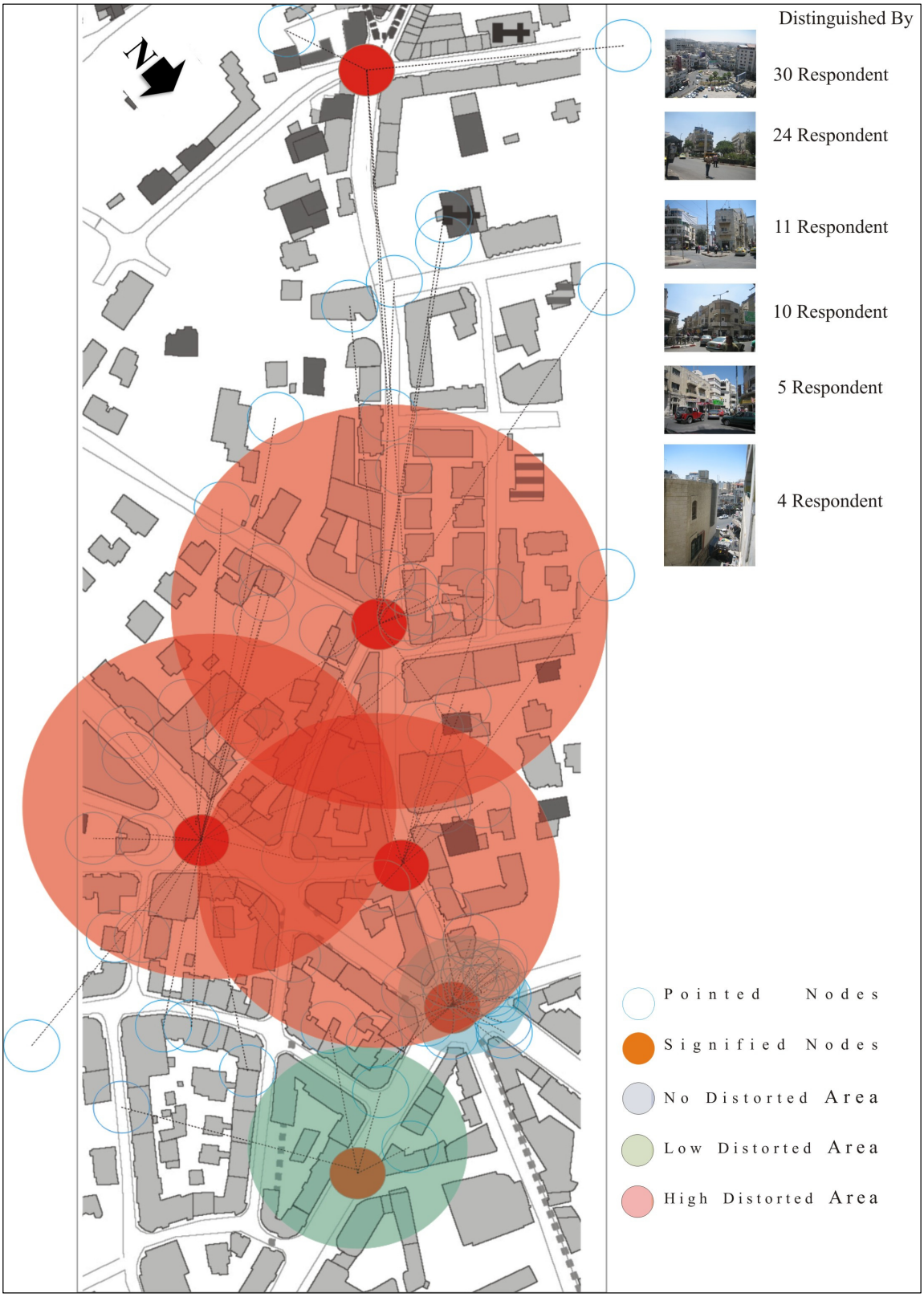


Figure 4-8: Ramallah City Center users' mental map, Indicated Nodes

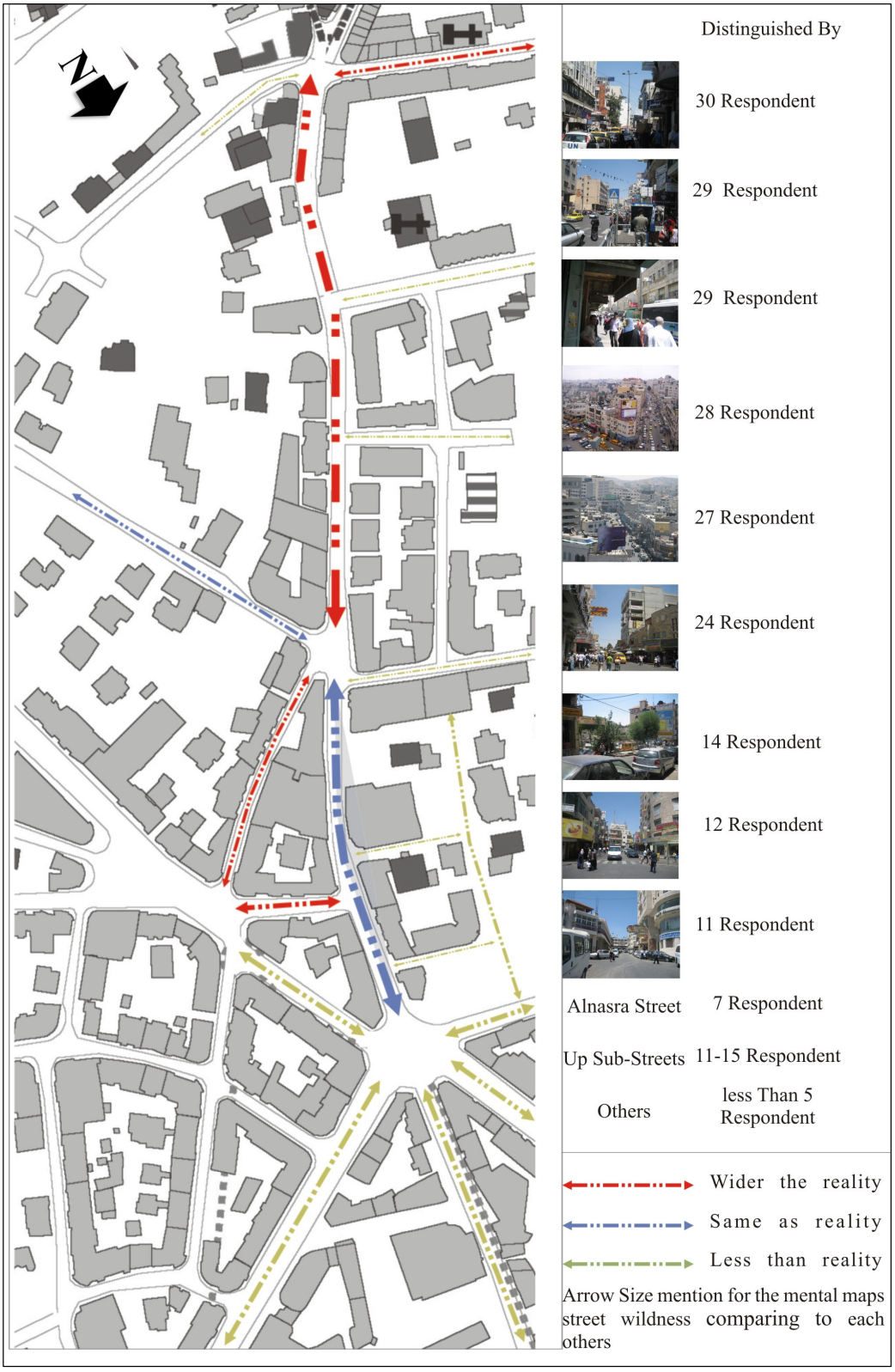


Figure 4-9: Ramallah City Center users' mental map, Indicated Paths

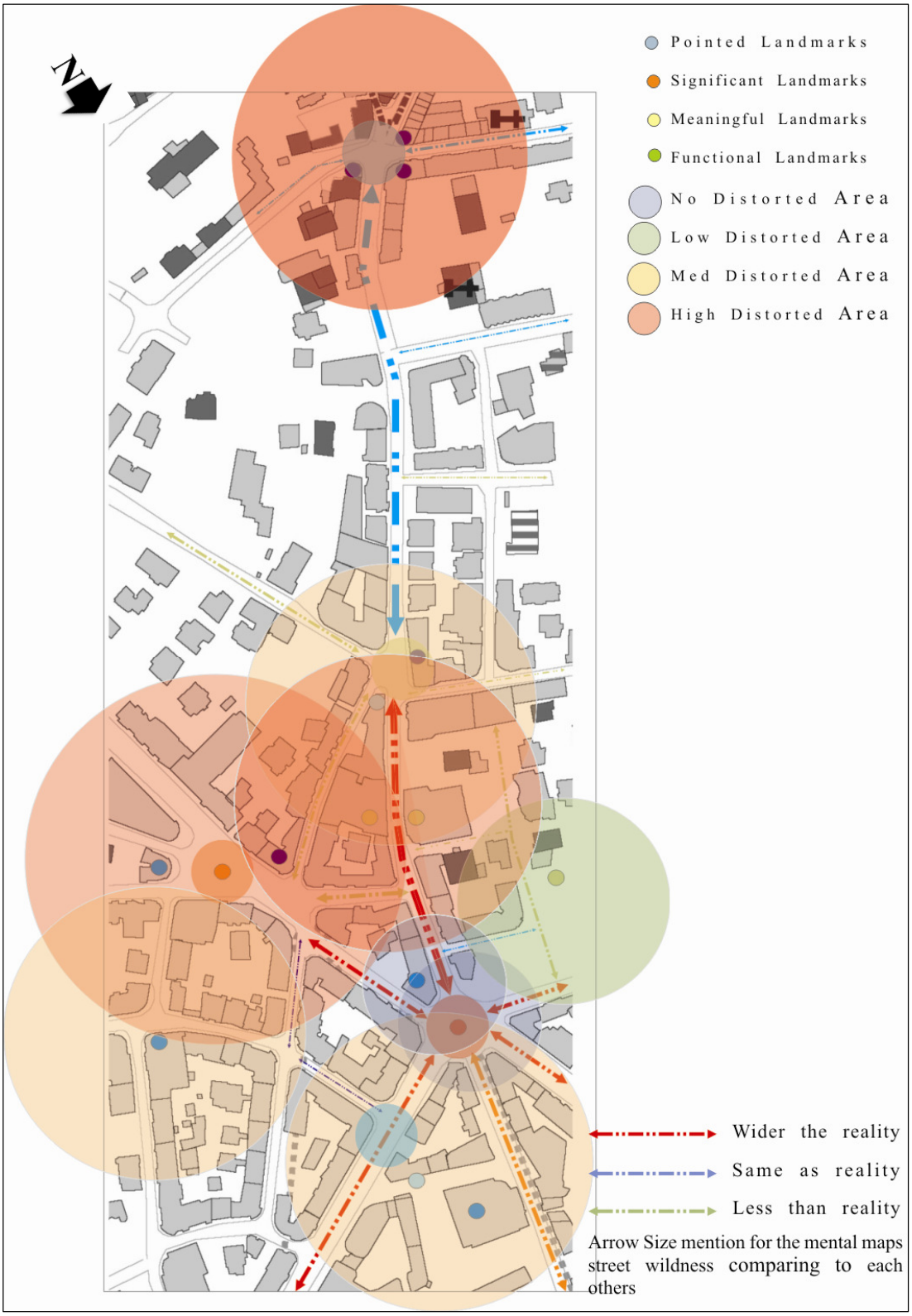
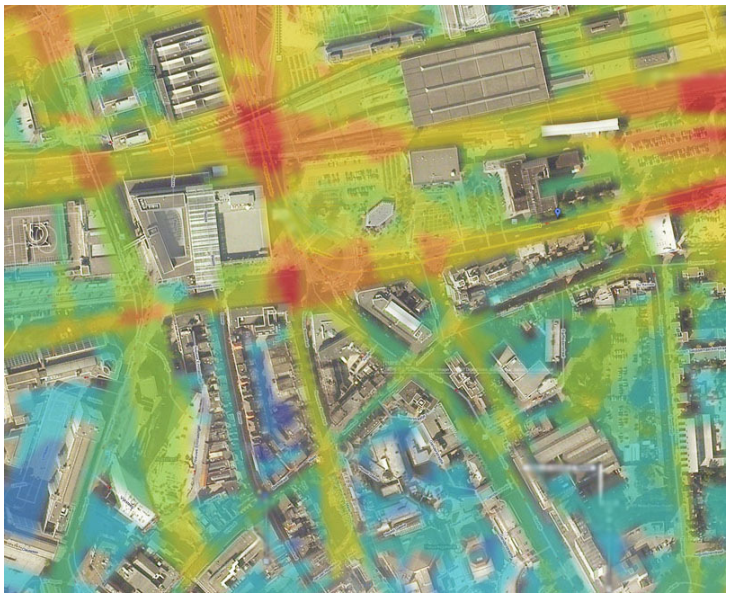


Figure 4-10: Ramallah City Center users' mental map, Comprehensive map

Figure Billow; Eindhoven depth map analysis, at http://www.peripheralfocus.net/palpable_city.html- revised on 15 September, 2009



METHOD & ANALYSIS

CHAPTER FIVE- EMPLOYED METHOD & PROBLEM ANALYSIS;

RAMALLAH CITY CENTER SPACE SYNTAX METHOD & ANALYSIS

"I could tell you how many steps make up the streets rising like stairways, and the degree of arcades' curves, and what kind of zinc scales over the roofs; but I already know this would be the same as telling you nothing. The city doesn't consist of this, but of relationships between measurements of its space and events"

(Italo Calvino, 1978: 10)

Inquiring city image derived from the fundamental understanding of the physical elements, which fabricates the visual appearance, and the profound investigation of the urban spaces demonstrate the unapparent relationships between the city elements. Primarily, and within human-environment relationship domain, these are spatial entities that represent the barest of relationships to the world which are geometrical. Significantly, geometry is wrapped by space attributes, distance and direction. From Bill Hillier's (1996) theoretical view, the space attributes demonstrate the interrelationships between urban elements within which the relationship between man and his environment is revealed. Based on this, Hillier and colleagues (1984) present their Space Syntax Analysis method, as a tool for inquiring the spatial attributes for better understanding of the human-environment relationship. The theory offers a consistent method for investigating the issues that Lynch's theory has been criticized for, "*However, urban design research has also criticized Lynch's work for ignoring the relational characteristics between physical elements of the urban environment*" (long et al. 2007:129-01). Consequently, the implementation of Space Syntax Analysis as a second analytical tool, for understanding the urban form characteristics in Ramallah City Center, is essential for covering the issues that Mental Mapping approach missed.

This chapter is concerned with the implications of Space Syntax Analysis method on Ramallah City Center. It demonstrates the methodological implementations of the theory in the area. Furthermore, the chapter presents the analysis results and outcomes. Eventually, the chapter shall come up with a set of arguments regarding the spatial analysis of Ramallah City Center.

5.1 THE USE OF THE METHOD

The research adopts Space Syntax Analysis technique as a second method for analyzing Ramallah City Center urban form and come up with new insights at the theoretical level. The use of the method, which was presented by Bill Hillier and colleagues (1984), is considered an important attempt for enforcing the first step analysis outcome and bridging the gaps that Mental Mapping has sought to cover.[17] Substantially, and as has been mentioned before, the research hypothesized the ability of the two theories to orchestrate together into analyzing and investigating the existing urban form. Intelligibility is deeply influenced by distinctiveness,

[17] See Section (3-4)

singularity and visibility, and Space Syntax is an appropriate technique for measuring such parameters. Furthermore, Space Syntax is a proper technique for pinning down the parts that Mental Mapping overlook such as the spatial interrelations and the micro-macro scale analysis investigation. From the research's different theoretical perspectives, adopting Space Syntax within a mutual process is essential for filling the gaps that the theory itself seeks to cover. The method itself is still primitive for dealing with the two dimensional aspects of space and disgrace the three dimensional one (Wang et al. 2007: 048-01). Moreover, the theory interpretations into the level of the cultural context is still limited, the theory is trying to explore the structure of space within a socio-economic motivators, while it cannot give a full explanation for the cultural motivations (Pearson & Richards 1994: 30).

The implementation of the theory aims at defining the place Intelligibility, which is an important aspect for defining human-environment relation within the built environment. The method is based on two stages; mathematical-spatial analysis stage and socio-economic interpretation stage. The combination of the two stages shall come up with important insights that will feed into the understanding of Ramallah City Center urban form, as well as bringing up ideas regarding the theoretical level. This analytical stage basically depends on the software analysis; the Depthmap Analysis. Such analysis will come up with a set of criteria that is essential for defining the place Intelligibility. The next two sections demonstrate general ideas about the Depthmap software and some important preferences about the Intelligibility measured criteria.

5.1.1 THE USE OF THE SOFTWARE

As a math-based method, Space Syntax Analysis depends on the j-graph based analysis in analyzing and representing the spatial characters analytical information. Basically, there are different software's that can conduct the j-graph analysis; some of them are oriented into a vector analysis basis, axial maps, and others into plan of system analysis. Inquiring spatial configurational relations in Ramallah City Center adopts the Depthmap software as the primary tool for conducting the analysis there. Depthmap is a "*computer program to perform visibility analysis of architectural and urban systems. It takes input in the form of a plan of system, and is able to construct a map of 'visually integrated' locations within it*" (Turner 2004: IV). The argument for adopting Depthmap based on the high ability of the software stems from the need to supply the configurational analysis into a plan of system relations which covers open areas, rather than axial analysis that covers a sort of linier spaces. Depthmap has the ability to

conduct analytical process within a linier, convex and plan spaces. From a different point, Depthmap is useful in conducting both, the Integration and Connectivity analysis, which are the two main parameters the spatial analysis in Ramallah City Center attempts to do.

Originally, Depthmap developed from two stands of thoughts. One was the Isovist analysis (Benedikt 1979), which draws contours of equal visual fields within one plan and call it as '*Isovist field'*. Benedikt (1979) believes that the Isovist field gives insights about how people navigate the actual space (Turner 2004: 1). The other stand of thought that develops Depthmap software is the Space Syntax Analysis theory. Since both theories have acknowledged the role of movement pattern of people within space, it was decided to combine the two theories into one simple analytical system that is the (VGA), which is measured through the Depthmap software (Turner 2004: 1).

The idea of VGA is based on an overlaid grid of points on the intended analytical plan. Then a graph is made within which each point is connected to every other point that it can see. The graph measures the number of connections each point uses to see other points in relation to the others; this represents the visual connectivity parameter of the analyzed plan. Furthermore, the graph measures the number of visual steps each point needs to reach the other point; this graph represents the Integration value of the analyzed plan. These two values, the Integration and the Connectivity values are the values that define space Intelligibility from Space Syntax theoretical view. Accordingly, the Depthmap is considered as important software that Space Syntax theory adopts for inquiring the spatial configuration relations. And this is exactly what the research implemented on Ramallah City Center spatial analysis inquiry.

5.1.2 SPACE SYNTAX IN RAMALLAH CITY CENTER; ADOPTED PARAMETERS

Space syntax analysis in Ramallah City Center aims at inquiring into the spatial configurational relations values. Therefore analyzing and observing the Intelligibility characteristics of the study area is the core aspect of the study. In this regard, both the Connectivity and Integration graph analyses are the two main broad parameters that have been adopted. Integration is representing a global measure while Connectivity a local one. Adopting these two urban criteria allows the study to move from local pattern into a global one. The research has defined and analyzed the two criteria based on the following:

- Inquiring the spatial Connectivity value which is the attribute that takes into account the relations between each space and its neighbored spaces. It basically illustrates the visibility of certain points from different location. Connectivity graph runs on the local level, where a number of other attributes can be measured in a form of separate graphs that give further detailed insights on the Connectivity parameter. In this rubric, the study goes farther with the Connectivity attribute analysis by investigating the following parameters on the local level (Stadler 2008: 16-27):

    1. The Clustering Coefficiency- compares the number of possible visual connections to the actual connections. The high value areas are marked with the red color that demonstrates areas' with high privacy, contemplative space and a good pause point and small world area.
    2. Control- picks out the visually dominant areas. The high value areas are marked with the red color meaning that the place is dominant in location and is easy to observe other locations form this place.
    3. Controllability- picks out the visual dominant areas. The high value areas are marked with the red color which demonstrates the places that can be easily observed.

- Inquiring the spatial Integration value, it reflects the mean linier depth from the all other lines in the system (Hillier 1996: 119). This attribute is a global one; it is with a great importance to understanding the way the urban system in the study area functions because it counts the number of movements that pass through each space in relation to the whole system. The Integration value in Ramallah City Center is measured according to the following attributes:

    A. The Mean Depth- that calculates the average number of each space to reach any other vertex. The high value areas are marked with the red color that demonstrates the need for a large number of steps to reach any vertex, and the location of the space as a distant space.
    B. The Visual Entropy- analyzes the different distributions of depths. In another way, it defines the degree of order in space from a certain point. The high value areas are marked with the red color that demonstrates areas with high order.

For measuring both the Connectivity and Integration values, the study runs two different visibility graph maps; each of them is based on a different AutoCAD map in order to accommodate the different requirements for each attribute. The first graph has been run in order to calculate the Connectivity value. Since the aim of this value is based on the visual connections, many barriers that don't block the seen, or can see through have been removed from the map. The other visibility graph has been run for measuring the space Integration value, where the barriers that limited the movement have been placed. In the both maps a grid analysis with 2 meters length units has been laid over; such grid dimensions demonstrate high resolution. Furthermore, it is important to note that the Depthmap analysis adopts larger area than the actual area of study. A buffer zone with a 100 meters offset outward, enlarges the area of inquiry in order to avoid the bias of dead ends that will impact the accuracy of the software analysis.

5.2 IMPLEMENTING SPACE SYNTAX ANALYSIS AT RAMALLAH CITY CENTER

The deep understanding of human-environment relation is a basic step for outlining and redesigning our cities with more human dimensions. In this regard, inquiring the spatial configurational relations of space structure is a fundamental step for space design. This step is based on the thorough investigation of the spatial Intelligibility criteria. The following sections shall demonstrate the results of implementing spatial analysis in order to look into these two attributes, with their graph's different analytical parts.

5.2.1 CONNECTIVITY VALUE: RAMALLAH CITY CENTER

Specific base maps have been prepared for inquiring the Connectivity value in Ramallah City Center. The outcome of such analysis has been illustrated in a number of graph based maps. The graph based maps are considered a powerful graphic method for representing and explaining the analysis and results. Principally, this attribute analysis is represented into the general scale through the Connectivity graph map. Based on Ramallah City Center Depthmap analysis, the Connectivity map (figure 5-1), demonstrates the areas with high and low values of visual relations into the local level. It brings up the relation between each cell and its neighbor cell. Based on the same map, areas marked with red color demonstrate high value Connective cells. As the color range varies from red to blue the value of Connectivity changes from high connection to low connection areas.

According to the Connectivity graph analysis map (figure 5-1), Almanara roundabout is marked with the red color. Specifically, the area where Almanara monument is located has been demonstrated as the highest connection area within the whole area of study. While the other parts in the same roundabout area are marked with the red and yellow colors, demonstrate a strong value of Connectivity. The yellow colored areas are extended from Almanara area north toward the City Center Building zone, and toward some parts of Rokab street area. With the same value of connectivity, the northern parts of Alsa'a square have been marked with yellow. Within the same square and as we head south, the connectivity value decreases. Significantly, the south/east part of the square has been marked with a light/blue color representing weakly connected area. Furthermore, Rokab node, the farmers' market node, Alnasra junction and some parts of Rokab, Albarid and Alquds streets are marked with light/yellow color that demonstrates a less connectivity value than the other listed areas. These areas are more scattered within Alquds street rather than the other noted areas. According to the same graph analysis (figure 5-1), the remaining areas, are marked as low connected areas, whereas areas like Alomara street and other sub-streets are marked as a very low connected areas with the dark blue color.

