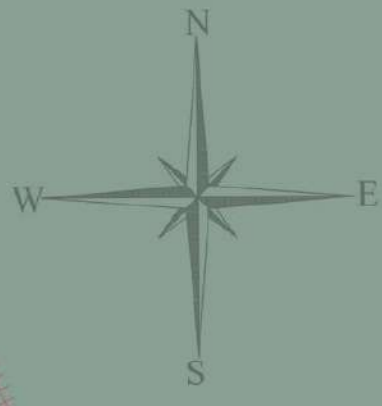


The Transformation of The Urban Landscape In  
The Old City of Baghdad between 1854 -2009



AL-Hasani Mohammed.K

# **The Transformation of The Urban Landscape In The Old City of Baghdad between 1854 -2009**

VON DER FAKULTÄT ARCHITEKTUR, BAUINGENIEURWESEN UND STADTPLANUNG  
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***To my supporter and everything in my life-My  
Father***

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***To the meaning of Life –My Mother***

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***To My soul- My Sisters***

-----

***To The Memory of person who will never  
forget -My Grand Mother***

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***To my Gorgeous close friends***

---

***To my Professor and colleagues in BTU  
Cottbus &Stuttgart***

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***Mohammed.K AL-Hasani***

# Abstract

The development process of the city of Baghdad moved from the compact urban pattern to the gridiron one and went through multi interventions up to the current city shape. The old city core experienced a long series of modernization process that affected the old urban fabric and the coherence among urban elements. This dissertation tried to explore the intervention methods and the variety of impacts that have been occurred inside the old core. Exploring the morphological basis regarding the city composition will be the first step to analyze the impacts of the modernization process. Altering the idea of urban space considered the main reason behind any changes in the city having a continuous modifications in the hierarchy. New streets that were added to the city changed the urban space hierarchy in each time. Starting from analyzing the spatial form via exploring the morphology of the city up to analyze the city skyline is the main methodology of this work. The spatial form of the city of Baghdad shows the impacts of multi planning approaches belong to variant master plans which were proposed and achieved to manage the city growth and development. Those impacts were varied and explained in this dissertation based on the change in the city network, city expansion and land use distribution. The ideology of each scheme was analyzed to present the accumulative policies that formed the last form of the city of Baghdad. One of the best methods to explore the transformation process was to follow the morphological steps that the city pass through. The typomorphological approach was chosen to explore the change in the city components from parcel to neighborhood. The old city of Baghdad was analyzed and explained in details in term of investigating the morphological layers for different periods showing the development of Baghdad urban structure by new comparative plans that explain the change between two following morphological periods. The urgent needs that lead to each intervention inside the old core were explained in details. The understanding of the transformation in each morphological period was based on the following criteria's (urban growth, urban space development, urban components and innovations) to provide a comprehensive investigation about the behavior of the urban components. The urban space development and building typologies were explored and documented showing the impacts of interventions inside the old core. The investigation of the main old and new streets was well assessed showing their structure, building typologies and the role of the urban space typologies along the segments of those streets. The transect analysis method was used by having nine sections through the old city in different areas to understand the transformation in the city of Baghdad and the impacts of the unregulated development process accompanied within the lack of clear urban management method. The impacts of the modernization process were exposed in three dimensional level by relating the present situation with the aerial images of the city in 1962 and 1917 providing an enhanced procedure about the morphological development of the urban structure.

The development of the city skyline provided a clear interpretation about the impacts of inserting new urban space and building typologies inside the old core. It was so clear that the hypothesis of this dissertation was proved in showing the role of the street hierarchy change (for both pedestrian and car street in different segments) in exploring the mechanism of the conflict among urban components that bring more destruction to the city. The conclusion showed what to avoid in any prospective rehabilitation process and gave the impacts of the previous interventions that should not be repeated in the future.

*Key Words: Spatial analysis, Typo urban morphology, Urban space, Transect analysis*

# Zusammenfassung

Die Entwicklung der Stadt Bagdad wechselte vom kompakten Stadtmuster zum Rasterplan und durchlief mehrere Interventionen bis zur aktuellen Stadtform. Der Kern der Altstadt erfuhr eine Vielzahl von Modernisierungsprozessen, die das alte Stadtgefüge und die Kohärenz zwischen den städtischen Elementen beeinflussten. In dieser Dissertation wurde versucht die Interventionsmethoden und die unterschiedlichen Auswirkungen auf den alten Stadtkern zu untersuchen. Die Erforschung der morphologischen Grundlagen bezüglich der Zusammensetzung der Stadt ist der erste Schritt zur Analyse der Auswirkungen des Modernisierungsprozesses. Als Hauptgrund für die Veränderungen in der Stadt, in welcher kontinuierliche Modifikationen der Hierarchie stattfanden, wird die Änderung der Idee des Stadtraums angesehen. Neue Straßen, die der Stadt hinzugefügt wurden, veränderten jedes Mal die Hierarchie des städtischen Raums. Die Hauptmethodik dieser Arbeit ist eine Analyse der räumlichen Form beginnend mit der Untersuchung der Morphologie der Stadt bis zur Analyse der stadtsilhouette.

Die räumliche Form der Stadt Bagdad zeigt die Auswirkungen von Multi-Planungsansätzen verschiedener Masterplänen, die vorgeschlagen und umgesetzt wurden, um das Wachstum und die Entwicklung der Stadt zu verwalten. Diese Auswirkungen wurden in der Dissertation aufgrund der Veränderung des Stadtnetzes, der Stadterweiterung und der Landnutzungsverteilung variiert und erläutert. Die Ideologien jedes Schemas wurden analysiert, um die Richtlinien, die die letzte Form der Stadt Bagdad bildeten, gesammelt zu präsentieren. Eine der besten Methoden zur Untersuchung des Transformationsprozesses war das Verfolgen der morphologischen Schritte durch die die Stadt gelaufen ist. Um die Veränderungen der Stadtkomponenten von Parzellen bis zur Nachbarschaft zu untersuchen, wurde der typomorphologische Ansatz gewählt. Die Altstadt von Bagdad wurde bezüglich der Ermittlung morphologischer Ebenen zu verschiedenen Zeiträumen im Detail analysiert und erläutert. Dies zeigt die Entwicklung der Stadtstruktur Bagdads anhand von neuen vergleichenden Plänen, die den Wechsel zwischen zwei aufeinander folgenden morphologischen Perioden erklären. Außerdem werden die wichtigen Gründe, die zu jedem Eingriff in den alten Stadtkern führten, ausführlich erläutert. Das Betrachten der Transformationen jeder morphologischen Periode basierte auf den folgenden Kriterien (städtisches Wachstum, städtische Raumentwicklung, städtische Komponenten und Innovationen), um eine umfassende Untersuchung des Verhaltens der städtischen Komponenten präsentieren zu können. Darüber hinaus wurden die städtische Raumentwicklung und Gebäudetypologien erörtert und dokumentiert, um die Auswirkungen von Interventionen innerhalb des alten Stadtkerns aufzuzeigen. Die Erforschung der alten und neuen Hauptstraßen wurde sorgfältig bewertet und zeigt ihre Struktur, Gebäudetypologien und die Rolle der städtischen Raumtypologien entlang der Segmente dieser Straßen.



Um die Transformation der Stadt Bagdad, sowie die Auswirkungen des unkontrollierten Entwicklungsprozesses, der mit dem Fehlen einer klaren Stadtverwaltungsmethode einherging, zu verstehen, wurde die Transektoranalysemethode verwendet, indem neun Schnitte durch verschiedene Gebiete der Altstadt durchgeführt wurden.

Die Auswirkungen des Modernisierungsprozesses wurden auf dreidimensionaler Ebene beleuchtet. Die gegenwärtige Situation wurde in Beziehung zu den Luftbildern der Stadt aus den Jahren 1962 und 1917 gesetzt, wodurch ein verbessertes Verfahren bezüglich der morphologischen Entwicklung der Stadtstruktur bereitgestellt wurde. Die Entwicklung der Skyline der Stadt lieferte eine klare Interpretation der Ergebnisse des Hinzufügens neuer städtischer Räume und Gebäudetypologien in den alten Stadtkern. Dass die Hypothese dieser Dissertation bewiesen wurde, wird deutlich im Aufzeigen der Änderung der Straßenhierarchie (sowohl für Fußgänger- als auch für Autostraßen in verschiedenen Segmenten), durch die Untersuchung des Konfliktmechanismus zwischen städtischen Komponenten, die mehr Zerstörung in die Stadt bringen. Die Schlussfolgerung legt dar was bei zukünftigen Rehabilitationsprozessen zu vermeiden ist und beschreibt die Auswirkungen der vorherigen Interventionen, die in Zukunft nicht wiederholt werden sollten.

Schlüsselwörter: Raumanalyse, Typo-Stadtmorphologie, Stadtraum, Transektanalyse

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## **chapter Six- Conclusion**

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# Chapter -1-

## Introduction

## Chapter One – Introduction

### 1.1 Baghdad –The Endangered Old Core

The old Baghdad medieval city located on Tigris river tackled multi faceted transformation in the physical environment during the last century up to now. Urban Planning and architecture styles belong to a variety of approaches in the last historical periods were reflected in the city core and resulted in altering the physical, social and economic characteristics of the local content. The old core lost its notable urban features and faced a continuous destruction in the old physical form within the absence of conservation policies and urban management strategies causing more urban decay. No clear understanding was found for the old city reaction after each alteration in the physical urban structure, leading to increase the negative outcomes in losing more historical urban elements. The city of Baghdad had experienced partly changes from 1853 until the end of the Ottoman rule in 1917. The city structure had improved under the rule of Midhat Pasha<sup>1</sup> when a new castle (Sarai), schools, hospitals, tramway and more infrastructure and buildings were built in both city parts AL-Rusafa and AL-Karch<sup>2</sup>. Industrialization in the 19th century had a massive influence on the city regarding urban transformation and society that was brought about by the colonization in the 20th century (Pieri C. , 2010, p. 21). The city of Baghdad experienced a significant change in urban structure in the Late Ottoman Period in the beginning of 19<sup>th</sup> century and under the British mandate in 1917 up to now. The historical urban fabric composed mainly of market, administrative zone and residential land use that estimated to occupy the majority of the city between 2-3 km<sup>2</sup>. The new horizontal streets with their free standing blocks that could reach up to 32 m were implanted inside the old core and were then intersected by vertical streets heading to three bridges across the river, creating a disrupted urban form where the traditional area were removed or left as a decayed or neglected area. The orthogonal grid system provides the corner stone to increase the transformation process inside the old city (Bianca, 2000, p. 226). Today the old city of Baghdad faces urban decay, segregation and gentrification due to the uncontrolled planning policies and the rapid urban transformation process. The outstanding architectural heritage and urban fabric were downsized in a severe way due to the absence of urban management strategies. The local government was not able to allocate resources to rehabilitate the old heritage of the city and was not able to cope with the technical and physical requirements. The heritage we have now is quite little if compared to that of the

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<sup>1</sup> See Biography P.435

<sup>2</sup> AL-Karch is the western part of the old city across the river and was initiated before AL-Rusafa.

past but it is still valuable. The medieval city of Baghdad now is under sever threat to be disappeared in next few decades repeating the history where the initiated round city in Abbasid period disappeared totally without any traces found till now.

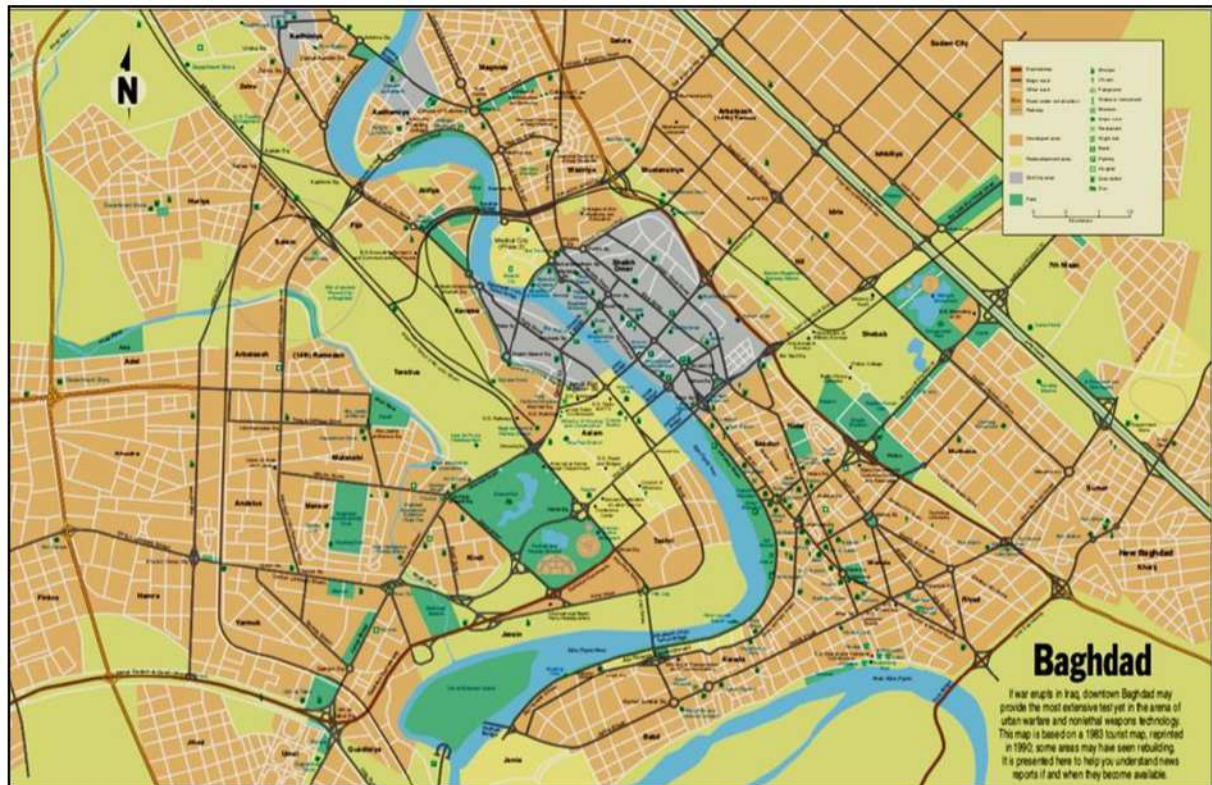


Fig. (1.1): - Baghdad old core in grey color:Source :

[https://www.globalsecurity.org/military/world/iraq/images/baghdad\\_stars-and-stripes.jpg](https://www.globalsecurity.org/military/world/iraq/images/baghdad_stars-and-stripes.jpg) (Accessed 15 Feb.2015)

## 1.2 AL-Rusafa– The Vital Central Part of Old Baghdad (Main Case study)

The study focuses on the eastern part of the old city of Baghdad (AL-Rusafa) which is considered the main historical part in the city that experienced voluminous morphological developments through decades (Fig.1.2). The most historical monuments, markets and administrative buildings are concentrated in this part showing the identity of the city as an old medieval town. This part has started to be developed far from its old medieval town since the beginning of the last century, yet later it has experienced a conflict between urban elements belonging to different urban patterns as they are differing in function, proportion and form resulting with a devastation in the homogeneity of the traditional urban fabric. The area occupied about 5.6 km<sup>2</sup> and was divided to four linear segments along the river by vertical streets directed to the river creating small islands of neighbourhoods that were not attached to each other like before and were separated by physical barriers represented by streets and

their aligned buildings (JCP, 1984, pp. 8-15). The demand on commercial facilities is increased every year as it is considered the main centre for wholesale trade as a main central business district (CBD) in addition to its importance as main civic centre.

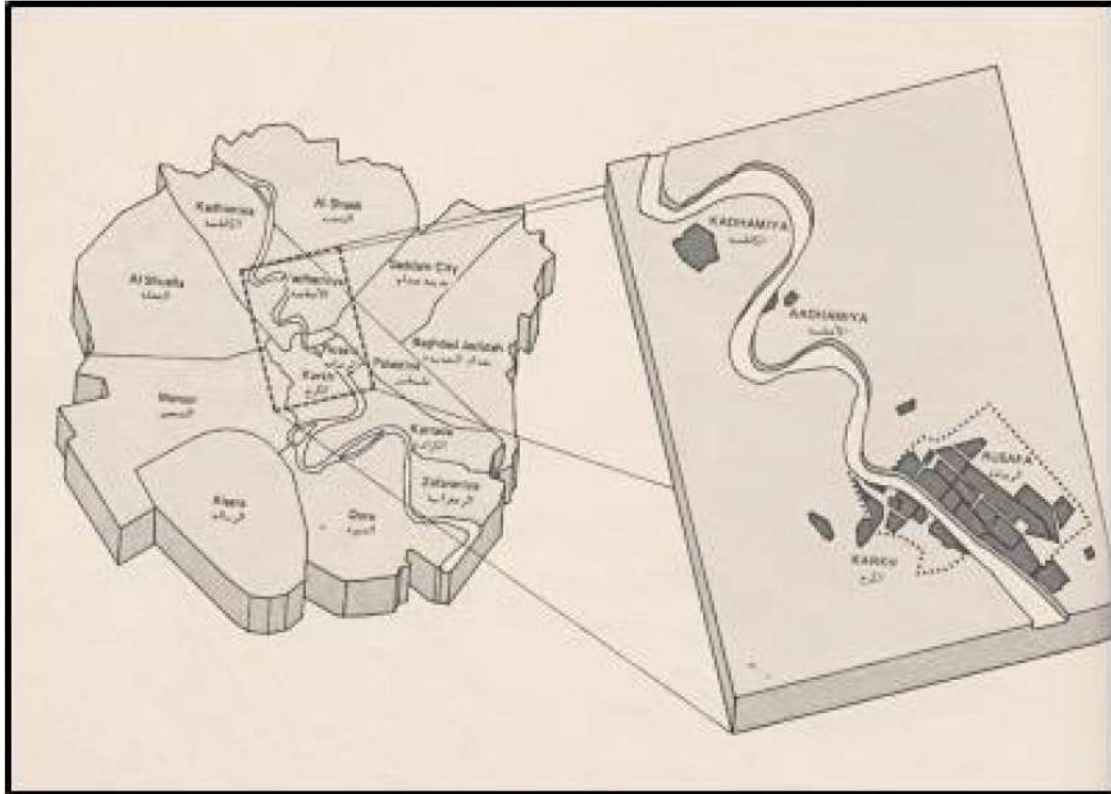


Fig. (1.2): - The Location of AL-Rusafa within Baghdad City, Source: JCP1984:9.

## 1.3 The Modernized Baghdad Old Core

### 1.3.1 Multi Conflicted Urban Patterns

Like all historical medieval cities in middle east, the city of Baghdad presented an outstanding paradigm of variant urban patterns and overlapped urban structure that resulted from a dramatic evolution process through last decades. The city passed through a multi faceted transformation process and has undergone fundamental changes in the physical and cultural environment. The city retained its compactness till the end of the 19th century when a new model of western spatial structure was introduced by having large vehicular streets that penetrated the city fabric. The intensive interference in the historic urban structure was continued in the following decades and caused a real damage in traditional urban elements that carried spiritual and historical influence for the city. Several streets had been carved in

the old urban centre in order to link both city expansions in the north and the south. This strategy introduced a new idea and structure of urban space represented by wide streets with new hierarchies, large squares and plaza instead of the traditional narrow ones. The intensive interference caused more devastation and degradation in the already existed fabric and created more vacant lands, and also resulted in undefined spaces and uncontrolled growth. Large areas of the old core were occupied by renewal projects that reflected a modernist process from the 1950s up to the 1980s of the last century and introduced a new architecture and technical facilities that coped with the rapid demand of modern infrastructure. Inserting modern urban spaces and building types far from the old existed one have altered the interaction between spatial elements and changed the hierarchy of the whole urban space structure associated with socioeconomic problems. The old urban centre was ended up into segregated urban spaces and isolated sectors which were surrounded by multi storey buildings. The absence of development strategies to protect the urban heritage fabric of Baghdad city allowed modern structure to extend and destroy wide areas of the inner part. The historical quarters with their main features and monuments started to be reshaped and react in a different way within the new concept of urban space. Indeed, the aim of this research is to recognize the impacts of modernization process on the traditional spatial structure represented by the characteristics of urban space and building types and explore their reaction within the linkage to the new inserted concept of space and building types.

### **1.3.2 Urban Hybrid Space Network**

Traditional urban space in middle eastern city in general and particularly in Baghdad combines the whole urban fabric with different patterns by connecting the city boundaries and the urban elements in a unified scene of urban structure. Due to the social and economic driving forces accompanied by the rapid need for modern functions and technical infrastructure, a new idea of urban space was introduced following the western city model that followed the rational planning movement which started to spread between (1890–1960) having wide vehicular streets and plazas instead of the traditional urban fabric. Introducing new space types has altered the hierarchy of traditional urban spaces and resulted in new building types, scale, and geometry. The variant urban elements were reordered in new form and hierarchy to adapt the modification process. Accordingly, the relationship between urban space and built structure is changed and caused many spatial conflicts by having a degradation and fragmentation in the homogeneous traditional urban fabric. This alteration created new spaces and destroyed others, changing the urban elements order and the definition of the whole urban structure and finding new urban poles instead of the old ones.

## 1.4 The Investigation of Urban Landscape Development: Learning from -The State of Arts

Hybrid urban structure in the modernized old oriental cities composed by both modern urban space types and the traditional spatial elements. Many scientific researches, articles and practical studies dealt within the oriental cities especially their conformation through decades showing always the main characteristics of the urban structure in having compact fabric with modern urban patterns like Stefano Bianca book (urban form in Arab world) which he emphasized on the urban transformation in Baghdad, Aleppo, Mecca and other oriental cities. Many other articles and practical studies done by GIZ regarding Aleppo, Damascus and also Aga Khan regarding the development of Darb-AL-Ahmer in Cairo, dealing within finding the best solutions to mitigate the urban conflict between different urban patterns. The urban elements and the relation between urban space and building types were always under inquiry in term of spatial, cultural and social influences that still need more to be investigated based on their roots and the innovations behind their alteration showing their historical role in each morphological period. The City of Baghdad experienced the same situation and need to be explored and investigated regarding the transformation in its urban elements showing the role of the spatial conflict in altering the entire urban scene. Eugen Wirth<sup>3</sup> elaborated the urban elements of the oriental cities and their functions to form the urban landscape starting from the agglomeration of the parcels in compact way, the necessity of having the inward looking courtyard buildings for both private and public up to composing the quarters that were separated by main streets. He distinguished five characteristics of the oriental cities: the degeneration of old planned cities, cul-de-sac pathways in the residential quarters, courtyard houses, the central market and distinct quarters (Wirth. E. , 2000). In his book<sup>4</sup>, he was looking for the dynamicity that operates the whole parts of the city starting from the economic life, city function, social and religious factors up to the main physical components and building types. He compared the oriental city structure to the western approach and used the geographical description to show the structure and function that shape the city as a place of live (Wirth E. , 2000, pp. 3-4,6). Eugen Wirth was looking for the structuralism and the identity of the oriental city. He investigated the origin of the Oriental cities and their belonging to the

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<sup>3</sup> See Biography P.432

<sup>4</sup> The book was only in German called (Die orientalische Stadt im islamischen Vorderasien und Nordafrika) and focused on cities in the middle east and north Africa.

past urban and architecture of the old civilizations, showing their impacts in each period. Wirth tried to compare different types of cities in order to discover their distinguished characteristics. His process based first in analyzing the function of the city and its regional and economical role accompanied with their spatial arrangement. He emphasized that the spatial arrangement is considered a product of human interaction according to the cultural, social and economic conditions ( (Wirth E. , 2000, p. 7). The second analysis step was the city's economy and its role in shaping the city in the past and after each modernization process showing the development on the market and infrastructure ( (Wirth E. , 2000, p. 195). The third step was analyzing the role of privacy in shaping the old city and the change that affect the relation between privacy and publicity after modernization. The fourth step was analyzing the city components and building types and their role within the city in each period. His approach was examined the possibility of the new functions to adapt the traditional building types and the way that had been configured in the new development areas (Wirth E. , 2000, pp. 160-165). The role of traditional urban elements within the new city structure was explored and examined especially for the main streets and building types and their development according to required new functions. The physical entities of the city were analyzed starting from the quarter and its function up to the houses and their variant types, showing the alteration in the way of living and the relation between old and new sectors. Wirth was emphasized on the relation between indoor and outdoor spaces ending with finding the planning strategies to keep the old city. He mentions the extension of the oriental old core cities, showing the growth variation starting from modernized quarters and ending with having slum area around. Wirth analyses the alteration in city function as a result of adding new streets or removing many city parts. In spite of the alteration in the spatial characteristics of the commercial spines as a result of the westernization, the market always adapts its paths and keeps its potentiality inside the city (Wirth. E. , 1975, p. 58). He compares the growth and the function of both western and oriental cities showing that both city structure are based on systemic arrangement of the urban components. This approach was not dealing or exploring the prospective impacts from the continuous modernization process. The types for both urban space and buildings were not followed and explored in a combined method like what have been done in this work. This work emphasized that adding more modern urban space will alter the hierarchies for both old and new ones, changing the role and the interaction of the whole urban components. This dissertation shows how the hierarchy and characteristic of the new urban spaces could alter the entire use and function of the city. This could be readable in more details by exploring the city skyline in each part of the city, following the morphological change in different eras starting from the quarter up to plot, in an accumulative process of developments.

Stefano Bianca<sup>5</sup> was emphasized to explore the urban environment of oriental cities what he called (Arab Cities) and the sources of the preformed forces regarding life style, social and religious power that participated to produce the final shape of those cities. He emphasized about the modernization process in the oriental cities and the role of the western urban structure model that participated to alter the spatial characteristic of the compact urban form to be more fragmented by having wide streets and outward looking building types. His book (urban form in Arab world past and present) emphasized on the impacts of the modernization process that continues to affect the physical, social and economic aspects in the traditional oriental cities and the resulted structural conflict. He highlighted the possible solutions and potentials to reintegrate both the traditional and the implanted urban patterns. Different cases of spatial clashes and conflicts between old and new structure in different areas of the oriental historic cities were analyzed showing the proposed rehabilitation projects that was planned to be achieved which the city of Baghdad was one of those case studies. The revitalization project for Baghdad that was done by JCP<sup>6</sup> and was detailed by Bianca provides a comprehensive strategy that should be followed without showing the risks of the continuous modernization proposals on the city and the expected transformation in the future. This work cleared and explored the spatial clashes that Bianca talked about in the level of the transformation in urban components. The buildings and urban space types explained the mechanism of clashes between both western and eastern approaches of the urban structure. This dissertation focused more in creating the morphological series that could explore the reason of each change and its prospective impacts. This work emphasized on the characteristics and types of the added urban spaces and building types, showing the process of the urban transformation that should be explored to associate the conservation planning processes that Bianca illustrates.

AL-Ashaab<sup>7</sup> in his morphological study in 1974 about the city of Baghdad followed the geographical approach to explain the city development up to the seventies of the last century, showing the main characteristic of the urban structure and the planning approach in each morphological period. This work continued to explore the city of Baghdad morphology with different methodology through using the type as the basis for the morphological development. This work overlapped each plan belong to certain period to the previous one to explore and distinguish the direction of development and the point that the city moved from growth within

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<sup>5</sup> See Biography P.436

<sup>6</sup> JCP Japanese consultant and partners who committed to prepare conservation strategies for AL-Rusafa in Baghdad in 1984.

<sup>7</sup> See Biography P.434



the vacant land within the old city border up to the start of transformation in the existed traditional urban elements. Following the typo-morphological investigation of the urban components was introduced by the Italian architects and urban planners Muratori<sup>8</sup>, Cannigia<sup>9</sup> and Aldo Rossi<sup>10</sup> in the Mediterranean compact cities like what had been done in Venice by Muratori and this methodology was adopted and developed by the German urban planner Gerhard Curdes<sup>11</sup> to explore the morphology of many cities in western Europe like in Aachen and Cologne in Germany rather than used in common in the oriental cities. What distinguished this work from Curdes Analysis method was the combination between the analysis for the city morphological layers and the characteristics of urban spaces after each period within the city skyline. Mantho<sup>12</sup> relay on the urban sections to show the development of the city. He indicated the role of the city skyline to explore the transformation in urban structure area starting from the buffer zone area up to the old core for different cities worldwide. This dissertation used this method only for the old core showing the development that was happened when the old core was the only built up area within the city wall up to the recent situation where the city became part of large built up area through analyzing the same sections in different historical periods.