The study conducts a graph analysis at a detailed level; the outcome of this analysis comes out as the following:

- Clustering Coefficiency value at Ramallah City Center- areas with high Clustering Coefficiency value are marked with the red color. These places represent areas that are less visually exposed and have high privacy. While areas with low Clustering Coefficiency are marked with the blue color and represent highly exposed areas. The degree between the two colors shows the differences between these two ranges. According to the Clustering Coefficiency graph analysis map (figure 5-2), Almanara roundabout area is marked with a very low value color; the dark blue color. With the same value, the northern parts of Alsa'a square, Rokab node, Alnasra junction, some parts of Rokab Street and some sub nodes are marked with the blue color that indicates a low level of Clustering Coefficiency value (figure 5-2). Areas that have been marked with the red color, like some parts of Alquds Street and Rokab Street, are considered as a high Clustering Coefficiency value areas. While areas with the yellow color, such as Alirsal Street, parts from Rokab Street and sub streets are considered as middle Clustering Coefficiency value.

Apparently, the areas that have been marked as a low Clustering Coefficiency value are almost the areas of intersections. While areas with high Clustering Coefficiency value are areas that are located between the buildings and are less exposed. Significantly, the connection between Almanara roundabout and Alsa'a square has been marked as a low Clustering Coefficiency value and extends to reach the Diamond restaurant building. While the southern east and west corners of Alsa'a square, have been evaluated as less exposed areas with a high Clustering Coefficiency value.

- Control value at Ramallah City Center- The Control value graph demonstrates the dominant areas and high Control value areas are marked with the red color. As the color changes from red to blue the Control value becomes lower. Viewing the Control value graph map (figure5-3), Almanara Monument location and the center of Alsa'a square's northern part have been marked as the highest Control value spots. Areas around these two spots, beside most of the area intersections have been marked with the yellow color that indicates areas with middle control value. While Alirsal Street, Almojama'a Street and some other parts of Rokab have been marked with the blue color as a low Control value areas. For farther insights on the Control value, (figure 5-3) shows the Control value distribution at Ramallah City Center.
- Controllability value at Ramallah City Center- The Controllability value graph presents the areas that can be easily observed. Red color refers to areas with high controllability; areas that can be considered as highly observed locations. While areas marked with blue color are considered as low controllability spaces, where it performs as less observed locations. Based on Ramallah City Center Controllability value analysis graph (figure 5-4), the center in general is marked with a low Controllability value that is divided into three degrees of low controllability. Again, Almanara roundabout, with the extension toward the City Center Building, Alquds Street, and the northern part of Alsa'a square have been marked with light blue as low controllable locations, whereas the other spaces have been ranked with lower values as illustrated in (figure 5-4).

5.2.2 INTEGRATION VALUE AT RAMALLAH CITY CENTER

Integration value is the second attribute for inquiring the Intelligibility criteria at Ramallah City Center. As has been mentioned earlier, the extensive examination of this attribute brings up deep insights about the configurational relationships at the global level. The

comparison of the Integration value to the Connectivity value offers a good base of understanding for the spatial relationships in Ramallah City Center on the different levels. The Integration analysis at Ramallah City Center has been achieved through conducting a graph analysis for two aspects; the mean depth graph analysis, and the visual entropy graph analysis. Basically, and in order to get a general idea about the Integration value, and before getting deeper with the two detailed graph analysis, the Integration graph map (figure 5-5) offers a comprehensive perception about the Integration value in the center. According to the graph analysis, the center in general is marked as a high integrated area. Almanara roundabout, the central part of Rokab Street, Rokab node, Alnasra junction and the northern part of Alsa'a square have been marked as the highest integrated zones with the red color (figure 5-5).

For farther apprehension for the Integration value, the outcome of these two analytical attributes comes as follows:

- Mean Depth value at Ramallah City Center- the high Integration value areas are marked with the red color that indicates areas with a high number of steps, changing vertex, to be reached. The degree of this attribute ranges between red and blue to demonstrate the change from high to low values of mean depth. The mean depth is an important attribute for defining the degree of integration in any urban context. Shading the lights on Ramallah City Center case, and as shown in the mean Depth graph (figure 5-6), the study area in general is characterized with a low mean depth degree. These areas, based on the graph analysis, are ranked into three different degrees; the lowest mean depth areas are marked with the dark blue, and the low mean depth areas are marked with light blue, and most low mean depth areas marked with the cyan color (figure 5-6).

  According to the graph (figure 5-6), Almanara roundabout, the central part of Rokab Street, Rokab node, Alnasra junction and the northern parts of Alsa'a square are marked as the lowest mean depth value areas with the dark blue color. Areas such as Almojama'a Street, Alquds Street, Zohiman Street and Alirsal Street, are marked with the light blue color as a mid-low mean depth value, while the remaining areas in the center are marked as low value with the cyan color (figure 5-6).

- Visual Entropy value at Ramallah City Center- this attribute demonstrates the degree of order for each space in terms of visual depth. Areas with a high value of order are marked with the red color, while the less ordered areas are represented with varying

colors from red to blue. The area of Ramallah city center in general is marked with a low value of Visual Entropy (figure 5-7); however some parts have been marked with yellow expressing a close value to the high Visual Entropy. Rokab node has been marked as the lowest Visual Entropy area with dark blue, this area is located within Rokab Street that has been marked as low value with the light blue (figure 5-7). Alquds Street, Zohiman Street, Alirsal Street, and the south western part of Alsa'a square are marked close to high value zones. Significantly, some parts of Almanara roundabout are marked as the highest Visual Entropy spaces in the whole area of study with the yellow color (figure 5-7).

5.3 INSIGHTS ON RAMALLAH CITY CENTER SPATIAL STRUCTURE ANALYSIS

The implementation of Space Syntax Analysis on Ramallah City Center, aims at bringing farther insights for understanding the physical status of the center that can contribute to the notion of humanizing the area. The method intends to go beyond the traditional examination of the human-environment relation through investigating the spatial relations attribute of the physical environment. Basically, the investigation of Ramallah City Center has been oriented so as to establish relationships at two levels, the local and the global levels. In addition to this, the study examines both the spatial Connectivity and Integration values. Connectivity is an important attribute for defining local measurements, and Integration value examines the global relationships. In the highlight of Ramallah City Center, the Connectivity value analysis shows that Almanara roundabout and Alsa'a square are the highest connected spaces within the whole area of study (figure 5-1). Significantly, the central area of Almanara roundabout has been labeled as a very high connected area; it demonstrates a strong visual connection with its neighboring spaces through its Control and Controllability values (figure 5-2 & figure 5-3). These values indicate the strong role of the monument as a visual attraction point from different parts of the city. Moreover, the whole roundabout area is marked as high value connected area, the high connection value extends toward the City Center Commercial building (figure 5-1). Alsa'a square is marked as a high value connected too. Interestingly, this value is confined to the northern part of the square; the part that emerges from the paths intersections. While the southern part where the monument and the other significant elements are located is less connected to its neighboring spaces (figure 5-3). Based on this, Alsa'a Square is divided into two parts, where a sort of contradiction can be detected between the significant elements locations part and the high visual connected part.

Within the same two areas, Almanara roundabout and Alsa'a square, and the connection between the two spaces, Zohiman street performs as a middle range value in connecting the two spaces together. While, Rokab Street's value varies between low, middle and high connection to the neighboring spaces. However, there are three high connected value points that can be detected within this street, Almanara roundabout as edge space, the central part that is close to the red rose intersection and Tannos building, and Rokab building as the other edge of the street (figure 5-1). These spots mechanize as a series of points where each point leads to the other point. The process, within which these spaces orchestrate together, creates a high connection value in Rokab Street. Hence, it can be argued that the remaining nodes, such as the farmers market, Rokab building and Alnasra Junction has been marked to have a medium degree of connection to the surroundings. The back street, Almaktaba Alelmia street, is marked with a medium value, where the all connections from and to this area are low value marked. Significantly, Almanara roundabout lies within medium and high connection value streets, whereas, Rokab node surrounded by three medium and high connection streets and , Alsa'a square is surrounded by four low connection values.

Observing the Integration value analysis in Ramallah City Center within the Mean Depth graph (figure 5-6), the central part of Almanara roundabout, Alsa'a square, the central part of Rokab street, Rokab node, and Alnasra junction have been marked as the highest integrated spaces to the whole area of study. Contradictory, some of these areas that have been marked as high integrated areas are marked with medium or low Connection values. Interestingly, some of these areas, like Rokab node and Alnasra junction, have been surrounded by strong connection accesses that impact the degree of Integration for such spaces. In this case, it can be argued that areas with high Integration values are areas with high Connectivity or areas that are surrounded with high connection spaces as well. In addition to its value as the highest visual Connectivity value to the neighboring spaces into the local level, Almanara monument location is still marked as one of the highest integrated spaces within the whole area. This elevates the space as the most apparent integrated space in Ramallah City Center; it also justifies the status of this location as the central place within the whole area.

Similar to Alsa'a square Connectivity graph analysis value, the Integration value analysis has divided the square into two parts. A slight contradiction can be detected within the southern low value area, a small track of high Integration value is marked toward the east (figure 5-6). Furthermore, spaces that have been marked with a medium connection values like Almojama'a

street, Alquds street, and the red rose street, have been marked with a medium Integration value as well. Some spaces with a low connectivity have been marked as highly integrated like Alkasaba theatre while other spaces with medium or high Connectivity value are marked with low Integration like Almaktaba Alelmia Street. In the same regard, some spaces in the area in general represent a high Intelligibility value, where the relationship between the local configurational attribute and the global configurational attribute is covariant. At the same level, other spaces have denoted medium or low values of Intelligibility. Opposing to this idea, some spaces within the whole area of study have demonstrated a contradictory relationship between the two Intelligibility attributes, the Connectivity and Integration values. Some spaces that have been marked as highly integrated spaces have demonstrated a low Connectivity values, whereas some other spaces with a low Integration value have represented a high Connectivity values. These notes bring up the concept of local to global, the part to the whole relationships. Space Syntax Analysis theory brings a significant covariant relation between the Connectivity attribute value and Integration attribute value which is demonstrated with the Intelligibility value. Based on the theory point of view, spaces that are highly integrated to the whole system on the global level should be highly connected. While according to the conducted analysis in Ramallah City Center, some spaces that have low connection on the local scale are strongly integrated to the whole system.

In spite of the high Intelligibility value that has been given for Almanara roundabout, the area has been marked with three different Visual Entropy values (figure 5-7). This demonstrates the unorganized nature of the spaces. Within the same value, Alsa'a square represents two different values; a high Visual Entropy value area, and a low value area. This brings up the nature of the square's geometry in addition to the locational characteristic as important attributes for the detected contradiction there. Eventually, both Alirsal Street and Alquds street have been marked as highly Visual Entropic spaces that are highly structured (figure 5-7) and as small private/intimate places (figure 5-2).

The insights on Ramallah City Center space structure analysis can be summarized into two main levels as follow:

5.3.1 EMPIRICAL REMARKS ON THE SPATIAL CONFIGURATION OF RAMALLAH CITY CENTER

The spatial structure analysis at Ramallah City Center has denoted a wide range of Intelligibility values, which demonstrate different levels of capacities for the urban spaces

there. The Intelligibility value through its two attributes assists in establishing a constructive understanding about the spatial relations between the local and the global levels. It shows the potentials and conflicts that lie within each space by going beyond the physical image of the places into the power and divergence values of the spatial structure. These given values illustrate the essential remarks that contribute to more comprehensive definition about the urban form status, and then for setting clear visions for developing the environment within a human dimension. In this rubric, the spatial analysis remarks at Ramallah City Center can be summarized as the follow:

- Almanara roundabout area- the space demonstrates a high value of Intelligibility, where both Connectivity and Integration are highly denoted. The whole space is highly connected with the adjacent spaces; it is a remarkable space for observing, accessing and connecting the other spaces. The space is an open world, and the monument is located in a very visible location. Due to the high visibility of the space, all the elements are highly apparent. Furthermore, the space is highly interrelated to the whole system. Based on its Integration value, the space through its structure performs as the core space of the whole center. In terms of space structure organization, based on the Visual Entropy value, the space is less organized.
- Alsa'a square area- the Intelligibility value in this area has interestingly divided the space into two spaces; the northern part with high value and the southern with low value. Based on this, an obvious split has taken place, between the potentials that lie within each part and their way of mechanism. The northern part is highly connected and integrated; it has the potential to perform as a strong socio-economic hub, where a lot of accessibility and connections are available. While in fact, the space is highly dominated with traffic and chaos. Furthermore, the significant elements, which supposedly, should be located in order to perform as landmarks are all located on the low connected and integrated end. Therefore a sort of conflict can be detected in the space that leads for a clear dichotomy between its two parts.
- Rokab node area- the space has medium connection to the adjacent spaces, while at the same time it is highly integrated to the whole. The space is surrounded by four paths that intersect forming a junction. Apparently, three of these paths have been marked as high connection spaces. This has an influence on the status of the node as a high-integrated space. The node separates Rokab Street into two parts, the eastern and the

western part, where the eastern performs as a high intelligible area and the western as a low value area.

- Rokab Street- the location of Rokab node interrupts Rokab Street and divides it into two segments; the eastern part and western part. Within the eastern part, three highly connected areas are located; the areas are also visually connected to each other and create a hierarchal experience. This phenomenon leads for marking the whole segment as highly integrated area, where the central area of the segment is marked as the highest visible area. Moving into the western part of the street, this area is less connected where the last node, Alnasra junction, has medium connection, and the hierarchal experience as the other part of the street goes not exist. However, the same node in this segment, beside some parts of this street that are close to Alnasra junction have been marked as highly Integrated in a way that demonstrates another time the contradiction between Integration and connectivity attributes.
- Zohiman street, Alquds street and Almojama'a street- these three areas have been marked medium connection to the surroundings, slightly integrated within the whole center and highly organized area in terms of space structure.
- Alirsal Street and Almahkamah Street- they both demonstrate a medium level of connectivity and a mixed level of integration that varies between medium to low integrated areas. These areas demonstrate a high level of organization.
- Almaktaba Alelmia Street- this street in general is marked between high and medium connection, where the open view with Almanara is important for keeping this value. The Integration value ranges between high to medium as well. A kind of disconnection takes place between the street and Rokab Street due to the link paths which perform with low connectivity and low integration values.

Accordingly, it can be argued that Ramallah City Center performed as a highly integrated and well connected fabric. The whole area revolves around three main nodes, Almanara roundabout, Alsa'a square and Rokab node, where Almanara roundabout demonstrates the central part of the area. This triangular area, including the axes and nodes within it, performs as a highly connected and integrated area, while the other areas are less visibly incorporated in the whole fabric.

5.3.2 THEORETICAL REMARKS ON THE SPATIAL CONFIGURATION ON RAMALLAH CITY CENTER

Based on Space Syntax Analysis implications on Ramallah City Center, it can be argued that the method offers a comprehensive detailed view about the spatial structure of the area. Furthermore, the method justifies and explains spatial phenomena at two levels; local and global levels. Interestingly, Space Syntax Analysis theory shows a high ability for explaining the spatial phenomenon at the area of study that is characterized with rapid transformations. However, some insights have shown some sort of contradiction with the other application of the theory. Hence, the following can be concluded:

- The theory performs with a high efficiency for defining and explaining the capacity of the spatial structure through investigating the powerful and divergence potentials that lies beyond the spatial structural relationships. The method has the capacity to bring the existing potentials of each space that strongly impact the human behavior within the physical environment.
- The application of the method on some spaces in Ramallah City Center have demonstrated a level of contradiction with the case addressed in Space Syntax Analysis literature regarding the relationship between the two Intelligibility value attributes. Space Syntax literature has demonstrated a covariant relationship between Connectivity and Integration, while the application of the method on Ramallah City Center marked some contradictions in some locations where a low connected space has been denoted as a high integrated space.
- The method shows a strong ability in defining the way that urban fabric has been structured in, and the logic of spatial composition. In the case of Ramallah, the method defines the core area, the triangular area, and the interrelations between the spaces on the whole system.
- Since the method is able to define the high connected and integrated spaces, it illustrates a quality performance in allocating socio-economic activities. While, the method still seeks the ability to contribute to the socio-cultural attribute that has to do with emotional interaction facilities.
- Similar to the previous point, the method presents the quality for analyzing spatial structures, in relationship to the entire potentials. While it seeks the link with the behavioral patterns of use. Alsa'a square presents a clear example on this, where the method shows the high potential and the low potential areas, with the conflict between

them, the method is not able to detect the actual conflict in the use of the space for seeking a three dimensional and human illustration view.

The outcome for applying Space Syntax Analysis in Ramallah City Center has shown a certain level of compatibility with such cases. However, some contradictions and gaps have been detected within this experience. Hence, there is a need for bridging these gaps through adopting a complementary theory, which is able to measure the noted points that Space Syntax Analysis failed to explain and that can accommodate the theory for a high level of suitability in cases such as Ramallah City Center.

5.4 SUMMARY

The Study has adopted Space Syntax Analysis as a second method for analyzing Ramallah City Center and bringing further visions that could enrich and go beyond human-environment relationship in order to humanize the area. Applying such a method based on the application of the Depthmap software that is able to produce a visual integration plan for architectural and urban spatial systems. The study adopts the Depthmap for determining both the Intelligibility value attributes; Connectivity and Integration values. The two attributes are connected to other sub-attributes like the Clustering Coefficiency, Control, Controllability, Mean Depth and Visual Entropy. Running the visibility analysis graph depends on two different maps that have been set in order to accommodate the Connectivity and Integration attributes requirements. The application of the method in Ramallah City Center has shown the area as a high connected and integrated area. It illustrates the logic of the spatial composition there; where a core area revolves around the triangular shaped zone, composed from Almanara roundabout, Alsa'a square and Rokab Node, and the area and links between them. Almanara roundabout has been assessed as the core space of the whole area. The analysis has denoted that other spaces out of the core triangular area were less intelligible spaces. Other notes have been detected such as the apparent division of Alsa'a square, the impact of the connectivity segments on the Integration value at Rokab node and the role of the same node in dividing Rokab Street into two parts and influencing its Intelligibility values. Eventually, the study has brought important observations regarding the application of Space Syntax Analysis on Ramallah City Center and thus the similar cases at the theoretical level. It has shown the ability of the theory in explaining the potential of the space structure, the powerful side of giving socio-economic suggestions for space use, and mechanism of spaces' composition. However, the implication of the method presents another level of contradiction between the connectivity

and integration values, beside the gap in defining the spatial phenomena on the basis of behavioral patterns of use. Significantly, the outcome of applying Space Syntax Analysis on Ramallah City Center brings important insights that will be farther enriched by comparing them to the outcome of the first analysis stage, the Mental Mapping analysis. This supposedly will broaden the tools and methods for detecting the existing conditions in area of study, and explaining and opening new horizons in the theoretical sphere of the two theories.

Figure 5-1: Ramallah City Center Connectivity Graph Analysis

Figure 5-2: Ramallah City Center Clustering Coefficiency Graph Analysis

Figure 5-3: Ramallah City Center Control Graph Analysis

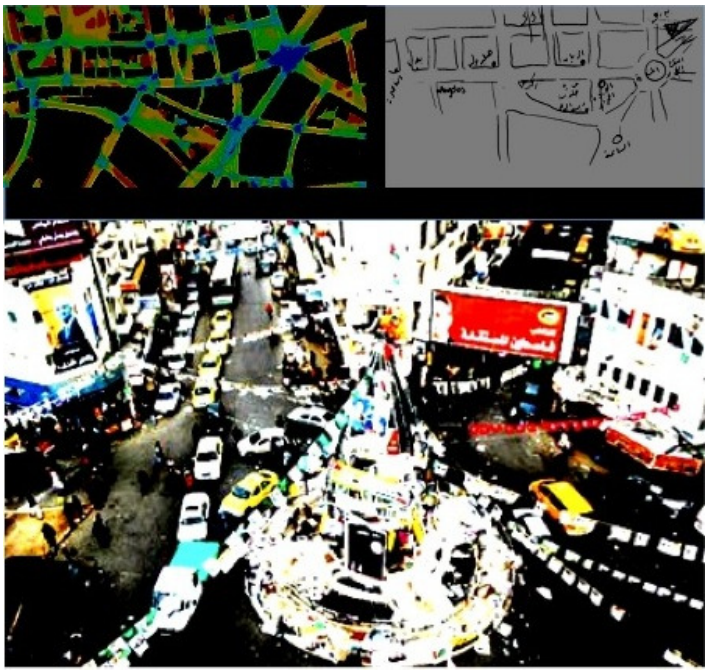
Figure 5-4: Ramallah City Center Controllability Graph Analysis

Figure 5-5: Ramallah City Center Integration Graph Analysis

Figure 5-6: Ramallah City Center Visual Mean Depth Graph Analysis

Figure 5-7: Ramallah City Center Visual Entropy Graph Analysis

Figure Below: Down-Almanara roundabout as the heart of Ramallah City Center. Up- two figures for the urban form analysis process at Ramallah City Center. (Source; researcher)



CONCLUSION & OPEN THOUGHTS

CHAPTER SIX- CONCLUSION & OPEN THOUGHTS;

SPECULATING RAMALLAH CITY CENTER URBAN FORM; CONCLUSION & OPEN THOUGHTS

"The problem is to extract an expression like "language of the city", from the purely metaphorical stage"

(Roland Barthes 1967: 415)

Compiling an urban model that is capable of investigating the urban form attributes at Ramallah City Center, and coping with the distinctive characteristics of this case as a rapidly transformed area, is the core concern of this dissertation. Based on the dissertation's theoretical argument, this model should give new theoretical and applicable insights in order to bridge the gaps between planning and urban design, where the human-environment relationship understanding is the fundamental base for humanizing the city, and where city planning is understood as a big scale architectural work. In this rubric, the dissertation adopts two urban form theories, Mental Mapping and Space Syntax Analysis. The addressed literature has introduced the two theories and the relationship between them as a vital matter for exploring the human-environment relationship "*The relationship between spatial configuration and spatial cognition is an important issue in understanding the relationship between human beings and built environment*" (Woo Yun et al 2007: 049-01). The ongoing efforts for combining the two theories together have presented Mental Mapping as an important component for its ability to provide the three dimensional image that constructs the basis of human taken actions (Wang et al 2007: 048-03) on one hand. On the other hand, Space Syntax has been suggested to address the limitations of Mental Mapping and go beyond that by investigating the configurational relations of spaces (Kim & Penn 2004: 483-504). The dissertation takes these efforts farther step by the attempts of building a new urban model, which is tested on the bases of the distinctive characteristics of Ramallah City Center case. Eventually, the outcome of employing these methods as one urban model at Ramallah City Center brought up new thoughts that have the potential for developing the area's urban form, and generalize farther reflections on the theoretical level.

6.1 GENERAL SYNOPSIS

Urban form transformations and its relationship to the sensuous environment in Ramallah City Center have been studied extensively. Based on the built urban analytical model, the dissertation emphasizes on the analytical stage for understanding the existing conditions, and then building a good base of knowledge, as a fundamental step for urban design. The employed model succeeded in bringing potential insights, regarding the physical elements and the spatial structure, for revitalizing the decline of Ramallah City Center urban form and city image. Such employment enriches the dissertation with potential means for humanizing the area of study. Furthermore, important remarks have been denoted on the theoretical level regarding the

proposed urban analytical model and its compatibility with areas of rapidly transformed structures as Ramallah City Center has been characterized.

Based on the Mental Mapping analysis outcome, the method demonstrates high compatibility as an evaluative method in such areas; however some gaps have been detected within this employment. The area has been evaluated as a low-legible area. The whole area has been considered chaotic and crowded, where organization in terms of elements' and zones is highly needed. The elements are structured abruptly; areas are very dense and less integrated with pleasure feelings. The density of the area is the main reason for choosing elements as distinctive. Function plays the core role for the high density of the area. The area has been divided into six zones, where Almanara roundabout presents the highest legible zone with low degree of vividness. Rokab node zone has been evaluated as highly legible too, while the other zones have been denoted as non-legible. On the theoretical level; some zones show opposition to the legibility criteria; vividness, density, rigidity and distinction. While some elements and zones have been chosen distinctive in spite of their low potential form characters. Most importantly, the method is able to predict the capacity of each space individually.

Shifting into Space Syntax Analysis, the method orchestrates the definition of the spatial structure values in the area, yet some gaps and contradictions have been raised too. The area in general demonstrates a high level of Intelligibility. The method was able to define the structural pattern of the area of study, the /triangular structure. Again, Almanara has been denoted as a high intelligible zone, and then comes Rokab node and Alsa'a. The other areas demonstrated a lesser degree of Intelligibility. However a degree of contradiction has been denoted between the intelligibility attributes; connectivity and integration. In addition, the method demonstrated gaps in interpreting the spatial analysis into socio-cultural bases.

Important gaps have been detected in the implementation of these two theories within the characterized area. Hence, the dissertation escalates the combination of the two theories in one theoretical model. Such combination brings up results as shown in the next section.

6.2 OPEN THOUGHTS; COMBINING THE TWO THEORIES

This section provides insights about the way the two methods come together and orchestrate an urban analytical model that can be applied on rapidly transformed areas. The

results below are open thoughts about Ramallah City Center urban form that can be interpreted in different ways and can enrich the design process.

6.2.1 CONNOTATIONS ON RAMALLAH CITY CENTER URBAN FORM

The combination of the two theories into one urban model has denoted the Legibility and Intelligibility values of the center. Hence, Ramallah City Center has demonstrated a contradictory value; the whole area has been marked as low legible, while at the same time it has been denoted as a high intelligible area. In general, the spatial structure is considered as an organized pattern, while a substantial consideration has been given to the physical elements that shape the environmental image. Points like the distinctive elements locations, the chaotic image, the unorganized structures and the huge and inhuman massing have been escalated.

Remarkably, Mental Mapping method divided the area into six zones that reflect the local level recognition of the area, while Space Syntax elaborated the mechanism of these zones on the global level. Based on Space Syntax Analysis, a triangular zone emerged between three zones and the links that connect them together; Almanara roundabout, Alsa'a square and Rokab node. The area between these zones have marked a high level of intelligibility, where spaces are highly connected together and well integrated into the system as a whole. While the outskirt zones have been marked with middle degree of intelligibility (figure 5-2 & figure 5-7).

In terms of local zones values, Almanara roundabout has been denoted both as high legible and intelligible zone. The area is very dense, and the elements are very distinctive. This can be justified with the high integration value of the space that attracts more circulation, and the high-connected location to the adjacent spaces, which makes it highly visible. However, employing mental mapping at this space denotes a low level of vividness, which indicates a low level of enjoyment within this zone. Alsa'a square elements are highly distinctive, while the zone has been marked with low rigidity, density and vividness degrees. Focusing the lights on Space Syntax attributes, a kind of spatial division can be detected here. Interestingly, the space has been marked with two intelligibility values: high north and low south. Distinctive marked elements are located within the low intelligible part, while the high intelligible part was missing on the users Mental Map. This division led for the low attraction value of the space and showed its unorganized structure. The third triangle pole, Rokab node denoted a high level of legibility and intelligibility. The high intelligibility value of the zone influences its high density; the zone has been marked as a vivid space. However, the zone recorded a low level of

rigidity and low distinction value. Considering the links between these three zones, the eastern part of Rokab Street denoted a high level of vividness and density that are enhanced with the high connectivity and integration values within this segment. The most dense, vivid and distinctive elements were located within the highest intelligible value spots. However, the street showed a low level of rigidity. Alomara Street marked a high value of legibility and intelligibility, while Zohiman Street marked the weakest value within this area with a middle value.

Moving toward the outskirts of the area, Almaktaba Alelmia Street has been noted as something on the backstage of Rokab Street. In spite of the high intelligibility value of the area; the area has been marked as low legible. Shading the lights on the Connectivity and Integration values graphs (figure 5-2 & figure 5-7), the links between this area and Rokab Street are low intelligible, this isolated the area from the whole fabric. The western part of Rokab Street showed medium and low levels of Legibility and Intelligibility, the same value has been given to areas like Alquds Street, Almojama'a Street, Alirsal Street and Almahkamah Street. Significantly, Alirsal Street and Alquds Street presented high levels of rigidity, while the farmers market has been marked as a negative chaotic place.

6.2.2 CONNOTATIONS ON THEORETICAL MODEL; THE TWO METHODS TOGETHER

Employing the two methods at Ramallah City Center has enriched the dissertation with significant connotations on the theoretical level that could add more potential for the ongoing efforts of matching between the two theories; these connotations can be labeled as follows, noting that these insights are confined to the cases with a rapid transformed urban form character:

6.2.2.1 ABOUT THE THEORY

The extensive analysis of Ramallah City Center demonstrated the capacity of the two theories to operate within one urban form analytical model. At the same level as Mental Mapping demonstrated a high capability in evaluating the urban form characteristics and problems, Space Syntax presented a strong ability to analyze the spatial capacities and potentials. Mental Mapping is based on the reality that lies in people's minds from which their actions depart. It all revolves around the physical attributes of the elements, and their impacts on people's behavior. Yet, it is not enough to understand the problem without outlining the

capacities that lie beyond the context and assist in understanding and opening visions. In this rubric, Space Syntax goes beyond these problems to the potential and capabilities that lie within the space. The nature of the theory is based on analyzing reality as exists. The combination of the two theories together allows viewing the human-environment relationship in a more comprehensive manner; within which each of the two theories allows to view the bridge from a different side. The combination of the two theories is a combination between the definition of the problem and the justification of this problem; it is a combination between how people see things and how/why they exist. The conflicts that take place between legibility parameters, like at Alsa'a square, are well justified after demonstrating the spatial capacities of the space. The potentials lying in some segments are highly understood with the spatial capabilities of the same segments. And the isolation of some areas is clearly explained with the intelligibility value of the surrounding spaces.

6.2.2.2 About the Technical Preferences

The dissertation demonstrates a level of interrelationship between the technical preferences that define legibility and the intelligibility. Crucially; this relation is not necessarily an analogous relation, legibility deeply influences intelligibility value, but that doesn't mean each intelligible area is as well legible. Intelligibility is more global, it is marked with the structure of the spaces that is outlined with the huge masses setting; buildings and geography, and it derived and impacted the socio-economic factor. Meanwhile, legibility is deeply influenced, in addition to the spatial and huge massing values, with the small scattered elements that deeply influence the image. Contexts with a rapid transformed image, has witnessed drastic changes on the existing original image, which is composed form the huge massing and spaces, by the addition of the new small elements in abruptly manner, and that is the case in Ramallah City Center. In terms of the relation between the two theories attributes, based on the headed analysis, dense value has been influenced with the integration value, while the degree of distinction has been influenced with the connectivity value. The rigidity degree is associated with the Visual Entropy. However, vividness doesn't show any correspondence with the intelligibility values. Significantly, the suggested model attributes perform highly in defining land use areas.

6.2.2.3 ABOUT LOCAL-GLOBAL RELATIONSHIP

The compensation between the two theories presents a good moves from local into global. Although Space Syntax performed powerfully in demonstrating the two levels, adopting Mental Mapping brought deeper insights on the understanding of the local level attributes. Significantly, and as has been demonstrated by other studies (Hillier 2006: 28), Space Syntax Analysis of the area proved that Mental Mapping navigation in such areas took place on the local level and it had significant interrelations to the global scale. Moving from one space to another promotes people to built a mental image about the space itself, however, according to the applied model; this local image corresponds to the global image of the whole area. The zones that have been defined as high-density spaces are at the same time denoted highly integrated. Furthermore, elements that have been marked as distinctive are associated with the highly connected spaces. This another time demonstrates the relation between legibility and intelligibility; High legible zone should point high intelligibility, while high intelligibility is not necessarily leading to high legibility.

6.3 CONCEPTS & APPLICATIONS IN RAMALLAH CITY CENTER

Based on the headed analysis, the suggested urban form analytical model is essential for revitalizing the decline of Ramallah City Center urban form and for humanizing the area by incorporating human-environment relationship parameters on the area development process. Therefore, adopting a similar model will enrich the planning process with views that can bridge the gap at the design level. It is important to indicate that the proposed model demonstrates a high capability to perform with areas that have the same character as Ramallah City Center area; the model can form the bases for the other same conditions areas. However, the following notes demonstrate some suggested applications.

ON THE GLOBAL LEVEL

The central triangular area should be designed as the hub area. The area's functions should be reconsidered from commercial activities into more mixed high active capacity socio-economic facilities. The triangular area should be less interrupted by traffic conjunctions; means of attracting pedestrians and accommodating their needs within this area should be considered. The three nodes should be developed as the main spaces of the area where

Almanara roundabout facilitates as the hub area; these nodes should occupy recreational, economic and interactive facilities, while the segments occupy commercial activities. The outskirt area should be considered as a ring zone, where other less dynamic facilities can be located. Critically, these zones should be well connected to the hub area; disconnection with the central area is going to be a critical challenge. Since functions play important role in such areas to attract people, this area should integrate a certain level of commercial facilities that reduce the crowdedness in the central area. Furthermore, there is a need to minimize the impact of the huge massing and the overwhelming signs that interrupt the whole center image; the area seeks dynamic, human and meaningful elements that could add more pleasure to the people's experience. Vegetation, water features, and considering the architectural style and identity will improve the image at the center. Eventually, it is important to note that the structure of the space mechanizes positively, therefore any alterations should sensitively consider the spatial structure and its interrelation to the physical elements distributions.

ON THE LOCAL LEVEL

Almanara roundabout has a high legible and intelligible value; yet, the zone's vividness value should be reconsidered. Minimizing the bulkiness of the masses, reducing the unplanned signs and reconsidering the design of the statues are important aspects. Furthermore, the place should integrate more pleasurable elements that enrich its vivid value. The place should mechanize as an integrated junction between the triangular and outskirt zones. A level of detachment between the high intelligible area and the location of the significant elements is demonstrated at Alsa'a square. Accordingly, there is a need to reinstall the statue, and to reduce the overwhelming traffic in the northern part, where pedestrian circulation should be integrated more than the vehicular. Socio-economic activities should be incorporated in this part, while the southern part should incorporate some recreational activities that could attract more people and hence improve its legibility value. Rokab node seeks more organized urban form; significant statues could be installed there. Rokab Street's eastern part should incorporate commercial activities. Rigidity should be improved through considering the signs and architecture style there. Importantly, there is a need to consider the significance of the buildings that are located in the middle part of the street, the high intelligible spots there (figure 5-2 & figure 5-7). Within both, Rokab's western part & Alnasra Junction, recreational facilities can be incorporated. In order to attract more people to the place and improve the area's legibility, the area has high potential to be transformed for a full pedestrian area. There is a

need to reorganize the place and to restructure competitive elements that can facilitate as distinctive attractive elements. Farmers Market needs for more organization that brings more tidiness and pleasure. Alquds, Alirsal, Almahkamah and Almojama'a streets, can incorporate commercial activities with less attraction, like grossary shops, agencies and offices. Almaktaba Alelmia street, should incorporate socio-economic facilities it are important to connect the street with Rokab street through developing the links between the two street with elements and functions that increase their integration to the whole fabric and then reduce the overwhelming capacity over Rokab's eastern part.

6.4 FARTHER STUDIES

The dissertation has opened new questions for farther inquiry in the future. Basically these questions articulate the significant insights that have been brought up through the employment of each theory separately or the combination of them both in one model. Remarkably, it should be noted that these questions revolve around areas that are characterized with rapid transformations.

Primarily, a crucial question has been escalated, which revolves around the capacity of applying mental mapping in areas with rapid transformations. This issue has been brought up based on the contradictory value that has been detected between the legibility parameters at Ramallah City Center. Some zones have been mentioned as significant with distinctive elements, in spite of their low rigidity and density like Alsa'a Square. From one side, the incorporation of Space Syntax gives a convenient justification for this phenomenon. However, another argument can be extended based on the nature of the area as a rapidly transformed area. The rapid change of the physical status of the area could confuse the users' mental image. An intervention could take between the former status of the area and the current due to the fast change on the urban form.

Significantly, the relationship between the two attributes that formulate intelligibility value, Connectivity and Integration is the second topic to be further investigated. The implementation of the theory at Ramallah City Center has detected crucial contradiction in the relationship between local and global levels, which disagreed with the addressed literature. The analysis has noted high integration zones with low connectivity values. Therefore, farther researches on the areas with a similar character than Ramallah City Center are essential.

Eventually, the dissertation brings up a new urban model, which can be incorporated in areas with rapid transformations such as Ramallah City Center. Further studies are suggested to check the difference of employing such a model between areas with rapid transformation character and areas with normal rate development character, and then feed back the theory with supplementary insights regarding the relation between both; legibility and intelligibility. These efforts are significant to incorporate theory as a practical means to improve the urban context.

"*Nothing is as practical as a good theory*"

(*Bill Hillier public lecture at TU-Graz, 2008)*

THE END

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APPENDIXES

APPENDIX I

Questionnaire about Mental Mapping in Ramallah City Center

1. What first comes to mind, what symbolizes the word "Ramallah City Center" for you? How would you broadly describe Moserhofgasse area in a physical sense?
2. We would like you to make a quick map of Ramallah City Center area. Make it just as if you were making a rapid description of the city to stranger, covering all the main features. We don't expect an accurate drawing- just a rough sketch.
3. a. Please give me complete and explicit directions for the trip that you normally take going from home to where you work. Picture yourself actually making the trip, and describe the sequence of things you would see, hear, or smell along the way, including the path marks that have become important to you, and the clues that a stranger would need to make the same decisions that you have to make. We are interested in the physical pictures of things. It's not important if you cannot remember the names of streets and places.

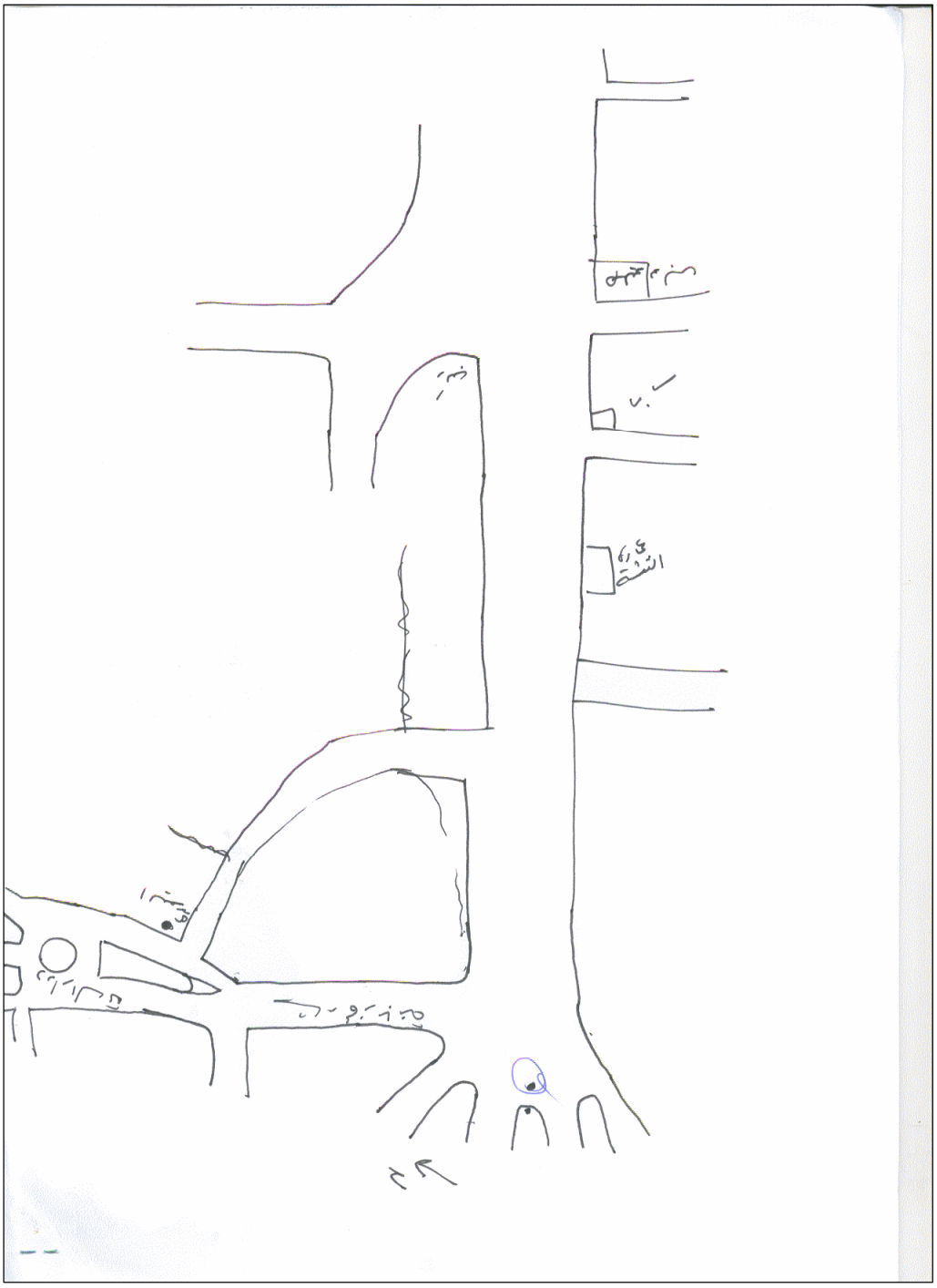
   b. Do you have any particular emotional feelings about various parts of your trip? How long would it take you? Are there parts of the trip where you feel uncertain of your location?
4. Now, we would like to know what elements of the area you think are most distinctive. They may be large or small, but tell us those that for you are the easiest to identify and remember.
5. a. Would you describe ---------- to me? If you were taken there blindfolded, when the blindfold was taken off what clues would you use to positively identify where you were?

   b. Are there any particular emotional feelings that you have with regard to ----------?

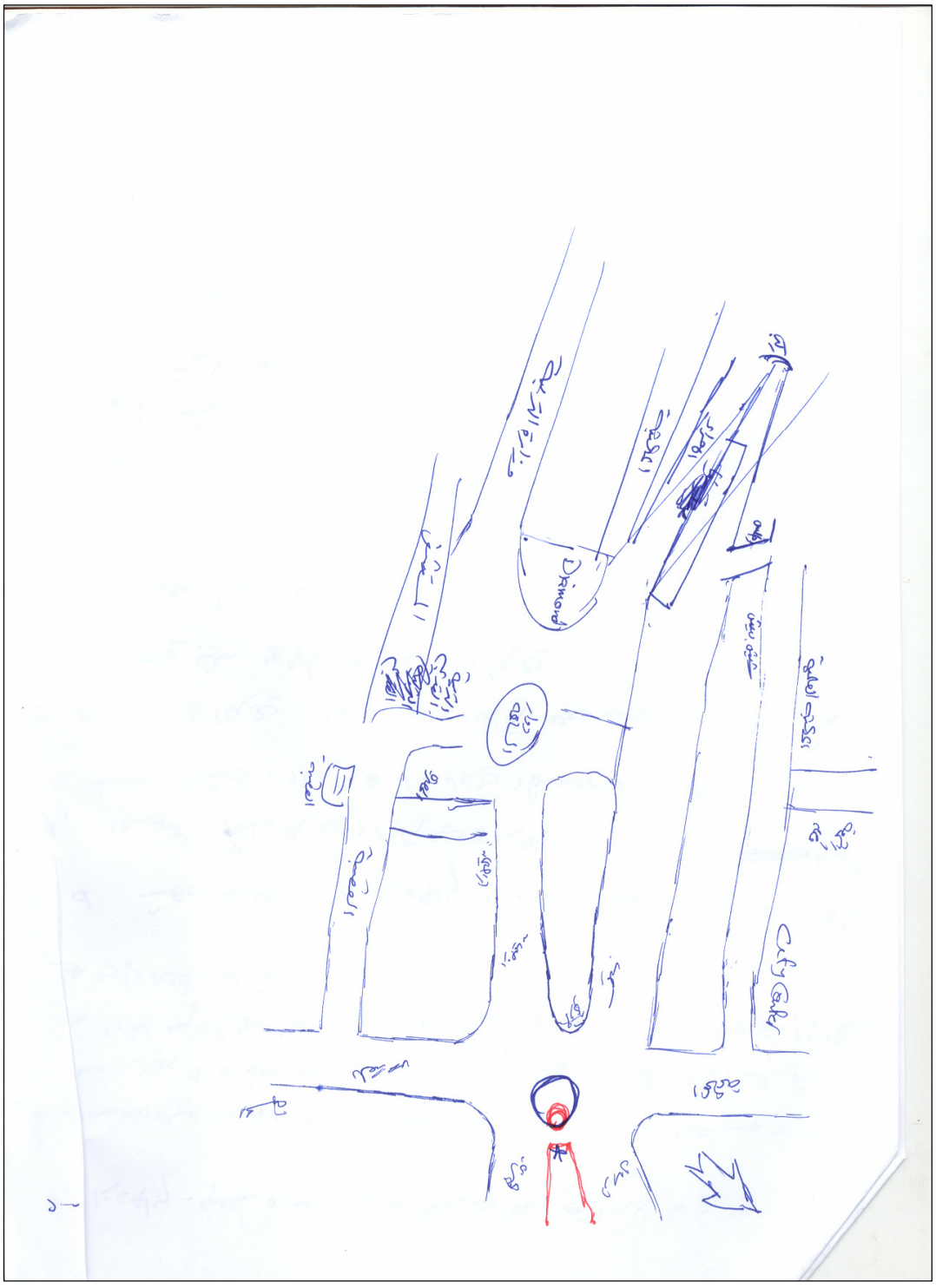
   c. Would you show me on your map where --------- is? (And if appropriate where are the boundaries of it?
6. Would you show me on your map the direction of north?