This work considered one of the basic resources that dealt with the morphological development of Baghdad. It provided the motivation to look for the reasons behind the transformation process by tracing the layers of the old core in each morphological period following the development in the types of urban elements to show the change in urban structure and the reason behind and explore the impacts for the next period. Applying the typo-morphological method in exploring the transformation process in the oriental city in general and in Baghdad will provide a better knowledge about the urban context of the city and explore in more detailed process the impacts that resulted from planting the western urban pattern model. Those impacts could also be explored from the city skyline in different places which mostly in many cases were not shown in the morphological plans. The urban space characteristics and the skyline could be investigated by analyzing many transects through the old city to clarify its reaction within the periphery and show clearly the extension of the new structure and its impacts inside the historical fabric within different morphological periods. The process of this work used both the typo-morphological analysis and urban transects

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<sup>8</sup> See Biography P.436

<sup>9</sup> See Biography P.433

<sup>10</sup> See Biography P.431

<sup>11</sup> See Biography P.433

<sup>12</sup> See Biography P.435

development to explore the city layers on the ground level accompanied within the three dimensional analysis. It worked to illustrate the change in building types and the relations between urban space and built up area in different morphological periods with main focus on the characteristics of the traditional and modern urban spaces and the change in their hierarchy. The aim is to elaborate the variant impacts and outcomes from the continuous transformation process that could be initiated and increased from further modernization in the oriental cities.

**According to what had been done in previous studies in describing the urban components of the city of Baghdad still there is more need to explore the role of western urban model within the oriental city structure and according to that the dissertation methodology answers the following main questions:**

- 1. What are the impacts of the western urban structure model on Baghdad as one of the oriental cities and how spatial conflict resulted from the modernization process that was occurred from 1845 up to 2009?**
- 2. How old and new urban space types shaped and interacted within the surrounded built up structure after the modernization process in old Baghdad city?**
- 3. How Urban Landscape in Old Baghdad city has been devastated within the continuous transformation process in consequent morphological time intervals?**

**The study answers the following questions in relation to chapters: -**

- 1. What are the impacts of the subsequent master plans in shaping the city of Baghdad in general and the old core in particular?**
- 2. What are the morphological changes of the old city of Baghdad that occurred through different historical periods following the historical urban components?**
- 3. What are the main features and characteristics of the modern and old urban space concept (streets & squares) in old Baghdad city and how could their hierarchy have altered with each morphological period?**
- 4. How is spatial conflict initiated and characterized during the subsequent transformation process and what are the impacts of the modernization process that resulted from inserting different urban patterns in changing the coherence and the skyline of traditional urban fabric based on analyzing the urban sections through the old core?**

**The Expected Outcomes: Goals & Objectives**

1. To explore the role of subsequent master plans and political decisions through history in shaping the current spatial structure of the city of Baghdad and their impacts on the old core in a macro analysis level.
2. To explore the morphological phases of the old city core of Baghdad showing the characteristics of the transformation process in each time period in a micro level analysis.
3. To understand the spatial conflict and the overlapping between the traditional and modern urban structure after the modernization process in subsequent periods.
4. To elaborate the impacts of modern urban spaces on the traditional one belongs to their hierarchy, their physical characteristics, buildings types and their impacts on the surrounded urban elements.
5. To Identify the main criteria and values that need to reactivate and reintegrate the modern urban space into the traditional one and vice versa and to prove the fact of the validity of the traditional space as a main integrated urban element through the process of the urban transformation.

**1.5 Setting Urban Space Hierarchies-The Hypothetical Argument**

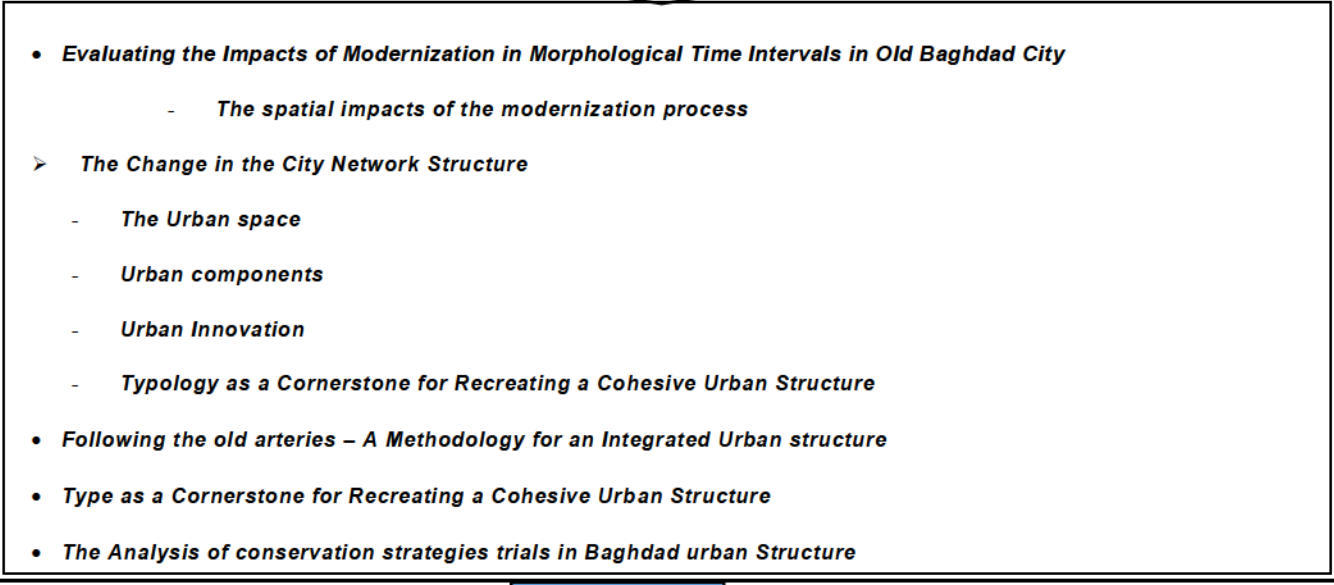
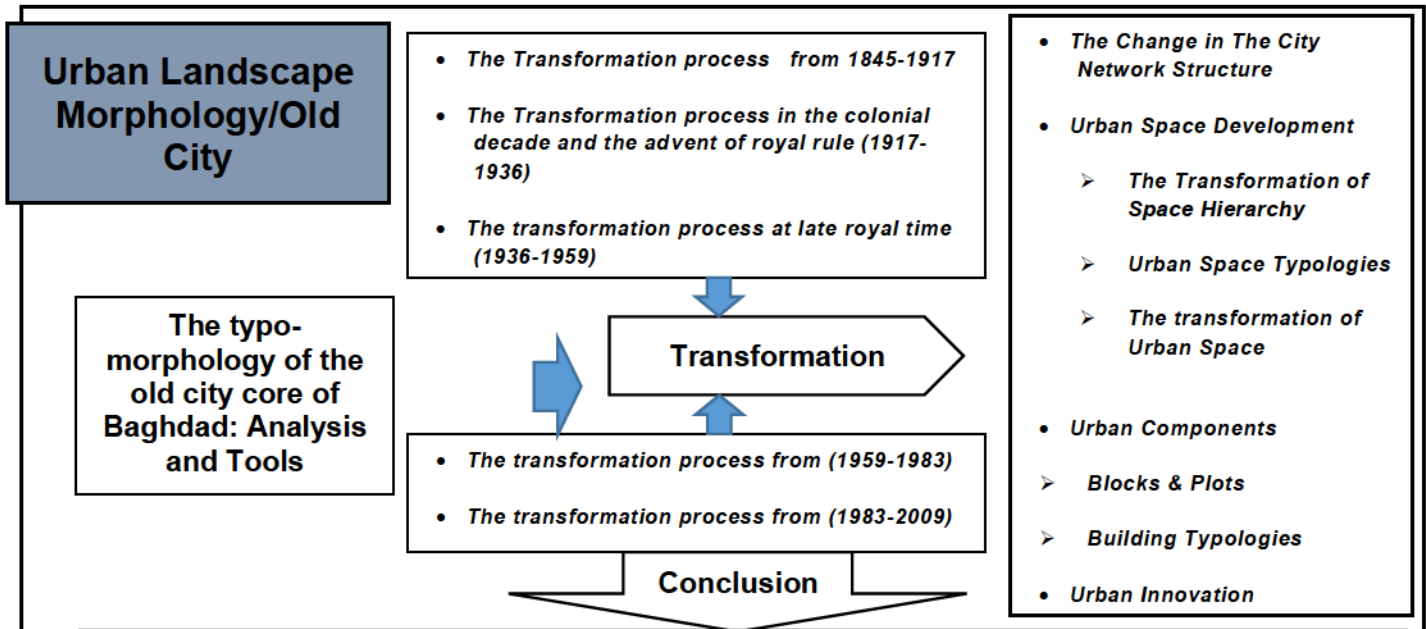
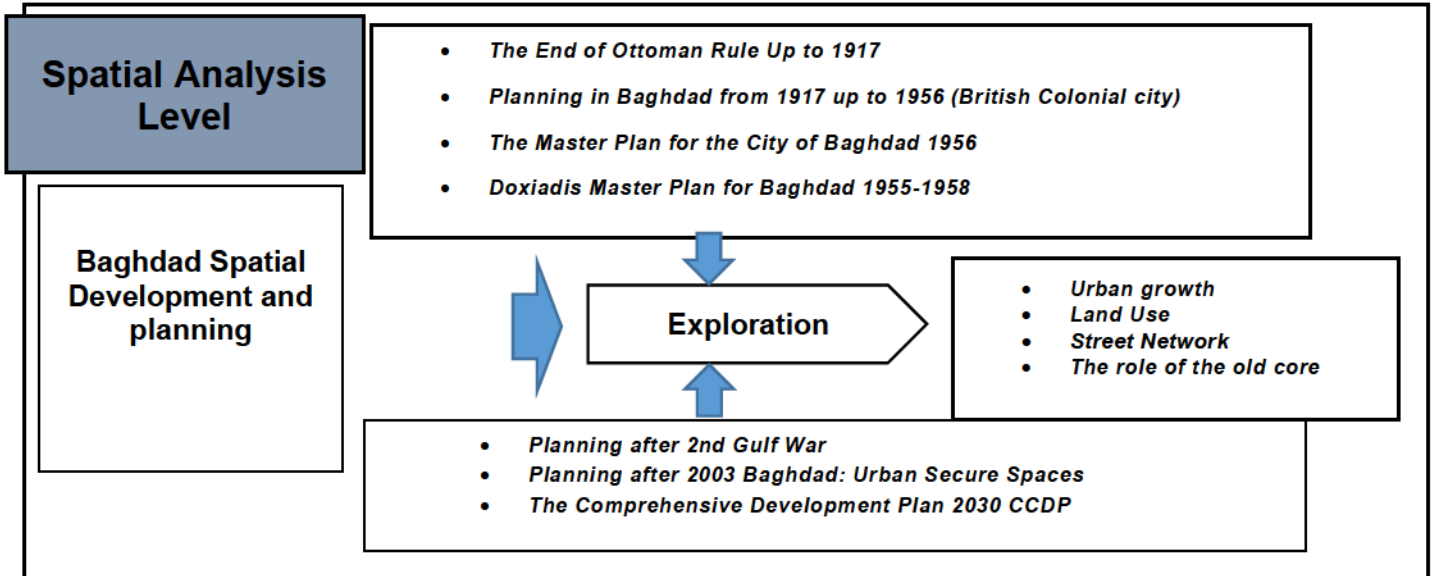
Urban space always combined different functions but they should have provided a secure and shielded movement by having a chain of accessibility from more private streets and squares to the lower private space like private rooms in house (Franck, 2010, p. 2). Apparently, it is quite common to say that the traditional and modern urban public spaces in historic oriental cities are not integrated epically in the hierarchy and functions and accordingly they are facing interruption and many spatial problems especially in moving from public to private showing an alteration in the relation within the built up area. The old city experienced a fragmentation among its spatial elements based on different development approaches and types of intervention since decades. All extreme Interventions have adopted the western approach in carving out broad streets and plazas which failed to be integrated within the surrounded

traditional urban fabric and in particular to the traditional public spaces. The modern urban spaces (streets & squares) affected the urban scene by dividing the old city into isolated parts altering the idea and the spatial characteristics of the traditional urban space and affected its hierarchy and its relation within the surrounded built structure. The change in space hierarchy also altered the role of urban elements by changing the interaction between spaces and built up area, thus accelerating the transformation in building types and reproducing new urban models. The study argues that resetting the hierarchy of traditional and modern urban spaces is urgently required to reintegrate and reunify the fragmented city structure. The study is hypothesized that the impacts of modernization on the historic urban structure are varied and depend mainly on the hierarchy and type of modern urban spaces (streets & squares). It is also hypothesized that hierarchy and urban characteristics of the traditional urban spaces could be modified according to the change in the hierarchy of modern spaces and the surrounded building types. Different types of interventions and projects had variant impacts on the traditional urban fabric. The traditional urban spaces (Maidan, streets, mosques & shrines and market) varied in reaction according to the type of the added modern spaces (streets and plazas). The interaction of both modern and traditional urban spaces together affects the built up area through land use distribution, the role of monuments (historical and new landmarks) and the change in building types. The study examines the impacts of modernization process on the traditional urban spaces and built up structure in different places through following the morphology of the urban components by analyzing the horizontal and vertical transects along the old core. The transects will show the impacts on different criteria like the space hierarchy, land use, historical monuments, buildings types, and buildings scale and proportion.

## **1.6 The Proper Methodology in Following The impacts of Modernization**

In order to come up with appropriate answers to the above queries, the dissertation methodology is based on a deliberate analysis of the impacts related to different planning approaches and interventions on the city's planning and in particular the old core. The typomorphological approach is applied to deduce the causes and the potentials behind the transformation of the city urban elements. It is used to explore the conflict forces among multiple urban patterns where different types of urban spaces were placed and altered the surrounding building types. The aim is to look for the potentials that link between the past and the present and at same time to investigate the accumulative impacts that was initiated since

decades. The final objective of this process is to explore the mechanism of the transformation process and predict the prospective changes in the cityscape and the urban structure. The analysis is focused on examining the hierarchy and the characteristics of both modern and traditional urban spaces and their mutual impacts on shaping the entire urban form in the modernized old city. Multi urban sections were taken through the old core using horizontal and vertical transect analysis to illustrate the impacts of modernization by means spatial criteria. The result of this analytical exploration enables the research to expose the impacts as well the reaction of the intervention on the old fabric in different historical periods from 1845 up to 2009, See Fig. (3.1).



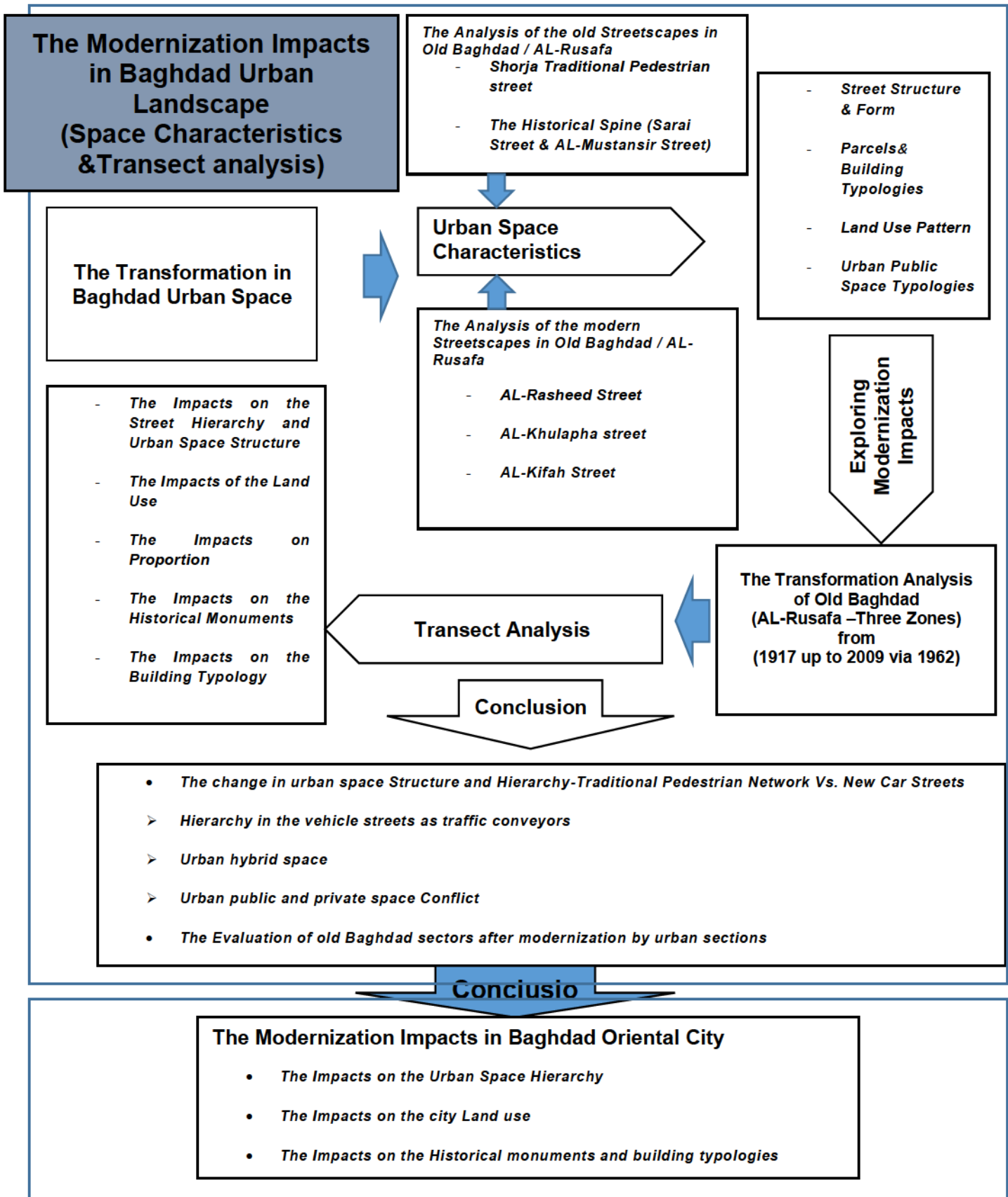


Fig. (1.3): - The Research methodology in following the impact of the modernization process, Source: The Author.

*The main approaches and methods of analysis that can be utilized in carrying out the study aims and objective could be summarized in the dissertation chapters' s as follows:*

### **1.6.1 The Investigation of Urban Landscape Development- The State of Art (Chapter II)**

This Chapter will investigate the state background for the topics that the dissertations used as a proper methodology to analyze the city urban landscape. The typo-morphological analysis as a basic method in finding out the development aspects and innovations in the city core. This approach provides a detailed explanation about the configuration of urban structure in general and urban space development in particular. The chapter starts with introducing the theory concept of urban morphology and transformation process. It indicates the methods used to explore the morphology throughout history and the development of both geographical and typological approaches. The idea of typo-morphology is considered a primary tool to illustrate the interaction among urban structure components. This chapter represents the principles of the Italian School initiated by Saverio Muratori in tracing the old city structure and the types behind. This approach was the basis of Gerhard Curdes morphological theory which laid emphasis on defining the relationship between built structure and urban space within the urban context. The theory put forward that the change in the plot and building as a small cell is the groundwork for the block change. The primary focal point of this chapter is to demonstrate the dynamic process of change in the old city of Baghdad based on the different historical planning ideas and concepts. An overview about the modernization in the compact middle eastern urban structure was given by analyzing the resulted hybrid urban space network showing the transformation process in urban space based on hierarchy, urban structure and form and the main components that shaped the space. The research provides a summary and introduction about the history of transect analysis and its role in exploring the influences and the interactions among different urban structure elements that shape the cityscape.

### **1.6.2 The Spatial Development of Baghdad City (Chapter III)**

This Chapter illustrates the sequences of urban pattern development. It, in another word, illustrates the physical spatial arrangement that contributed potentially to shaping the city in the last decades. In this chapter an analysis is introduced for the whole planning approaches



done by British mandate in 1921, Monpirio in 1956<sup>13</sup>, Doxiadis<sup>14</sup> in 1958, Polservice<sup>15</sup> in 1973 and CCDP<sup>16</sup> which is proposed in 2013. The main analysis criteria are the urban growth, land use change, the development of urban neighborhood and the role of the old part within the whole city. The stagnation period after the frequent wars were illustrated showing the idea and the concept of the new land use plan which currently under preparation to reestablish a new management system for the city. A final analysis is made based on the above criteria to show the impacts and rules of those approaches in building the city spatial structure and reaching the current plan. Meanwhile, the Chapter will shed light on the evolution layers of the city and the planning approaches in order to reach its final shape and show the current problems of the whole city. The above mentioned master plans and planning approaches of Baghdad that were partly or completely followed were digitized using Auto Cad software and then layered in one map showing the different approaches that were followed subsequently in composing the current spatial structure of the city of Baghdad and the role of each planning pattern in shaping and modifying the old city core.

### **1.6.3 Urban Typo-Morphological Analysis for Baghdad Old City (Chapter IV)**

Based on Gerhard Curdes typo morphology methodology as the main rebounding approach, the mechanism of urban transformation for the old cities was explained in this chapter. The effects of the past historical planning approaches to the existed built structure and socioeconomic context are subject to be investigated by a set of criteria that explain the sequences of transformation process. These criteria are: network structure, Parcel and building types within historical monuments, blocks, urban space types and the innovations inside the city. The main indicators that contributed to the analysis of those criteria are their hierarchy, regularity, edges, orientation and scale. The scope of analysis considers the historic period between 1854 and 2009 where a massive transformation took place to disclose the main features of change in the urban structure and type through the transformation process that occurred in consequent time intervals from 1854-1916, 1917-1936, 1936-1959, 1959-1983 and finally from 1983-2009. All proposals and plans set forth or achieved in the old city were explained in this chapter. Searching for the historical plans from different archives in the world

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<sup>13</sup> 1956. Master Plan for the City of Baghdad, by London's Minoprio & Spencely & P.W. MacFarlane.

<sup>14</sup> 1985, Greek planning office Doxiadis prepared the master plan concept for Baghdad.

<sup>15</sup> 1967, Engineering Firm: Polservice Consulting Engineers Warsaw-Poland prepared the comprehensive Master plan for Baghdad 2000.

<sup>16</sup> 2010, Comprehensive development planning Baghdad 2030 - Kateeb & Alame and PCI Japanese consultants – 2010.

was a difficult step. Berlin, Hauge, Ottoman in addition to Iraqi archives were visited to collect the rare plans and maps that were not published before and considered so unique for this research. The historical plans that belong to consequent time intervals were digitized by using Auto Cad software to know the transformation that occurred for each period with regard to the one before. The resultant plans showed the change in urban structure for a certain period in comparison to the older period. The plans were done for each two periods that witnessed a significant change in structure. The plans were enhanced by a set of rare photographs that were collected privately to show the change in urban structure through historical aerial photos for the urban fabric and photos regarding historical building types. Rare detailed maps for the modification process of some streets and squares or large-scale projects were shown and compared to each other to explore the idea behind the transformation process.

#### **1.6.4 The Modernization Impacts in Baghdad Urban Landscape**

This part illustrates the type, form and characteristics of urban space development based on the precise investigation of its morphological components that had been performed in chapter three. It is so important in this chapter to distinguish between the inserted urban space with its surrounded new elements and the existed traditional urban space shown for both the hierarchy, the categories of the surrounded built up areas and types. The research tried to divulge the result of combining different patterns of urban structure through the modernization process and categorize the hygiene urban space that resulted in the continuous interaction. The existed urban spaces were analyzed according to their structure, form, hierarchy and impacts on the surrounded land use. The principal focal point is to investigate the change in urban space pattern and their classification in the modernized urban fabric through the way of space construction, linkage and hierarchy. The chapter initially analyzes the traditional spaces that old city core has like pedestrian streets, plazas, cemeteries and mosques as a typical pattern for the middle eastern cities. A comprehensive investigation and analysis to the modern urban streets and squares are done regarding their hierarchies on the physical, economic and social levels. A clear investigation was done through field survey to analyze and describe the architecture and construction style for the streets. The main four vehicular streets, AL-Rasheed, AL-Khulapha, AL-Kifah and Shaik Omar with the old pedestrian artery AL-Mustansir street were detailed and analyzed in this chapter to find their configuration and physical characteristics. Those streets were constructed through the old urban fabric, parallel to the river and segmented into five parts according to their intersection within the perpendicular streets that connect them in a series. The analysis will use these segments to show the variation in hierarchy and proportion of those streets and their integration to the

surrounded historical area. The analysis uses the criteria of space structure and hierarchy, parcels size, buildings types, land use pattern, scale, the regularity and the interaction within the surrounded built structure. The chapter aims to explain the hierarchy of those streets on physical, economic and social levels to explore the grade of importance (strength and weakness) for each street according to its potentiality within the whole city in general and the old core in particular. Setting the hierarchy will provide the basis for the analysis of their impacts on the surrounded area. The main streets and squares were surveyed and photographed during a very critical security situation (this explains the fair quality for some photos) in order to analyze the physical structure and building types for the existed traditional and modern urban spaces. Some aerial photos were also used to enhance the analysis process and to give a clear and complete image for the connectivity and continuity of the existed urban space network.

This chapter explores the integration and conflict among urban components through the modernization process in historical urban structure. The impacts of modernization process on the traditional urban elements are examined by illustrating the reaction and the change in urban elements like the old traditional urban spaces (streets, Plaza, market and mosques) and the surrounded building types within the western idea of modern urban spaces (streets and squares) and their outward looking building types. The main method in exploring the change in spatial elements is to use the transect analysis. The change in properties of the traditional urban structure is based on the way of inserting the modern urban spaces which could be attached to the old one, and could overlap with the old one or substitute the traditional one. Many sections were taken into account through the old core of the city of Baghdad up to the river passing the courses of the five main streets. The selected eight sections provide a variety of cases that demonstrate the impacts of modern urban spaces on the configuration of traditional urban form in general and urban space in particular. The physical characteristics of each street have different impacts on the surrounded area from the others. The significance of the analysis lies in presenting the potentiality of street hierarchy in changing the urban structure of the old city and exploring the physical and nonphysical influence on the urban fabric around and the community who live and use it. The connectivity, continuity and coherence of the urban fabric are under estimation in different zones. The result shows how the city operates combining a variety of functions and types with different integrity degree between the urban elements. It is important to estimate the ratio of the modernized area to the traditional one by comparing the recent urban structure within the old ones through observing the change in urban sections within different periods. The primary measures are the street hierarchy and the structure of urban space, change in type, land use pattern, proportion and the historical monuments. The selected nine sections pass through four zones which are

bordered by the vertical streets that directed to river and could be summarized as follows : - Three sections through AL-Sinak area between AL-Sinak bridge and AL-Ahrar bridge that passed through the new civic centre and AL-Gailani shrine, three sections through AL-Shorja area between AL-Ahrar bridge and AL-Shuhada bridge that passed through the main traditional market area, two sections through AL-Qushla area between AL-Shuhada bridge and Maidan and finally one section between Maidan and Bab AL-Mudham bridge that passed through the governmental assembly of the Ottoman buildings. The updated plan for the old core city of Baghdad belong to 2009 were obtained from the Ministry of Planning as soft image without digitization for security reasons. The images were digitized again to explore the physical details (heights, land use, proportion) that are necessary for the process of transect analysis. The transects were drawn in details by using Auto Cad software as a main tool for exploring the modernization impacts on the traditional urban fabric. Those transects were compared to the situation in 1917 and 1962 where three dimensional sections were drawn based on archival satellite images in the same positions of the plan in 2009. The comparison explained the change in urban structure in different periods after inserting modern urban space and building types.

### **1.6.5 Appendix I**

The main significant produced and Archival maps, plans and figures were collected in a separate volume with (A3) paper size showing them in big size and in more clear details.

## **1.7 Data to be collected and Handled**

### **1.7.1 Obstacles to Be Handled – Finding Analytical Alternatives in Non-Secured Area**

Working in war zone considered the most difficult situation that faced the research during the study period. The lack of data was so significant as most of the existed plans and archival materials were burned in the war 2003. Many remained documents were found damaged in poor conditions which were collected from the debris after the end of war and maintained to be used partly again. The security situation was not stable in the study area during the research time as it was a theatre of military operations where many car bombs were occurred in many districts. This made the documentation and the photographing process hard to be done even after the improvement of the security situations. Questionnaire and observation

process were so difficult to be done and officially was not allowed due to security reasons. The existed survey for the buildings in the old city that was done by the Iraq ministry of planning was not accurate according to the checkup that was done consequently during the research work. This enforced to make a survey for the main streets only rather than neighborhoods that was hard to do due to security reasons and their building survey assumed to be more or less reliable. Even though, many risky adventures to photograph the area and collect some information about the existed situation were done successfully and sometimes caused a sever personal problems. All those obstacles contributed to change the methodology of the work several times to reach the main objectives in order to provide a clear and scientific process that was based on analyzing the current and actual physical changes.

### **1.7.2 Literature Review**

The dissertation depends on specific references related to the topics of urban typomorphology, urban space, urban form and its role in conducting the last trials that deal with the spatial order of the modernized old urban core. The research focuses on finding the development and the practice of the morphological analysis of the city and skyline development through urban sections as one of the main qualitative and quantitative analytical techniques in exploring the urban spatial form. Scientific books, papers, dissertations, bulletins, reports and electronic references were used to achieve the target of the research especially those which deal with urban conservation and urban heritage. The theoretical part explained the methodology that should be followed to understand the transformation process and the role of altering the urban space type to reshape the city structure. The development of the city of Baghdad was analysed based on the old writings, archival books, brochures and magazines that were considered the basis of this work in each part down to the transect analysis which explains the impact of the severe interventions on the traditional urban fabric. Many documents belong to the modernization impacts in many old middle eastern cities like in Aleppo and Cairo were reviewed to generate comparative analysis within the situation in Old Baghdad city.

### **1.7.3 Archival Maps and Pictures**

It is absolutely one of the important fundamentals of the present study to have old historical maps like territorial maps, city maps and detailed maps. Different archives and organizations all over the world were visited in order to search for any available data. The main visited locations were the Iraqi Archives, the Ottoman Archive, British Archive, Berlin National library,

Hauge National Library, Leipzig National Library, Tübingen Orient Institute and Miasto project Company in Krakow Polen. Some rare maps and pictures were collected from the internet, old dissertations and books that all participated in enhancing the analytical description of the old city of Baghdad. Those maps and engravings provided a detailed knowledge about the physical characteristics of the former structure in different stages. It was very important to mention that the dissertation followed the 2009 plan that was produced in the last preparatory census. Some personal surveys and information that got by Apple maps application were belong after 2009 and that because of the improvement in security situation which was so critical and risky.

### **1.7.4 Interviews and Field Survey**

Field observations and survey were carried out to get a clear knowledge about the variables change in the historical area in spite of the bad security situation in the study area. Qualitative and quantitative surveys were also done in the case study area to identify the parts that are exposed or less exposed to the modernization process. The frequent visits to the three areas of case studies were so effective to get the physical data like pictures and sketches and also to compare them with the available collection of maps which were relatively not updated. The observation of the actual physical traces is very important for the documentation process and to provide an accurate data for further analysis. It was also so important to analyze the modern urban spaces by documenting all physical elements of the main streets and squares. This process was carried out until the end of the research in order to acquire all updated information about the transformed urban elements in the selected transects in the case study area. Surveys and Interviews with inhabitants, planners, architects were done to enhance the discourse of the impacts of modernization on the old city.

### **1.7.5 Collaborative Observation**

The dissertation was precisely concerned with the review of different policies and conservation strategies both on the local and national levels for the same study area or other case studies that have been executed and carried out in different cities abroad, appraising the outcomes from those strategies. This observation method attempts to recognize and estimate the potentials and faults in the study area from stakeholder's points of view to explore the missing and intangible points concerning the analysis methods.

# Chapter -2-

## **The Investigation of Urban Landscape Development (The State of Art)**

## Chapter Two -The Investigation of Urban Landscape Development

### 2.1 Urban Landscape Analysis of the Old City Core

The research focused on the urban transformation process inside the city and the way the city structure reacts in each period. It also analyzed the potentials and outcomes from those actions to predict the process of change that contributes to shaping the urban structure. The exploration of morphological changes in the hybrid urban structure that consist old and new inserted pattern in the Middle Eastern cities could be based on combining the typo morphological approach which was initiated by Muratori and some idea of Conzenian geographical approach<sup>17</sup>. Both methodologies could analyze the clash between different urban patterns and different urban space concepts and their relation to building types. Curdes way of analyzing was the main process in finding a methodological analysis of the modernized cities in the Middle East like in Baghdad. Those methodologies provide a comprehensive understanding of the impacts of each morphological period that could be determined based on urban planning, social and political factors to the next one and provide hints and integrative strategies in any prospective urban conservation plans to keep and reintegrate the existed scattered remains of the urban fabric. Following the methodology of this dissertation in describing the development in urban structure, urban typo morphology, urban space structure and urban transect analysis were the main basic specifications that provide effective tools in exploring the main criteria indicators to analyze the accumulative transformation process in urban structure . The impacts of inserting new urban space types (streets and squares) into the existing compact middle eastern urban structure is investigated through a comprehensive analysis of the relationship between the urban elements that formed the city. Finding out regularities and irregularities in urban structure started on three levels of analysis: the first one is the spatial development of the city as Macro analysis to show the impacts of planning strategies in shaping the city and the second is specified mainly to the morphology of the old city core as Meso level of analysis reaching to characterize the urban elements and the relation between urban space and the surrounding building types after the modernization process as micro analysis level.

***The theoretical base of the urban landscape analysis in the modernized old city of baghdad is based on the following structure as shown in (Fig.2.1)***

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<sup>17</sup> See p.24-28



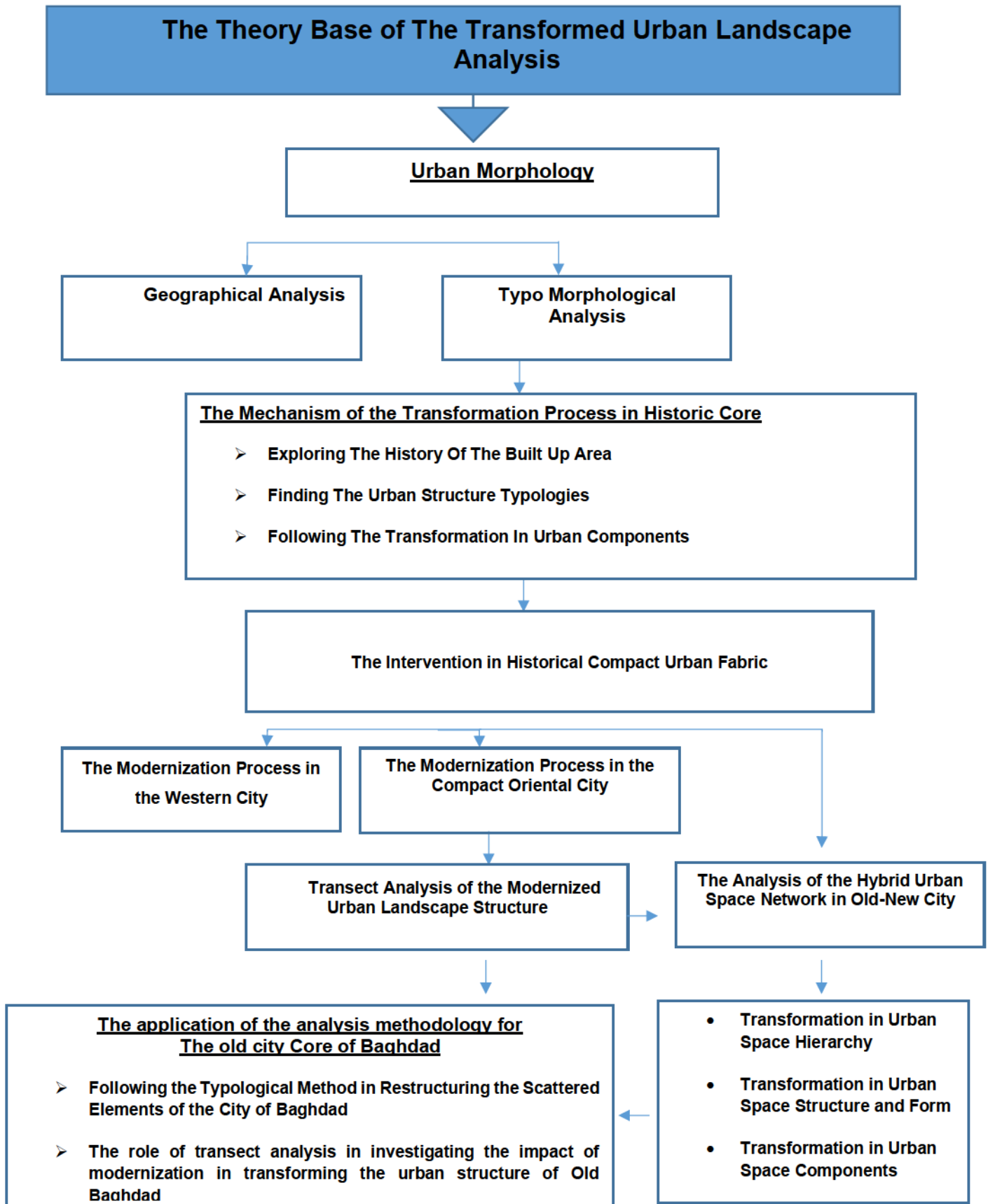


Fig. (2.1): - The Theoretical base of the Urban Landscape Analysis in the old city of Baghdad,

Source: The Author.

## 2.2 The Notion of Urban Morphology

The world morphology belongs to the Greek world (Morphe) that deals with form, shape and structure. It is mainly used in clarifying the inherited structure and the relationship between the parts of the living organism in biological science (Oxford Dictionary of English, 1997). Urban morphology is mainly concerned with urban design as an applied science. It deals with the composition and design of urban form theoretically and practically. The morphology of the city is the result of long and short term decisions done by architects, engineers and other decision makers (Evans, 2005, p. 16). Urban morphology is concerned with illustrating the initiation of form, functions, structure of urban landscape and the way of development until it reaches the final shape (J & M, 1986). The urban morphology aims to study the settlement as a physical entity and as a transformed built environment based on the interaction between urban elements and social forces (Gebauer, 1981, p. 1). The urban form could not be recognized without a better understanding of the inherited context and the main characteristics of the transformation process. Undoubtedly, the process of forming cities is based on nonstop spontaneous changes accompanied by intentionally planning activities under certain roles of social, economic and political factors. Urban morphology is therefore a strategy to conduct and discover historical traces within the city today (Topcu M., 2012, p. 2). The change in city morphology responds to the development context over time and examines both the physical entity and its evolution in a certain time course (Vance, 1990). Following the transformation process within the city is a basic tool to explore the reasons and potentials behind the change in spatial configuration. The transformation processes express the development in historic urban cores within different cultures and planning approaches. Meanwhile, urban elements always interact through mutual and dynamic ways since urban space is the initial element in forming the built structure and work to provide the final shape (Moudon, 1997, p. 3).

The term urban morphology is referred mainly to explain the specific characteristics of urban fabric by having an accurate description of the combination of both plot and building patterns (Conzen M. , 1990, pp. 134-144). The city is a complex per se that resulted from these interactions and many accumulative interventions shaped by planning and cultural forces. The tangible socioeconomic impacts and outcomes are always under examination because of their ability to create and change the physical elements that form the city (Moudon, 1997, p. 3). Urban morphology deals with the structure and the successful handling of materials which compose the fabric of the city. The urban materials are able to be modified based on the reaction to the external and internal forces. Following the destruction process and examining of the result of change are the only ways to understand the properties of urban components and improve the urban context. The urban structure is based on different hierarchies or levels

represented by plot, neighborhoods and web sectors which are subject to be interdependent and a product of social and cultural development. Urban morphology results from many decisions that were taken by multidisciplinary decision makers to solve planning problems and issues that continually occur. Wheithand <sup>18</sup>defined the urban design dereliction as the failure to adapt the city morphology which is necessary to search for a coherent spatial structure that is shaped by specific urban patterns in specific topographies (Evans, 2005, pp. 16-17). He emphasized the role of building industry and urban economy in developing and forming city (Moudon, 1997, p. 4). The wide pervasion of many planning approaches and orthodoxies initiated by Wright, Le Corbusier and Howard in the past centuries gave the argument a start to think about the natural behavior that participated in building cities based on different human approaches in city development. Colonized historic old cities were influenced by modern European style through changing the urban form, structure and destroying the existing original one. Following the morphological approach is the only method to repair and adapt any changes and damages in those cities. Urban morphologists studied the tangible outcomes on physical level resulted from accumulated and integrated actions of cultural, social and economic forces over time. Morphological analysis could be achieved through the dynamic interrelationship between main urban organisms finding out the morphogenesis characteristics of the city. The physical urban form of the city considers the best medium of morphogenetic analysis through the continuous transformation of its components (building and space) and could be clearly recognized through four levels of resolution: building and plot, block and street, city and finally the entire region (Moudon, 1997, p. 7).

## **2.2.1 The Initiation of Morphological Analysis**

### **2.2.1.1 Tracing the Urban Form by Historic Geographical Maps**

The German geographers set the corner stone for analyzing the morphology of the city in the 19<sup>th</sup> Century. Fritz classified towns and cities by analyzing the plans types. By this way he enhanced the role of maps in discovering the traces of historical cities (Gauthiez, 2004, p. 73). On the other hand, Otto Shuelter<sup>19</sup>, a researcher, has confirmed that geography is the basis to explore and characterize the urban landscape. Mapping the urban form and its physical characteristics was the main tool of the tracing method in urban morphology in spite that maps were showing simple diagrams for many street patterns that used to illustrate the distribution of the historical core elements. The tracing method of the city evolution was the main potential

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<sup>18</sup> See Biography P.433

<sup>19</sup> See Biography P.436

examination tool in the next century and later became the basis of the morphogenetic approach which had first been used to map urban form components (Whitehand J. W., 2007, p. 2). In the beginning of the 19<sup>th</sup> century, Baumeister<sup>20</sup> started to illustrate the role of old urban structure in deciphering the locations of the new fabric. He proposed that the traces of the old walls could be considered the origins of the peripheral roads (Baumeister, 1902).

### 2.2.1.2 The Cultural Interpretation of Urban Form

Shuelter found a physical fact of Anthro-geography<sup>21</sup> as a new discipline. He highlighted the cultural geography as a morphological approach by illustrating the linking points between the settlement's features and the land use. The meaning of cultural geography contains the settlement properties, economy and transportation (Whitehand J. , 1981, p. 2). His idea is based on the main hypothesis that the morphology of cultural landscape in human geography is matching the geomorphology in physical geography. He classified the city form pattern in different zones and classified the building form according to their shape and materials (Schlüter, 1899, pp. 68-73).

## 2.2.2 Geographical- Morphological Method

### 2.2.2.1 Following the Geographical Nature

Stuebben<sup>22</sup> defined the urban landscape network within building types as the main tool of analyzing the space. He paid a great attention to different ways of transformation process through different approaches of city extension and development (Stübben, 1907, pp. 3,34). The urban geographers focused on the inner urban structure of the city until 1960s, their attention was specially laid on the historical components, land use and building types and their ages (Dennis & Prince, 1988, p. 11). Another trial to examine the urban form was done by Geisler<sup>23</sup> and Martininty by having a monographic classification of sites, city plans and building types based on topographic maps (Geisler , 1924, p. 7). The later studies done by Bobek<sup>24</sup> has referred to the necessity to define form, function and the transformation process within the geographical nature of the city (Bobek & Lichtenbergert, 1966, p. 13). Regional, social and economic factors are considered the main significant factors in establishing the geographical nature of the city. Keyser<sup>25</sup> divided the urban form into harmonized

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<sup>20</sup> See Biography P.431

<sup>21</sup> Anthro-geography is branch of anthropology dealing with the geographical distribution of humankind and the relationship between human beings and their environment.

<sup>22</sup> See Biography P.434

<sup>23</sup> See Biography P.436

<sup>24</sup> See Biography P.433

<sup>25</sup> See Biography P.433

morphological parts, property pattern, urban monuments and urban public spaces pattern (Kayser, 1958, pp. 17,18).

### 2.2.2.2 Townscape cell as keystone for morphological analysis

Conzen<sup>26</sup> studied the past history in order to provide the key to develop the city in the future. He suggested to divide the town scape in the tripartite division: town plan, built up area and the utilization of town (Whitehand J. , 2001, pp. 103-104)<sup>27</sup>. His evolutionary approach is based on tracing back the main urban elements, site, street network, plot and building types sorting them into plan units types and subtypes (Conzen M. R., 1960). Those three elements interact with each other to compose the most local morphological area called the urban landscape cell. The townscape cells are combined in units which integrate with each other to compose the hierarchy of urban form. The final product of urban form is resulted from consequences of changes and actions through time in the original form (Larkham, 1998, p. 164) (Conzen M. , 1975). Conzen had considered the built up area of the townscape as an accumulative result of urban development in different historical periods reflecting the social and cultural history for each one (Conzen M. , 1986, p. 25). He worked within the scope of the relation between applied geography and conservation combined with the methodology of urban landscape management by setting priorities for analysis and development (Larkham, 1998).

The life history of the city reflected the social values that affected the urban structure and pattern of the city in each historical period. The willing to destruct the existing building to have new functions occurred when the it became no longer satisfactory , motivating to replace the old one by the new (Conzen M. , 1966, pp. 57-58). One of Conzeian ideas is to clear the relationship between the parcel and its building by defining their dimension and boundaries. He introduced the theory of burgage cycle, which is based on filling the plots with buildings that have burgage back land ending to clear the building of the fallow before starting a new cycle of development (Fig.2.2) ( Whitehand J. , 2001, p. 105). It was noticed that the plot size of residential area lacks the regularity in dimension. That brings the question about urban fringe development. Geographer Herbert Louise noticed the irregularity through studying the urban expansion progress ( Whitehand & Gu, 2010, p. 6949). On this basis, Conzen developed the fringe belt theory by relating the city outskirts with building cycles, land values and innovation. The fringe area considers the basic distinct zone, which is formed between historical core and residential areas. The fringe belt is connected to Conzen idea of the morphological frame through the way that urban forms have created on the ground during the

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<sup>26</sup> See Biography P.435

<sup>27</sup> Cited also in (M. R. Conzen 1960).

transformation process from rural land to urban use (Whitehand J. , 2001, pp. 105-110). The fringe belt is formed from large variations of town extensions within the time period. It started by having slow extension that caused by a variation of obstacles in housing development up to compose a distinctive zone around the built up area. It was characterized by having a distinct zone out of the historical core with a scattered road network and the large vegetation area. The fringe belt provides the historic geographical frame that reflect the previous social and physical development of the city in the existing physical form (Whitehand, , 2005, p. 20).

Conzen started to draw maps for town and worked to survey the land plot by plot dealing with the city as historical artifact to find the concept of the urban form development. The building types were more examined in a way that more connected to the morphological process of the city scale rather than architecture features of building types (Larkham, 1998, pp. 163,168). The connection between building types and other urban elements was not clear regarding particular historical period. It was not detailed and their structure was not derived from the previous historical period. Whitehand tries to combine the analysis of the city change with analyzing the behavior of users, decision makers and the impacts of property development (Whitehand, 1981, p. 174). He incorporates the economical standard within the analysis of the urban morphology related to the building industry in the city and the common development in life standard ( (Cömert, 2013, p. 11). Whitehand mentioned that the Conzenian approach was more developed in the last quarter of the 20<sup>th</sup> century to cope with science of urban landscape management. Conzen approach was based on three attributes belong to each morphological period: the ability to resist the change, morphological characteristics and the hierarchy of urban units (Whitehand J. W., 2007, pp. 1,6). Slater<sup>28</sup> used the Conzenian method in plot dimension analysis to rediscover the historical boundaries of the plots and their internal subdivision (Slater, 1990). Other researchers like Daives<sup>29</sup> concentrate on analyzing the geographical morphology through identifying the cycle and the interrelationship between form and function within time and space like in his research in South west coal field area. He was emphasized that the hierarchy in functions could be noticed in the sense of the form within the fluctuations in having temporal changes in each period (Davies, 1966, p. 108). The Urban Morphology Research Group (UMRG)<sup>30</sup> proceeded on their research based on the Conzenian method through examining the nature and amount of change in urban landscape, the agent which caused the change and finally the management of the alteration. Kroph<sup>31</sup> tried to bring

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<sup>28</sup> See Biography P.436

<sup>29</sup> See Biography P.436

<sup>30</sup> Urban Morphology Research Group (UMRG) is founded in 1974 in U.K at the University of Birmingham for investigating the aspect of geography in urban form, See <https://www.birmingham.ac.uk/research/activity/urban-morphology/index.aspx>.

<sup>31</sup> See Biography P.434



96). He depicts the column types as four trees occupying a good square and covered by both the branches as beams and boughs as a triangle roof. The original type in nature has considered the source of the possible forms of architecture (Guney, 2007, p. 6). The type means the process of classification, sorting and order the objects by collecting or distinguishing the characteristics (Schneek & Marie Bruce, 1989, p. 124). Quatremere de Quincy<sup>33</sup> introduced the type concept by comparing type and model. His idea is based on the fact that type is vague and built in germ and it is able to be copied while models could be imitated and repeated. He established his idea on three basics: origin as basic form, the structure and the particular character (Quatremere de Quincy, 1977, pp. 147-150). In architecture the classification of buildings is based on the criteria of function, form, location, material and style and should be adapted to the reason behind this classification of buildings type (Schneek & Marie Bruce, 1989, p. 127). Aymonino<sup>34</sup> isolated the type as an element that represents part of the whole city (Aymonino, , 1985, pp. 49-51).

### 2.2.3.2 Type as a Reference

The second type theory started to appear in the form of typecast within the industrial rapid development and mass production. Durand's idea of the type is based on the classification of the building form that stands on morphology and function, hence creating a sort of "typological atlas of architecture". He suggested a table of geometric compositions that could be used as a basis for planning the building. He showed a clear difference from the idea of character as he established his work on analyzing the external elements of urban form. During the modernism period, the concept of type became standardized and mechanically produced. Rationality, function and control mechanism could be considered the main properties of the prototype. Le Corbusier also used the term domino type to describe the structure which was accompanied by Plan Libre<sup>35</sup>. He introduced a new approach of type separation to adapt different moods of architecture products (Guney, 2007, pp. 6-8). David and Branda Scheer<sup>36</sup> started to categories the type according to several factors: the relation to the space, the variation of scale when the type of smaller unit like buildings determine the type of the bigger level like the districts and finally they mentioned that there was no specific function that determine the type. Type could be reflected by the relationship between functions, economy and the social structure that could sustain the historical continuity without restriction to a certain architecture (Scheer & Scheer, 1998, pp. 154-155).

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<sup>33</sup> See Biography P.431

<sup>34</sup> See Biography P.432

<sup>35</sup> Plan Libre or Free Plan refers to an open plan with non-load-bearing walls in dividing the internal space, See (Curtis, 1986,p.96).

<sup>36</sup> See Biography P.431



### 2.2.3.3 The Type as a Basis for City Morphology

#### 2.2.3.3.1 Saverio Muratori (Operative History with Combined Urban Structure)

The investigation of the development of urban morphology could not be formalized without understanding Saverio Muratori (1910-73) approach in analyzing the composition of Italian squares which is in his opinion based on the consolidated environment between surrounded monumental buildings and squares. During the 2nd World War Muratori introduced the concept of “operative history”. His idea was published for the first time in his essays between 1944-46. He considered the city as living organisms and set of arts. He assumed that the tradition of the place should have continuous effect on the new building (Cataldi & G. L. and Vaccaro, P., 2002, p. 4). Muratori concentrated on the problem of modern design process in early seventeens which neglected the continuity within the history regarding building type and architecture. His works in Venice were aimed to find new methodological approaches in adapting the physical urban environment by fitting the new adding building to the old heritage. (Cataldi G. , 1998, pp. 37-38).

The analysis of the internal structure morphology through different historical periods in Venice was done in four years (195—1954) by Muratori to explore and survey the city finding out the main historical building types. He did a comparison analysis for the city through centuries regarding the Lagon city<sup>37</sup> finding out the main features of building types in the inner structure of the architecture regardless the function of the buildings as shown in Fig.(2.3) ( Yina, 2009, p. 5). In his analysis of the idea of the operative history of Venice, Muratori focused on the notion of type as a basic tool to generate and define the city that could work to keep the continuity of urban structure elements (Guney, 2007, p. 11). After the World War Muratori had adopted the Italian architecture to design several public buildings: S.Giovanni Church, Gata in Pisa, Ente Nazionale di Previdenza ed Assicurazione social office in Bolgona, Christian domestic party office and Tuscolano Church. Muratori in his experience always expressed his displeasure of the gap between architecture works and quarters planning. Type, urban fabric, city elements and operative history were the main tools that Muratori used in the application of his theoretical ideas in the first urban survey done in the Venice city hub. Muratori Ideas were mainly focused on the composition and behavior of urban form in the old compact core when new projects were implemented inside and also to the projects in Sub area where many solutions could be applicable. Muratori planning methods are mainly based on phase’s

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<sup>37</sup> Lagon City located in northern Italy where Venice is located and is an enclosed bay of the Adriatic Sea, See [https://en.wikipedia.org/wiki/Venetian\\_Lagoon](https://en.wikipedia.org/wiki/Venetian_Lagoon).

methods that belong to certain time intervals (Cataldi & G. L. and Vaccaro, P., 2002, p. 4). Muratori determined six undefined problems which he introduced during his research: the first was the architectural language and its technique. He found the difference between structure and form of the 19th century that affected the architects' work in the short term and the reaction and sense of builders and users. He found that the irreversible damage caused a separation between physical and natural environment as a result of using high mass of new materials and techniques that did not grasp the traditional characteristics of cities. Muratori defined the organisms of architecture as a cohesive mass built in structural form that could be able to be transformed by using space and time. The second problem which Muratori identified was the type features and its philosophy. Muratori was against the ideas of separation between monuments accompanied by other fine arts and architecture and other urban components. Those trends extended in town planning due to high demand on dwellings after the war. To solve this problem, types may be the best tool that need further development by Muratori. Within the type methods, Muratori could solve the serial production of buildings that share the same characteristics and also to solve the root of many consequences of problems in the same urban structure. Muratori clearly defined type by the mechanism of building evolution in different urban scales accompanied by the collective of unconsciousness that adapt the functional and technical optimization.