APPENDIX II

Sketched Maps at Ramallah City Center



Respondent 1 Sketch Map



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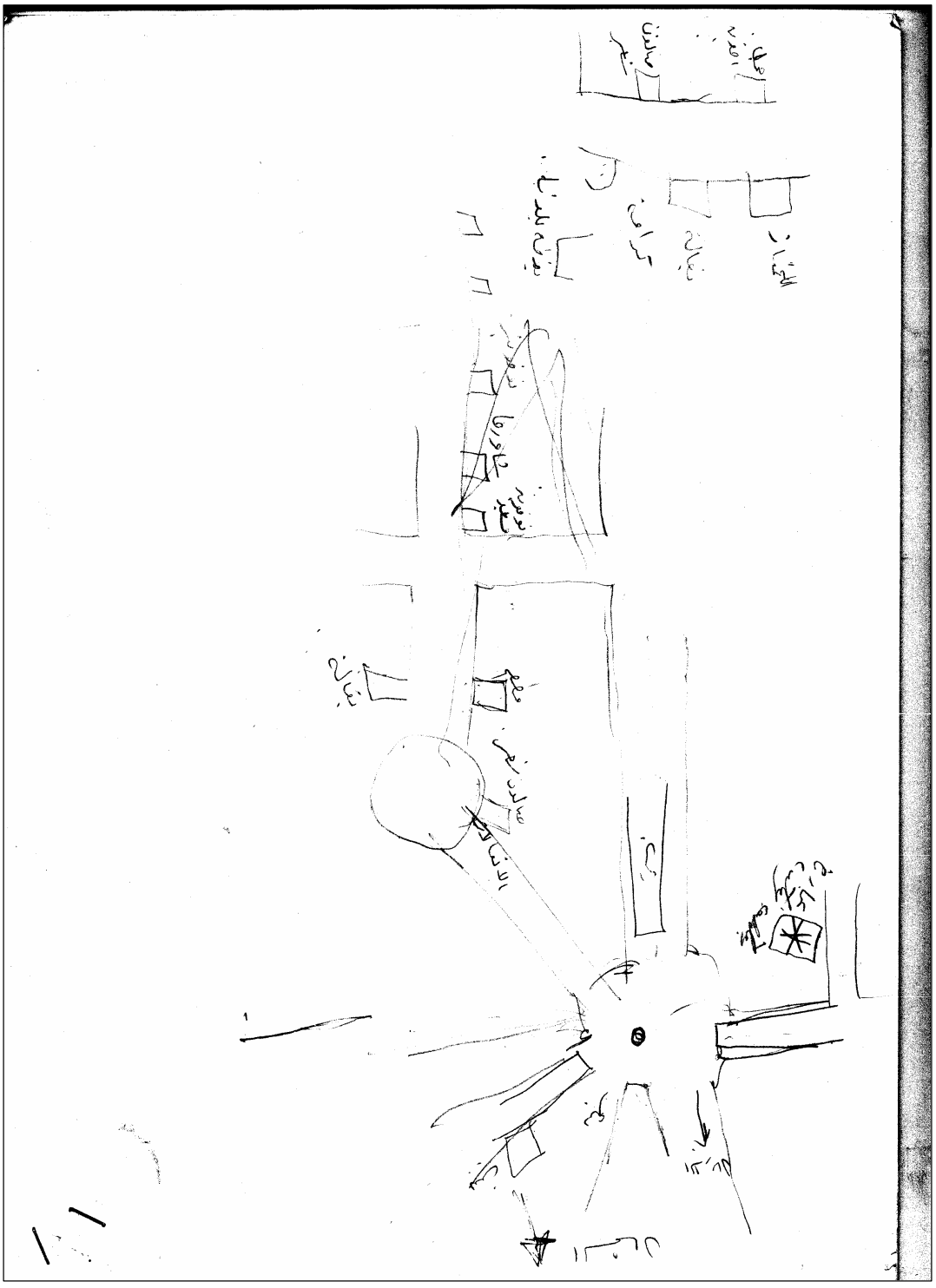

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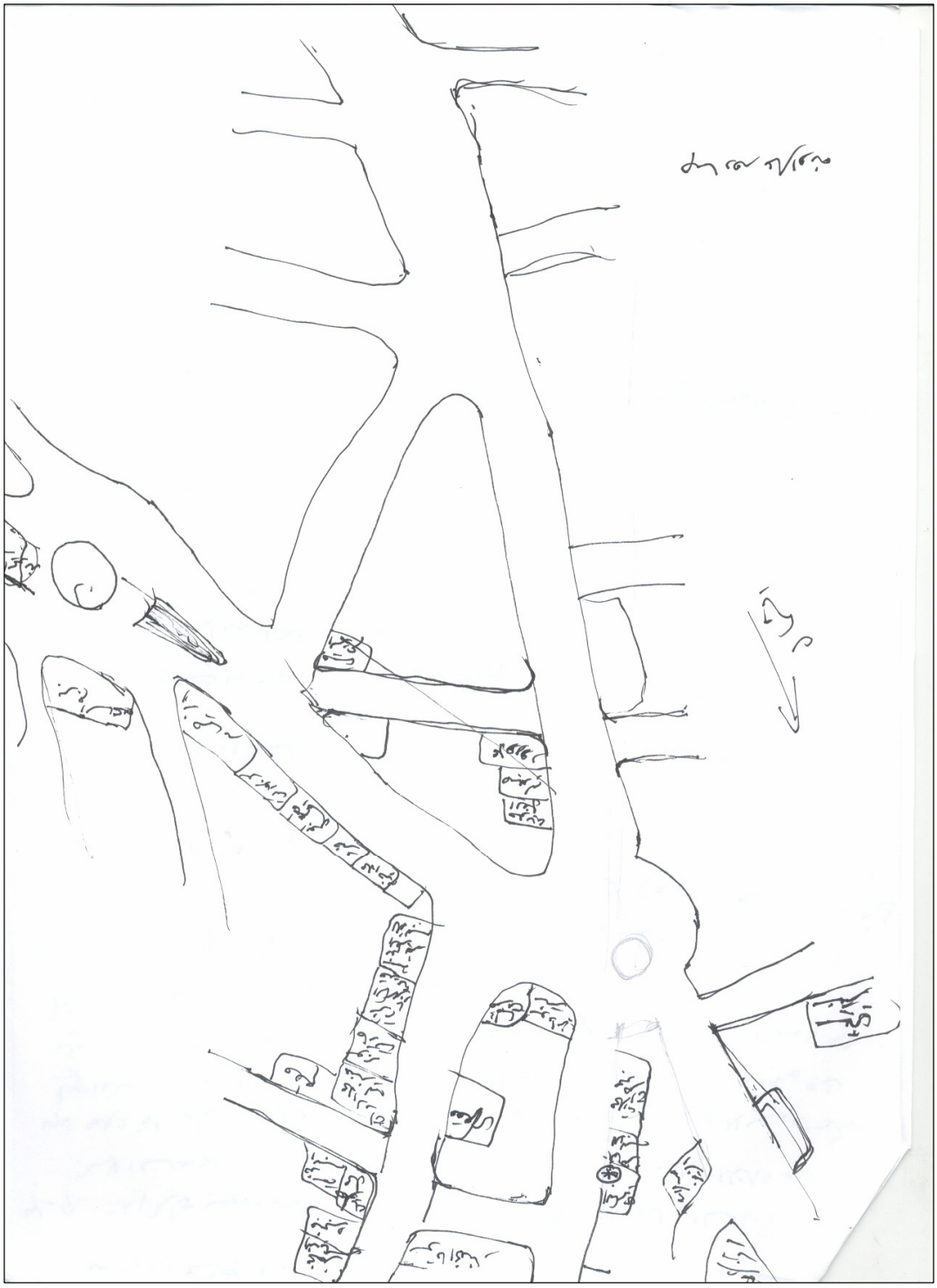

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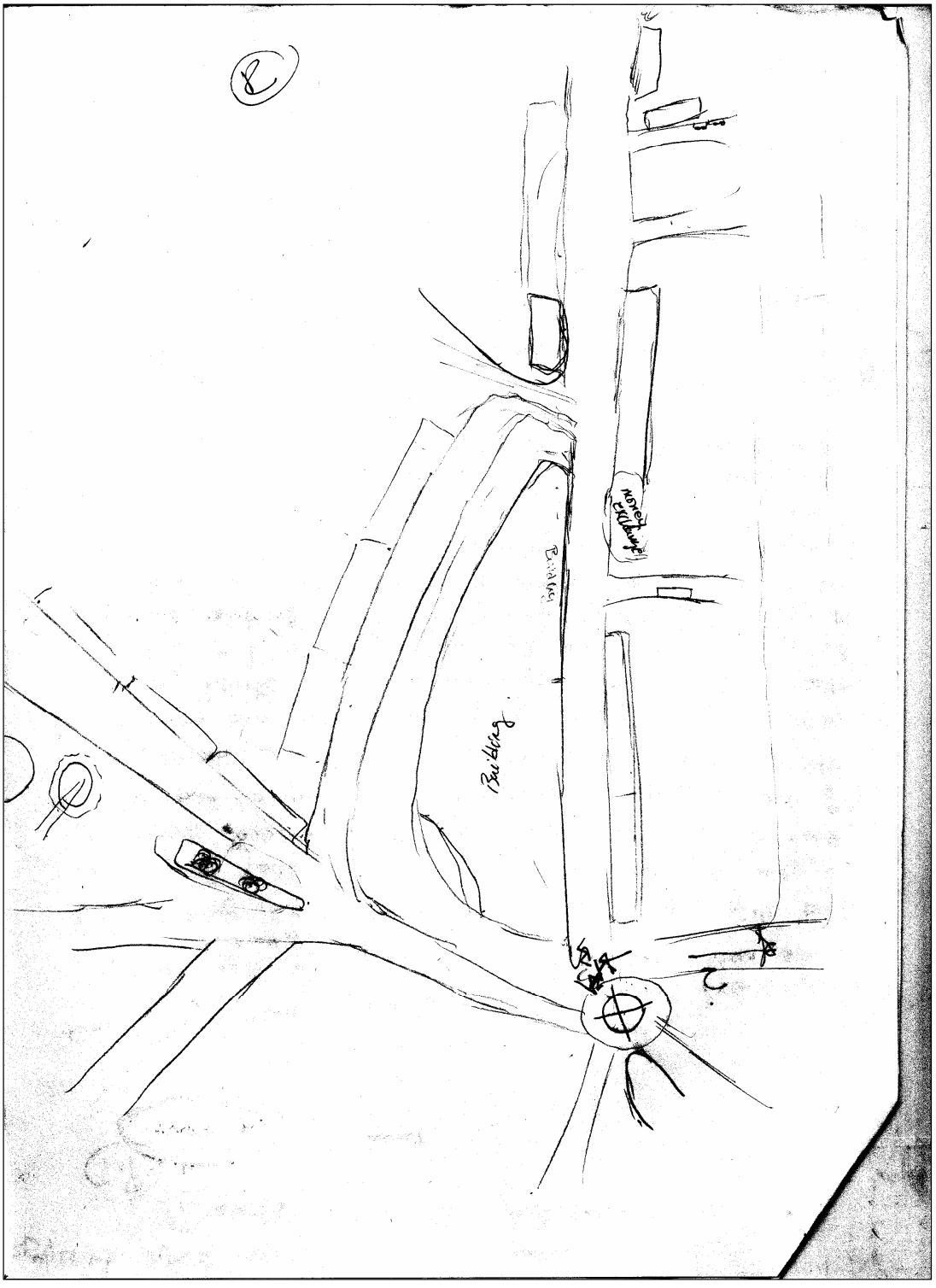

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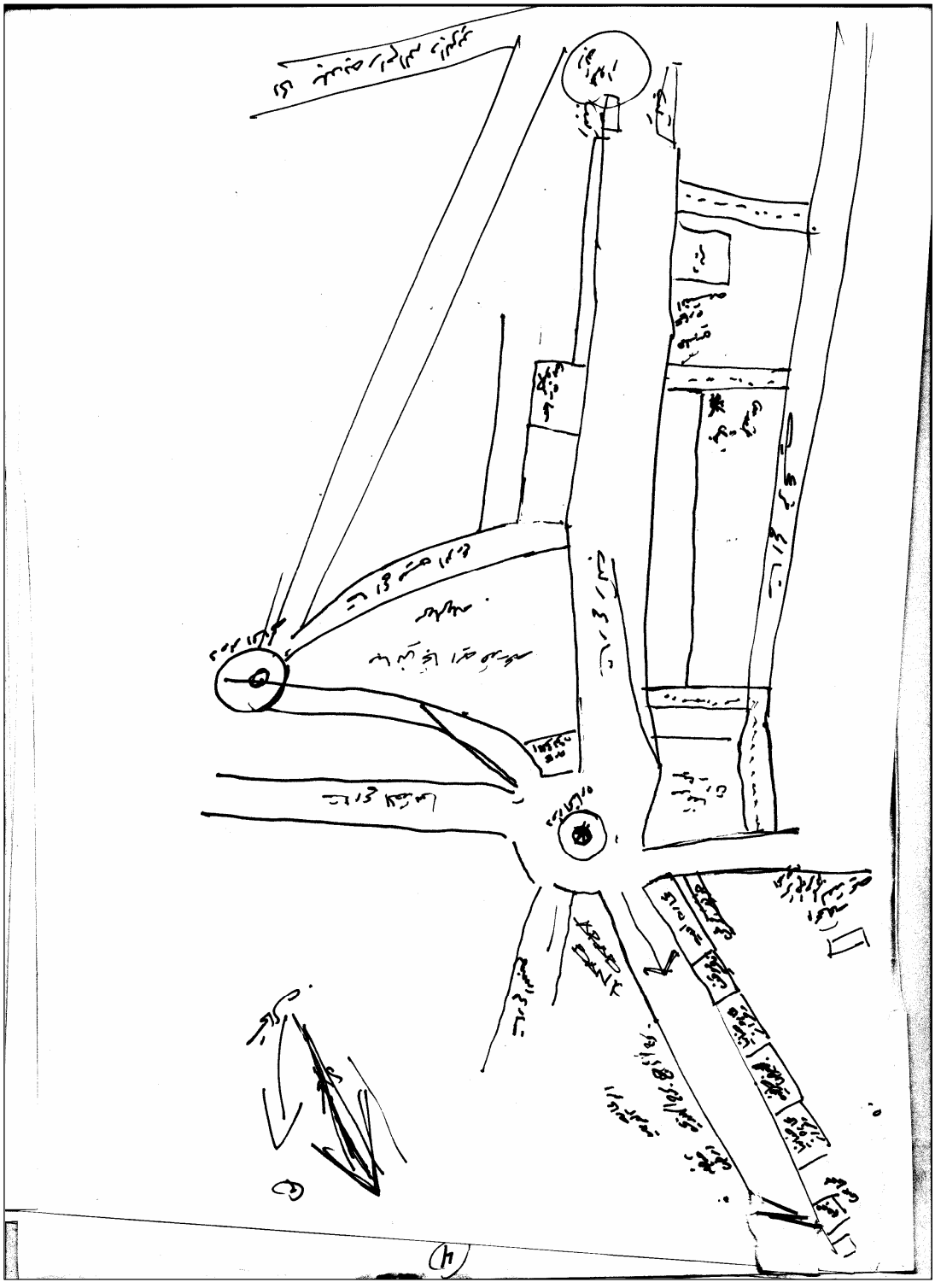
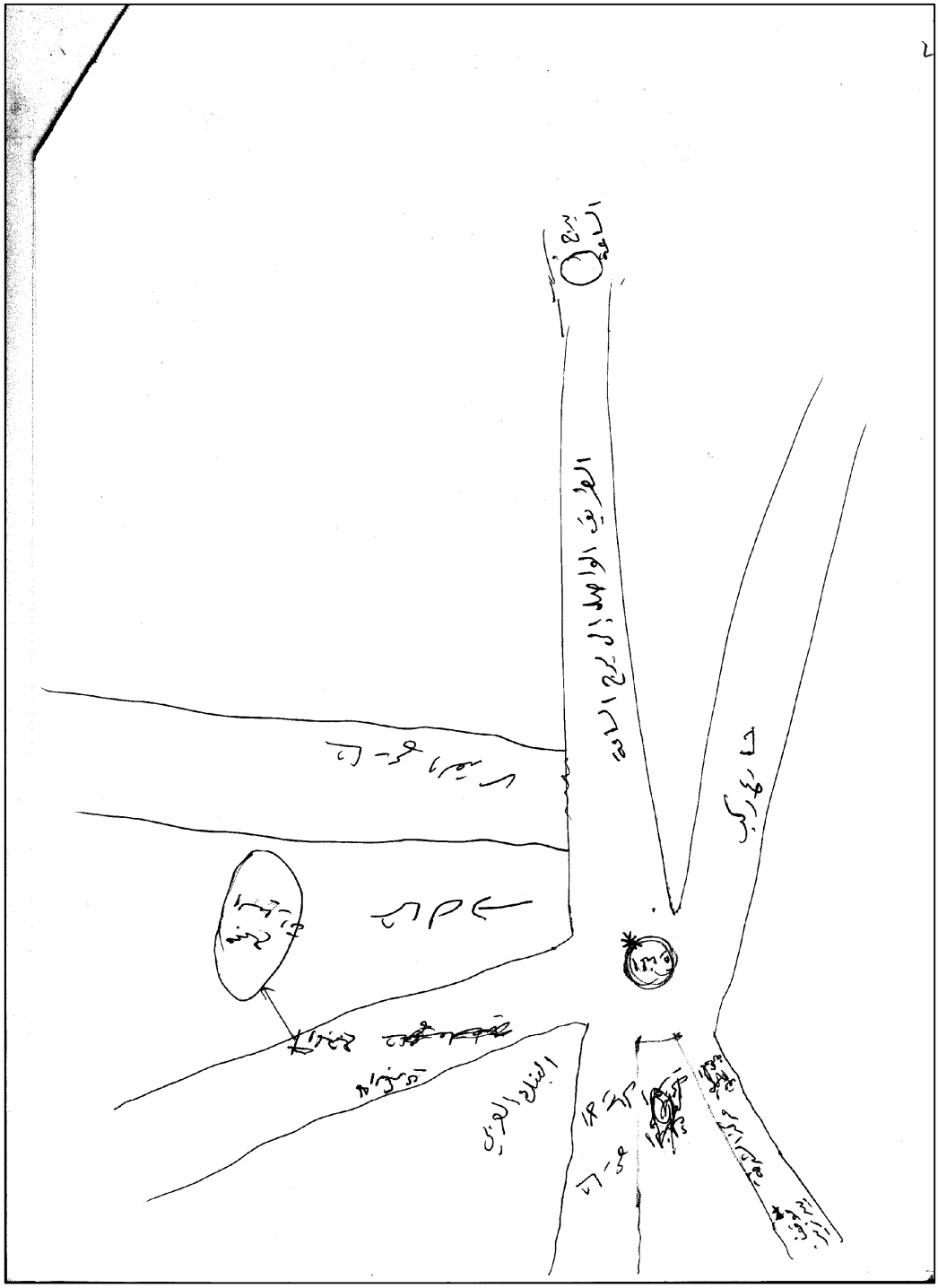


Respondent 6 Sketch Map

Respondent 7 Sketch Map



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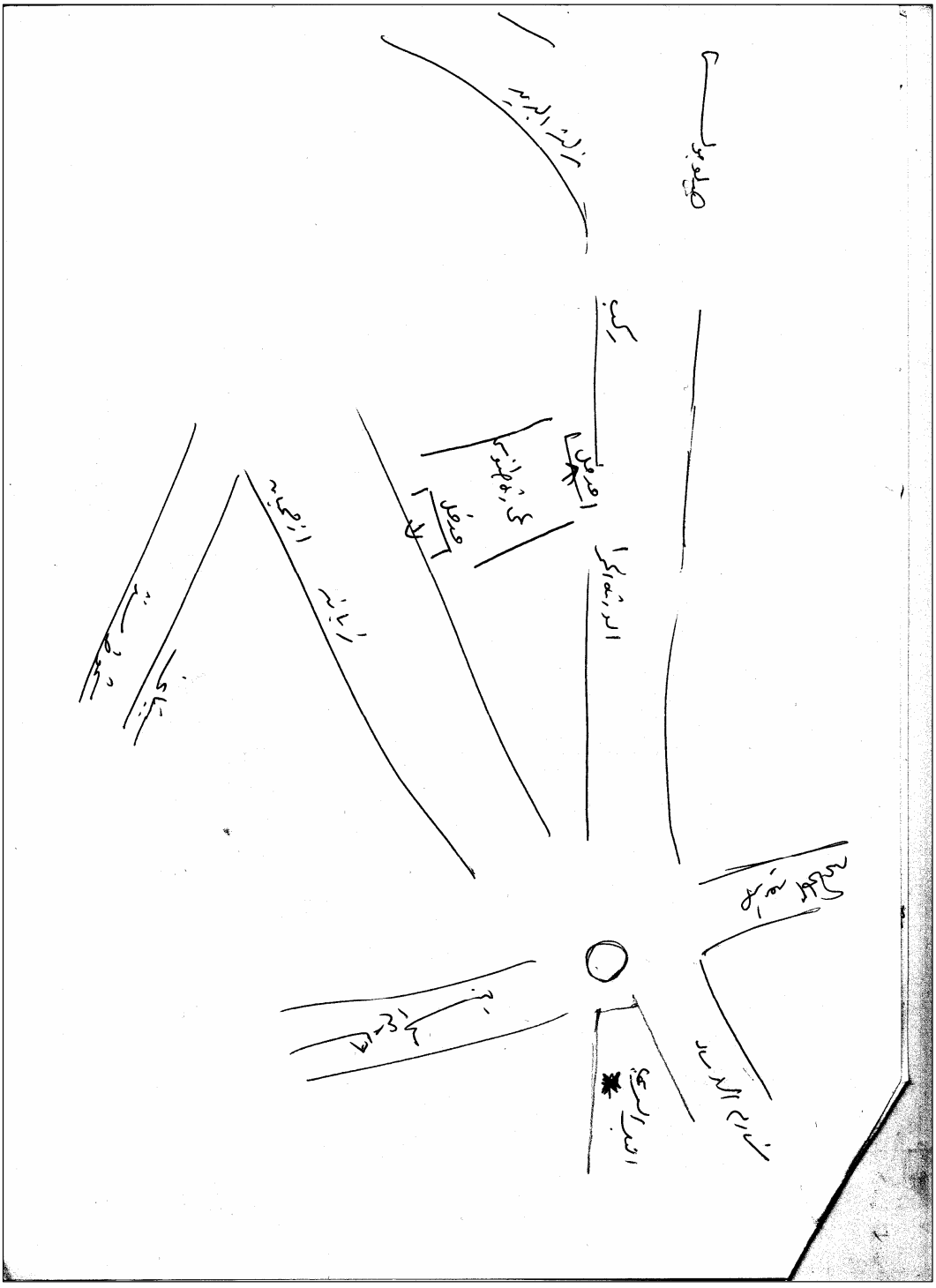

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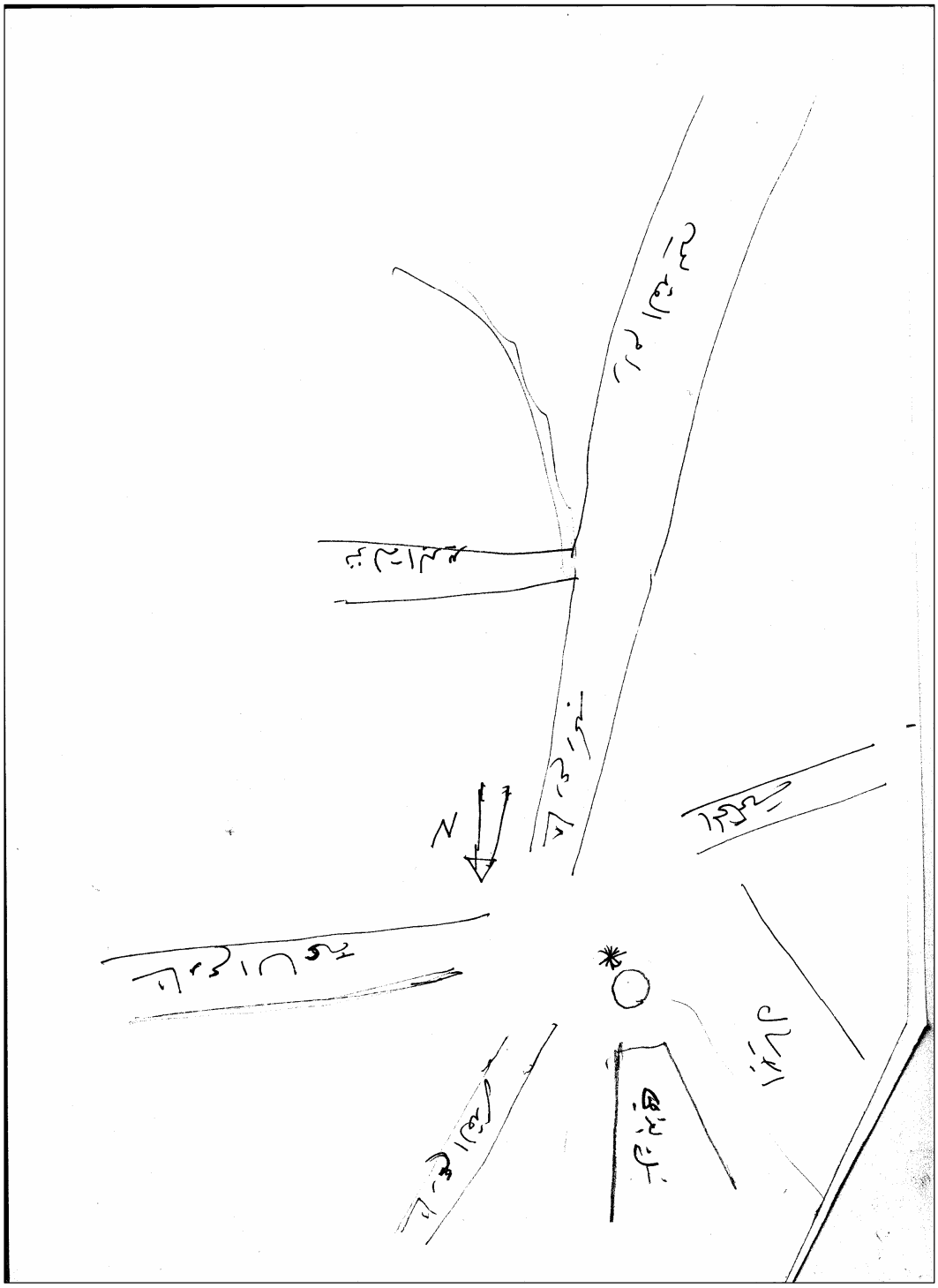

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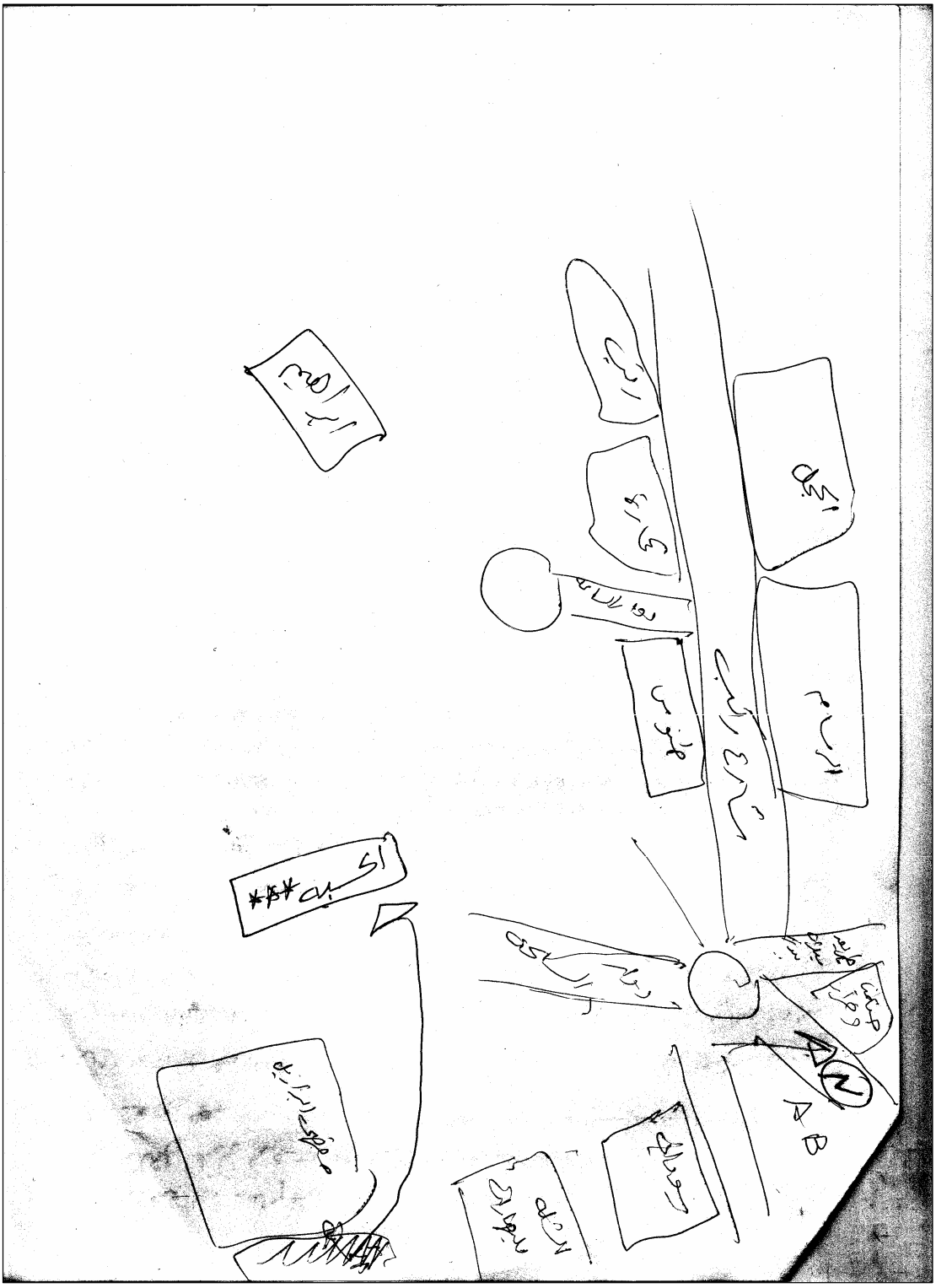

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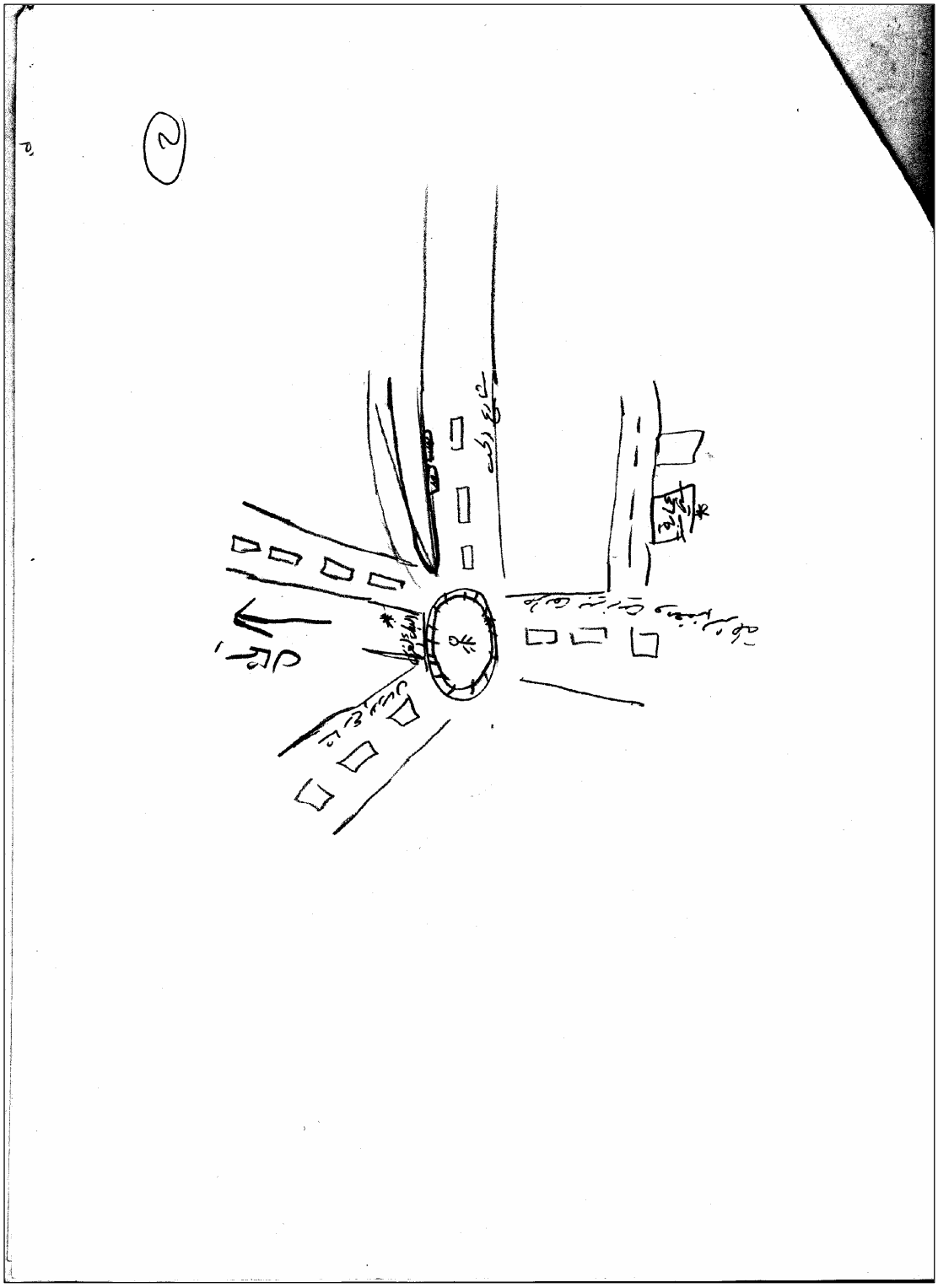

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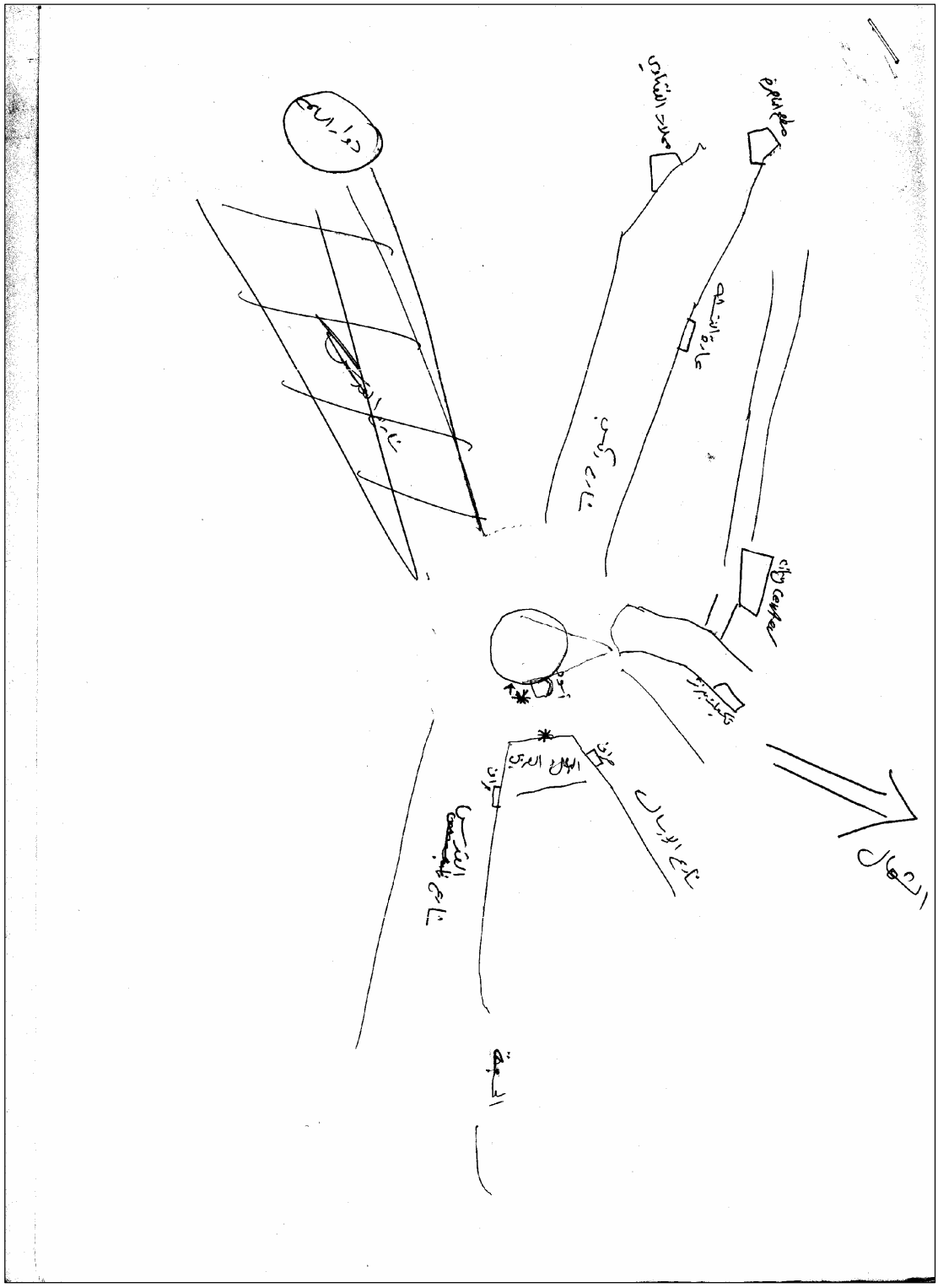

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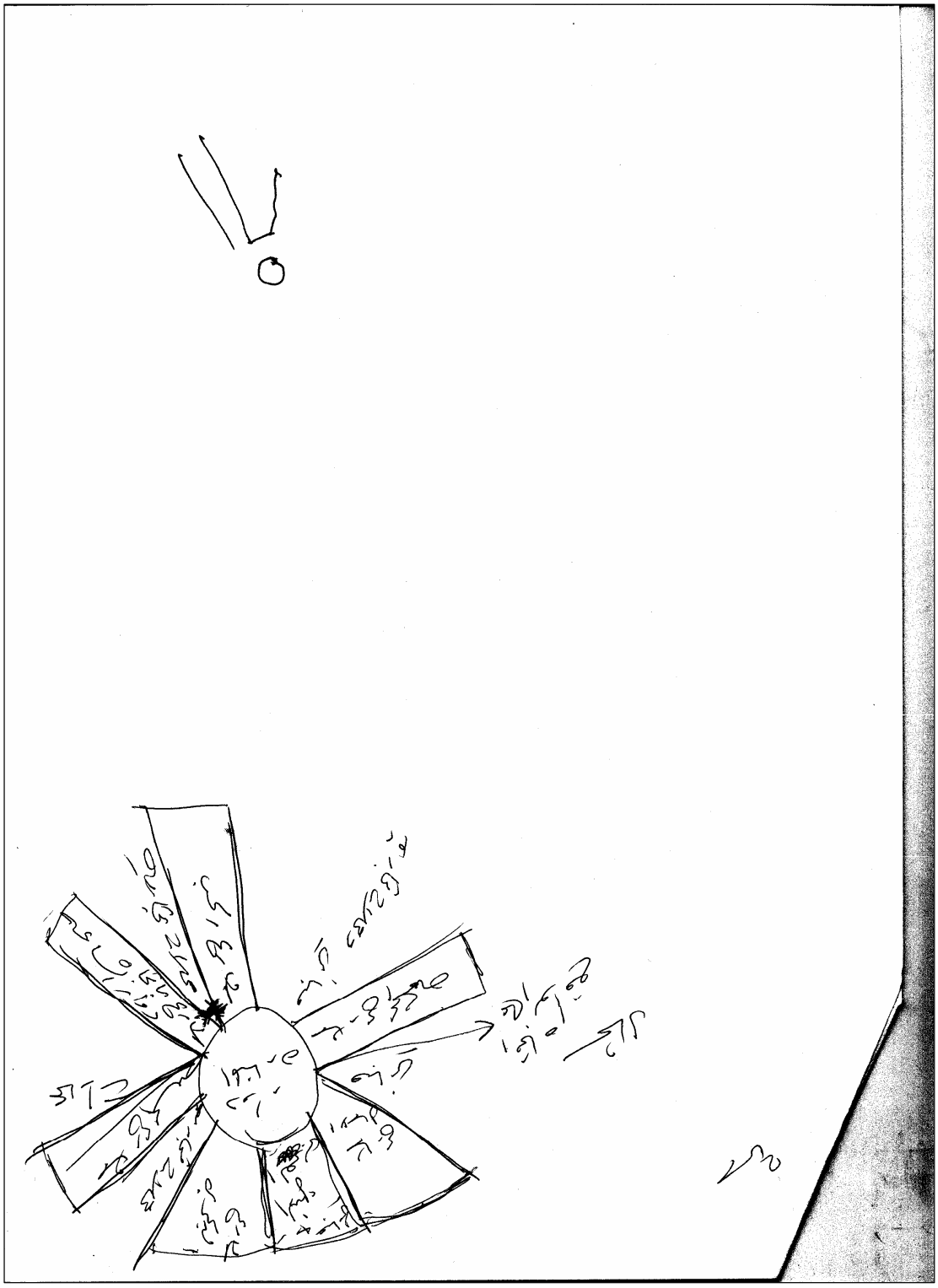

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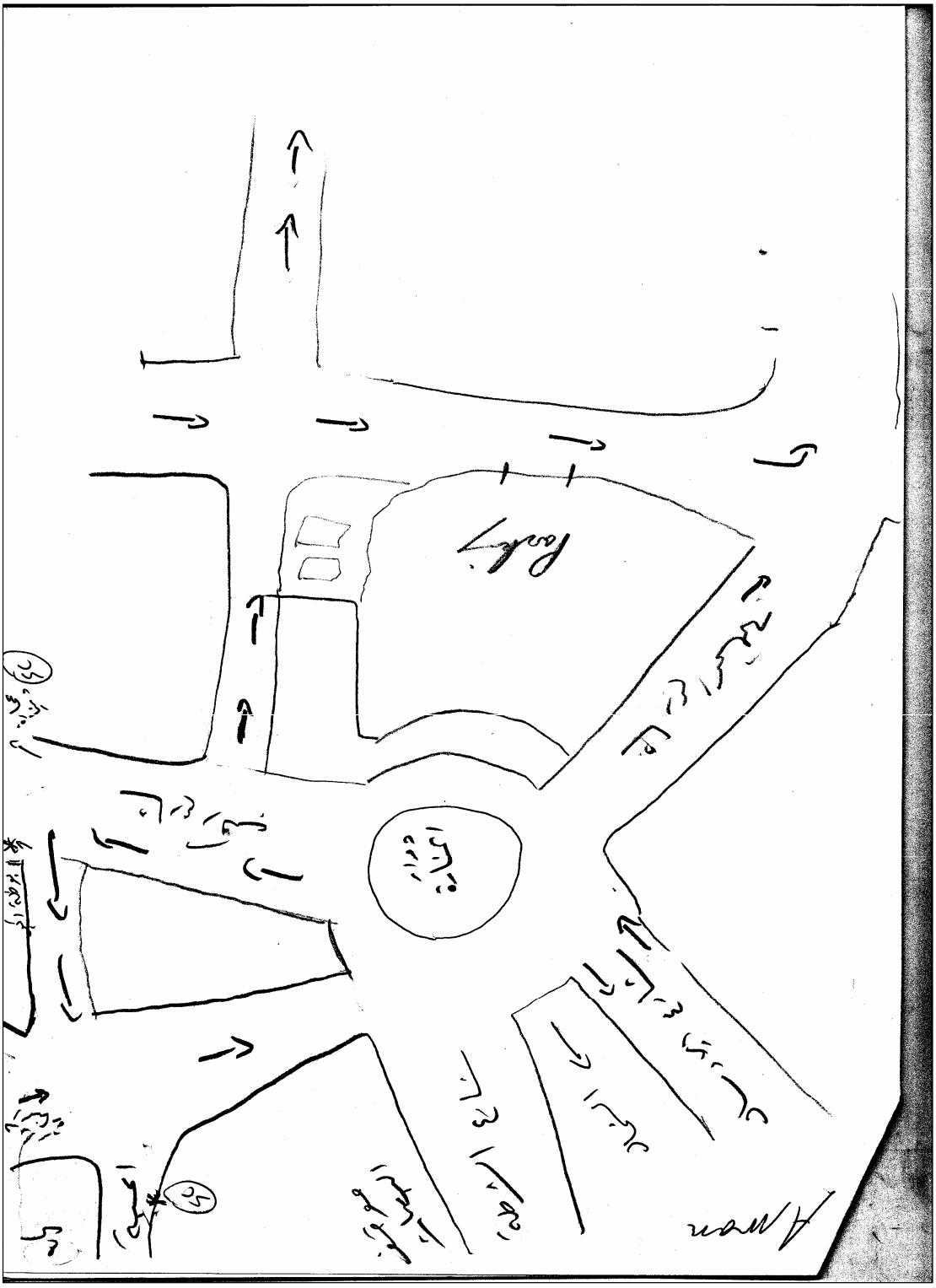

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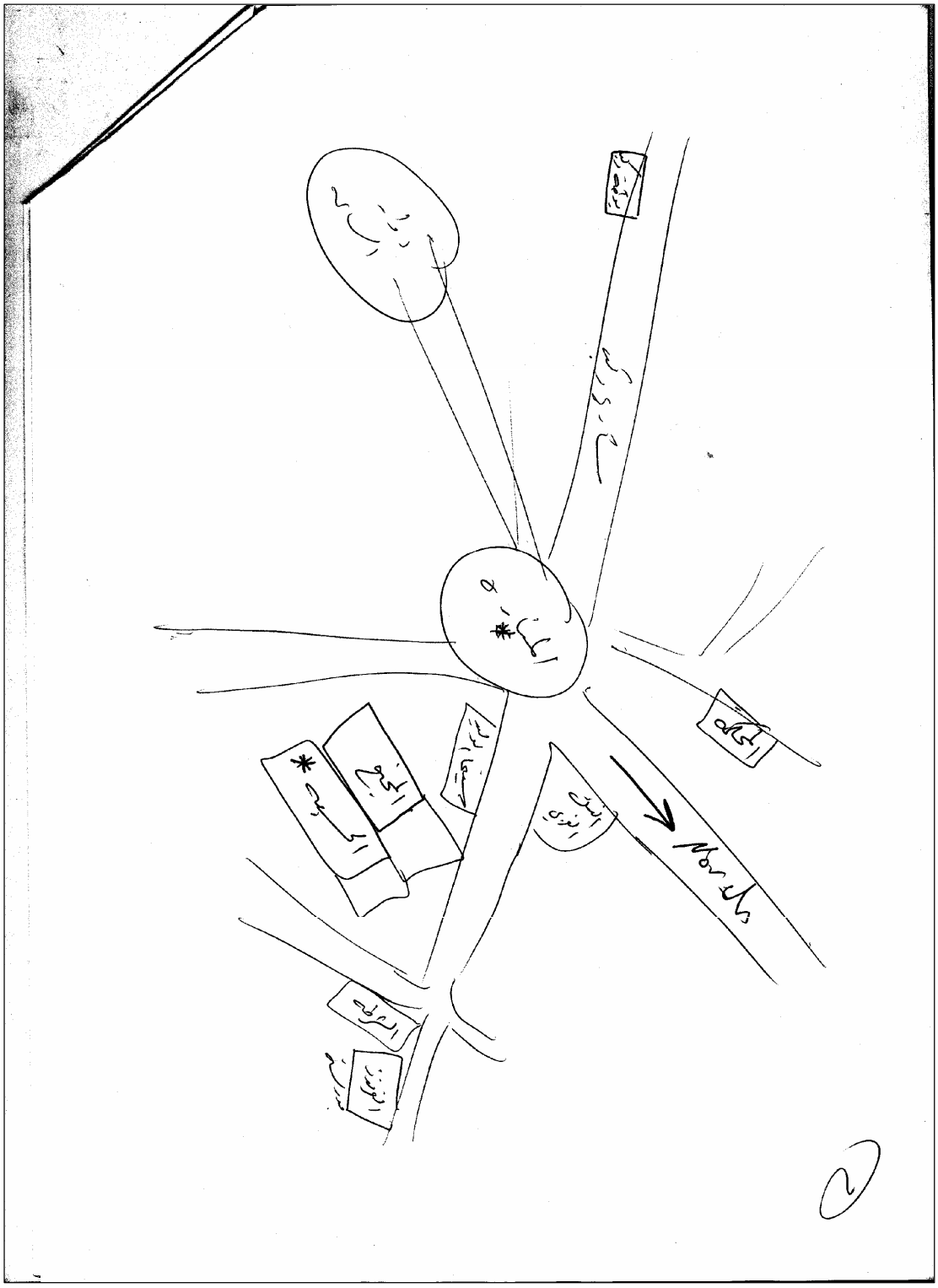