Muratori derived his type concept from Aristotle writings who had emphasized that the house form was based on the intangible concept of other houses that generate several objects with specific matters. The third problem which had been identified by Muratori was the establishment of the built environment. He believed that spontaneous planning of type within its cultural contents is the basis for the evolution of building history considering that building tissue is the basis for urban elements. Muratori was so interested in two issues: the scale of building and its internal context. He emphasized the importance of the historical buildings that should be always preserved and protected from any threats intend to destroy them. Muratori's main concern was how to intervene modern architectural in historic urban fabric. The fourth issue was the human environment and geography as Muratori was so interested in discussing two matters: territory and world internationalization. Muratori defined territory as the positive outcome shared by nature and human. This concept went beyond the contemporary idea of geography and its tradition which was found by Alexander von Humboldt (1769-1859) and his Berlin school. Muratori believed that territory transforms continuously, as it is always composed of manmade cycle. Through history, the territory cycle has moved from natural material to house and then to village reaching the town as a main territory final product that links architecture to geography. The fifth issue which Muratori was interested in belongs to the possibility of using the history as an operative and innovative idea to unify the city through the development process. He pointed out that man, nature and culture are the basic integrated

elements to explain the urban issue. The last issue for Muratori was the history of civilization development through linking the operative history with the city structure (Cataldi G. , 2003, pp. 21-26).

#### **2.2.3.3.2 The Dynamicity of Urban Form Development in Cannigia Analysis Method**

Cannigia started to develop a typological method as an approach to the science of built environment based on the potentials of Muratori's ideas of building type as a priori synthesis. He provided a clear illustration of Muratoris thoughts in a simple and applicable way practically and theoretically. He applied the building type approach to the city fabric by improving Muratoris concepts of primary unit and its relevant area. In addition to those concepts, he focused on relating his survey of routes to identify city walls and gates that had been mostly abandoned later in the growth process. Caniggia was affected by Muratori concepts, especially in the correlation between architecture history and design. He considered the development of buildings in urban area from ancient to recent types is the basis for his urban survey as he was dealing with both house and town on the same level. Cannigia classification to his type based on space –time charts. In this tabulation diachronic changes of building type occupied the vertical axis while synchronic or variants occupied horizontal axis. Carnegies' ideas could be considered more morphogenetic and show the role of type's evolution in the dynamicity of urban form development which is called typological process. The formation of type's genesis and its aggregation provided him with a formative matrix that shows old city traces and layouts. He was concerned to analyze the urban fabric that resulted from types transformation process. He classified types in both residential and other specialized areas that contain many variations of functions. The local tradition within history gives the basis for setting the planning rules that could solve urban problems and provide continuity between traditional and modern cities (Marzot, 1998). Cannigia believed that each building is the product of the past and the initial basis for the town when it was firstly created (Cataldi , Maffei , & Vaccaro, 1999). At the end of each transformation process cycle a phase of new type emerged from the former one based on the recent social demand for the new period following the hierarchical arrangement from the individual town up to the building and its material (Caniggia & Maffei, 2001, p. 55).

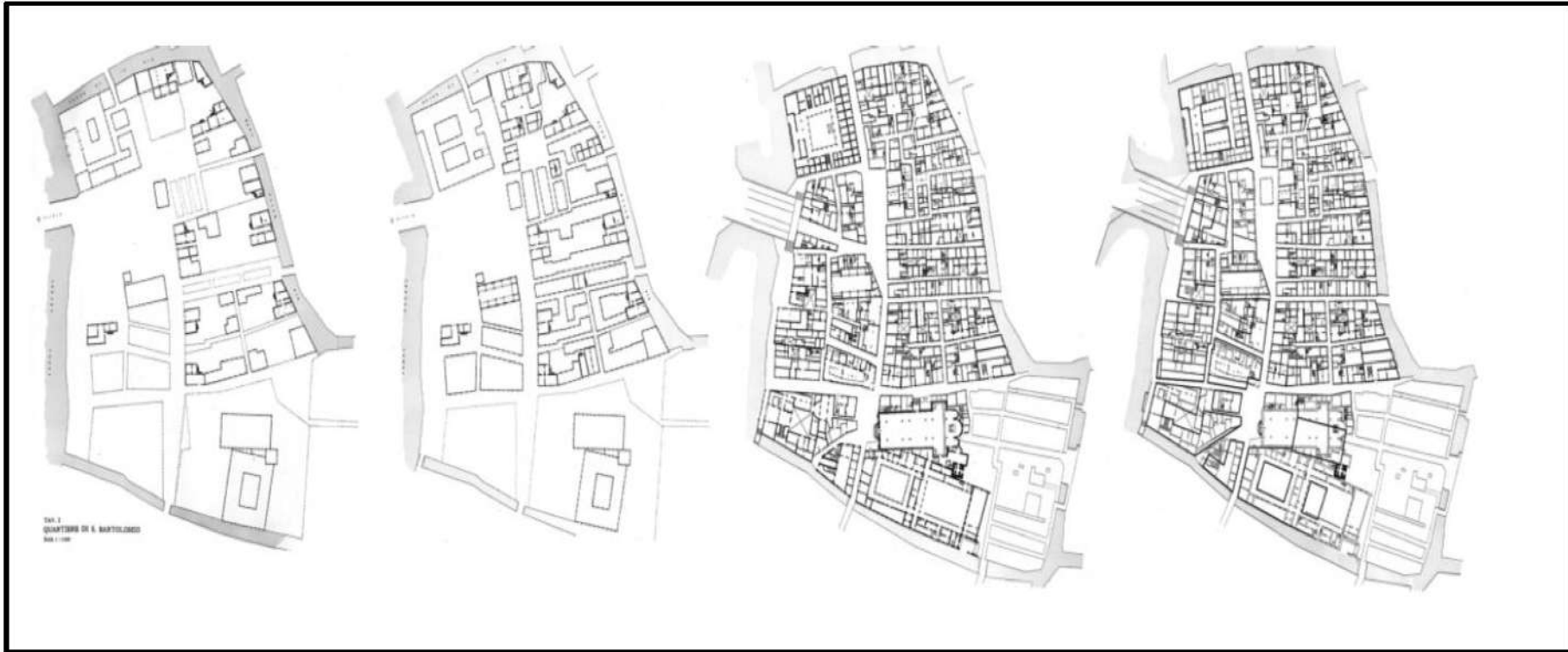


Fig. (2.3): - The morphological study of Vince by Muratori in1959, Source: Yina 2009:5.

Muratori, Caniggia and Maffei based their typo morphological analysis in aggregated systems, structures and organisms by setting a hierarchy as shown in (Fig.2.4) based on the relation between part and whole (Kroph.K, 2014, p. 45).

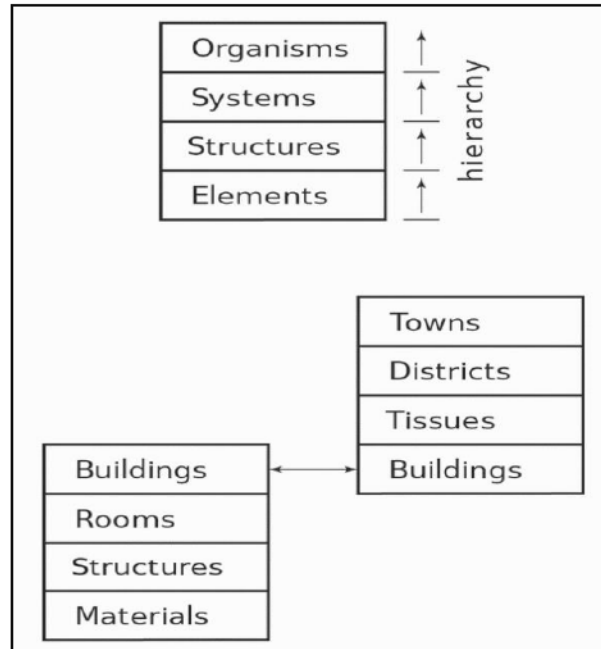


Fig. (2.4): - Muratori, Cannigia & Maffea hierarchical arrangement of the typo- morphological analysis,Source: Kroph 2014:45.

### 2.2.3.3.3 Aldo Rossi and The City Permanence

Aldo Rossi in his book (*Architecture of City*) mentioned that the type development was based on continuous needs and the willing to achieve beauty. He asserted that the specific type is always linked to a specific form, life mood and the nature of society. His definition stated that type is something sophisticated and has a conceptual logic to establish the form. He asserted that type is the study of components in both architecture and urban levels that was not being able to be reduced. Type is constant and predetermined and react with techniques, style and function as well as the character of architecture elements (Rossi A. , 1982, pp. 40-41). Rossi described the type as permanent and flexible enough to adapt some change with keeping its contextual permanence. Rossi pointed out the continuity of historical context in the cities through the collective memory of the city and its monuments as man made artefacts. Rossi believes that the city is a product of unconscious social life of human activities (Rossi A. , 1982, pp. 29-35). Rossi concentrated on the idea of permanence in the city by analysing and identifying the historical monuments and the primary city elements (Mohammadi, 2001, p. 61). Aldo Rossi understands the city as a combination between urban texture which composed the form of buildings lined along streets or squares and the large scale monuments that carry the

artistic characteristic of the memory of the city (Rossi A. , 1973, p. 78). Any insertion of a new monument will be adapted in the city which is considered as continuous fabric. The types of these monuments were derived from the old geometry types that used to have courtyards and centralized or linear blocks. In addition to Aldo Rossi's main components (monuments and urban texture), Broadbent<sup>38</sup> proposed a third element which has been defined as suburban areas ( Broadbent, 1990, p. 348).

#### 2.2.3.3.4 The Relation Between Space and Built up Area

Both building and its defined space are considered one urban unit bordered by land boundary according to its ownership. They have different types and gathered together to compose the urban fabric within different time intervals. Typo morphologists were too much concerned with residential types that compose a large area of the city and their reaction with other monuments buildings (Poerbo, 2011, p. 77). Colin Rowe<sup>39</sup> introduced the change in urban space types and their relation to buildings with their idea of collage city, through the clash between traditional and modern fabric showing the fluctuation in both figure ground plans between solid and void. The traditional space is more active and accessible and could react more flexibly to adapt basic and changeable needs. They proposed a type of collision between many modern and traditional elements or what could be described as combining different types to create more livable spaces. (Rowe & Koetter, 1978, p. 62). Leon Krier <sup>40</sup>confirmed the idea of redesigning the urban quarter as a basic tool to integrate the socioeconomic life with cultural activities against the functional segregation in the urban fabric (Broadbent 1990, 196). Rob Krier<sup>41</sup> started to create urban space types when he used streets and squares types as basic elements to explain the city morphology and development (Fig.2.5) (Krier 1979). Anderson classified the streets according to the built form that includes them, land use, circulation and accessibility (Andeson, 1978). Another approach classified American streets according to several factors related to the land use of the area and the density of the built up area associated within the orientation of the fronted buildings along the alleys (Calindaro, 1978). Schuhmacher <sup>42</sup> classified streets according to their purpose and the reason behind the construction and use, their form configuration, and the interface between vehicular and pedestrian (Schumacher, 1978).

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<sup>38</sup> See Biography P.431

<sup>39</sup> See Biography P.432

<sup>40</sup> See Biography P.433

<sup>41</sup> See Biography P.435

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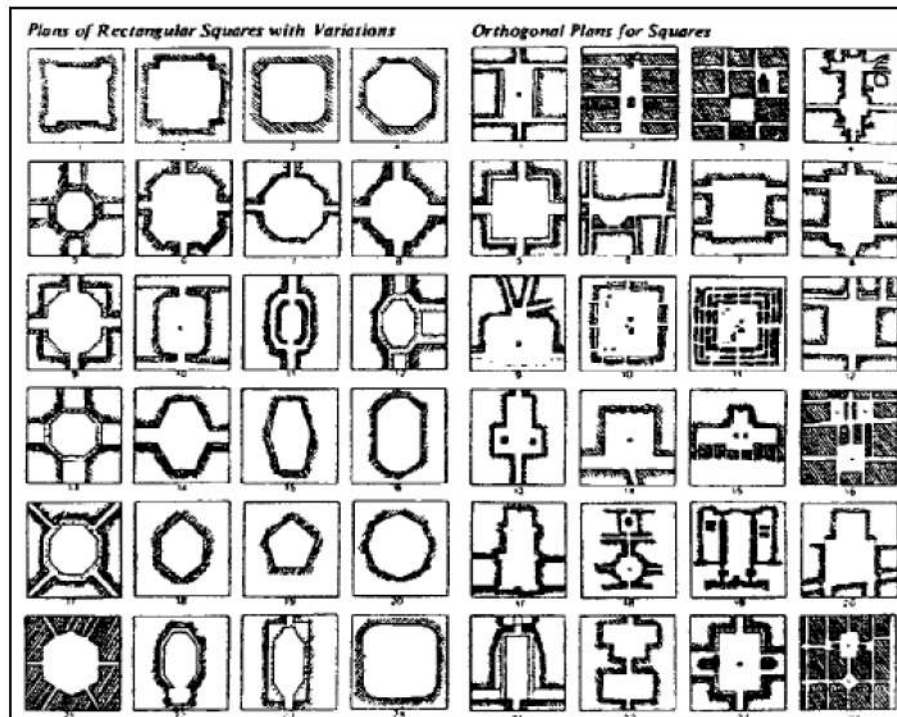


Fig. (2.5): - Urban space types, Source: Krier.R 1979:32-33.

#### 2.2.3.3.5 Gerhards Curdes - Rebounding the Urban Components

The contemporary Urban development neglected the connectivity and the organization among urban components and the relationship between space and mass due to the ignorance of the town planning form and its structure (Curdes G. , 1997, p. viii). Curdes determined six factors that emanated from the human needs which participated significantly in forming the city. Those factors could be summarized as follows: -

- Minimizing the travelling distance and time as much as possible.
- Providing enough urban space for the city requirements.
- Variety and distinction to express the identity of people and the city.
- The need to have an order system in the urban environment.
- The social affiliation that affects the spatial pattern organization.
- The lethargy of the urban structure which resists any physical modification.

Curdes studied the texture of the city as a morphological issue resulted from adding new elements. He gave different urban form types depending on the arrangement methods of urban elements and classified them to: Heterogeneous structure, homogenous structure, Mixed Heterogeneous-Homogenous structure, transformed structure, Broken structure, the margin area structure, special areas and the area in between configuration form (Fig.2.6). The

classification is based on the distance between the elements, their form, and scale (Curdes G. , 1997, pp. 17,18).

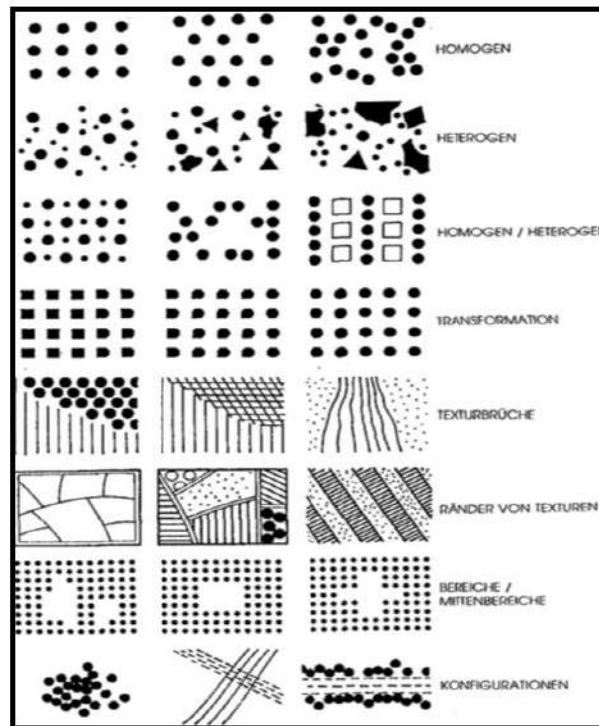


Fig. (2.6): - The classification of the city structure, Source: Curdes1997:18.

The accumulative process is considered the main principle in building the structure that is based on the relationship among parcels and the connection system between other urban components. The urban texture is also resulted from the division and arrangement of the existing one in rational method and use. The final texture is the combination between the additive and divided one that normally existed in old cities and experienced a severe transformation process (Curdes G. , 1997, p. 75). Curdes understands the urban morphology as an aggregation of four interdependent levels: parcels, block, district and territory (Fig 2.7). The process of type evolution could be achieved through the following factors (Curdes G. , 1997, p. 66): -

- 1- The interleave of the urban layers always affects the characteristics and the variation of different objects.
- 2- The flexibility of urban layers adapts the changes.
- 3- The urban structure consists of many objects that could limit the full transformation in the city.

Each level has elements beginning from the lower level that is inserted as a basic element to the upper level (Curdes G. , 1989, p. 143). Curdes investigated the urban space to identify the



main urban structural elements with their forms and arrangements by finding out the main typological characteristics of those basic elements which are block, courtyards, space orientation, solitary buildings or group of buildings (Poerbo, 2011, p. 68).

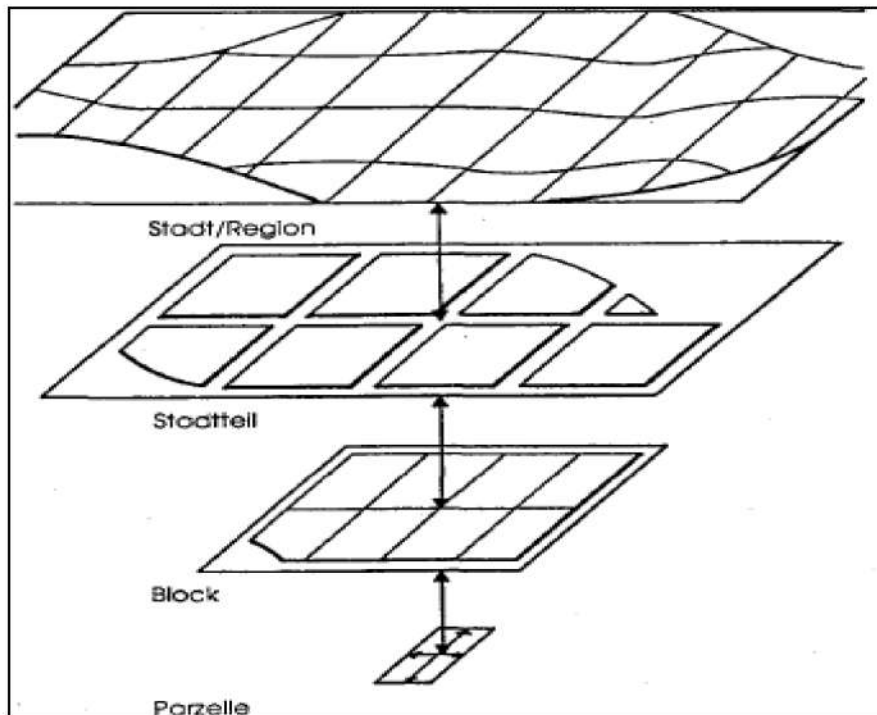


Fig. (2.7): - The morphological layers, Source: Curdes 1997:66.

#### 2.2.3.3.6 The Adaptation of Human Needs in Urban Form

Urban form is always generated from irrational generators based on human needs and feelings rather than logic and computations. The city is a combination of many artefacts with many functions that was found to satisfy these needs. Each artefact is composed of a kind of positive and negative reactions and is based on the user's willing that participates in determining the direction of urban needs which are changeable. This process leads to creating new functions and forms in a continuing process. The urban form is determined by the urban needs and demands, economic development and communal attitudes. Urban form is an accumulation of gathering urban components and artefacts over a long time to satisfy specific functions. Each defined urban component should fit to the urban environment by having a clear relationship within the total urban form (Banz, 1970, pp. 91-92). The characteristics of urban units can be considered on human scale when all urban form components are assembled as hand made. The recent components become an assembly of prefabricated units which do not reflect the natural human need anymore (Banz, 1970, p. 193).

## 2.3 The Mechanism of the Transformation Process in Historic Core

### 2.3.1 Exploring the History of The Built Up Area

The variation in social development and traditional urban culture could be reflected in the development of the historic centre and built structure by having a variety of building types. Many types through history were initiated and changed in consequent stages of development. An intermediate step was taken through the transformation process ending with totally new urban structure (Curdes G. , 1997, p. 17). The alteration process in types always proceeded through an interval period of time called phases within many interventions. Muratori assumed that history of urban structure always could maintain the civic and cultural identity of human being actions (Petruccioli, 1998). One of his focal thoughts that the building history is developed spontaneously in a permanence method which could be followed later by reforming different historical stages that provide indications for further forthcoming development (Cataldi G. , 1998). Following the traces of urban components could be considered a successive technique to realize the causes behind the existence of each urban element and to have better knowledge about the structural arrangement of the whole urban complex. Exploring the spatial layers is a technique of analysis and investigation of the physical urban form to explore the pattern of city growth (Sima, P. & Zhang, D., 2009). The urban environment shows the procedure in forming the small cell represented by the building and the way of composing the entire neighborhood in an accumulative way. Human behavior within time accompanied by spatial and natural determinants could be considered the main factors in shaping the built environment associated with the need to develop the social, cultural and economic situation for each stage. Built environment might not be able to be applied to those principles if it has a discontinuity within the surrounded natural environment ( AL-Ani, 2012). The continuous intervention and experiments in the built environment have some negative externalities which caused spatial and social segregation affecting the structuralism of the urban context. The process of transformation in type, invention or merging new types in the existed one or substituted it by another one could be accepted or refused by the whole body of the urban context. The process of changing could occur on two levels: The first is the change of the whole network resulted from the part that changes one or more elements and vice versa. The second is the effect of the change of one element on others from the same level and the interaction to adapt any success and failure. Curdes summarized the transformation process as follows (Curdes G. , 1997, p. 93): -

1. Changing the use of parcel and building
2. Reorganizing the building inside the parcel
3. Building the free parts from parcels and blocks
4. Increasing the number of building storeys
5. Merging the parcels
6. Modifying part or whole block
7. Modifying the block size by changing the street network
8. Modifying more than one block
9. Changing the whole quarter

Urban space is considered a combination of elements among different types of urban morphological elements. Urban space development and the renewal of functions both participated potentially in changing the urban type which could be developed continuously or may have a discontinuity within the old one when it became invalid to adapt the new urban requirements.

### **2.3.2 Finding The Urban Structure Types**

The structure of the city shows the basic elements that are participated to build the entire urban form for the city reaching the final shape in having homogenous or heterogeneous urban structure. Gerhard Curdes divided the type of the urban structure into four types as following (Curdes G. , 1997, pp. 72-78).

#### **2.3.2.1 The Additive Structure**

The distance between two buildings played a big role in generating mutual impacts on each other. The far distance resulted with free shapes and less impacts while close distance creates more impacts on the adjacent buildings. In this system the building is the main base element accompanied by its function. The additive form has no particular shape because it depends on the relationship between the parcels and the connectivity between each other. The arrangement between buildings depend on the logical use of buildings and parcels and sometimes to some formal concepts. The main advantage of this type is that each individual building has impacts on its surroundings through size, position and direction. The additive procedure continued with more or less buildings through time where stability in form is existed. Most of the old towns based on the additive structure which considered homogenous while the heterogeneous structure has different size, form and position.

### **2.3.2.2 The Split Structure**

The idea is rather old and was used in Roman military formations and later in Baroque and Renaissance. It is based on dividing the area into streets, blocks and parcels. The main benefit of this method is the rational division of right proportion with a predetermined arrangement of the area. This method is flexible and could create middle zones in the main and secondary streets by main work spaces. It also has a disadvantage represented by the difficulties to modify the city structure due to the ownership difficulties and sometimes due to the topography.

### **2.3.2.3 The Mixed Form**

Many cities are based on both additive and split structure found in the mixed form. The city core normally has irregular structure followed by regular quarters that also were surrounded by an unplanned ring development around as is the case in London and Dresden. Other examples are based on filling the existed quarters by renewal projects through having regular arrangement within the irregular one around and vice versa. The principle of the split structure was used as planning solution for the development of the additive one as in Hausmann plan for Paris. The new planning idea also was used in the new urban design projects where the additive type stays within together. Plurality could be found in many cities especially in the transformed area where a new structure prevailed.

### **2.3.2.4 Chaos and Collage Type**

In some cases, the mixed principle includes large scale objects with no dominant structure arrangement which is called chaos structure that includes deconstruction and continuous destruction in the urban form. The break in urban structure sometimes dominates the urban fabric and appears as collage without any clear idea.

## **2.3.3 Following the Transformation in Urban Components**

### **2.3.3.1 Parcel and Building Types**

Both parcel and building have considered the individual cell and the functional unit which form the urban structure and shape the flexibility of its configuration. The plot size and the building

inside are subject to be changed according to the function and the impacts of urban expansion in transforming the marginal area to central one. The plots shape, size, rules, openness and closeness and building type determine the final approach in shaping the urban context (Curdes G. , 1989). The demand for variant buildings and plot size is something changeable within time as they are based on the alteration in building type and the urban expansion impacts. The geometry of plot and buildings have considered the main fundamental element which owns the significant role in gathering the plots all together and changing the urban context (Curdes G. , 1993, p. 281). Property rights and the characteristics of their adjacent neighbors also determine the limitations and border of parcels. There are also many micro scale changes that affect the plot characteristics like the change in use and users, the modification in the internal and external structure of the building and the land value. The parcel could be divided through the following changes: -

1. Increasing the building size by using the adjacent parcels.
2. Increasing the number of building floors which need more space outside.
3. Dividing the parcels.
4. Grouping more parcels to adapt large function projects.

Curdes classified the plot type forms according to the main basic and frequent shape which could be classified to rectangular with different sizes, square, parallelogram, triangle, multi - sided forms and irregular shapes. The plots are always separated by measurable straight lines. The size and form of plots differ according to historical phases and the change in cultural habits. Buildings type is considered the complementary part of the plot that together configures the primary cell of the urban structure. The building type could be determined according to form, function, architectural style with details and material, and finally the location within the city. Most changes later are caused as a result of the following reasons: The usage of the empty part of the plot, altering the floor number, the method of linking many plots in a larger one, and the alteration of the entire block border which is considered the more difficult case as it causes subsequent changes to the adjacent blocks (Curdes G. , 1997, pp. 86-87).

### **2.3.3.2 Block Neighbourhood – City**

Block formation depends mainly on the individual plot element and the way of agglomeration with other plots. It depends mainly on the ability to attach the small units to big one or gather them in one large parcel composing the block unit (neighbourhood) (Curdes 1989). The way of combining plots and configuring the block was easier in the first trials reaching to final

boundary of the block, but later it was limited to little changes within the final boundary like binding several plots. There are also big changes like the total alteration of the block shape which is considered the most difficult one as it occurs only in catastrophes or by the decision to have a huge project with new functions. The whole process of change is directed and balanced by the social demand associated with cost and benefit of that alteration. The change in the gathered parcels will cause modification in the adjacent parcels border and the block may keep its shape through the connection with the surrounded urban space streets and squares or could lead to change of the other blocks adjacent to it. Because of these complications the urban system on block level is difficult to change. The change is possible when the land value is changed or when a change occurs in the function that leads to urban space configuration. Blocks have a strong resistance to changes because of the upper high level forces that control the changes that come from the city network as well as the lower forces that come from parcels agglomeration (Curdes G. , 1997, p. 87). Curdes classified Blocks form into two Categories: the first is the regular block with rectangular, oblique and polygonal shapes, and the second is the irregular block which generally results from curved roads. The blocks could be composed of different building agglomerations or clusters which could be varied according to their spatial organization and is defined by a network of streets. In order to rediscover the change and transformation in blocks the following criteria could be used: block form and proportion (size), block functions and use, orientation, openness and closeness according to the interaction with the internal and external space and the methodology of parcel distribution. The spatial aggregation could be done in three methods: the first by gathering individual buildings with a large space in between, the second is the aggregation in the form of row from one or both sides alongside the street and the last one is the arrangement of blocks from three or four open sides. The blocks in planned towns can be easily distinguished from irregular and compact urban pattern by means of standardization. The block form is determined by internal divisions and forces, external impact of the urban structure and the geometry of the streets (Curdes G. , 1993, p. 284). Blocks and Urban space are always interacted and have mutual configuration. The street network system is considered the main backbone for the arrangement of the spatial elements.