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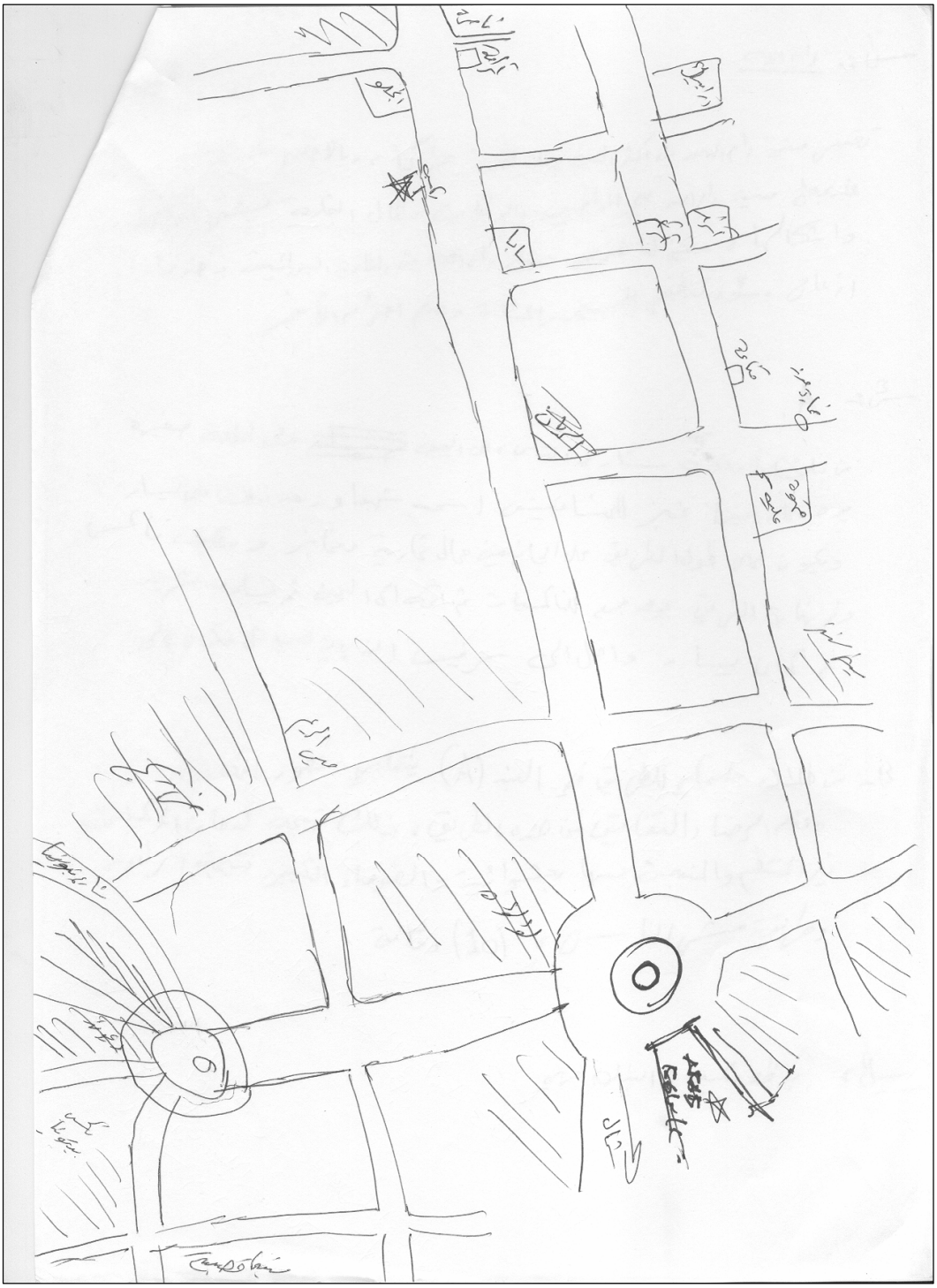
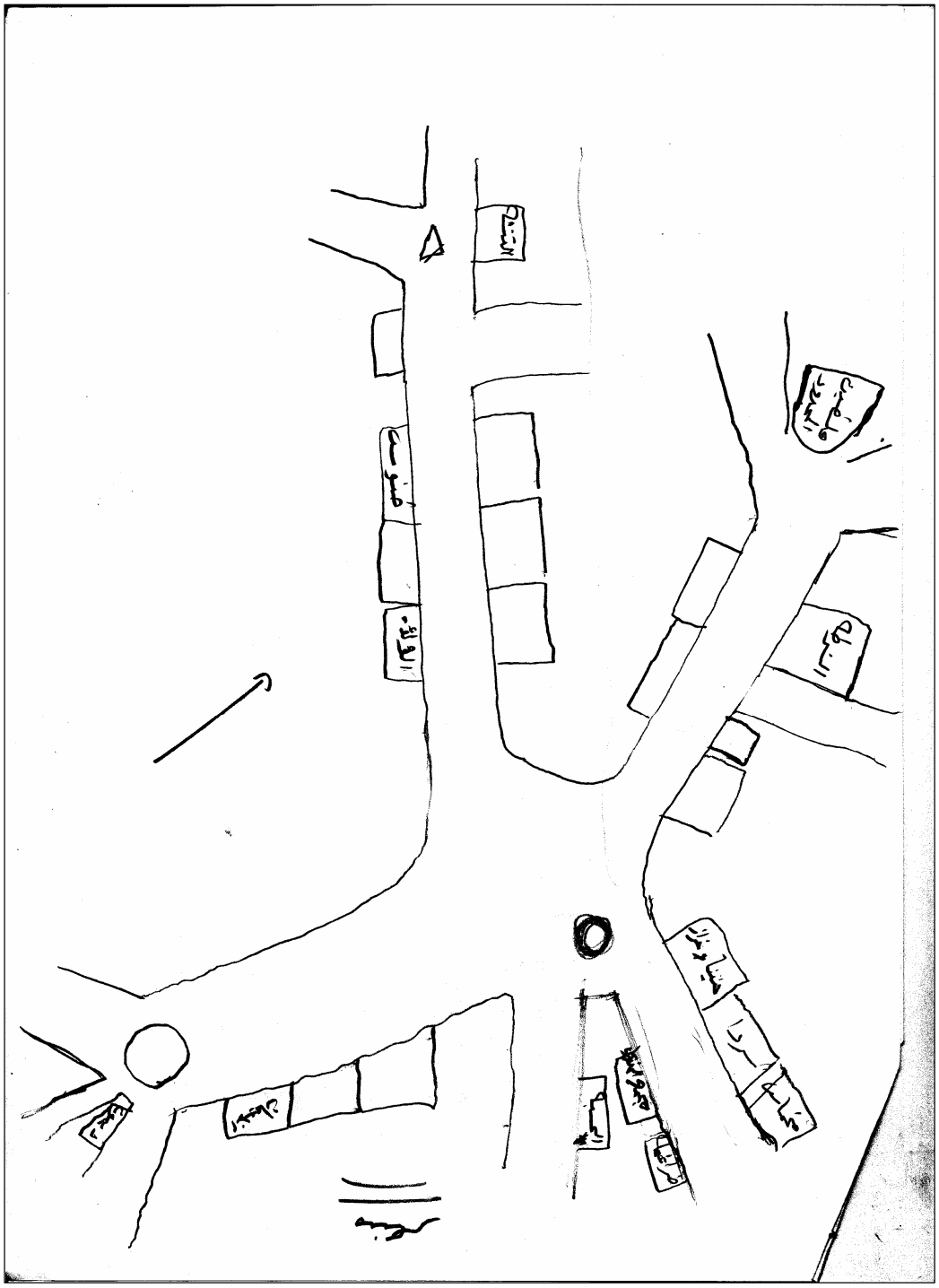


Respondent 17 Sketch Map



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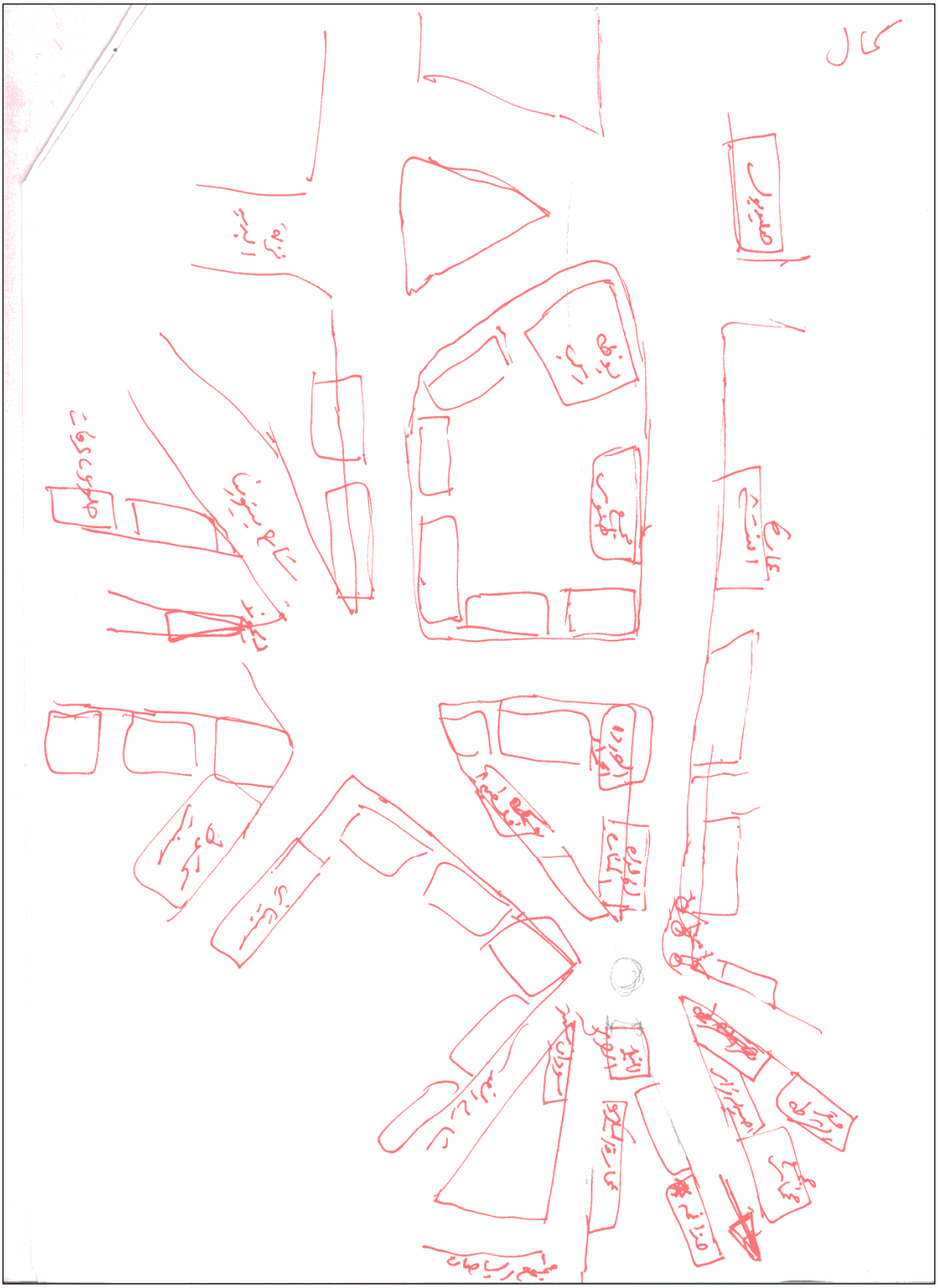

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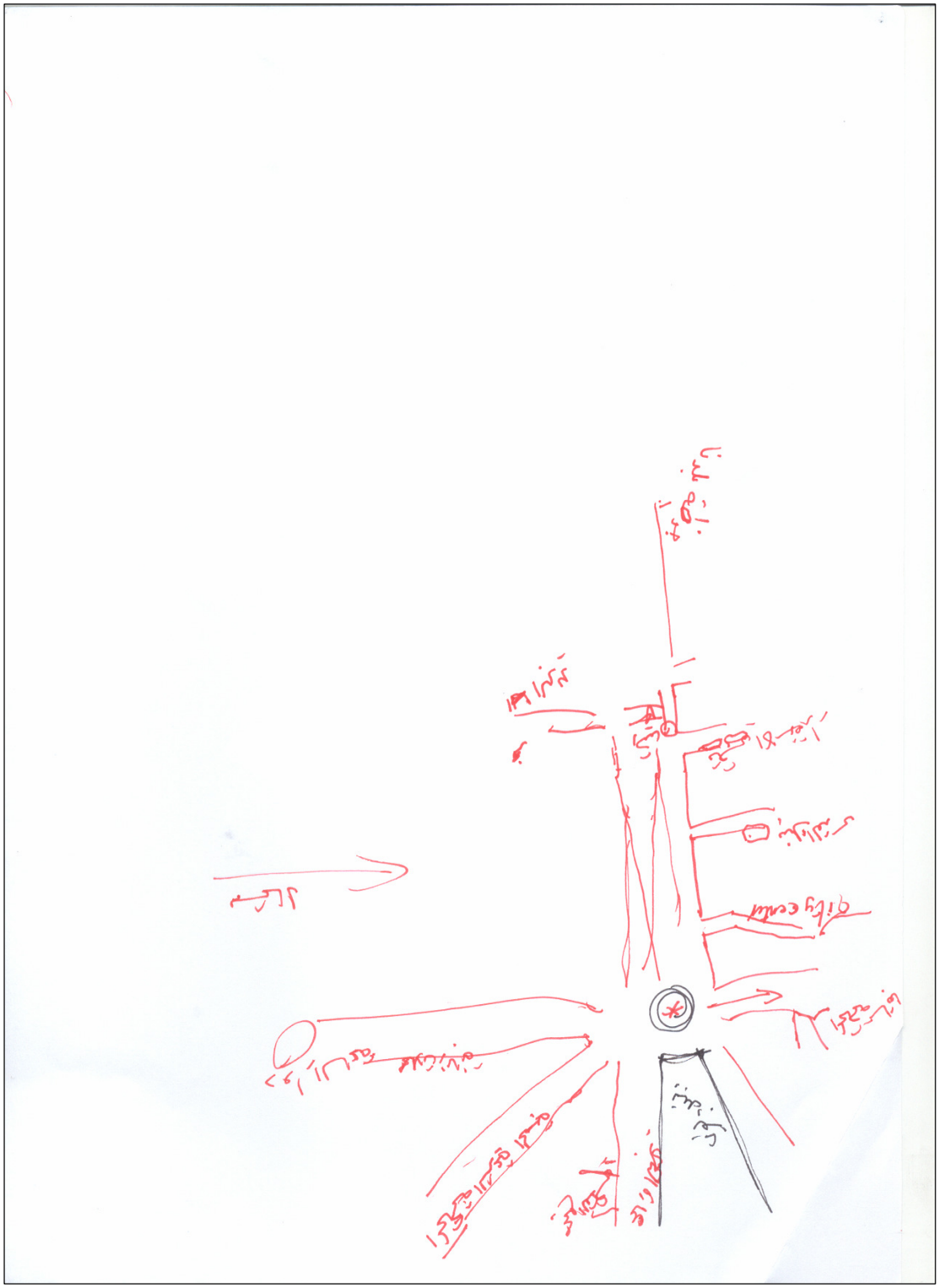

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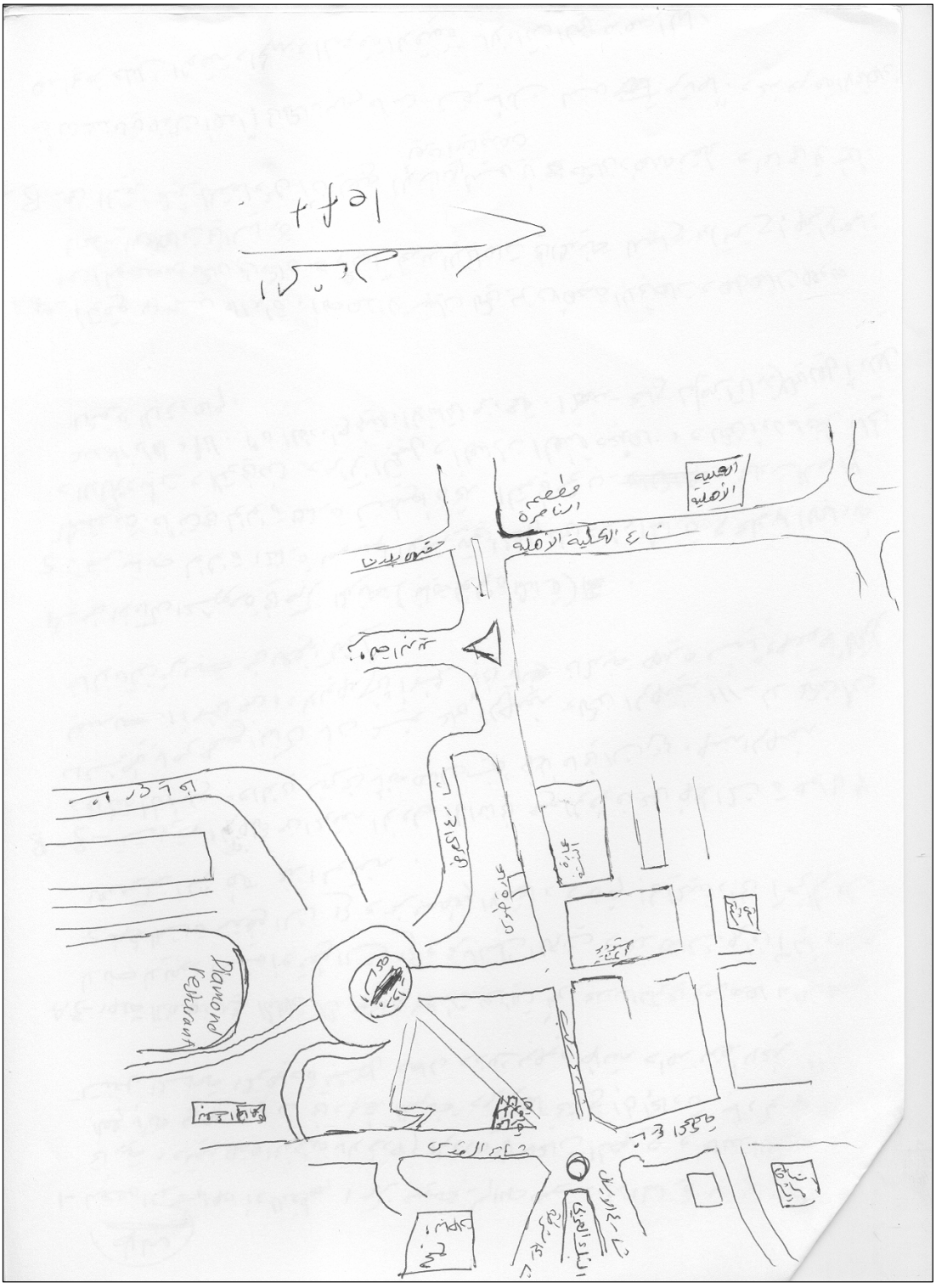
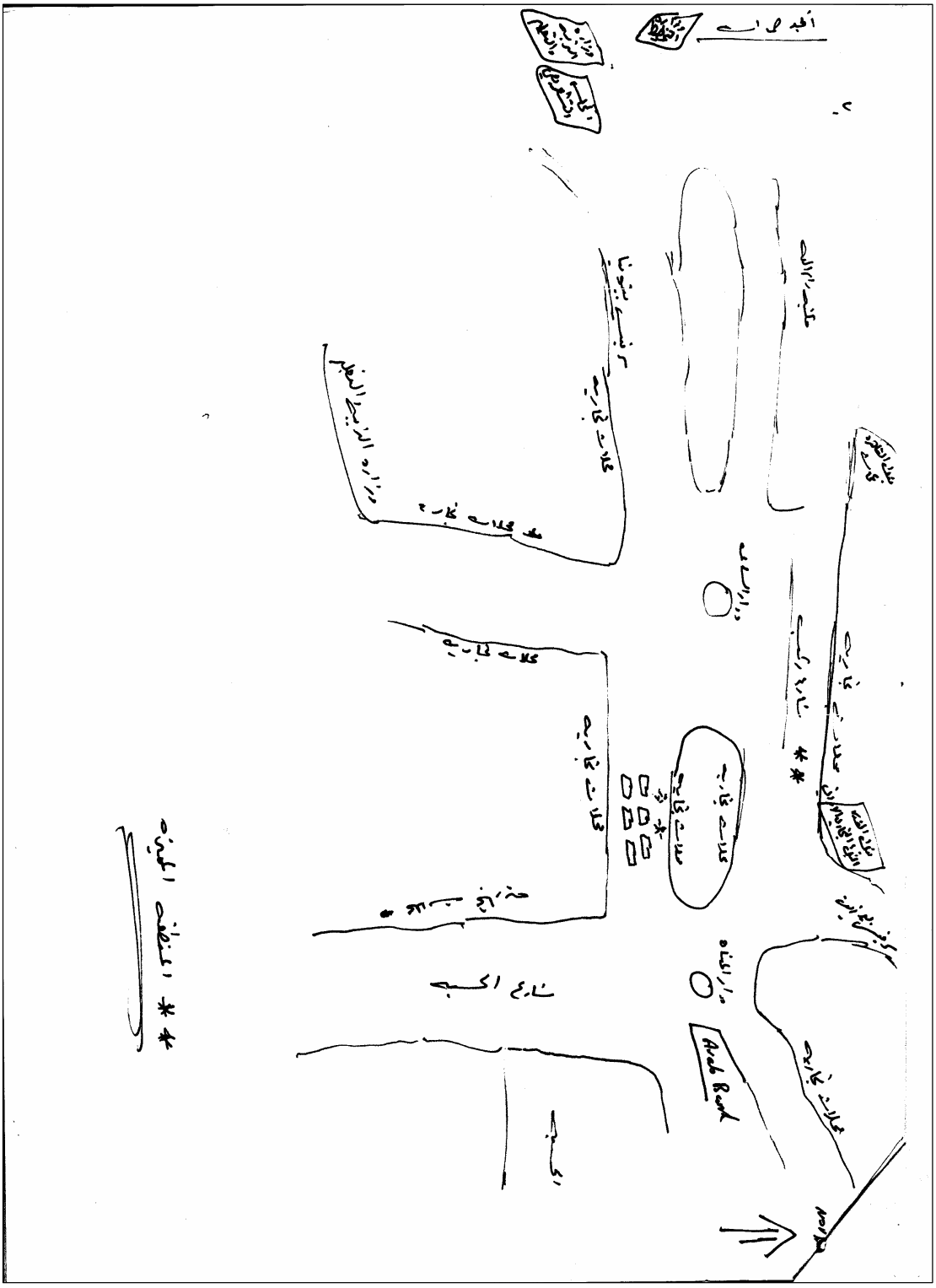


Respondent 21 Sketch Map

Respondent 22 Sketch Map



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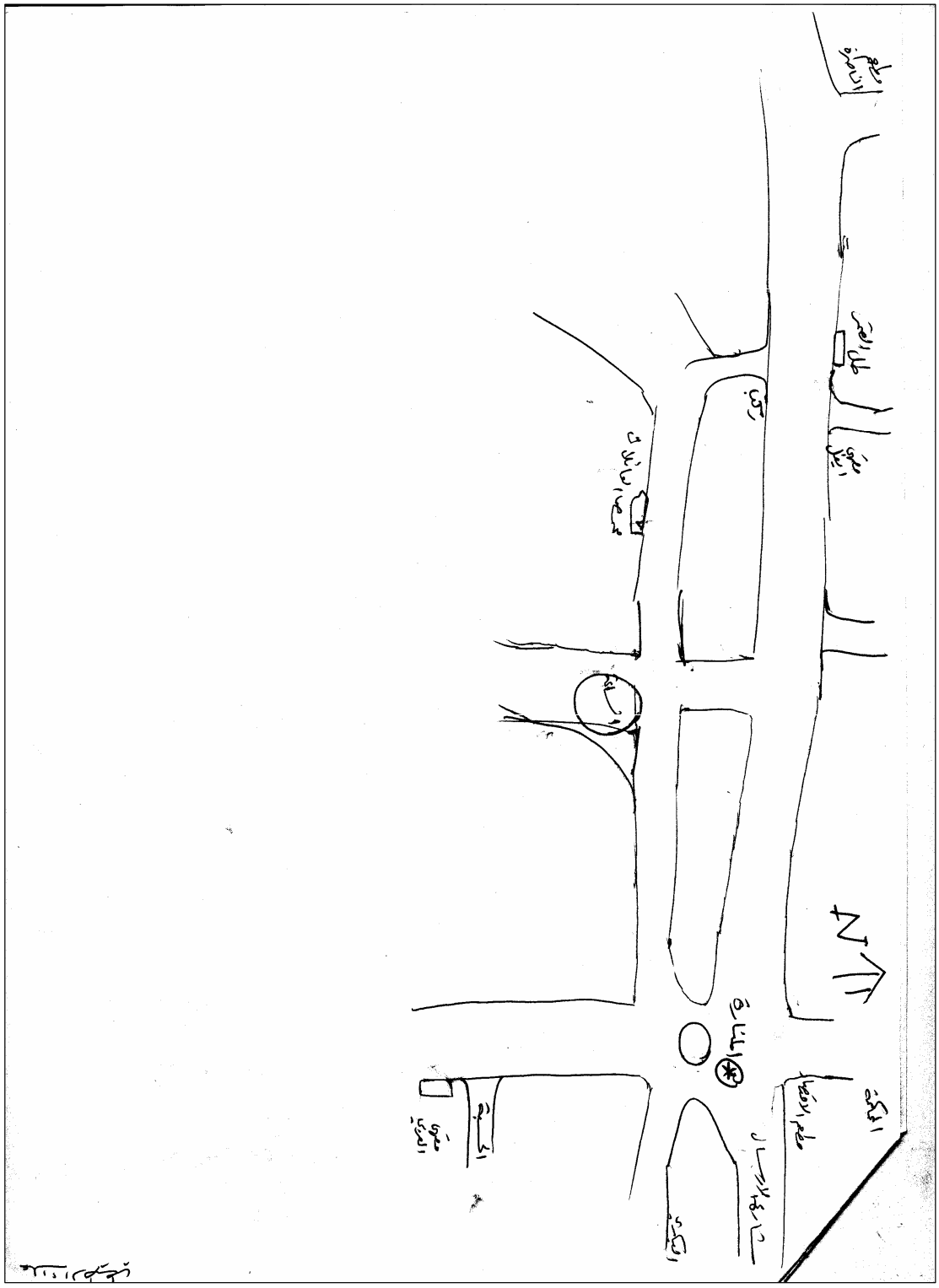