### **2.3.3.3 District Types**

The city is divided into portions of land surrounded by higher levels of streets which could have a uniform or variegated structure. These portions illustrate the composition and the way of interaction between different urban components. The district is one of the modern or grown city parts or could be also identified as the main city core that has changed from an independent city with limits and boundaries to part of the city components. The transformation

of districts is based on the change within the city, the development idea of the city, the growth pattern (radial, linear, polarized and sprawl), the spatial distribution and land use zoning, the relation between blocks and finally the margins development

### 2.3.3.4 City Network Structure

According to Curdes, the city network form could be divided and analyzed according to the following types: regular network, irregular network, transformed network, fragmented network and an overlapped network between fringe belt and existing urban web (Curdes G. , 1997, pp. 45-52). During the transformation process, the city network took different morphological textures. The fabric texture may keep its homogeneity or become totally heterogeneous and also may mix both textures. The typo morphological approach introduced tools and criteria for plans, volumes and architecture forms to be judged within urban context (Cerasi 1998). Typical plan had a great educational impact in showing the relation of buildings to their context and other urban elements to generate the city form. Curdes confirmed that spatial fabric could be conceived as homogeneous when there is a similarity in urban elements which form the spatial order or similarity in the geometry of the associated spatial components. It could also be defined as heterogeneous when there is dissimilarity in the elements of spatial structure. The irregularity in heterogeneous texture could be visually conceived within the absence of dominant regular system. Urban fabric could have also both form types heterogeneous and homogenous. The urban form could have regular or non regular arrangement of geometrical elements based on the shape of the in between spaces (Curdes G. , 1997, pp. 17-18).

### 2.3.3.5 Urban Space Type

The Space structure could be defined in two kinds: negative and positive. The positive space structure could be defined as the space with buildings that are called the built structure and connected to the negative structure which are represented by streets and plazas. The urban space (streets and plazas) is the main element which explains and connects topography to the city structure. The definition of urban spaces should be classified according to the following criteria (Curdes G. , 1997, pp. 110-111): -

- The hierarchy of space through the Size of streets and plazas.
- The distribution of internal monuments which are defined by symbols or group of buildings.
- The borders and the surrounded buildings which are defied by spaces.

The urban space configuration connected to the built mass could have priorities as space could follow building and built structure or could be followed by them. In both cases urban equilibrium is the result of the integration process which always adapts the macro and micro scale change in the whole structure. On its part, type development is the basic tool which explains this interaction and the way to acquire and apply any new requirements through history. The urban space transformation process could be varied according to the types that were composed through the impacts of the mutable relation between built structure and both internal and external spaces. This changeable relation belongs to the arrangement method of urban elements, their definition and their orientation. The space according to Curdes could be divided into three types according to its relation to buildings which determine the space border. The first type is the combined space bordered vertically and arranged by regular mass (building and plantations). The second type is the streaming space where negative and positive spaces have the same value without clear borders. The third is the spread space where both combined and streaming space principles are gathered together (Curdes G. , 1997, pp. 116-118)

Urban space is considered the bounded element between elevations and within its physical entities it always carried esthetical qualities. The privacy concern considered with highly concern through movement from public open air spaces to private shielded ones based on the activities that was held in the city into both urban space types streets and squares (Krier R. , 1979, pp. 15-17). Urban space or as named as the negative structure interacts within the built-up area (positive structure) to provide the urban form of the city. They are varied in geometry according to the types for both plazas and streets. The linear urban space types (streets) varied in their characteristics according to their form, scale and functions (Curdes G. , 1997, pp. 118-123). The form of the street based on the following criteria: accessibility with their polarity in having straight or curved streets, width and length, formal or informal, land use of the adjacent area, circulation, hierarchy of connectivity and scale, buildings form, height and interaction between pedestrians and vehicular network ( Moughtin, 1992, p. 133). The plaza is the second type of urban spaces which always differs in configuration according to social and cultural context of the society and the place itself. The main criteria which used to explore the transformation in plazas could be characterized as follows: the location of plazas and their integration within the spatial structure, the organization of the surrounded building and edges, proportion, openness and closeness, the entities inside plazas like monuments, the surrounded land use, the change in space dimension and form (regularity and irregularity) and accessibility through number of streets feeding the plazas (Curdes G. , 1997, pp. 129-140). In order to establish a procedure to analyze the space type, the following criteria are established: The relation between part and whole (space configuration within primary urban elements), the urban artifact impacts on the transformation process as fixed elements and a source of



collective memory of the city. The role of functional change in shaping the urban space. Streets and plazas hierarchy according to function, circulation, orientation, adjacent building function and neighborhoods, density, accessibility and scale.

### **2.3.3.6 The Role of Historical Monuments in Transforming Urban Type**

Aldo Rossi described the historical monuments as artifacts and define them as unique and highly qualified building form or agglomerated complex of buildings which have developed in space and time and are highly responsible in composing the city form through its wealthy history. He intends to discuss the urban artifacts within historical memory as an urban product and illustrate the mutual relationship among these products and their users. He recommended to look for what he called the quality of space which shows the experiences that could be gained and the characteristics of special memories (Rossi A. , 1982, pp. 29,32). He believed that a good knowledge of the city urban form could provide the outlines for the main characteristics of the urban artifacts. He emphasized that urban morphology could be defined as “a description of the forms of an urban artifact”. Monuments express the potential of city and gives the coherence to the urban fabric. It could be considered as archetype for spatial governance. Aureli mentioned that archetype could be defined as an alternative notion of type which defines the group of forms in singular one (Aureli, 2011, p. 32) <sup>43</sup>.

### **2.3.3.7 The Role of Innovation Within Typo Morphology Process**

The city transformation process is carried on by the typo- morphology investigation based on the subdivisions of the urban form in components, configuration type and order (Sima, P. & Zhang, D., 2009). The urban form development cannot be considered stable, but may be altered depending on different stages. Space and time are very significant parameters which could be used to typify such an evolution process (Montanari, Curdes, & Forsyth, 1993, pp. 6-9). It was found that incremental changes and modifications are one of the categories of the city transformation that could be achieved by many small changes and adjustments (Mandipor 1996). Innovation could be defined as utilizing the brand notions and themes which play a role in city development (Crowley, 2011). Innovation forces drive the transformation process which can stimulate the cultural habits in the city and affect the urban structural evolution (Montanari, Curdes, & Forsyth, 1993, p. 12). Innovation process shapes the urban structure development. It could be an integrated approach to have strong social and civic values or could be

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<sup>43</sup> See Biography P.435

degenerative one that contributes especially to segregating the social and spatial order of city structure ( Garde, 2008).

Crudes points out that soft innovation allows the individuals to have their own decision and control their activities like in developing green system for the city, conversely the general decision as in the transportation system is considered a hard innovation as it runs the whole town circulation (Curdes G. , 1998, p. 14). A certain innovative action may run for a short time and have little effect rather than the ongoing evolution actions or may impose change dramatically for long run period. According to Montarari<sup>44</sup>, three main parameters are essential to observe the innovation process in urban fabric: the nature of town, physical scale and time (Montanari, Curdes, & Forsyth, 1993). The urban transformation proceeds only by innovations which are achieved by many urban actors. A single decision or many small decisions always represent the innovation which has a potential social impact (Haase, 1993). The invention of new thoughts and new planning notions will modify the space design within the existed type and lead to shape variant types based on the chosen innovation method. Tracing the physical evolution and development process as part of urban morphology is considered the initial step to start an urban landscape management (Conzen M. , 1966).

## **2.4 The Intervention in Historical Compact Urban Fabric**

### **2.4.1 The Modernization Process in the Western City**

In the 19th Century, Marreto<sup>45</sup> reevaluated the city to explore the unity in historical urban form and the possible continuity of its original and old characteristics to extend up to present situation in order to show the difference which occurred between both old and new urban fabric (Cataldi, , Maffei , & Vaccaro, 1999) . Hassinger <sup>46</sup>mentioned the idea of preservation to show the modern development impacts on the historical monuments by focusing on land use, building function and the density of residential settlement as the main tools to achieve preservation (Hassinger, 1916, p. 25). The intervention in the historic urban fabric could create a kind of broken structure. The broken structure occurs when different structures face each other without a transitional zone. The disorder in urban structure appears when the geometry

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<sup>44</sup> See Biography P.431

<sup>45</sup> See Biography P.434

<sup>46</sup> See Biography P.433

and size of urban elements or the whole urban system change potentially. This change can be negative in having irregularity and disturbance in urban structure while it can also be positive by creating a variation in urban structure. The city network may grow in an accumulative way by keeping the same type of built structure, by dividing the existing one into more than one type or having a mixture of both approaches. This transformation may finally occur by importing a new totally different network as in collage approach (Curdes G. , 1997, pp. 18,72-78). Rob Krier depends, mainly in the use of the architectonic forms, on reinterpretation of the traditional brick work in Germany in the 19th century. He used the traditional brick work features and shapes as a basic tool to adapt the new elements in old existed one by two actions, the first was done by having a contrast between new building structure and traditional masonry brick work like in Ritterstrasse Housing and Spandau housing projects and the other action was done by having complete adaptation of brick work as in Lindenuferstrasse<sup>47</sup> (Kenneth, 1982, p. 27).

### 2.4.2 The Modernization Process in the Compact Oriental City

Wirth in his description for the Oriental city investigated the cultural and social impacts that participated to create the cities showing the role of old civilizations and religions in shaping them .He shows that the compact form, privacy and publicity and public space hierarchy are the main characteristics that could be distinguished from the western cities that belong to old ancient before Christ (Wirth E. , 2000, p. 10) (With., 1975) (Wirth. E. , 1974) (Salma, Renata, & Antillio, 2008). Since the 16<sup>th</sup> century the European approach in urban design and planning was based on using gridiron fabric with straight streets to show the main architectural monuments and then developed to use large avenue with focal point spaces after the mid of the 19<sup>th</sup> century where this new approach started in France. Those streets got filled first by carriages, then by cars, and this planning approach continued to cover large area as a result of the wide spread of car usage. The urban streetscape lost its social importance and became only as commuter within the city.

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<sup>47</sup> Housing typology designed by Rob Krier in 1979 in Berlin Spandau with inward and outward looking plan, See (Krier R., 1980.P,16).

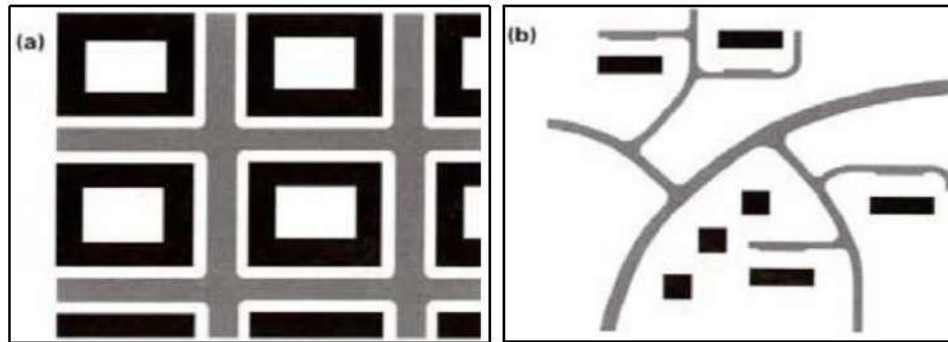


Fig. (2.8): - Gridiron network (a) versus wide streets (b), Source: Marshall 2005:6.

Large areas of historic medieval centres were removed and substituted by a huge network of vehicular streets. This approach was criticized in the middle of the 20<sup>th</sup> century because the whole urban life with dense and walkable city urban structure and with human scale architecture has disappeared and substituted by high-rise buildings along crowded vehicular streets (Binaca, 2000). The new modern model of streets creating three dimensional buildings fixed in space the flow while streets followed their geometry instead of fitting together (Fig.2.8) (Marshall, 2005, p. 6). Form and morphology were the main factors that could define the oriental cities (Wirth. E. , 1975). The urban centres in the traditional oriental city were estimated as highly dense fabric with only pedestrian streets surrounded by human scale buildings. Large areas from urban cores were substituted by wide streets and large scale buildings, removing an accumulative urban fabric that was built through long years (Fig. 2.9). The Ottomans started to apply the western urban method in old historical Islamic centres that were governed by them but with more respect to the human scale and to the traditional compact fabric<sup>48</sup>. This approach of urban modernization<sup>48</sup> was continued after the Ottomans by the colonial power and then was adopted by local authorities. The western urban design model prevailed as a result of the rapid economic development and the appearance of the urban sprawl problem. Local architects and urban planners who graduated from western universities worked hard on many projects to cope with the rapid increase in population and to apply their innovative ideas of modern architecture in their cities. The political issues at that time contributed to spreading modernization as a best tool of the rulers to show their power. Within the rapid development, new cities were initiated based on the western approach that contributed significantly to altering the social habits and physical relationship between indoor and outdoor spaces. The new urban structures were not compatible to both the original Arab

<sup>48</sup> Except in Egypt, which had a development plans long before other regions of the Ottoman Empire, See (Arnaud, 2015.p.976).

context and the inserted European forms. The change in social habits altered the way of living and in parallel the social interaction in the city. Many original inhabitants left the old city to the periphery in more modern settlements and be replaced by new tenants and immigrants. The relationship among inhabitants was affected and many individual houses started to be converted to small warehouses. The hierarchy of street was affected by transforming many private houses into more public for strangers. The other original residents who remained in the old city lost their privacy which was based on having gender separation associated to religious speculations and cultural habits. The individual street changes have hierarchically gradually affected the role of the whole network system. The population density has increased inside the old city and new informal settlements inside and outside the old core were accordingly formed (Binaca, 2000)<sup>49</sup>. Wirth emphasized that market could be considered the only criteria that could be influenced by Islam while all other physical entities belong to the old era before (Salma, Renata, & Antillio, 2008). Since the 1950s, modernization or westernization have led to intensive destruction and fundamental structural changes in the market, and to the realignment of their goods (Wirth. E. , 1974, pp. 203-260). The process of transformation continued in later periods and many new additional streets were added concurrently with more destruction of the traditional ones following the international model that is based on having new technology and more connection to the international market power. This produces a monotonous neighborhood with car street dominance far from any traditional style of living (Jaber, 2013, p. 36).

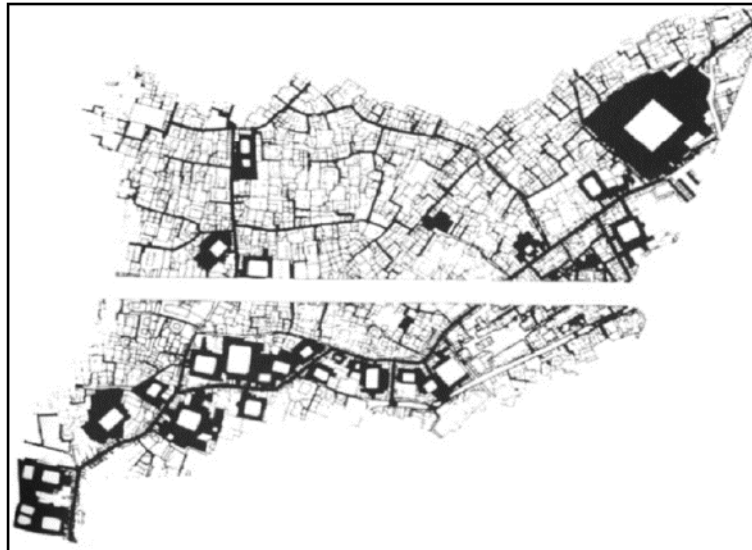


Fig. (2.9): - A new road in Isfahan through the old city, Source: Bianca, 200:202.

<sup>49</sup> See Chapter 8&9, Binaca 2000

### 2.4.3 The Analysis of the Hybrid Urban Space Network in Old-New City

#### 2.4.3.1 Transformation in Urban Space Hierarchy

A new urban space hierarchy and a new approach of the relationship between both urban public and the private spaces were initiated during the rapid process of remodeling the old urban centre by using the imported western urban design model. The gridiron network with large boulevards were started to take place on the periphery or pushed through the old city fabric and participated significantly in accelerating the transformation in urban form to adapt the increased need for vehicles and modern facilities. The new arteries and commercial centres compete the old traditional market arteries in the transformed areas and overrides its rule as a main distributor and a higher level in the space hierarchy. The new streets are normally rectilinear and wide, flanked by sidewalks and aligned by multi storey buildings. In the initial period, the streets showed due respect to the traditional environment by using many traditional elements in building facades. Later the width of streets increased with high rise buildings and large traffic squares, nodes and many intersections along each segment. This has created several poles inside and outside the urban core which increased the urban segregation and created several and scattered public centres. The public area extended and changed the hierarchy of adjacent streets and spaces. The private streets became more in danger as they lost more of their privacy by removing large area of semipublic and semiprivate streets. It is obvious that the interruption in the urban space hierarchy by adding an additional higher level space (streets & squares) affected totally the semiprivate and private level, leading either to canceling large part of them and transforming them into public or more isolated in closed cordons.

The city core and its edges gained more blurring regarding the relation between privacy and publicity that created a chronic interlaced problem between urban components and the space that connects them. The urban space structure, through this process, has always acquired an unstable and uncharted changes in its hierarchy and components having an indefinable urban hybrid space far away from the initial spatial concept in both urban conflicting patterns. These hybrid urban spaces have the tendency to be more public with lower privacy and the new streets are starting to be more public by placing a variant of many public buildings instead of houses. Any prospective integration process inbetween should keep the fundamental key to keep the space hierarchy through the transformation process, which is self-organized and continuous (Fig2.10) (AL-Hasani & Wessling, 2012, p. 88).

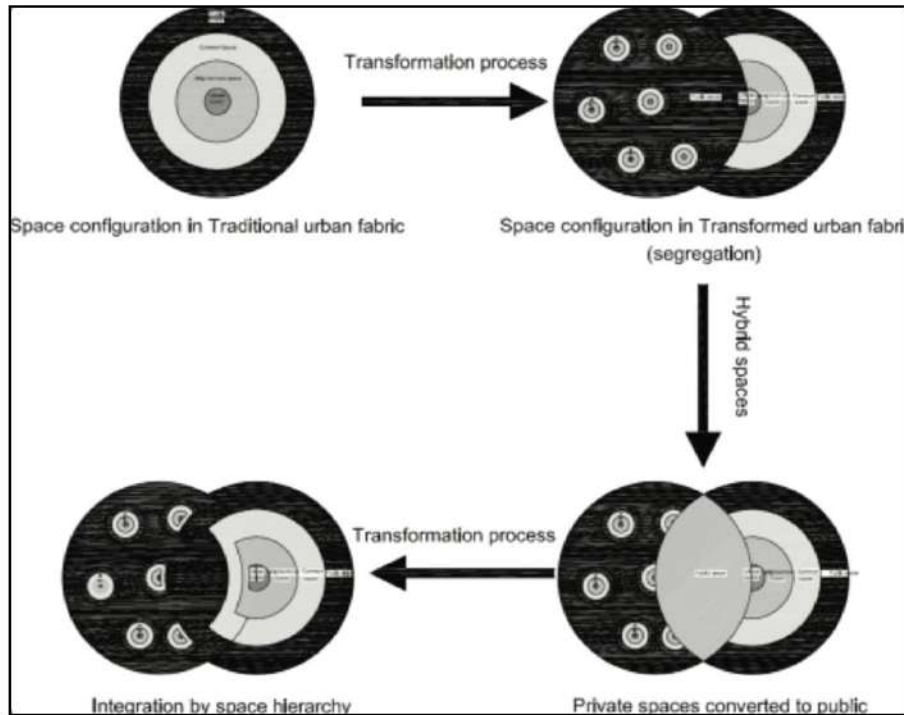


Fig. (2.10): - Urban space reaction in the transformed urban fabric with using the traditional hierarchy for reintegration, Source: AL-Hassani2012:89.

One other important reason that participated in changing the space hierarchy was the gentrification problem by transforming many old houses to be dormitories for poor workers and at the same time warehouses for goods. As a result, many private and semiprivate streets lost their privacy and became more public and accessible to strangers (Thys-Şenocak, 2008, p. 877). Hillier<sup>50</sup> emphasized that having more access to one area has always caused lower urban space control and then it would be difficult to achieve integration within the rest urban components (Hillier & Hanson, 1989). The new scale of the transportation has also interrupted the tradition movement hierarchy of the city and has broken the micro climate for the residence and motivate planners to have more oriented block along streets (Bianca 2000). Adding new streets encourage the tendency to add more in different locations that makes the hierarchy subject to change in each morphological period. This process will affect the coherence of the urban fabric and in each morphological period and should be subject to be managed and controlled in any conservation and revitalization process inside the old city.

<sup>50</sup> See Biography P.431

### 2.4.3.2 Transformation in Urban Space Structure and Form

The diversity of urban space forms provides distinguished and identifiable characteristics for their elements structure. These forms have differentiations that create and keep the sense of the place (Lynch, 1960). The space framework is subject to be changed according to the way of land division and organization. The organizing method of the ground level for the surrounded buildings and the extension of the sky level explained the series of configuration process regarding the final shape of the urban space. The design and allocation of urban space belong to several factors like form (included geometry, archetypes, historical value), enclosure, proportion, scale and relationships within the adjacent spaces, mode of transport, path system and hierarchy and finally the required nodes ( Dee, 2001, pp. 32,36-114). Historical evolution, geometry, urban form and socioeconomic change are also considered the main criteria that collaborated to form the space (Madanipour, 1996, p. 31). Squares are considered the main public spaces that compose by grouping buildings around an open area while the street is a framework that provides accessibility to squares and each building. Both types are determined by their function, scale and proportion according to the building geometry around (Krier R. , 1979, pp. 17-25). The new form of the space imposes a new situation inside the historical urban fabric. They motivate new types of buildings to be organized in different levels from low to high rise buildings according to the designated form and function having new higher proportion and scale or sometimes varied between low and high ones that participate significantly to lose the feeling of enclosure and the human scale as it was before in old cities. The linkage between different urban spaces forms is based on driving from one point to the another instead of connecting those focal points through hierarchical movements with frequent stops that encourage the social interaction among people. Six urban factors determined by Ferwati <sup>51</sup>tried to compare the visual elements of urban space streets like intensity of vision, functional landmark, scale, aesthetic, material and natural elements (Ferwati, 2007, p. 21). The new sightseeing is different and focuses on focal point monuments instead of having different and complementary scenes like in the old city. The new streets outside the old city used to follow certain restrictions according to the construction laws that belong to different countries. In general, they were wide and aligned by multi storey buildings according to their hierarchy within the entire city network that determines

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<sup>51</sup> See Biography P.435



their function. Those streets were extended and imposed inside the old city and became partly following the same pattern outside. Imposing the idea of having setback space in front of the main buildings permitted many impacts and changes in the old urban fabric through increasing the dependency on car movement, providing inappropriate climate conditions due to the increase of the sun heat on the surface and also became limited to be used by other activities (Jaber, 2013, p. 36).

#### **2.4.3.3 Transformation in Urban Space Components**

The new hybrid structure experienced more variations in size, dimensions and ownership regarding the juxtaposition of blocks and their parcels. The land use distribution started to be more mixed in the hybrid urban structure changing the density to be less than the traditional one (Arnaud 2008). Bianca mentioned that many historical elements were removed through the modernization process and participated in the creation of isolated urban blocks. The main public buildings were also isolated from the entire urban fabric by removing the surrounded urban structure following the western model of creation outward looking focal points. The main public buildings like big mosques and markets are sometimes isolated by wide roads. The continuity of urban element functions was affected in parallel as it is always based on the coherence between all urban elements and their mutual relationship (Bianca, 2000). The urban traditional street network consumes approx. fifth of the whole urban fabric while the new added structure used wide, linear and interconnected streets flanked by wide sidewalks (Jaber, 2013, p. 32). The old urban fabric was divided into isolated blocks with different shapes according to the streets pattern that was planned and cut through the old core. Many buildings and historical structures were removed disregarding the social, economic and physical impacts on the remained historical structure. The residential structure is exposed directly to the new inserted spaces and building types, altering the daily habits and the traditional way of living. Mobility by vehicles prevailed inside the old city instead of the pedestrian that accelerating more destruction inside the old core (Bianca, 2000). The plots were restructured along the aligned main new streets. They started to follow more geometrical shapes through merge and division process. The types of buildings followed the new added types and started to be transformed according to the prevailed architecture pattern in each period neglecting the old historical one. Those two processes urge to have more streets inside the block to provide more accessibility. The remained historical urban fabric is decayed and becomes invalid to adapt the development process. The commercial pattern that was brought by the new streets spread inside the isolated blocks where the living standards are ranked down with less privacy. The modernity started from inserting new parcel and building types that participated

to alter the whole block or could be vice versa by inserting new blocks that could change the adjacent parcels and buildings. Having more integration among urban elements creating more continuity to adapt the old traditional urban components to the new one while the segregation among urban components caused a discontinuity within the existing traditional structure with more destruction, See Fig. (2.11).

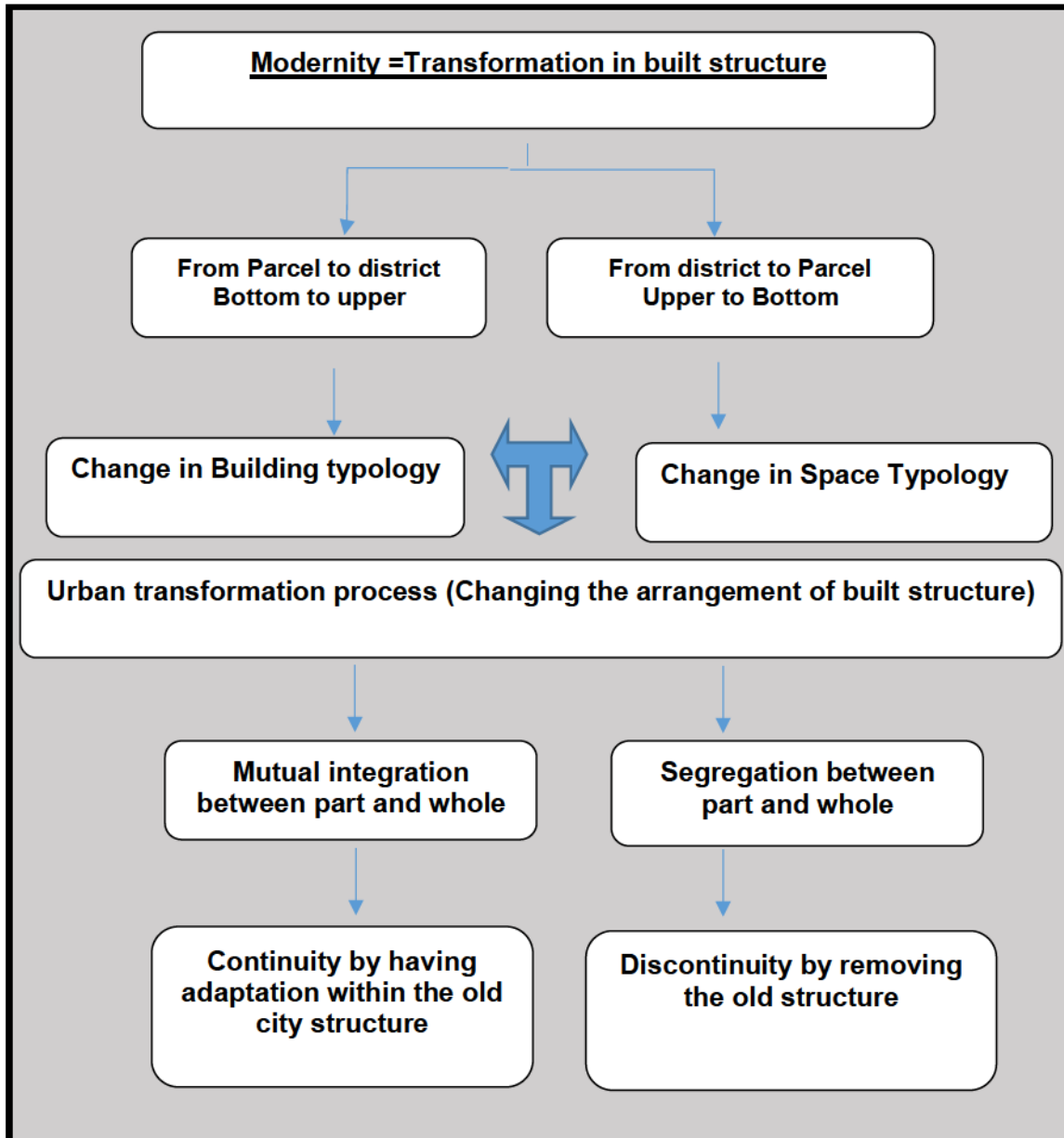


Fig. (2.11): - The transformation process in the built structure, Source: AL-Hassani 2012:89

## 2.5 The Transect Analysis of the Modernized Urban Landscape Structure

### 2.5.1 The Urban Transect as an Analytical Tool

The traditional Middle Eastern urban structure had undergone radical impacts due to the contemporary idea of urban space. Urban sections considered one of the practical tools to investigate the behavior of the traditional urban landscape structure that was exposed to an accumulative transformation process resulting from the continuous modification in urban space form, structure and hierarchy. One of the significant analyzing systems in urban design is to explore each specific zone in the city and its spatial characteristics through different periods in micro scale level. This method is considered more accurate and provides better outcomes based on descriptive, exploratory, predictively analysis. The main tool to explore the impacts of the modernization in the variant city zones is the combined analysis for both horizontal and vertical transects to evaluate the urban scene in three dimensional aspects before and after modernization and propose different solutions for the inherited chronic problems. Transect in the city provided an accurate information that could not be read in the city plan and provided a correlated material that could be used as an analytical tool to determine the spatial relations in the regional context (Mantho, 2015, pp. 13-14).

The urban section analysis shows a variety of street patterns that reflect the social, climatic, cultural and morphological affairs in each zone. Transects in the city illustrate the way of the interaction among different urban components and patterns showing the hierarchy of urban spaces in different zones and the reaction of urban elements according to the type of intervention. It clears the behavior of the users through moving from the public urban area up to the inhabited area and vice versa. Vertical sections could explain many matters in the city that could not be explored in the horizontal section and shows how the variations of movement from an old area to a new one is configured and planned. Using the urban section to analyze the city structure allowed a better explanation of the spatial relations and the expected consequences from any intervention on a different level of accuracy. It allows information that could be spatially ordered to find out the relations among districts and lead to redefine and manage the whole urban system.

## 2.5.2 The History of Using Urban Transects

The main concept of transect was initiated in the science of Biology and used to document a special phenomenon in a certain area to show the spatial distribution mapping. In the 19th century, transect was used and developed during the planning and construction of streets in industrial projects to combine and revise their variable components (Mantho, 2015, pp. 12,18). Transects used traditionally for regional surveys regarding geographical analysis and recently used for investigating and identifying the community development, population and urban planning showing the quality and quantity criteria for a certain area. Transects illustrates the everyday use of urban spaces and the spatial distribution (Krebs & Pilz, 2014, p. 5). In the beginning of the last century, transect appeared again in the idea of valley section that was proposed by Patrick Geddes. The geographical section was based on showing the development of human activities within nature along the city ( Clavel & Young, 2017, p. 3).

Mc. Harg<sup>52</sup> introduced a new method of creating more operational transect as a transparent over layers to explain and investigate the land. This process is used to exclude the most sensitive land concerning ecological issues from further development and minimize the environmental damage (Mantho, 2015, p. 13). In the new urban design approach, transect is considered as an order system used to allocate sequences of habitats along a gradient of specific geographical land. It could be considered a design element that correlates different urban components based on defined zoning system to achieve an integrated complex of urban natural, physical and cultural environment (Duany, 2002, pp. 251-260).

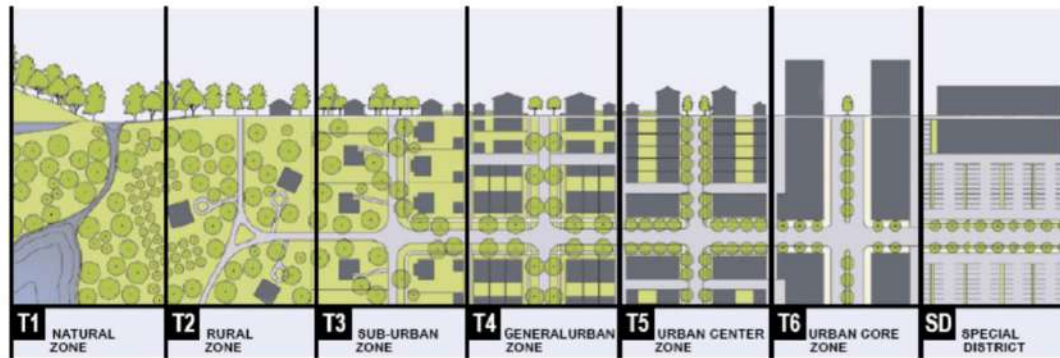
It shows how urban patterns could be composed and interacted among each other to create a gradient from a highly dense urban area up to the nonurbanized area. The Urban Design Congress proposed the transect method to establish main guidelines for zoning system to be used in explaining the urban sprawl problems and to find out models for defining the relationship between physical and natural environment. The new urbanism illustrated that transect analysis could provide a real data base concerning the relationship between density and urban pattern. Bohl Charles & Plater-Zyberk <sup>53</sup>proposed to use transect in built environment analysis by dividing the city to six zones starting from rural area (T1) as nondevelopment area, (T2) as rural area with limited development, (T3) as sub urban area with low density, (T4) as general urban zone with high variation in urban pattern, (T5) as the main urban centre and finally (T6) as the main urban core (Fig.2.12 ) ( Bohl, & Zyberk, 2006, p. 5).<sup>54</sup>

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<sup>52</sup> See Biography P.432

<sup>53</sup> See Biography P.432

<sup>54</sup> See also Mantho 2015:28



A TYPICAL RURAL-URBAN TRANSECT, WITH TRANSECT ZONES

**Fig. (2.12): - The built environment structure using transect analysis, Source: Bohl, Charles C Plater-Zyberk, Elizabeth 2006:5.**

The transect idea is the main framework used by urban designers to prepare and design plans and systems for managing the city, distributing communities and explore the required types for the proposed urban elements. Based on the connectivity among different urban patterns, roads were classified by Marshall to four types regarding each urban network pattern that belongs to different morphological period by proposing a section in the city that includes all types. This is based on connecting the old city core street pattern that is orientated in different directions as called Type (A) with new settlements that have perpendicular junctions with gridiron network that is called type (B). The series continued to connect last two types within suburban area that have a main artery as a main backbone of the villages that are designed as extensions astride on this arterial road. The final type is the new developing area with modern hierarchy that is characterized by looping or branching pattern filled by super blocks (Marshall, 2005, p. 84) (Fig2.13).

Yardim<sup>55</sup> used the urban section to analyze the ground urban level and determine the locations of transport infrastructure within the city as main poles that could serve the main public spaces (Yardim & Hacıhasanlı, 2015, p. 48).

<sup>55</sup> See Biography P.435

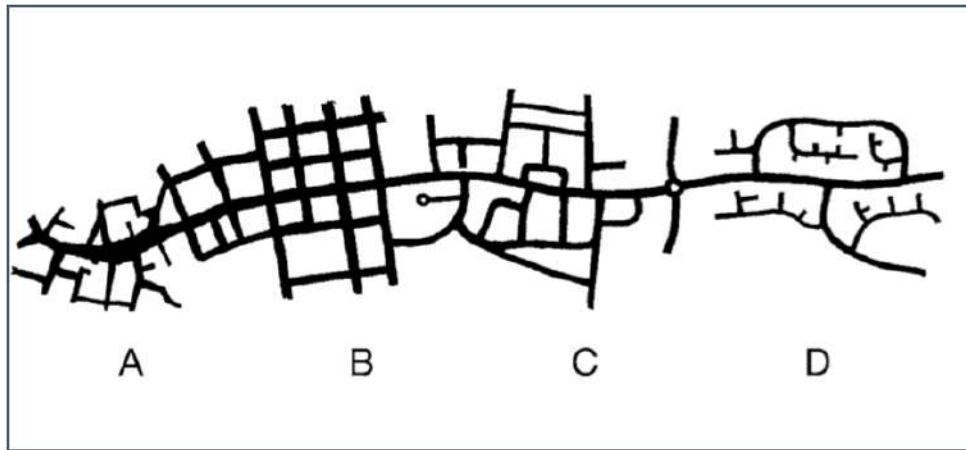


Fig. (2.13): - Streets transect (ABCD) according to urban pattern, Source: Marshall 2005:84.

### 2.5.3 The Main Objectives and Outcomes of the Transect Analysis Method

*According to the above inquiry that was based mainly by Robert Mantho in his book (urban sections: an analytical tool for cities and streets) the main objectives that could be gained from analyzing the urban sections could be summarized as following:*

1. Finding out the connections and the relationships among different urban structure elements that lead to shape the cityscape.
2. Collecting information from different parts of the city in order to visualize the spatial order for the whole built up area.
3. Exploring the interaction between urban space and the adjacent buildings and showing either they are integrated or not.
4. Understanding the social behavior for both inhabitation and visitors and also the economic development in the analyzed area.
5. To discover the framework of the activities that could shape the city and explore the habits and the way of living for different social groups who live along the city section.
6. The section examines the collected information on two levels, the first one is macro scale level to show the total urban scene and second is the micro scale level for more detailed impacts caused by the continuous development process.

7. To have a comparison between many parts and cases in the city, finding out the main differences and similarities and explore the important and unique characteristics for each case ( (Mantho, 2015, p. 19).
8. Comparing different parts of the city that have variation in urban patterns to conclude the types of the main urban elements showing the similarities and differences in divergent urban fabric.
9. Comparing the main physical and functional characteristics of many sections in the streets inside the city and find out the main features that gave a special characteristic to each part of the city.
10. Finding out the impacts of the street on the adjacent neighborhood to explore the scale of district through spatial relationships and the impacts of having horizontal and vertical physical elements.

#### **2.5.4 City Sections Comparative Criteria as a Descriptive Analytical Method**

Like in Architecture, urban design could use sections to illustrate the spatial relationship within a specified urban scale. Sections could be used to discover the development of the city through decades showing the spatial transformation process that caused the change in urban structure and form. They also normally used in the new designed projects to show the predicted impacts on the urban scene and how this project affects the spatial hierarchy. Large scale Sections provide a variety of information depending on the urban form types that were initiated in different areas according to spatial, environmental and cultural factors. The cutting should be through the main important buildings and urban patterns to show the similarities and disparities that could provide better information about the city development. Sections could work as comparative tool between different city zones with different densities and participate to understand the interaction between those sectors. The sections show the orientation criteria of development inside the city whether it was concentric or having the linear pattern or may combine both patterns. They are also used to find out the position of main potentials that enhance the city development. The role of natural elements and topography in forming the city is one of the most important criteria that section could investigate like in Genoa city where space reacts according to different forms in spite of its compactness showing the irregular network that was influenced by topography (Fig.2.14. a)

The sections could find the vertical dimensions that are not readable by the horizontal sections through clearing the spatial consequences and finding out solidity and openness in the urban fabric as main analytical criteria. The sections provide more about the urban space spatial components and characteristics concerning the criteria of form, depth and hierarchy. Those criteria connected to both the social values and the densities of the built up area like in Fez where having a dense and tight urban form with low scale that reflect the privacy concern as a compact pattern for the Islamic city (Fig.2.14. b). Sections showed the criteria of uniformity versus the disorder and the regularity versus irregularity in the urban structure as in Glasgow section where the uniform grid blocks are so obvious in dominating the urban scene (Fig.2.14.c). The measured criteria, especially the proportion of buildings to the streets and the relations to the human scale, are highly concerned by transect analysis. Sections always laid emphasis on the style of the planning that belongs to different historical periods. Presenting the size of buildings related to the urban space and their balance is one of the most important criteria that sections is looking for in order to illustrate the vertical concentration of buildings against the horizontal one and determine the impact of modulation like in Chicago (Fig.2.14. d). Finally the existence or nonexistence of spatial definition could be discovered obviously through the large scale sections to find out the transitional points and define the variety in scale inside the city (Mantho, 2015, pp. 32-42).

### **2.5.5 Transect Analysis Methodology & Practice**

In order to analyze the impacts of modernization in old city of Baghdad, a new hierarchy of zoning will be set by having transects through the old city core. The hierarchy is started from buffer zone area passing the residential part up to the main public zone. The hierarchy of the existed old and new streets have determined the zoning series which may vary in order according to the type of public space and street pattern. This method will show the way of the interaction between urban elements and will investigate the impacts of modernization process on the surrounded area. Having multi sections in old core will help to investigate the consequences resulted from changing the street pattern by adding new urban space types instead of the old ones. The modification in urban space type and hierarchy established a kind of discontinuity within the old urban structure but at same time connected to the variant urban poles in the modernized area.





(a):-Section in Genoa



(b):-Section in Fez

(c):-Section in Glasgow



(d):-Section in Chicago

Fig. (2.14 a, b,c,d): - variant transects showing the unique characteristics in different urban patterns, Source: Mantho 2004:32.

The discontinuity in the urban scene in some parts along the old core will be explored on different levels through the transect analysis showing the impacts caused by implanting new urban elements and building types. In this chapter many sections through three selected zones in the old city of Baghdad will be investigated, analyzed and compared to find out similarities and disparities caused by the modernization process. Using the two dimensional plan and section could be considered the best and innovative method that could compare the change in the spatial pattern for different parts of the city. It helps to compare the role of different patterns in composing the recent urban scene finding out the best solutions of integrating the variant types of urban structure through urban management strategies. In the chosen sections, some combined information will be collected showing the street layers that are formed by the main and the secondary paths within the surrounded vertical and horizontal planes. Each section will show a different approach of reaction regarding the historical fabric according to the types of the implanted urban elements. Transect through three zones will show the shared impacts on urban fabric and will distinguish the unique one for each individual case based on its role in causing a severe modification in the surrounded spatial structure and the neighborhood pattern around. The horizontal and vertical dimensions for each section with plane metric urban grain analysis illustrate the variation of the spatial character for each section and provide a wide spectrum of different reactions to the modernization process. The transects through three zones will provide the physical image and vertical information to the city. They will explain the way of the growth, the sharing and separated spaces, the change in privacy and publicity, the role of existing activities (religion, economical, administrative) and finally the city skyline and relation to the river.

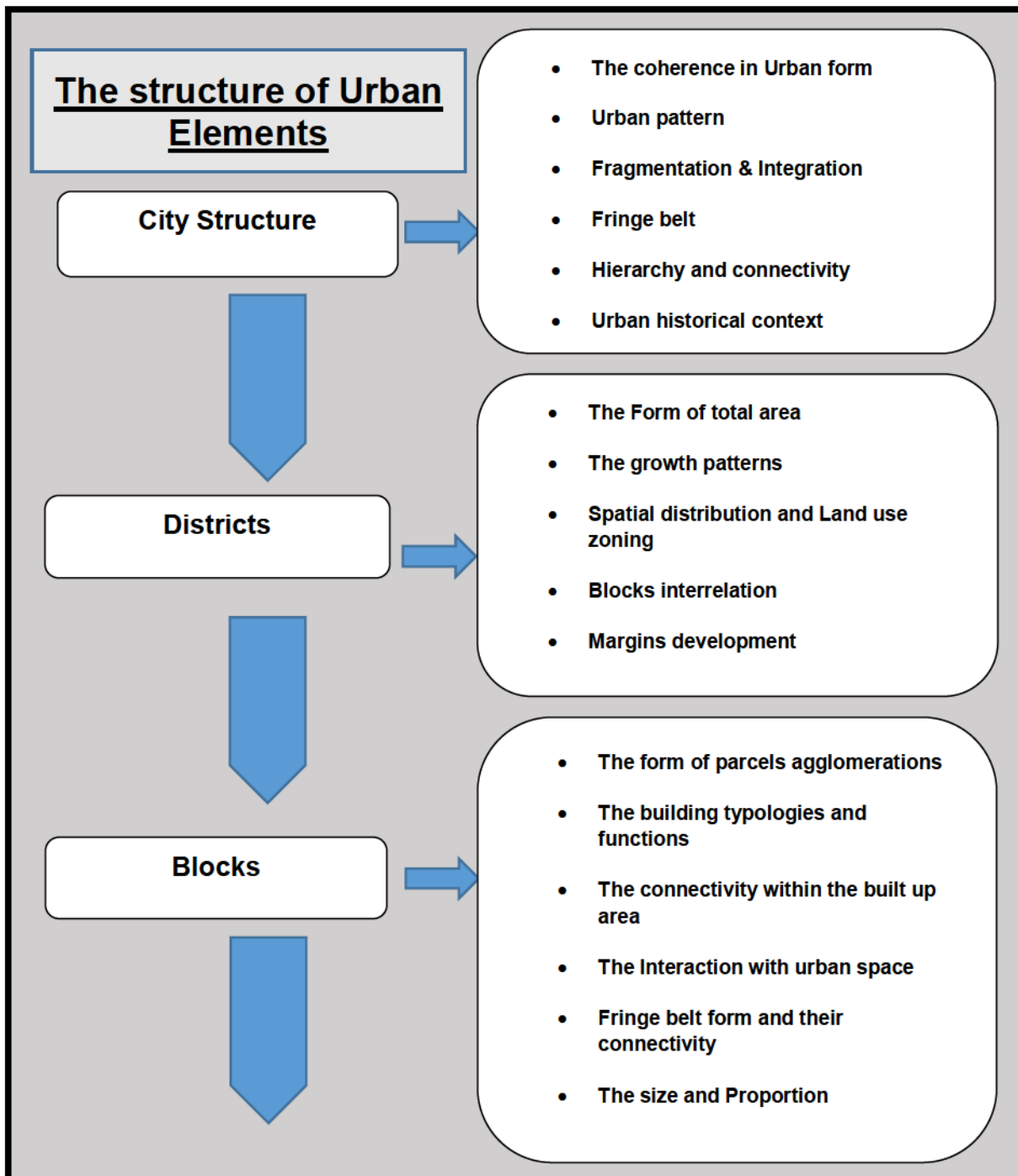
## **2.6 The application of the analysis methodology for the old city Core of Baghdad**

### **2.6.1 Following the Typological Method in Restructuring the Scattered Elements of the City of Baghdad**

The research followed the typological analysis with a series of correlated methods by combining the urban elements and understanding the city through the transformation in building types based on the relation between urban space and the built up area. The research was looking for the reasons behind every transformation in the type of buildings and plots related to the surrounded space that leads to change the block characteristics. It was also looking for the traces that motivated this change to come up with the new development and looking always for the originality to revitalize the old cities by disclosing the hidden urban

context behind. In parallel the destruction process sometimes also followed the old traces of the historical development which provided motivations from further modifications like widening old streets or expanding historical monuments. The random destructions in the old city fabric are always accelerating the transformation process in the surrounded area in a negative way. This was done by adding new blocks and building types within new streets in the destructed part regardless to the interaction within the original land use pattern for the area around thus altering the relation between urban space and building types. Sometimes these new blocks and building types ignored the traces and the space hierarchy of the original situation and impose a new situation by creating a gap within the original urban pattern which is starting to experience highly transformation process to match the structure and functions of new blocks and the urban spaces. The study combined between the exploration of typological development for both buildings and space following the old traces within the change in the hierarchy of urban space to find out the way of reaction. The typo-morphological method was not only used to deduct the process of change in the urban elements but also to look for the impacts on the connectivity between those components. The conclusion was to find a method of analysis in the hybrid cities with more than one urban pattern by layering the city structure that belongs to different periods and fixing the type of alteration whether it was an accumulative or imposed. This is meant to understand the characteristics of the inserted urban space and building type. The idea of urban space always affected the building types especially in the Middle Eastern cities. The study found that exploring the urban space hierarchy within each morphological change is a better way to follow the direction of development and the reaction of old structure that should be understood in any prospective conservation and management approaches for keeping the heritage of the city. The study also revealed that the inserted new types of the space altered the reaction of building and its plot either by forming totally new blocks or modifying the old ones depending on the hierarchy of space and the connectivity within the surrounded potentials in the whole urban components. It was looking for the alteration in the privacy degree of the urban public space that normally in middle eastern cities ranged from public spaces and semipublic to the semiprivate where the private is represented by the individual dwell. After understanding the reaction between new and old concepts of urban spaces, the study stated the transformation in building types within the changeable idea of space starting from the plot as a smaller cell and ending with the block that gathered a number of parcels and their buildings that were modified according to the type of the intervention. The buildings that filled those parcels within the new idea of urban space will be explored to show the different types related to different functions. Following the typological method in exploring the morphological sequences of the old city of Baghdad will conduct and explore the way of transformation and the motivations that accelerated the loss in the traditional urban fabric. This method is providing a better knowledge to explore the way

to deal with any intervention and find out the integrated elements that could restore the connectivity between the scattered parts of the city. The old city core was affected by internal and external forces that accelerated the transformation process but at the same time it has some potentials that kept cohesion and the general outline of the city. The main elements that should be discovered and investigated within the transformation process in each morphological period were urban structure, districts, blocks, parcels and building types, urban spaces, historical monuments and the innovation behind the alteration, having more exploration for the criteria of those elements as shown in the bellow classification, See Fig.(2.15): -



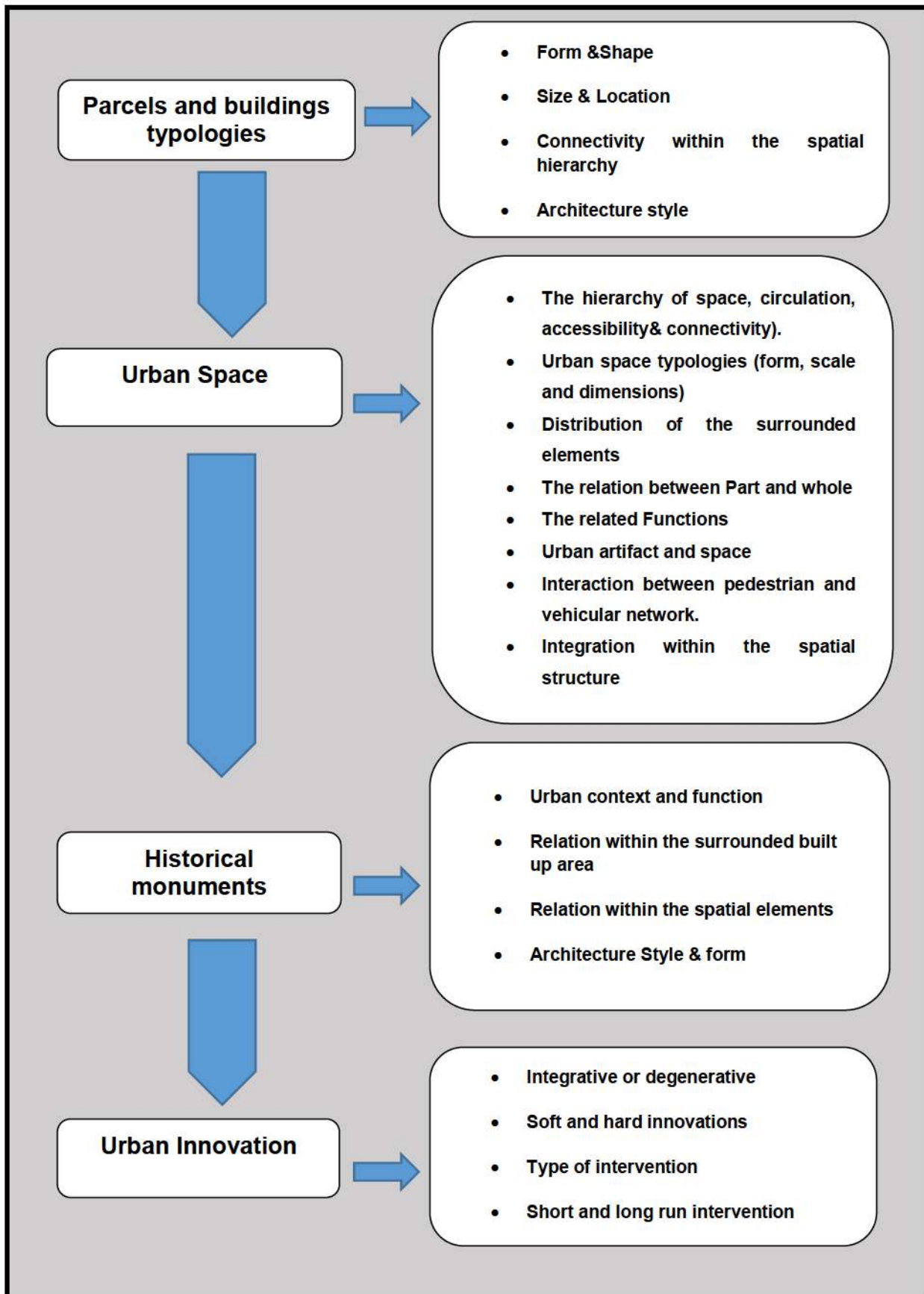


Fig. (2.15): - The Typo-Morphological Analysis for Urban elements, Source: The Author.

### **2.6.2 The role of transect analysis in investigating the impact of modernization in transforming the urban structure of Old city core of Baghdad**

The study examines the modes of Interventions in the old city in three types: Regular interventions by an accumulative process, imposed intervention by planned strategies and the crucial interventions to solve such a problem. The percentage of change in old urban structure was compared to the remained traditional urban fabric showing the reaction of the traditional urban elements that were subject to be transformed according to economic, social and physical factors. The study used to analyze the whole urban structure of the city by combining the typo-morphological transformation analysis which was done in the third chapter within the development of urban space hierarchy that was done in the fourth chapter through transect analysis. Urban sections were taken through the old city structure to analyze and investigate the impacts of modernization and reaction of the old urban fabric in three dimensional assessments. This method is used essentially to fulfill the investigation of the coherence in urban structure between the oriental compact pattern with inward looking building types and western approaches with outward looking building types. It provides a clear overview about the combined and the segregated features of the hybrid urban structure in the modernized Middle Eastern cities which are composed of gridiron pattern within the interrupted compact neighborhoods to show the interaction between the new types of the urban space and accordingly the development in building types and vice versa.

It also shows the hierarchy and configuration of the old urban public spaces within the new streets and plazas during the transformation process which affects the aligned building types. The transect analysis reveals the present situation in the old city of Baghdad to investigate the change through different historical periods and in three dimensional analyses. A comparison analysis for the transects through the old city in different historical periods shows how the city skyline reacts in a vertical way through decades. The comparison analysis highlights the variation of impacts in the modernized urban structure and their potentials that could be used to reintegrate the city and determine the segregation elements that should be managed in prospective strategies. Both vertical and horizontal sections will explain the urban landscape development and the impacts on the oriental compact urban pattern after the modernization process shows the main physical, cultural, economic and religious factors that shape the city. The sections analysis explains the variety of impacts regarding the modernization process on different land uses and urban form patterns. The main analysis criteria are the urban space hierarchy, land use of the surrounded area, the change in proportion, the transformation in building types and the role of historical monuments.

# Chapter -3-

## **The Spatial Development of Baghdad City**

## Chapter Three- The Spatial Development of Baghdad City

The city of Baghdad experienced different strategies for development that were prepared in form of selective decisions or by comprehensive planning approaches reflecting a variation of planning strategies in different periods. The spatial order of the city that was structured through master plans varied in the way of land use setting, participated to shape the entire city structure within the old city core.

### 3.1 The City of Baghdad -The End of Ottoman Rule Up to 1917

Industrialization in the 19<sup>th</sup> century had a massive destructive influence on the Muslim city and society, and this industrialization was brought about by the colonization in the 20<sup>th</sup> century. The medieval plan of Baghdad experienced partly changes at the end of the Ottoman rule. A new dam is extended from the west corner of the wall in the eastern part of the city AL-Rusafa to save the city from the annual floods. It is also indicated that many parts of the surrounded wall were removed to ensure more access to the city. The Ottomans started to line the first car street in eastern part of Baghdad (Khalil Pasha Street) and tried to bring forth the International style of urban development by having a new railway station in the western part of the city as shown in the plan drawn by Herzfeld in 1916 (Fig. 3.1). The German introduces the rail truck to link the city to Europe with new main station built in the western part of Baghdad ( AL-Karch) (Fathi, 1977, p. 245) . New functions were also introduced into the city like modern hospitals, secular schools, Post office, and tramway that reflected the new mood of urban management which is controlled by the state.<sup>56</sup> The international Market power entered into the city enhancing the living standards, social and cultural conditions. The city began to extend outside the city wall to accommodate more military, health and industrial functions. This period could be considered a transitional one between the medieval and modern city and stimulate further prospective development for the city (AL-Ashaab, 1974, p. 207).