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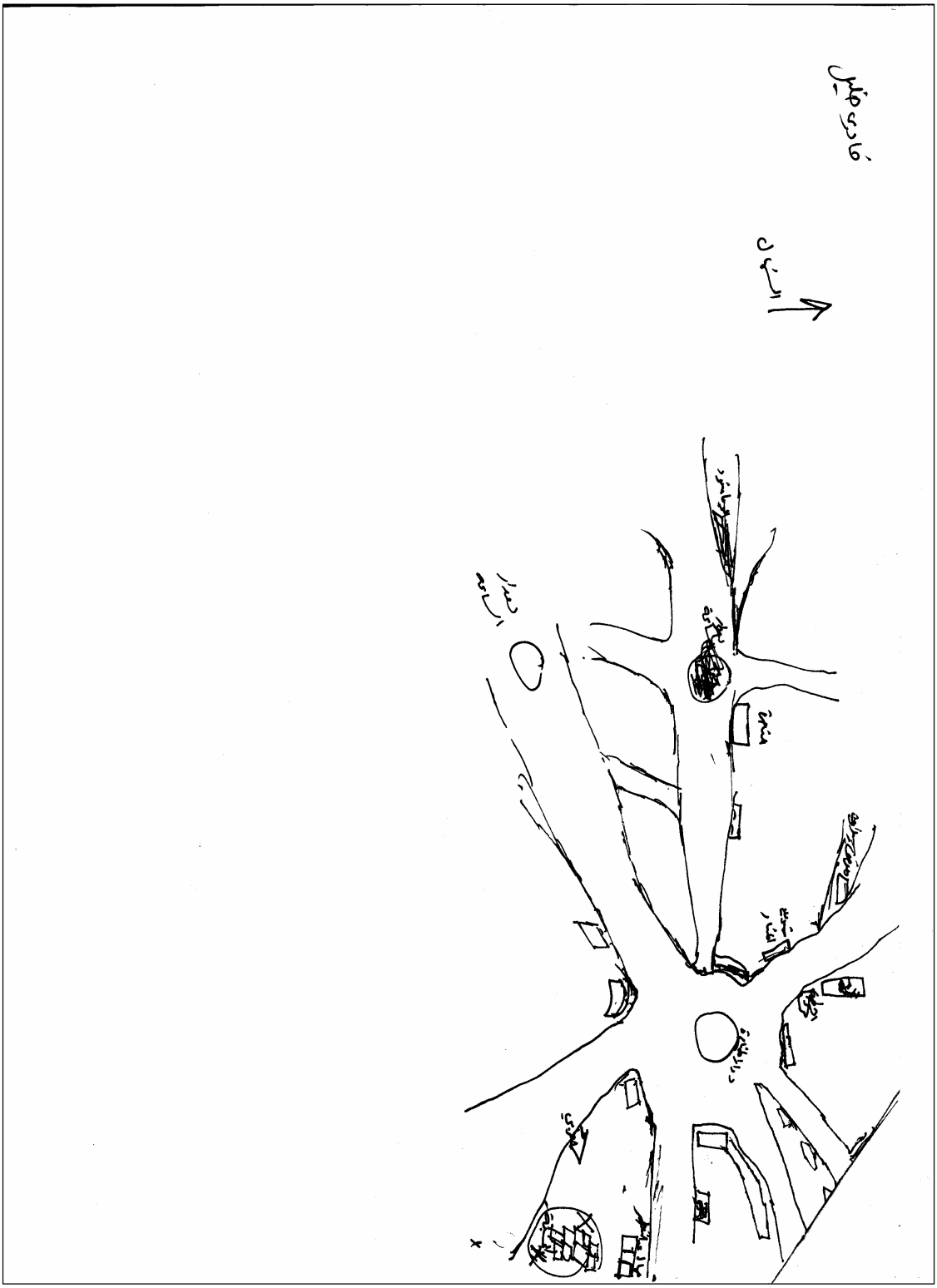

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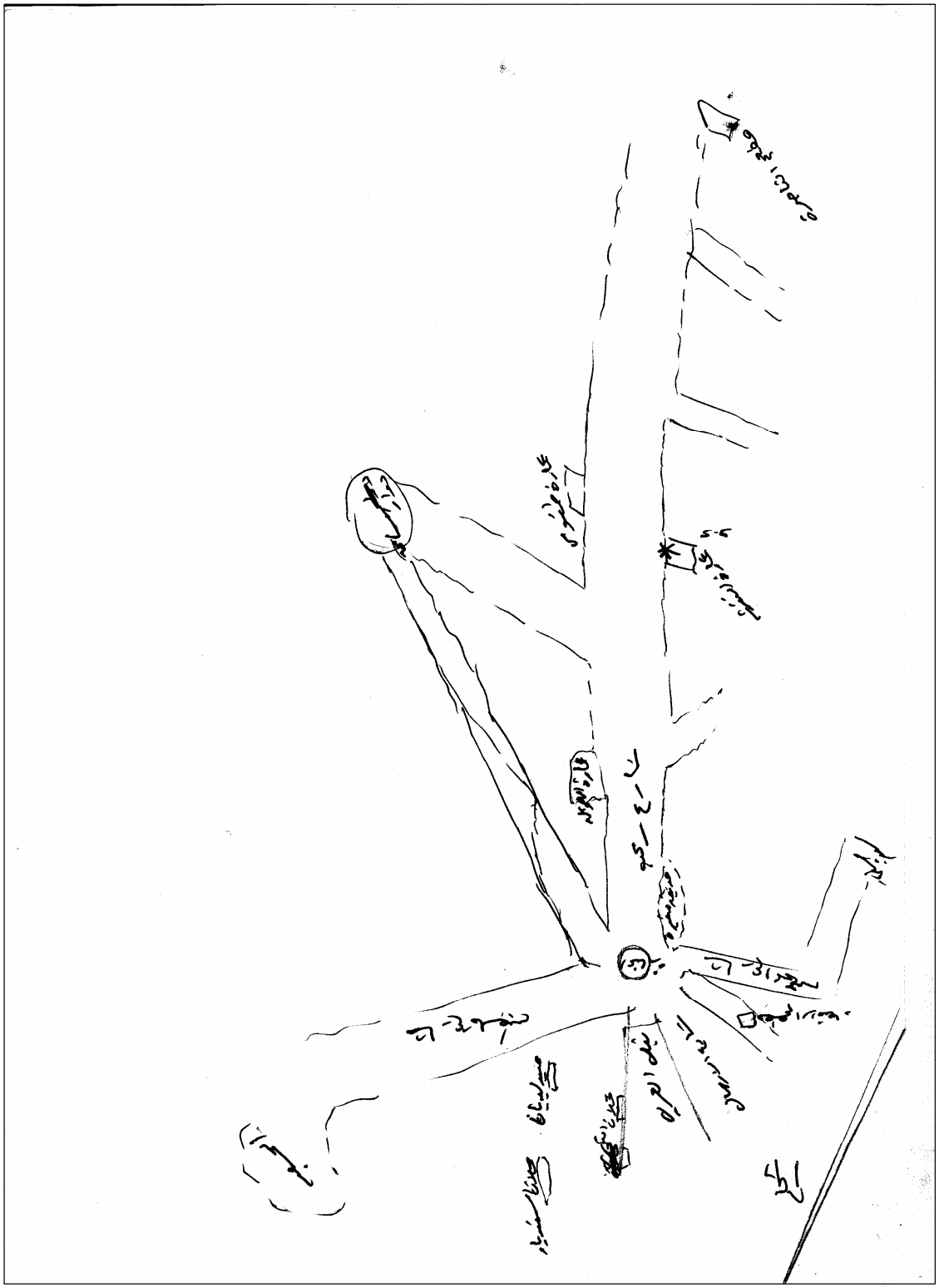
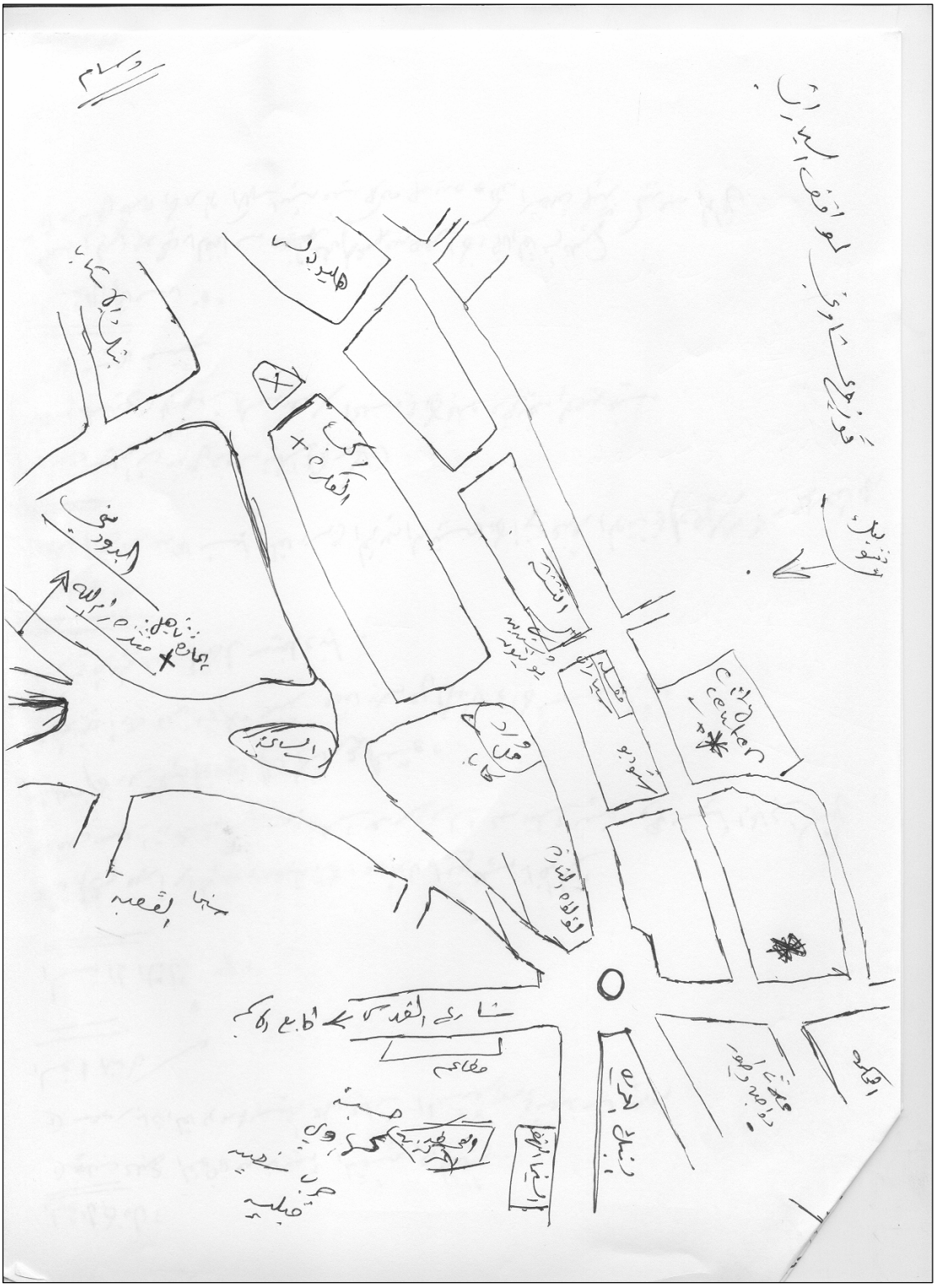
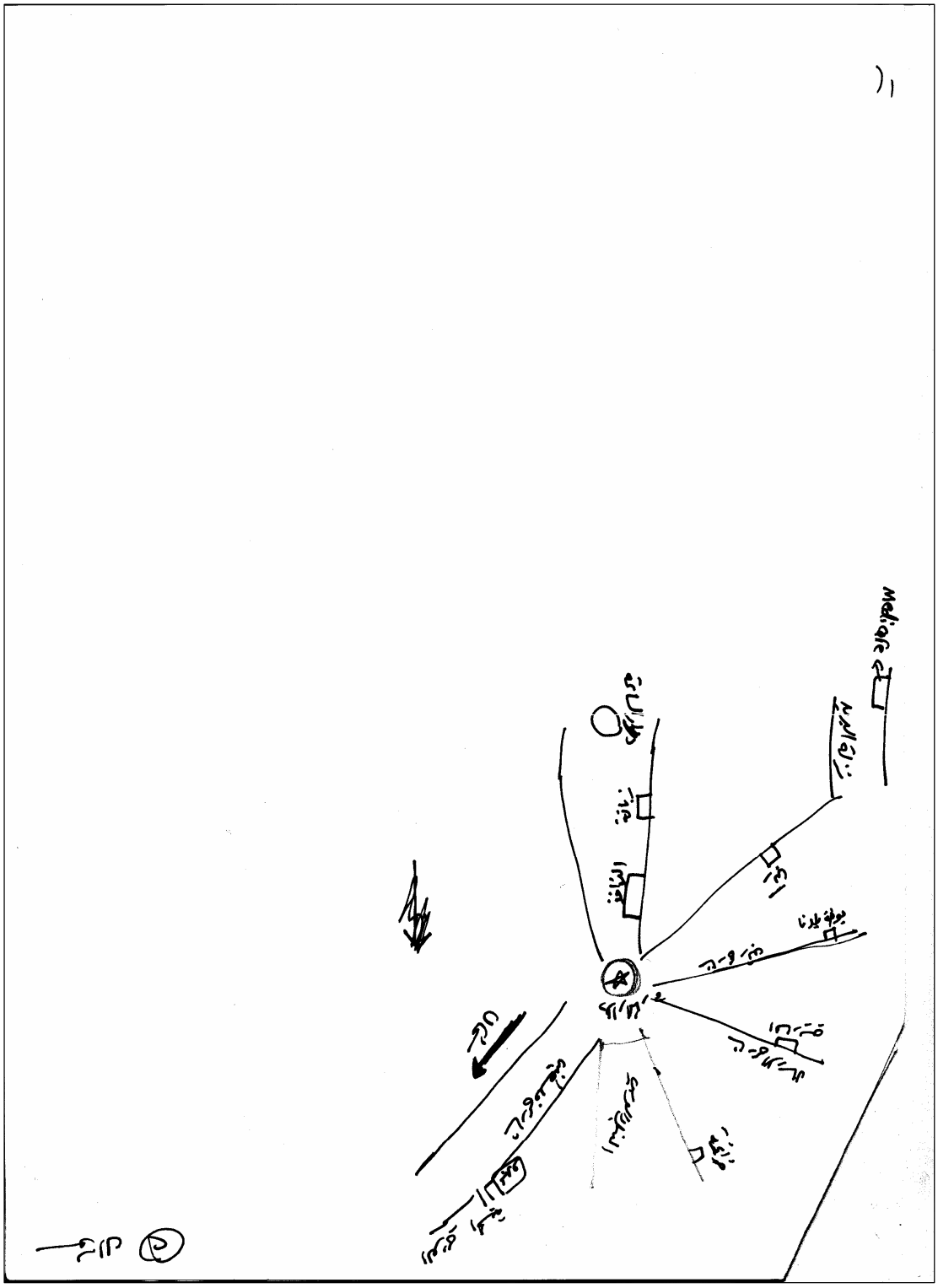


Respondent 26 Sketch Map



Respondent 27 Sketch Map



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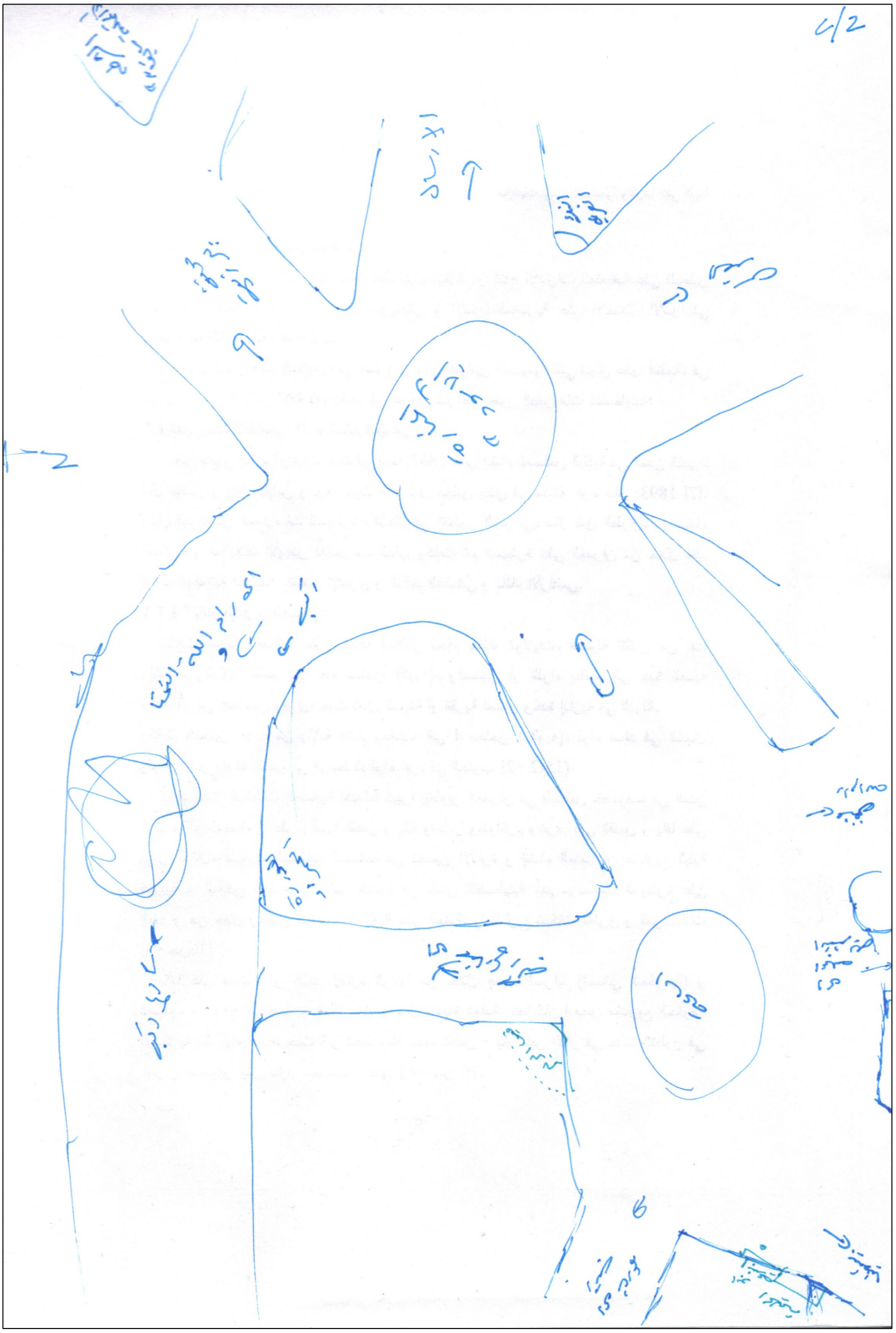


Respondent 29 Sketch Map

Respondent 30 Sketch Map

APPENDIX III

Moserhofgasse Project-Pilot Study

Area of study

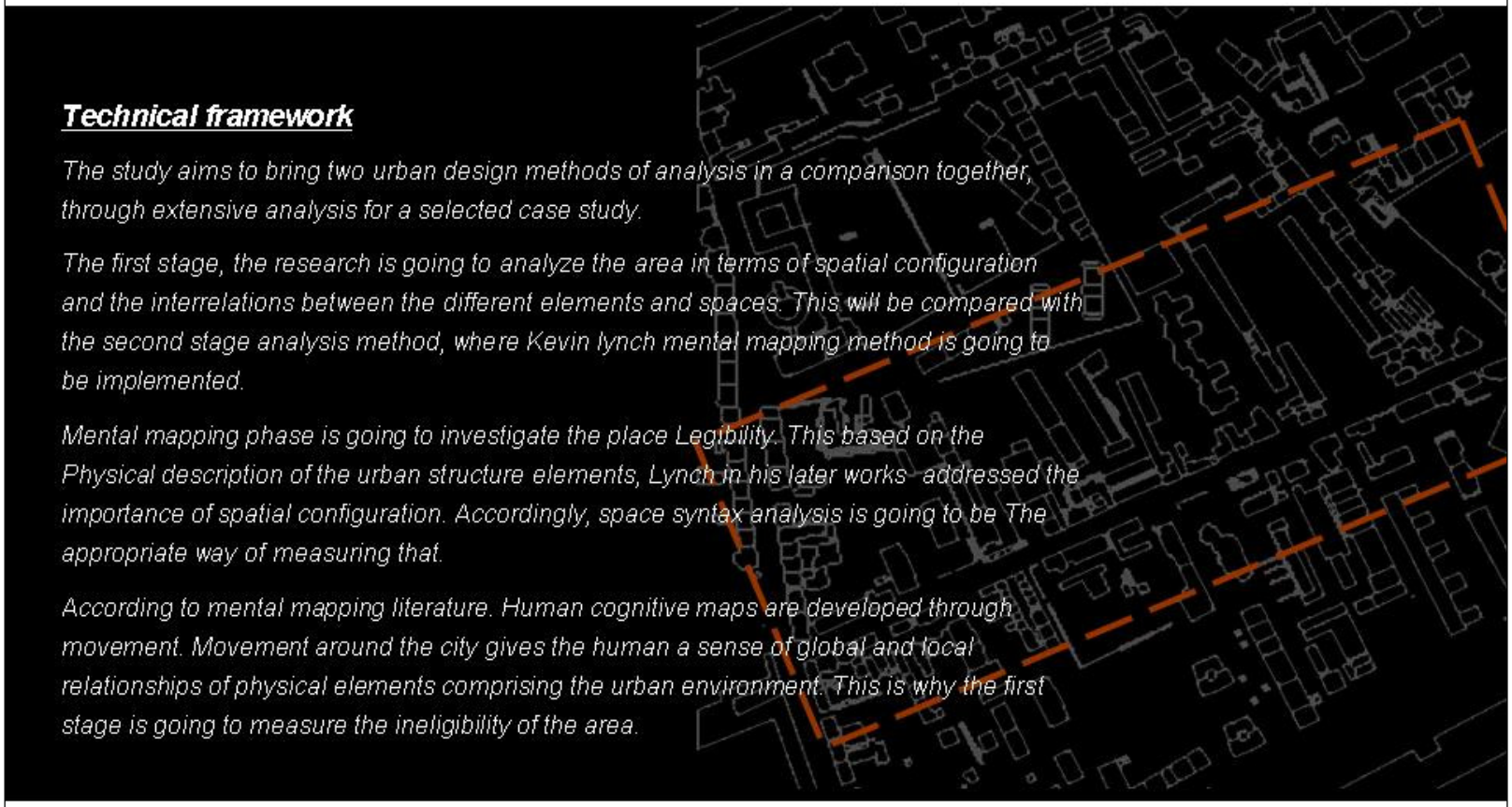
The study is headed in the area that the research hypothetically called as "Moserhofgasse area". "Moserhofgasse area" is one of the neighborhoods located in Graz city in Austria. The zone is a residential area, where a number of important institutions are located like a part of TUGraz University campus.