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<sup>56</sup> See Chapter 4 from 128-137.



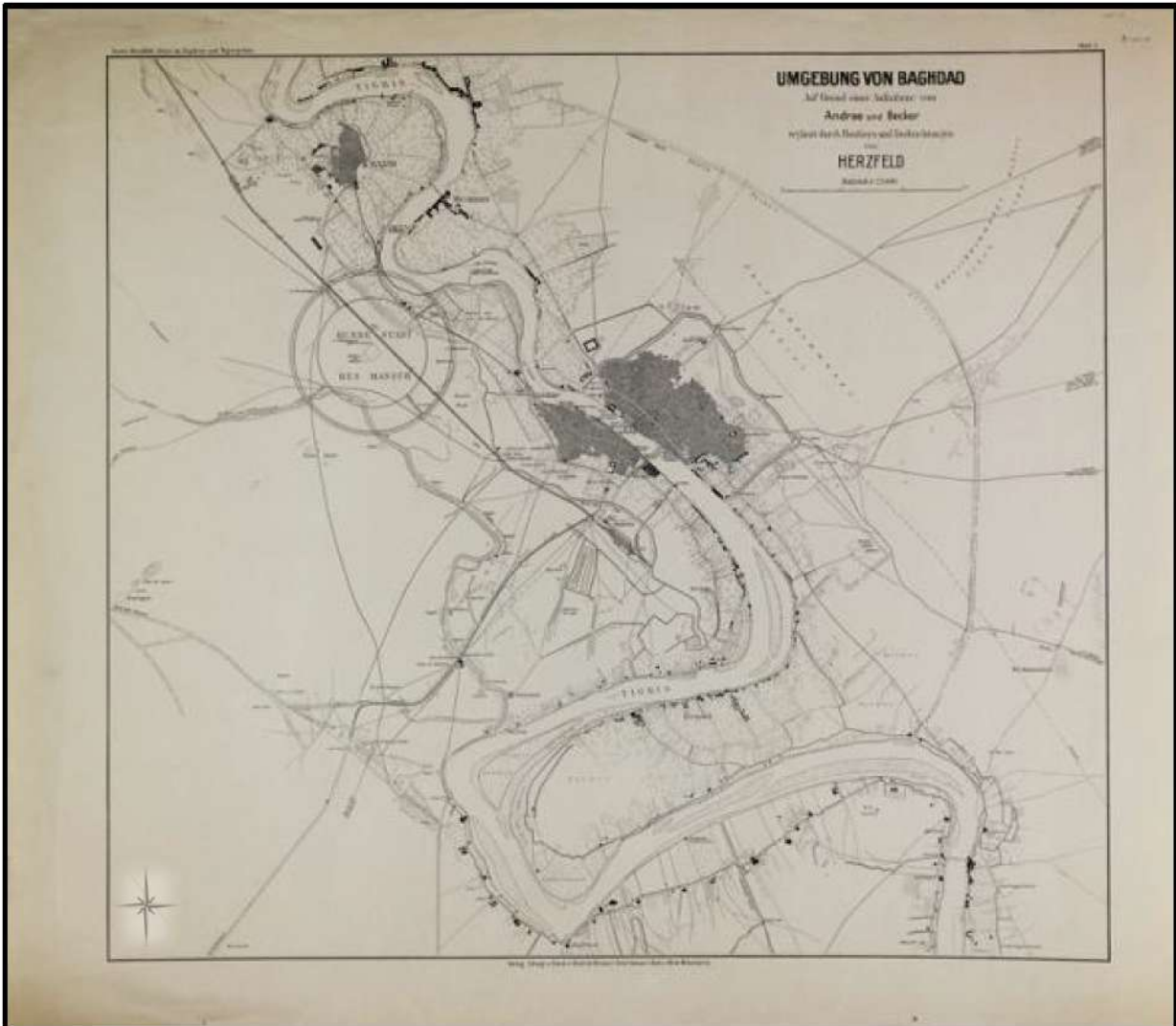


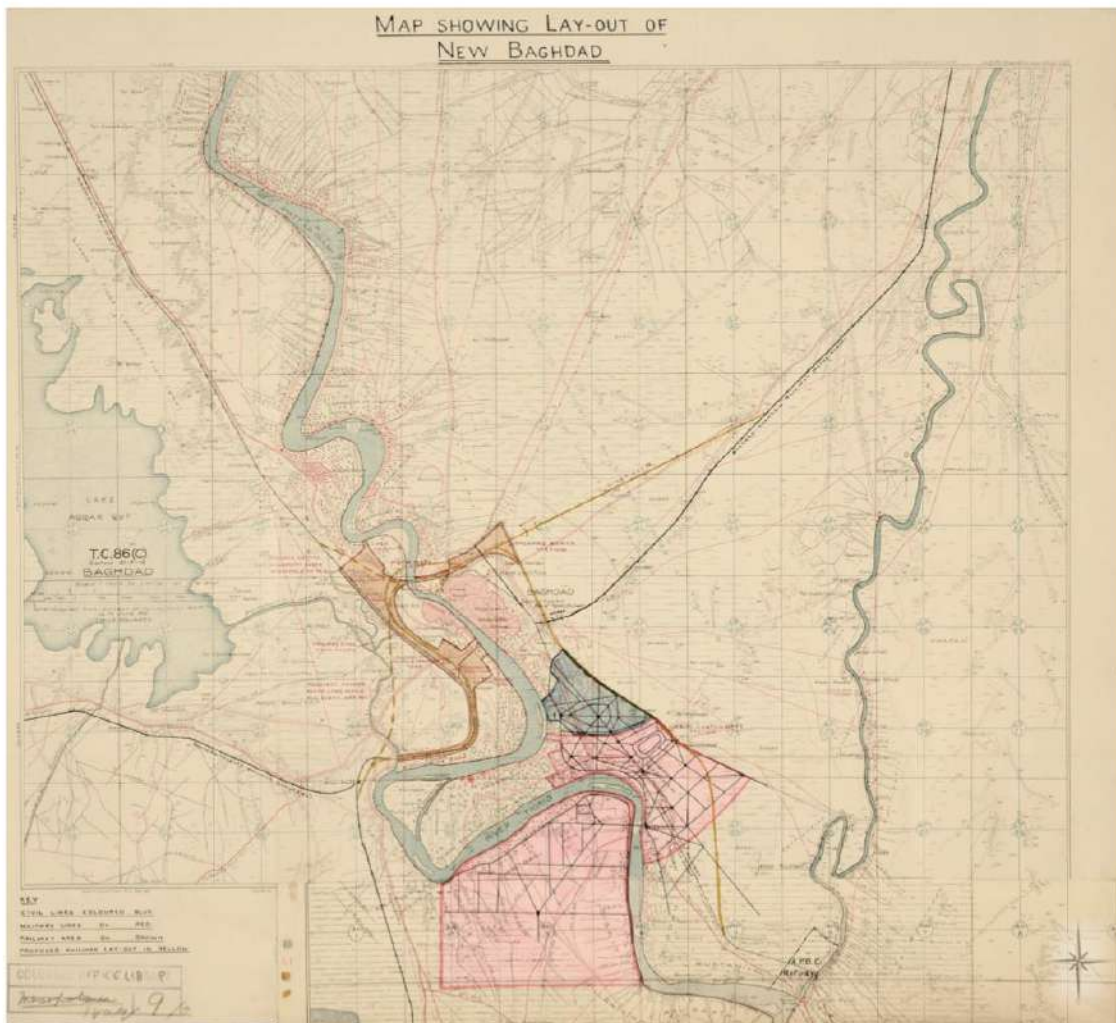
Fig. (3.1): - Baghdad urban structure under the Ottoman in 1916 drawn by Ernst Herzfeld, Source: (Sarre, Herzfeld, & Berchem, 1911-1920.), See Fig. (1) in Appendix I in A3 size

## 3.2 Planning in Baghdad from 1917 to 1956 (British Colonial city)

Urbanism in Baghdad experienced new development and structure since the First World War. Sir Arnold Wilson<sup>57</sup> prepared a master plan for Baghdad providing a distinction between civil and military zones inside the city and adding new neighborhood with their related facilities and functions using the gridiron system as a best pattern to accommodate the infrastructure for

<sup>57</sup> Arnold Wilson was the British Commissioner in Iraq between 1918-1920 during the colonial role.

the city Fig. (3.2) (Jackson, 2016, pp. 383-386). The city became the capital of the Iraqi state instead of a southern province ruled by the former Ottomans and practiced an intensive urban development programs to integrate the city with varied modern functions and infrastructure (Pieri C. , 2008, p. 266). New colonial development strategies in developing the cities had introduced modern planning concepts for the city of Baghdad set by British mandate and later by the Higher Council for Reconstruction<sup>58</sup>, which was established in 1950. The city extended along the river to both north and south as shown in (Fig.3.3).



**Fig. (3.2): - The Proposed New Baghdad Master plan in 1918 by Sir, Wilson ,Source: British Archive, CO1047/466,See Fig. (2) in Appendix I in A3 size.**

<sup>58</sup> Higher Council for Reconstruction was established in the fiftens to prepare development and construction plans for Iraq.

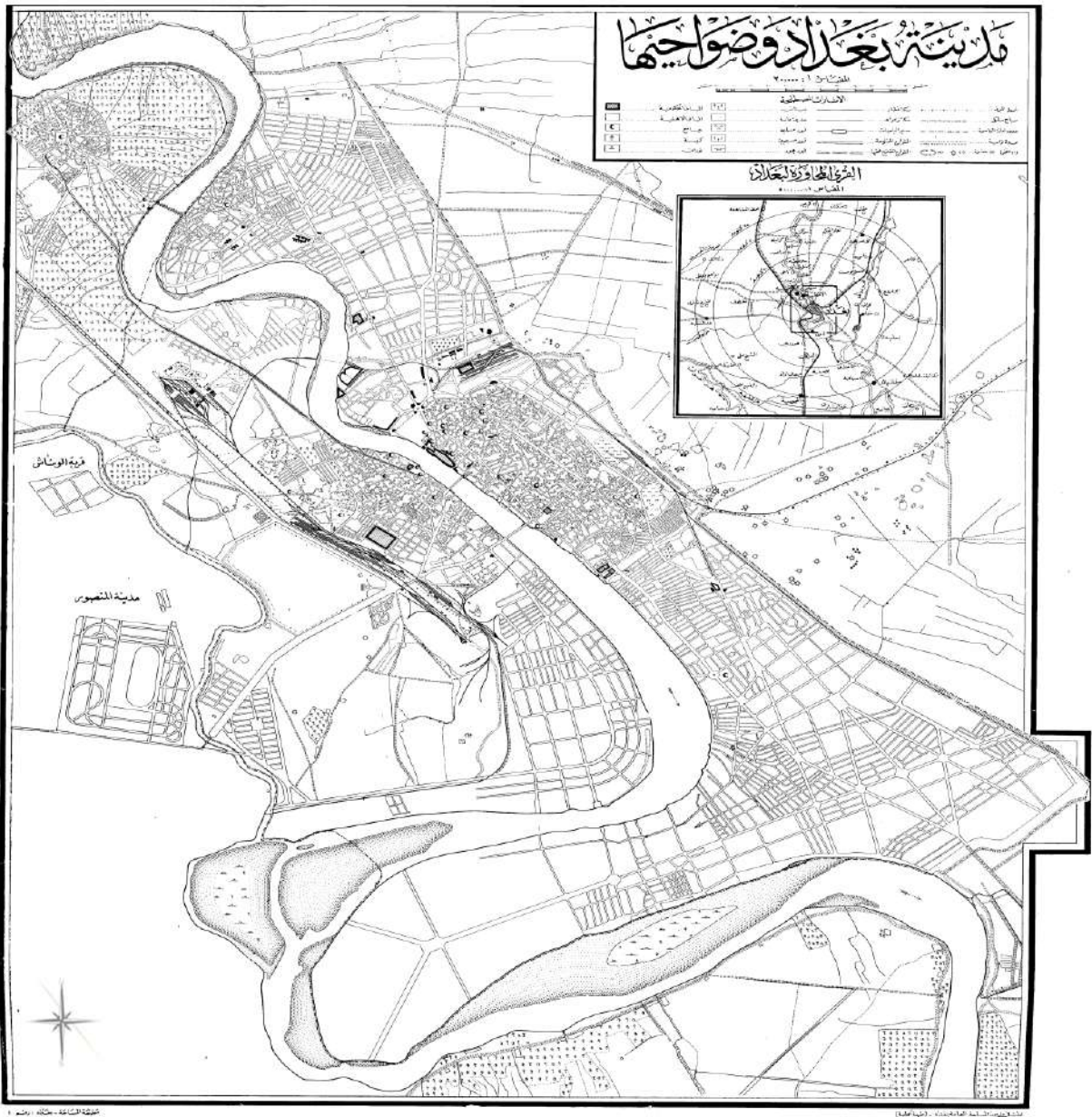


Fig. (3.3): - Baghdad map estimated at the beginning of fifteenth, Source: Iraqi ministry of irrigation, Survey directory, See Fig. (3) in Appendix I in A3 size.

### 3.2.1 Urban Growth

The British started to construct a dam on the eastern part of the city to allow more expansion<sup>59</sup>. Many architectural and urban planning projects took place under the British hegemony after 1917, representing the new modern tendency to build the modern capital of the reunified state of Iraq. They started to carve new streets in the existing fabric and expanded new others outside the built up area, to accommodate the military troops like the military camp of Hinaidi in the south of the current Baghdad city which called now AL-Rashid, and ended at Diyala River that branched from Tigris south of Baghdad. Many administrative buildings and the new residents were built with gridiron urban pattern such as Sinak, Bataween and Saadun departing from traditional vernacular town planning (Fathi, 1977, pp. 245-248). An expansion layout was established to provide a systematic framework that was able to adapt the colonial approach of urban development. New urban entities were inserted in the city when several garden areas dominated by brick-work houses were built designers (Pieri C. , 2008, p. 267). Both religious sites of AL-Kadhimiya and AL-Adhamiya<sup>60</sup> have experienced a significant growth hence played a role of suburban satellite cities. However, the city growth was randomly planned and carried on by arbitrary and uncontrolled development. AL-Ashaab mentioned in his research about the development of Baghdad city that he first master plan was thought to be drawn by two German planners in 1936 but it was never found. The regional role of the city had maximized as an important commercial centre for the whole state. The city expanded rapidly and the new built up area reached to AL-Adhamiya and AL-Kadhimiya in the north part and AL-Karrada district in the south and started to sprawl filling the vacant plots and substituted a large area of palm orchards. After 1945 the city expanded to the west and east sides, especially in AL-Karch and accordingly the boundaries of the official of the Baghdad municipality in 1948 were enlarged (Fig.3.4) (AL-Ashaab, 1974, p. 363). The old city diminished in the 1950s when the new structure expanded in the old core with new functions especially along AL-Rasheed street where it started to accommodate many modern building types. Two poles were extended along the old north and south Ottoman gates. The north one was specified for the governmental buildings, colleges and hospitals while the southern one accommodated the public facilities like cinemas, consulates and hotels mediating the main financial assembly where it occupied part of the old market. The houses of the worthy families extended along those two poles substituting large palm orchards. Many slums initiated in the

<sup>59</sup> AL-Kadhimiya and AL-Adhamiya: Districts in north Baghdad faced each other across the river where two shrines considered the main focal point for composing the urban fabric around.

<sup>60</sup> It called the Eastern dam that was lined along the eastern border of old Baghdad and substitutes the Ottoman Nathum Pahsa dam.

eastern part where employees who were immigrated from all part of Iraq live near the city creating a villages environment around (Wirth E. , 1953, pp. 309-310)

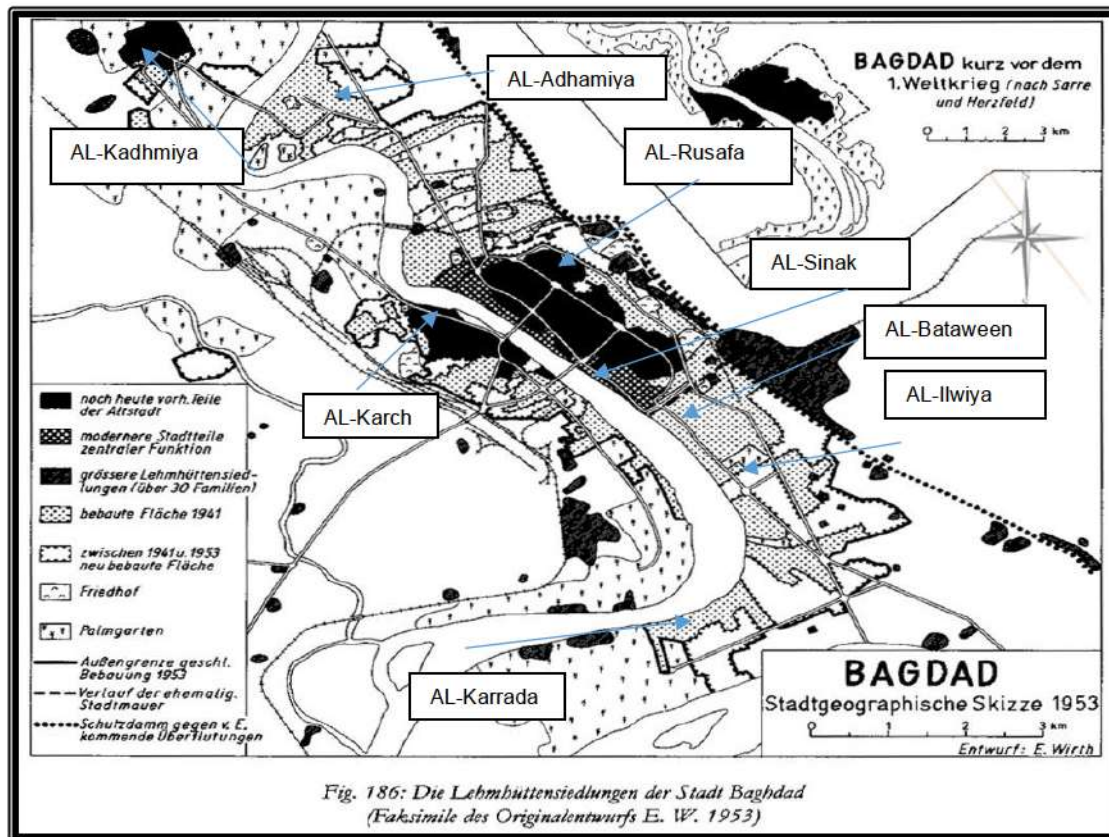


Fig. 186: Die Lehmhütten-siedlungen der Stadt Baghdad (Faksimile des Originalentwurfs E. W. 1953)

Fig. (3.4): - The city of Baghdad development up to 1953, Source: Eugen. W, 1953:311, See Fig. (4) in Appendix I in A3 size.

## 3.2.2 Urban land use

### 3.2.2.1 Religious Land Use

At the beginning of the 20th century there were many mosques, churches, synagogues and cemeteries located far from the Tigris River on the peripheries of both river parts AL-Rusafa and AL-Karch. The most important religious buildings in Baghdad were the shrines of AL-Kadhimiya, AL-Adhamiya and AL-Gailani in the eastern part AL-Rusafa where neighborhoods agglomerated around and received annually many international visitors., See also Fig. (3,4). Many local and international pilgrims do their religious visitations to them as for many centuries these are considered important landmarks and religious centres mostly known for their gorgeous minarets. AL-Kadhimiya is considered one of the biggest parts of the city based on the strong religious imprint which is a significant factor in attracting thousands of people. It has four minarets and gilded dome that had ever dominated the city skyline connected visually to the minaret of AL-Adhamiya on the other part of the river (Gulick, 1967, p. 249).

### 3.2.2.2 Governmental land Use

The change of governmental land use always relates to the change in government itself. At the beginning of the 20th century the governmental land use restricted to the Ottoman citadel and Qushla in AL-Rusafa along the river. Later the governmental land use was extended to the north of the old city adjacent to the old citadel and AL-Waziryah where the palace of the Hashemite royal family was built in 1920. One of the important factors of country development was the prevalence of state owned land in Iraq. This allowed a large-scale expansion in governmental buildings and other projects sponsored by the state. At the south of the old AL-Karch along the river the governmental centre moved to Karradat Meriam <sup>61</sup> on the western side of Baghdad (Gulick, 1967, p. 250). The educational buildings increased significantly in number at this time and were located out of the old core, especially in the area between Bab AL-Mudham and AL-Adhamiya while the main health centre was in Bab AL-Mudham. A new international motorway services were established to connect the city with other metropolitan area. In 1933 a new airport was built near the main station in western side to enhance the international position of the city<sup>62</sup>.

### 3.2.2.3 Commercial and Industrial Land Use

Since decades, the commercial and financial centre has concentrated in the old city where retail and wholesale trade, crafts and light industries took place in the AL-Rasheed street, AL-Kifah street, AL-Mustansir Street and the traditional market (Suq). On the other hand, the heavy industries were located in four areas within the city. The first is located at the periphery of the city along Sheik Omar Street in the old core used for automobile maintenance. The area had attracted further development due to the availability of vacant areas and its connectivity to the east rail station (AL-Ashaab, 1974, p. 288). The second industrial area is located in the western part of the city specialized in textile industry. The third area is in the south of eastern part including power station, construction companies and bottling plants. The fourth area resides in the south of western part and it is used as oil refinery up to now called Doura Refinery (Gulick, 1967, p. 253).

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<sup>61</sup> Now this area called the green zone where all governmental buildings including the presidential palace located in this zone.

<sup>62</sup> Later became military airport as new airport was built in eighteens in the far west substituted the old one.

### 3.2.2.4 Housing and Urban Neighbourhoods

A new model for urban housing appeared in Baghdad by having clear and geometrical layouts with external orientation added to the existing traditional fabric. Two floor balcony houses lined along straight streets which started to change the idea of family privacy and declared the end of the traditional housing model (Pieri C. , 2008). New urban areas were developed in the eastern part like Bataween, Ilwiya, Hinaidi, AL-Adhamiya, AL-Karrada and AL-Sinak, Fig. (3-4). They provided new housing types orientated to the river; these houses used to be owned by wealthy people as well as the British troops. The western side of AL-Karch was also developed especially in the periphery of old built up area and introduced new housing areas near the public, religious and governmental centres like AL-Salihya and AL-Kadhmiya. Due to the rapid immigration process, the city expanded to the north and south of old city and the need for new urban regulations were so urgent to cope with those changes. New regulations were set up in 1932 in Law Nr.50<sup>63</sup> but they were so far not valid with the new city housing expansion because of the land division rules which only could be achieved by the head of the quarter. A new law Nr. 44 was enacted in 1935 to impose regulations and practice in the town that resulted with applying codification system for residential area, including building height, building license, streets ratio and layout, criteria for zoning and new plot size division which had been classified into six types starting from 100 m<sup>2</sup> to 2000 m<sup>2</sup>. Every municipality was free to adapt its own rules as far as it respects the basic regulations. The residential zone normally depends on the plot size and the road system efficiency. The law determined the main roads size to be 6 meters and 4 meters to the secondary ones while the cul de sac roads were set up to be 3 meters (Pieri C. , 2008, pp. 33-43).

### 3.2.3 Streets Network

The city, for the first time, broke the semi circular shape as a medieval town and expanded out of the wall. It started to stretch along the river in the form of longitudinal pattern by connecting the end nodes of AL - Rasheed Street to the new AL-Sadun Street to the south and Imam AL-Adham Street to the north. It was suggested to keep the development along the river and to move the future development to the western side to get more protection against the frequent floods. A third artery was proposed parallel to the river in AL-Rusafa penetrating the traditional fabric together with the existing AL-Kifah Street and Al-Rasheed Street to ensure better connectivity to the north and south of the old city (AL-Ashaab, 1974, pp. 257-

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<sup>63</sup> This law was documented by the Iraqi Supreme Judicial Council under the link below in Arabic language only, See also [http://iraqid.hjc.iq:8080/main\\_Id.aspx](http://iraqid.hjc.iq:8080/main_Id.aspx).

285). The street Network followed what had been done in New Delhi by Lutyens<sup>64</sup> through connecting streets to central nodes Fig. (3.5 a) (Percival , 1922, p. 28). This was proposed by Sir Wilson first in his proposal for the new Baghdad that was not achieved but the idea of connectivity between street and nodes was adopted later as could be seen in the city extension to the south<sup>65</sup> Fig. (3.5 b).

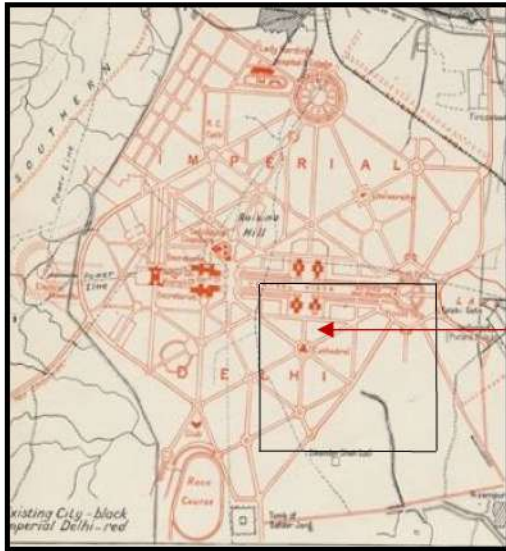


Fig. (3.5a)

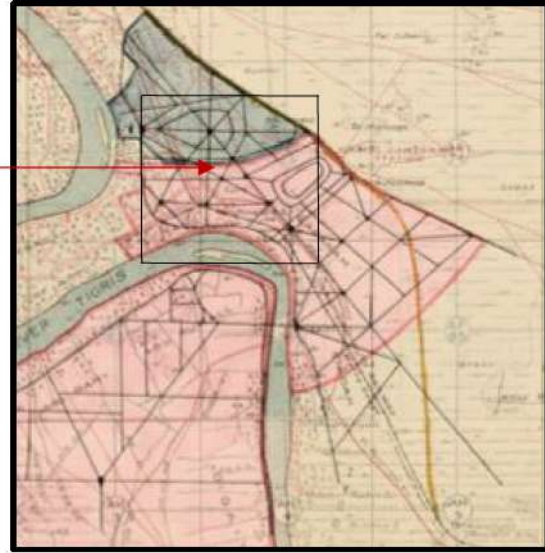


Fig. (3.5b).

Fig. (3.5a): - New Delhi scheme by Lutyens, Source: <https://architexturez.net/doc/az-cf-21741> , Accessed on 10.Sep.2018).

Fig. (3.5b): - Street Network in the proposed plan for New Baghdad, Source: British Archive CO1047/466.

### 3.2.4 Land Ownership and Urban Management

After the British occupation of Iraq, a property law was enacted in 1918 and this law defines that the state only has the right to own the property of lands while the previous owners were considered merely tenants. This law, however, allowed on a British benefit to make a new distribution of lands on some tribes who supported their mandate. In 1920 the British started to register the pieces of land in the names of tribal sheikhs, yet later they stopped doing so. In 1929 The Iraqi government started to use the official registration of Ottoman land (Tapu<sup>66</sup>) after its translation into Arabic language. After 1932 the government started to allocate land for individuals as tenants to get its benefit and after a number of years these individuals may assume a legitimate right to possess the land. This process is called Alezma Law which was

<sup>64</sup> See Biography P.432.