The selected area distributed around Moserhofgasse. The study is covering the area between Steyrergasse extended until Inffeldgasse , and the area Between Petersgasse extended until Munzgrabenstrasse.

The area will be analyzed extensively in terms of spaces and elements. The area in general is described as a well structured zone. A number of distinctive elements and spaces are scattered over the area.

The study will give special attention for "Moserhofgasse". It will consider it as the micro scale and the focal area of the study.

"Moserhofgasse"- (Micro Scale Study Area)



Technical framework

The study aims to bring two urban design methods of analysis in a comparison together, through extensive analysis for a selected case study.

The first stage, the research is going to analyze the area in terms of spatial configuration and the interrelations between the different elements and spaces. This will be compared with the second stage analysis method, where Kevin lynch mental mapping method is going to be implemented.

Mental mapping phase is going to investigate the place Legibility. This based on the Physical description of the urban structure elements, Lynch in his later works addressed the importance of spatial configuration. Accordingly, space syntax analysis is going to be The appropriate way of measuring that.

According to mental mapping literature. Human cognitive maps are developed through movement. Movement around the city gives the human a sense of global and local relationships of physical elements comprising the urban environment. This is why the first stage is going to measure the ineligibility of the area.

Studying the ineligibility of the area will be based on the following narratives:

•***Finding space integration-*** *which represents the number of connections that must be traversed if one were to move from every line to another. A high value of integration means that the place attracts a high density of movement. This is going to be measured through the Mean Depth.*

•***Finding the space connectivity-*** *it is the attribute that takes into account the relation of the space with its neighbor spaces. Spaces with high connectivity values will be more accessible from different directions and give people more possible choices. This is going to be measured through measuring the Control, the Clustering Coefficiency and Connectivity Graph.*

•***Finding the space visibility-*** *it is the attribute that represent the areas indicates that people can easily view them from different perspectives when moving around the city. This is going to be measured through finding the space Controllability.*

The study first phase is going to indicate the place Intelligibility, which will be compared to the place legibility that is going to me measured in the second analytical phase.

Analysis First Phase; Space Syntax Analysis

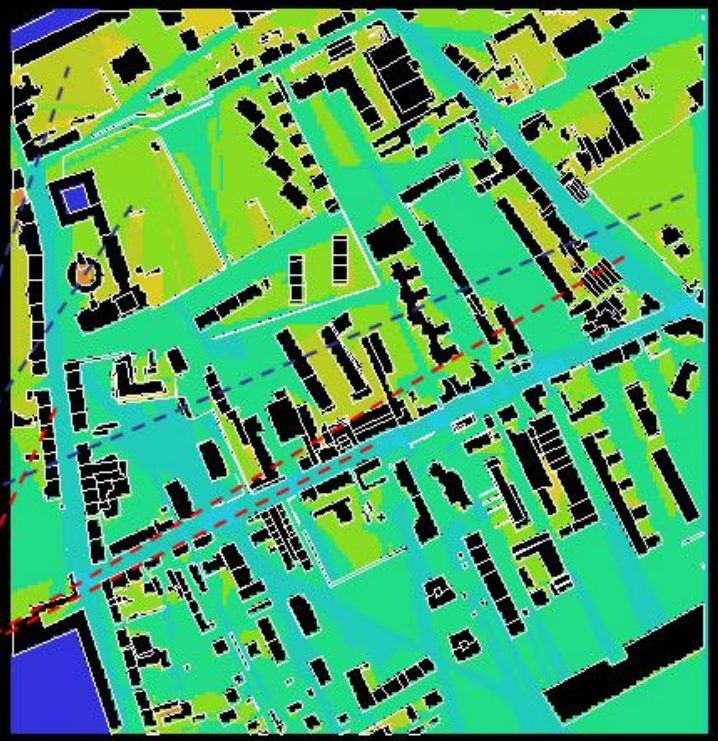
1. Space Integration- Through Measuring the Mean Depth

On The Macro Scale;

It is obvious that both of "Moserhofgasse" "MunzegrabnStrasse" and "Pertersgasse" are measuring a Low Value of Mean Depth. This means that these areas are with a low number of connections to be reached. Accordingly, it can be considered as a High Integrated areas where a high level of movement and density are taking place.

Areas with low value of integrations

Areas with high value of integrations



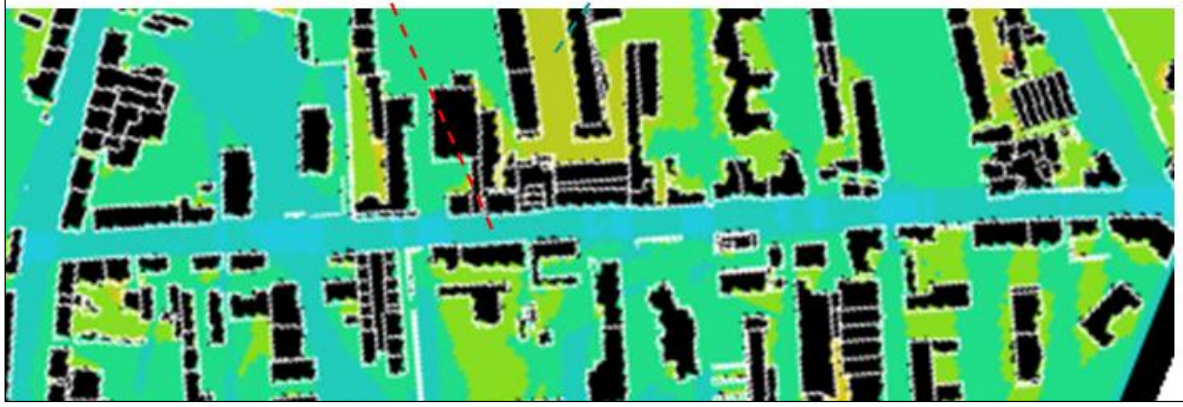
Visual Mean Depth Graph Showing the areas with High Value of integration.

On The Micro Scale;

Emphasizing on "Mosserhofgasse" on the micro scale level shows the street with the same Low Value of Visual Main Depth. This identifies the street as a high integrated space within all its sections. According to the analysis, emphasizing on the same level of analysis, the spaces between the buildings or behind the buildings are presenting a Higher Value of Mean Depth, this manipulate these areas as Low Value integrated spaces according to the analysis.

Mosserhofgasse street represents the same level of High value Integration within its all parts.

Areas between or behind the buildings represent a Low Value of Space Integration.

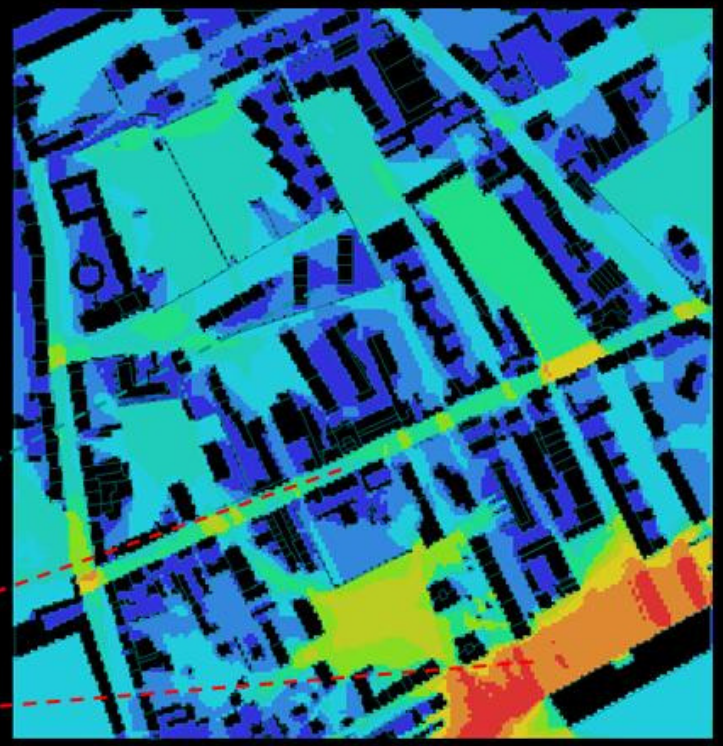


2.Space Connectivity- through measuring:

•Connectivity Graph

On The Macro Scale

The open area close to TUGraz University Campos indicates the highest value of connectivity. This means this area is with a high relation with its surrounding. Moserhofgasse represents a medium connectivity in relation to the other surrounded spaces.



Connectivity Graph Showing the areas with the Highest Value of Connections.

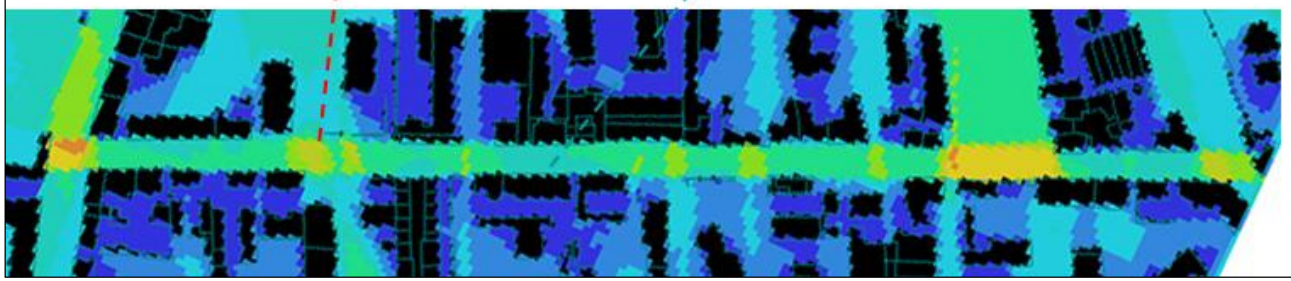
On The Micro Scale;

"Mosserhofgasse" shows areas with a high value of connectivity. These areas illustrated on the map are representing the intersection areas between the street and other main or sub street. This means that these areas are with a high connection value in relation to the neighbor spaces. Hence, area with edges from the both sides are represented on the analytical graph as areas with a low value of connectivity.

Comparing the street with other surrounded spaces, many sections of it are with higher value of connection than the close other spaces.

Areas with high connectivity within the Moserhofgasse street.

Areas with low connectivity within Moserhofgasse street.



•*Visual Control Graph*

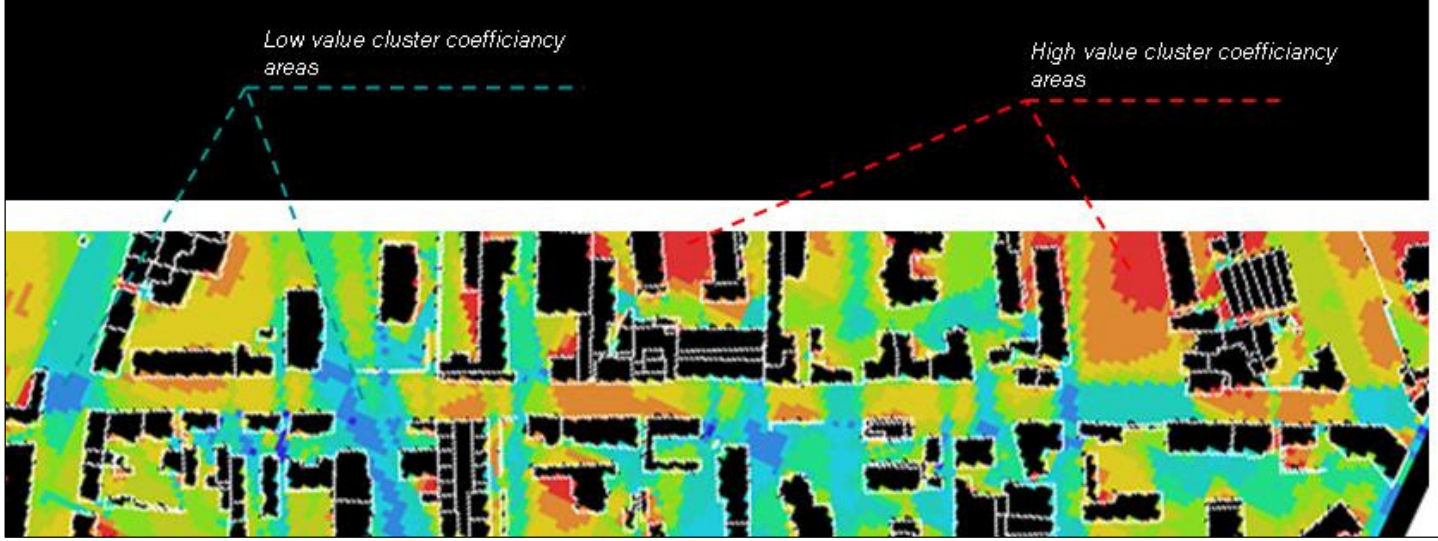
On The Macro Scale

Moserhofgasse, TU campus and some other open areas presents a high Value control areas. This means that these areas are characterized with a high visual connections to its close neighbor spaces. While another time areas between the building are characterized with a low value control areas.

Visual Control Graph Showing the areas with the Highest Value of visual relations to its surrounding.

On The Micro Scale;

Areas with private identity and closed settings, like spaces between the buildings and the private zones. Significantly, the enclosed area near to West dorms are presenting a high value of clustering coefficincy, it gives an idea of closed zones. While areas with continues relation to other spaces are presenting a low value of clustering coefficiancy.

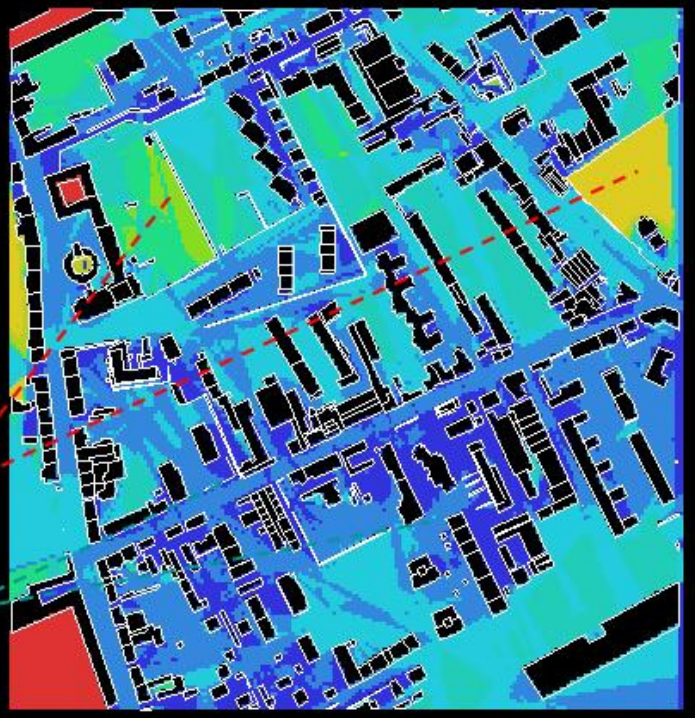


3. Space Visibility- through measuring;

Visual Controllability-

On The Macro Scale

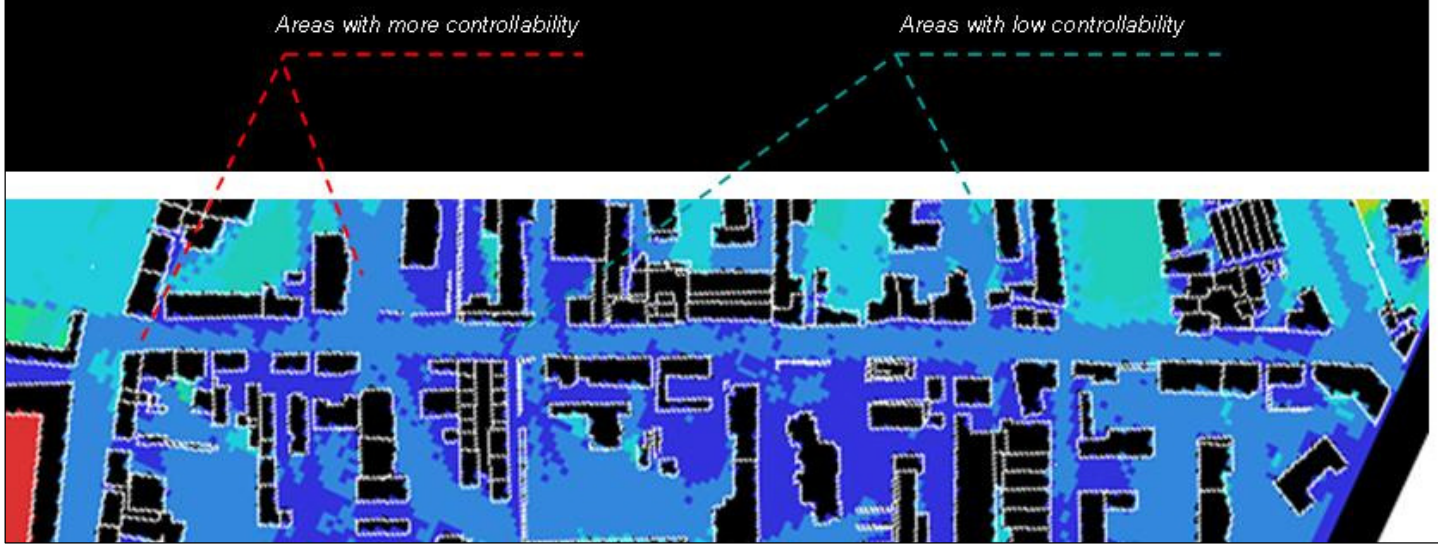
The analysis shows areas with high value of controllability as the areas which physically located in open visual area. The highest value controllability areas are the playground and the cemetery. While the inside areas, like moserhofgasse are presenting areas with low controllability. Accordingly, these areas with high value of controllability are visually open, and well seen from different locations. This means that elements in this locations are easily to be remembered.



Visual Controllability Graph Showing the areas with the Highest Value.

On The Micro Scale;

Moserhgasse on its micro scale, the street show a low level of controllability, which can be explained by the condense structure. A long side the street, the lowest value areas are the building adjusted buildings.

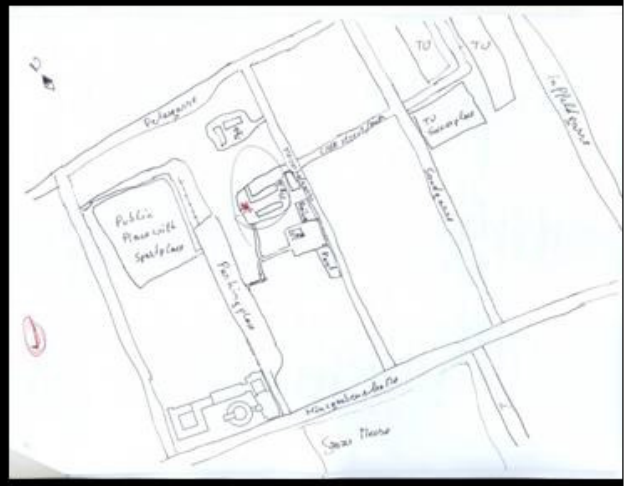


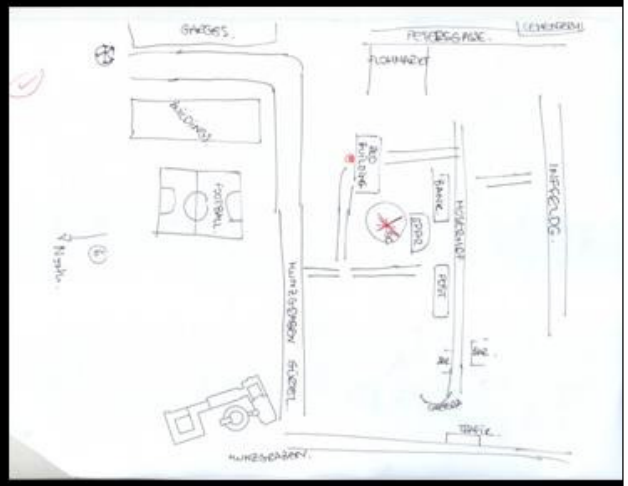
Analysis Second Phase; Mental Mapping

This phase aims to analyze the place legibility. This base on determining the vivid and dense spaces, and to find out the most distinctive elements of the urban context.

In order to measure these variables, a non- discursive questionnaire approach had been headed. The questionnaire were divided to three kind of questions. The narrative questions, which aim to point the distinctive elements within the urban context. Then, the imaginary trip, which is oriented in order to specify the vivid areas. The third questionnaire section is the sketching of the mental image which will assists to point the distinctive, vivid and dense spaces, and which will introduce the singular elements within the area.

The covered sample the questionnaire had targeted is 10 persons, and the questionnaire was oriented in a personal interview format.





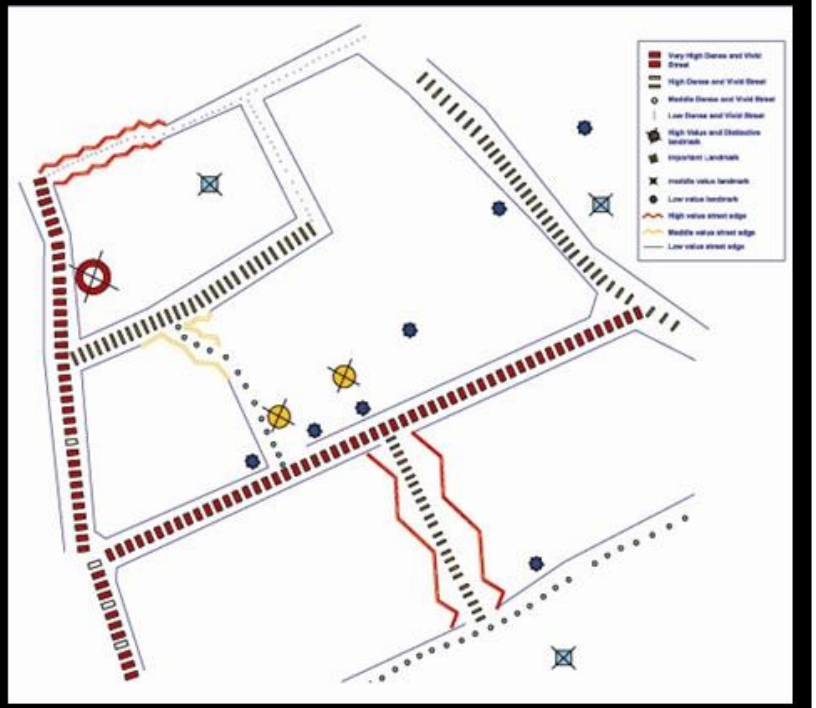
Analyzing The Mental Maps

The gained mental maps and verbal recall projected on a final map that represents the users visions about "Moserhofgasse Area".

The map shows that both "Moserhofgasse street" and Mungrapestrasse Street" presents a high value of vividness and density since most the respondents mention to these areas as a central areas within their cognition. While Petersgasse street with the Connection street toward Sandgasse street are presenting another important value of vividness and density, then comes other areas like spar .

Regarding the place landmarks, the Church presents the most distinctive landmark, then comes spar and west red building office and then the cemetery, university buildings and the play ground and finally some respondents mentioned for the post office, mox café, west 22 building, the nursary in sandgasse, and petersgasse, and Mercur Hotel as minor landmarks.

In terms of space edges, the respondents mention for the connection street toward sandgasse and Hafnaregl as very influential edges, then comes the fence near to spar area and finally they mention for the other space edges as less influence.



The Result Map presents the results of the gained mental maps and verbal recall