<sup>65</sup> According to Smriti Pant (a researcher and Ph.D student in BTU Cottbus who worked on investigating Delhi development), Wilson worked in Lutyens office in Delhi and later became the director of public work in Iraq and participated to shape the built environment in the city of Baghdad.

<sup>66</sup> It was a permanent contract of state-owned parcel or land given to one person or family.



amended in 1938 and 1959 (RTI, 2005, p. 3). In 1932 a new law for the land arrangement (Nr.50) was issued and amended in 1938 to solve the problems of property rights by issuing a new documentary to determine the land border for the owners. This law was not able to solve the property right problem due to the large area which could not be covered by the law in a limited period of time. In 1935 another law (Nr.44) was issued for roads and building management. This law tried to classify, arrange, organize and allocate residential, industrial and agricultural land. The residential areas were classified to five types based on plot size. The plans prepared for most of the cities emphasized only on the physical planning determinants without taking into account the economic and social factors and accordingly this law was not able to solve the city rapid expansion. In 1931 a new law (Nr.84) for the mayoralty substituted the Ottoman one enhancing the role to adapt the development in the city. It is worthwhile that all the plans prepared for Baghdad were arbitrary and not comprehensive without any long- and short term plans. They ignored the classification of main roads, the increasing of population density and the required services for the inhabitants (Muhsen, 2003, pp. 121-124).

### **3.3 The Master Plan for the City of Baghdad 1956**

A British firm, Minoprio, was requested in 1954 to propose a master plan for Baghdad. The plan was prepared in 1956 and partly adopted by the municipality and it was considered an official plan at that time (Fig.3.6). This plan remained only as general guide as it had no phasing development and legislation to enforce it ( AL-Adhami., 1975, p. 566)<sup>67</sup>. The main objectives of the master plan were to achieve efficient planning strategies by reorganizing the land use, main roads, public spaces and the urban expansion of the city, and to provide guidelines for a large scale development proposal that belong to different areas. The master plan was set to be as much flexible as possible and could be modified and adapted according to any prospective changes done by authorities or users. It was intended to allocate any available space of land for municipal purposes as well as other governmental requirements and to change the valid regulations and legislations to cope with the proposed strategies. The master plan emphasized that the city should adapt to modern approaches in providing social and physical facilities and to avoid any wrong utilization of land by private developers (Minoprio & Macfarlane, 1956, pp. 1-2).

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<sup>67</sup> The study founds according layer all strategies together hat the Majority of those guidelines were followed by the following development strategies especially the locations of the strategic projects and the constructed bridges that link both city parts across the river.

### 3.3.1 Urban Growth

A semi circular structure was proposed in the master plan with a diameter about 20 km (AL-Adhami 1975,566). The main idea of the master plan was to have a compact spatial form to continuously keep a short journey between home and work and to avoid buildings spread along main roads. The master plan recommended to concentrate the development on the east and west parts close to city centre rather than north south, which is considered the main development artery of the city with 14.5 Km. The master plan recommended to open up the land in the east part for further development and to accommodate about half million inhabitants along with other facilities. This zone was proposed to be bounded by an outer ring and is considered the best area to accommodate the slums in addition to its connectivity to the centre. In the west part, most of the development areas were concentrated west of Mosul road and south of the old airport on both sides of Damascus and Hilla streets. In the south a new residential area was proposed between the Tigris belt and the proposed railway truck. A rural boundary around the city was recommended to be expanded with approx. 9 meters where any built up area should be restricted except for those areas that are used for agricultural affairs and for activities that could be contributing to enhance the local income. This also would prevent any development around the main roads in a kind of unsystematic allocations of houses to avoid the social disconnection and high cost resulted from sprawl. There are no justifications to spread out of the city border as the residential allocated zones would be enough for the increasing number of dwellers. The plan suggested to have only low-density buildings and houses in the restricted area of no less than 2500 sq. The developers should pay all the public cost for the infrastructure. This suggestion was meant to keep the land free from undesired development. Some small high density residences would be necessary for the dwellers who settle in those areas, but Permission is only granted by the authority and only in case of having a small group of houses (Minoprio & Macfarlane, 1956, pp. 4-6).

### 3.3.2 Urban Land Use

#### 3.3.2.1 Residential Areas: -

The city population was estimated about 675,595 at the end of 1955. The main important task of the master plan was to relocate people who lived in slum areas, especially in the eastern part that widely expanded all over the capital as a result of the increasing number of immigrants from other cities. The master plan was recommended to convert some slum areas to a regular housing area and to reallocate others in the new planned housing area. The other

task of the master plan was to accommodate the anticipated future population growth taking into account the natural growth and the expected immigration. The master plan recommended to demolish the wide areas of the main historical centres of AL-Rusafa, AL-Karch, AL-dhamiya and AL-Kadhmiya area which have a dense population and congested buildings. The planners proposed to demolish part of the old centre of AL-Rusafa to construct a civic and business centre as a substitute and to keep only 33,955 dwellers to stay there while the rest were proposed to be shifted to the east outskirts of the city (Minoprio & Macfarlane, 1956, pp. 3-4).

### **3.3.2.2 Neighbourhoods Units: -**

The residential layouts were proposed to have different sizes of neighbourhood units which should not be intersected by traffic roads. Each neighbourhood should have its centre where services and main public buildings for community needs are located in. The land required for community needs should be comparatively related to ratio of the expected population for each neighbourhood, which is estimated to an average of about 10000 inhabitants. The size of neighbourhood units will be determined by a maximum suitable walking distance to the shops and schools and to the pattern of main streets. The master plan proposed to locate the neighbourhood centre in about a quadrant mile from its boundary and within 5 minutes walking time without the need to cross the traffic roads. The plan also proposed to have a limited number of major centres serving a group of neighbourhoods. It suggested a gross density varied from 40 persons per acre to 60 persons per acre with an average density of about 53.3 persons for a neighbourhood with 10000 inhabitants. The gross density of 60 persons per acre is equivalent to the net density of 164 persons per acre having plot size of 121 sq.m or 33 houses per acre. The gross density of 53.3 persons per acre is equivalent to the net density of 128 persons per acre having a plot size with 145 sq.m or 26 houses per acre. The gross density of 40 persons per acre is equivalent to a net figure of 75 persons per acre having plot size about 266 sq.m or 15 houses per acre. The average occupancy of the house was limited to five persons for the three proposed plot sizes. The net density could be varied within neighbourhood units and based on the amount of land specified for public facilities. The road widths depended on the density of the neighbourhood units by having wide roads in the high-density area (Minoprio & Macfarlane, 1956, p. 5). However, the master plan did not suggest to move the airport but to keep it in its location in the west part of the city. One more recommendation to have three bus stations is given in the master plan, one in the western part within the main railway station. The second was near the north gate and the third is located at the end of AL-Kifah Street in AL Tayaran square.

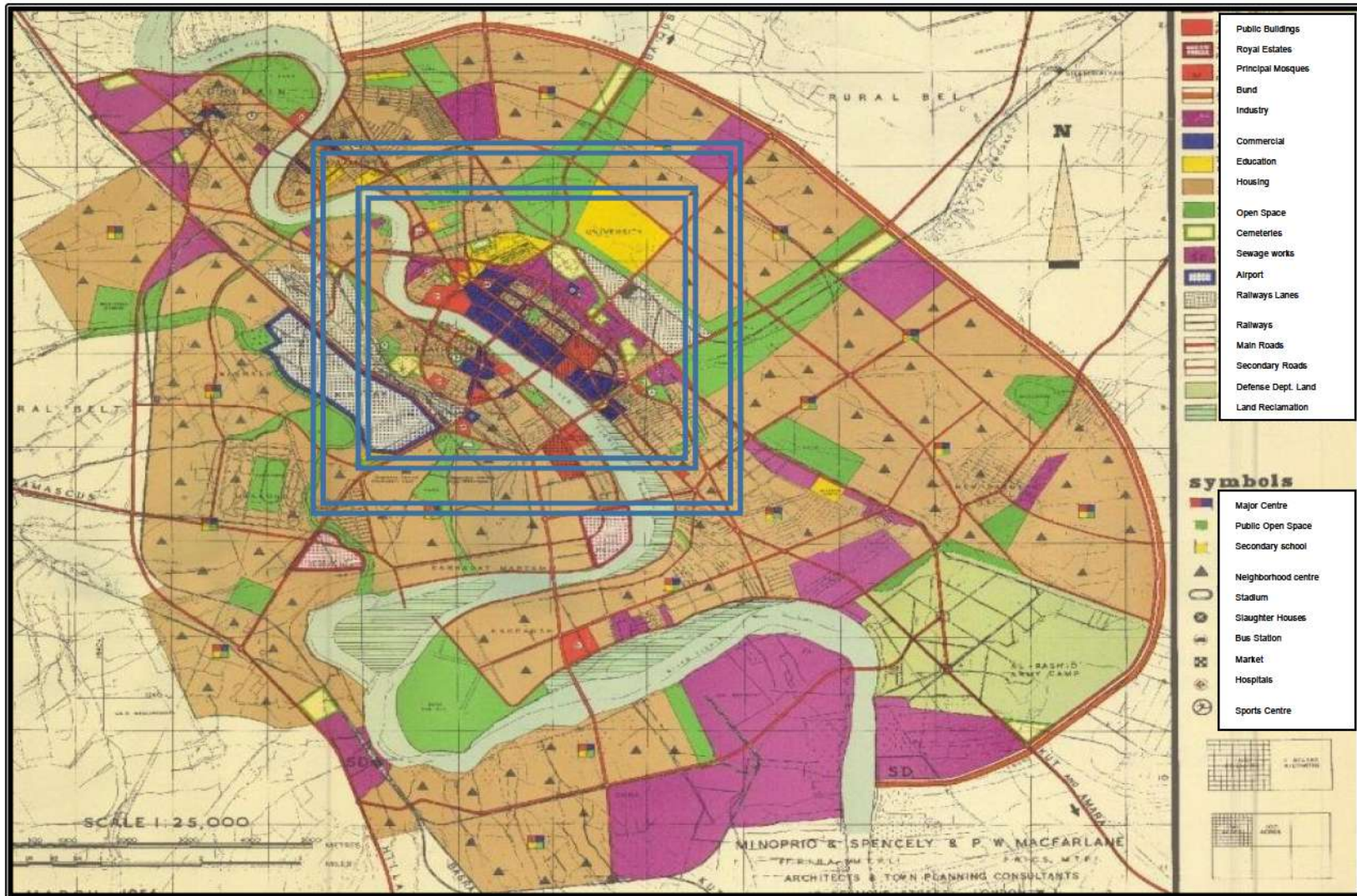


Fig. (3.6): - Baghdad master plan in 1956, Source: Minoprio & Spencely in 1956-Baghdad Mayoralty Archive (without Reference Nr.), See Fig. (5) in Appendix I in A3 size.

### 3.3.2.3 Industrial and Commercial Area

Two industrial areas one to the east and the other to the south of the Dora refinery were suggested by the master plan. These areas were meant to be for heavy industries and were planned to occupy about 3,500 acres. The concept behind this location is to keep away industrial sites from the residential areas. The existing of railway tracks on the western part constitute another area for industrial activities where employment could be created. Light industries were proposed to occupy 1,786 acres and to have them adjacent to residential areas to ensure better distribution of employment within the city. The master plan proposed to keep small workshops to occupy 370 acres on Sheik Omar Street on the boundary of the old town of AL-Rusafa<sup>68</sup> (Minoprio & Macfarlane, 1956, p. 12). The main commercial centres in both AL-Karch and AL-Rusafa were also suggested. Some of retail shops could be allowed within the neighbourhood units to meet the daily needs of the inhabitants. Markets for fresh fruit and vegetables were also proposed in the east side on Sheik Omar street, AL-Adhamiya, in the west near the railway station and on the west side of AL-Kadhimiya.

### 3.3.2.4 Civic Centre and Public Buildings

To gather the main municipal and governmental buildings which have daily contact with people in one civic centre is one of the main interests of the master plan. The site chosen had an area of 72 acres located in the area between AL-Kulapha street and AL-Kifah street with an extension to the river area and was proposed to substitute and demolish a wide area in the old quarter. About 70 acres on the west side were allocated to the south of the current Jumhuriya bridge for having the royal palace and parliament buildings (Minoprio & Macfarlane, 1956, p. 13). The Main Public Buildings were identified as follows: -

**Universities and schools:** - Primary Schools should be part of the neighbourhood units while secondary schools should be situated between the neighbourhoods. The university campus was proposed to be in the south of AL-Karradah peninsula or could be positioned within the proposed regional space in the western of AL-Karradah peninsula<sup>69</sup>.

**Hospitals:** - They were proposed to be located in AL-Kadhimiya in the north and AL-Karradhah in the south and it was recommended to enhance and develop the existed hospital at the north

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<sup>68</sup> The area gradually became one of the biggest industrial part of the city that threatens the old core.

<sup>69</sup> The location of the currently University of Baghdad Campus that was designed by Walter Gropius.

gate of the old city. Another hospital was proposed in AL-Karch part of the city along the river bank.

**The military camp:** - It was recommended to keep its position in the current AL-Rasheed barracks located south of Baghdad.<sup>70</sup>

### 3.3.2.5 Public Open Space

There was a quite need to have open spaces within the dense parts of the city of Baghdad, especially playgrounds for children, which were recommended to be five acres per 1000 inhabitants and should locate within the neighbourhood's layouts. Two regional areas to be public parks were proposed: one in the western edge of the AL-Karrada peninsula and the other in AL-Kadhimiya along the river bank. A continuous belt of open walkways was also proposed along the river Tigris. The master plan proposed also to have a stadium and open spaces in western part of the city in the south part of the current AL-Jumhuriya Bridge.

### 3.3.3 Streets Network

The master plan was recommended to enhance the connectivity between north and south through AL-Khulapha Street, which was built parallel to the preparation of this master plan. It was also recommended to promote the east-west links in order to reduce the traffic on the central business district and AL-Rasheed Street. The plan was proposed to have an under bridge in AL-Tahreer square in the south gate of old core to reduce the traffic on this main node. It was also recommended to connect the north end of Sheik Omar to AL-Adhamiya on one side and to the railway bridge crossing the Tigris to the main station on the other side of the AL-Karch. The third proposal was to have north-south link to bypass AL-Rusafa old core and to move rapidly from one area to another. Regarding bridges, the master plan recommended to have 5 other bridges. The first one is to substitute the pontoon bridge between AL-Kadhimiya and AL-Adhamiya. The second one is to connect the eastern part to the royal palace and then to Damascus road. The third bridge is to connect AL-Karradah peninsula to the north. The fourth one is to connect AL-Karradah to the Dora in the south of the city and then directed to Kut and Hillah Road. The last one is to connect the north gate Bab Al-Mudham to the western part. The master plan also proposed to have roundabouts at the bridge heads as the best solution to avoid the traffic jam. A river boulevard along the eastern part to AL-Karradah was also proposed with a recommendation of a sufficient parking

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<sup>70</sup> Currently the military camp was decided to be converted to residential area.

lot, especially in the central area of the city. On the other hand, the master plan proposed three kinds of roads. The first major roads were estimated to be 40m width with double carriage. Whereas the secondary roads were estimated to be about 30m with single carriage and the last road type which belongs to neighbourhoods and estimated to be 20m (Minoprio & Macfarlane, 1956, pp. 8-9).

### **3.4 Doxiadis Master Plan For Baghdad 1959**

Doxiadis were committed to start large housing projects in Iraq in 1955 and for the association it was the first large scale project out of Greece. The housing projects aimed to provide accommodation for the immigrants who came from the rural areas. The program intended to cope with basic human needs, basic services and future development. It was emphasized to provide satisfaction for the users by providing wide technical experience and to offer them the possibility to have free participation in the program to avoid uniformity and monotony. The principle of a multidisciplinary approach of Ekistics<sup>71</sup> was the base framework to develop housing in Iraq (Theodosis, 2008, pp. 167-69). The Iraqi Government assigned Doxiadis in 1958 to prepare a master plan for the fast expanding city of Baghdad with other projects regarding rural and urban housing (Fig.3.7) (Pyla, 2008, p. 7). The master plan was prepared to accommodate three million inhabitants up to 1978 and to cover an area about 50 sq.m within an assumption of annual population growth rate about 5.6% ( AL-Adhami., 1975, p. 568). Doxiadis provide a comprehensive master plan which should be integrated into various buildings and pilot projects. They promised to provide a plan for long term urban and regional developments, especially the improvement of the housing condition (Pyla, 2008, p. 8). Despite that the master plan was not achieved, it was a reference for further housing projects in Baghdad.

#### **3.4.1 Urban Growth**

Urban expansion, efficiency and control are the basis of the planning model in Doxiadis master plan. This planning method is called Dynapolis or the dynamic city. The primary concept behind this idea is to enlarge the city along the main axis to avoid jamming. The business centre has to develop and expand along this main axis and should be controlled by having an efficient zoning, better public building locations, efficient road system and green area while the residential areas should be developed on the flanks of the city core based on the concept

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<sup>71</sup> Ekistics is the science of human elements that deal with multi discipline sciences from geography through anthropology, biology, sociology, technology, architecture and art. See (Constantinos A. , 1970).

of the linear city<sup>72</sup>. The Tigris River was the reference to set up the principal axis in Doxiadis plan for Baghdad by having a rectangular expansion following the north-west and southeast axis of the river. The Dynapolis city concept has no expansion limit, but in Baghdad case, Doxiadis set the limits of expansion (Pyla, 2008, p. 8).

### **3.4.2 Urban Land Use**

#### **3.4.2.1 Residential Area**

A gridiron system was proposed to accommodate the residential sectors and subsectors with slight modification in the city centre to adapt the commercial sector (Pyla, 2008, p. 8). One of the master plan ideas was to bring the water to the inhabitants in the area who are far from the river by constructing a canal that starts from Diyala River and ends in Tigris. This canal was implemented and became part of the city<sup>73</sup>. The result was to have better conditions to resettle the informal settlement along the water canal which is considered one of the biggest problems faced the city development at that time ( AL-Adhami., 1975, p. 569). The residential sectors were not attached directly to the river except the area in AL-Karradah Peninsula. They separated from each other by secondary roads and major commercial arteries or sometimes by green belt strips. The boundaries of the residential sectors formed the rectangular border of the city and indicated the limitation of the land use plan.

#### **3.4.2.2 Neighbourhood Concept**

The main neighborhood idea for Doxiadis was to create several homogeneous community groups of 100.000 inhabitants. Those communities had their own educational, recreational, commercial, and health centres. They were divided into smaller units to accommodate different socioeconomic groups. The governmental centre with some housing projects on both sides of river are considered the main parts of the master plan which was implemented by Doxiadis ( AL-Adhami., 1975, pp. 569-70). One of the best examples of these communities was the housing project in western Baghdad (Fig.3.8). The project was designed to dwell 100,000 inhabitants and was divided to several community districts with 7 to 10 thousand inhabitants. Each district contained the social and physical facilities like mosque, shopping centre, educational centres, health centres, etc. The plan encouraged the pedestrian movement by having all social facilities accessible within walking distances. The project tried

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<sup>72</sup> Linear city is the kind of urban formation which elongated along a line (main roads or river) and take up more space than necessary.

<sup>73</sup> It was the only part that was achieved by Doxiadis master plan and all other residential projects were done randomly in selected area in both AL-Rusafa and AL-Karch.



to keep the plot size and road dimension for each district within human scale. Functional separation and social order were adopted within the master plan of the project. Each community is divided into small first class spatial communities arranged in a hierarchical way with 10-20 families of the same income. A group of 3 to 7 communities constitute the community class II which share the same economic condition. The process continues by grouping class II communities with the elementary school to constitute community class III of different economic status. By adding a mall and other social facilities to the group of communities' class III, the community Class IV is constituted and it is called the "community sector" with 7 to 10 thousand dwellers and is considered the basis for Baghdad master plans. The first three classes correspond to the local scale of the Iraqi physical environment while other classes correspond more to higher scale which needs more infrastructure. The idea of hierarchical communities is the best tool to have intermixed different social levels. The master plan introduced the idea of gossip square <sup>74</sup> which defined a meeting place for each 10-15 attached houses (Pyla, 2008, pp. 11-13). The housing projects were planned to have a private ownership through selling the housing units to ensure the continuity of maintenance and to cope with the people tradition to have their own houses (Theodosis, 2008, p. 169). The project didn't follow the exact sector plan done by Doxiadis. The small gridiron was developed around the main artery to provide small plots and houses. Meanwhile, the markets and health centre were spread along the artery while schools are situated in the southern part to serve other neighborhoods. The artery is the only vehicular and pedestrian street while the others are only for pedestrians (Auni, 1979, p. 22).

A new master plan for AL-Thawara city was introduced in 1959 to develop a housing program in the eastern part of Baghdad. These low cost houses reflected the western influence and were more adapted to a new transportation network (Gulick, 1967, p. 251). The area of the city was estimated to about 2000 ha and was considered basically as a slum removal project. The city, based on gridiron was developed along main streets and divided into 80 semi-independent sectors with its affiliate services and within an area of about 500x3 m<sup>2</sup>. The original plan for AL-Thawara city has designated 51% of the total area for housing, 40 % for public spaces, 1% for commercial use, 3% for industrial use and 5 %for other services (Fig.3.9) (Auni, 1979, pp. 31-32). Other examples built by Doxiadis were based on the idea of gridiron like in AL-Yarmuk and AL-Rashad cities which were achieved in the beginning of 1960s.

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<sup>74</sup> Gossip square is found by Doxiadis as an external paved space found in each smallest community supplied by benches and plans used as a meeting point for the inhabitants. See. Pyla,P,2013.

### **3.4.2.3 Industrial and Commercial Areas**

The master plan proposed to allocate the commercial and business centre in the old city core as well as in new development areas, which is expected to grow along the main axis of Dynapolis. The commercial development was proposed to follow the major arteries of the rectilinear road system. The industrial zones were located at the edges of the city far away from the old city (Pyla, 2008, pp. 8-9). The industrial areas were located directly along the river area and attached to residential sectors from the other side.

### **3.4.2.4 Civic Centre**

There was also a tendency to have a modern and a symbolic city centre within the visual ordered, uniformity and regularity of the city taking in account the great sensitivity of the old fabric and its special qualities.

### **3.4.2.5 Public Open Spaces**

The green open spaces were planned to be concentrated along the river on the north and south of the city centre forming a natural barrier from the industrial area on both city edges. It was also planned to occupy a green belt along the eastern bank of the river in the south of city to separate the industrial zone from the military camp and some commercial and residential sectors. This green belt extended along Diyala River to provide a natural border for the city. There is also a recreational area between the residential sectors, especially on the north western part of the city.

### **3.4.3 Streets Network**

The master plan suggested a rectangular area along the main southeast and northwest artery on the Tigris River course. The rectangular city was subdivided by a road system that incorporates the existing road pattern with new rectilinear roads. The main aim was to ensure an easy connectivity on the basis of local and regional level (Pyla, 2008, p. 8). In the eastern part there was one major artery directed to Baquaba while in the western part there were three major arteries directed to Hilla. These arteries within the main north- south axis were given high priority, and they were connected to the secondary roads within residential sectors and sub sectors.



Fig. (3.7): - Doxiadis Baghdad master plan in 1959, Source: Nikos Hadjikyriakos-Ghika Gallery, <https://gamblersfallacy.tumblr.com/post/117782922074/baghdad-master-plan-1955-1960-constantinos> (accessed 10 Aug. 2017), See Fig. (6) in Appendix I in A3 size.

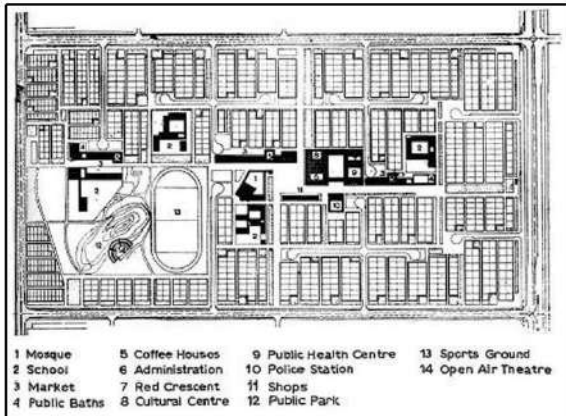


Fig. (3.8)

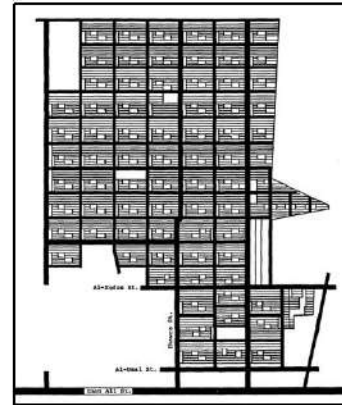


Fig. (3.9)

Fig. (3.8): - Western housing project by Doxiadis, Source: Pyla 2008:11, Marefat 2008:6.  
 Fig. (3.9): - AL-Thawara housing project by Doxiadis, Source: Auni 1972:30.

### 3.5 The First Official Master Plan Pol service 1973

A comprehensive development plan was authorized for Baghdad in 1973. after deriving the first master plan for the city in 1976 (Fig.3.10) (Stanek L. , 2017). This plan sets the administrative boundaries of the city and the development strategies till 2000<sup>75</sup> (Fig.3.11) (PolSERVICE., 1973, p. 18). The design of the city by Miastoprojekt in pollen was based on having a sociable city derived from the experience of Nowa Huta city design (Stanek Ł. , 2012, p. 367). The master comprehensive development plan was prepared as a result of many problems that faced the Iraqi capital at that time. The main objectives were to improve the life quality and to establish a guideline for the city to grow as metropolis city. The continuous immigration considered one of the main obstacles that faced Baghdad at that time. It was estimated by 70 % of the rapid increase in population from 1965 to 1971 which estimated about 530 thousand inhabitants. This population boost created a clear disparity in population density and average of inhabitants per residential unit. It affected the economic and social structure and created many informal settlements within the suburban area of the city having an increased pressure on the available infrastructure and services (PolSERVICE., 1973, pp. 26-33).

<sup>75</sup> Due to the Political issues the master plan considered valid till now and was updated by an authorized committee.

### 3.5.1 Urban Growth

The regional analysis for the metropolis of Baghdad was based on the examination of demographic situation, agricultural and industrial development, transportation and the availability of natural resources as main urbanization process factors. The analysis took into account the areas that are most appropriate for urbanization and economic evolution of the whole nation in general and Baghdad in specific instances. The regional plan was prepared to elaborate the following items: the territorial scope of the region, the role of the economy in the development process, settlements and infrastructure locations and the legislation required to control the development process. The main factors that limit the development process and were taken into account during the regional plan preparation were the way in dealing with existing built up area, flood protection, climatic and noise protection and to have direct access to the city centre. The main magnet points to achieve the regional plan basically belong to the availability of land and the financial resources (PolSERVICE, 1966, pp. 81-86). The new master plan involved a keen attention to develop the suburban area as part of the concept of "Greater Baghdad" beyond its existed boundaries. The area of Baghdad city was limited by the following boundaries: From the north it was bounded by an agricultural land and water intake resources, from the south, bounded by heavy industrial zone, from the east bounded by Diyala River and from the west bounded by the airport area. The idea of the concentric city plan was taken over and proposed to make the area of greater Baghdad of diameter ranging between 100 to 120 km. The Greater Baghdad was divided into 4 rings. The first ring is the inner city with a radius approximately 15 km and travel time about 1 hour from the city centre using conventional transportation modes. The second ring is the suburban area with distance of about 25 km from the city centre with 1-hour travel time using the rapid public transportation system. The third ring is a buffer zone with 25 km wide and about 50- 60 km radius from the city centre. The last outer ring is an urban area with distance ranging from 60 km to 100 to 120 km from the city centre (PolSERVICE., 1973, p. 37).

### 3.5.2 Urban Land Use

The primary idea of the master plan concept was to deliver a compact town and modern concentric structure with satellite and multi ribbon conurbations that required flexible transportation network and operational functions. The aim of using the ribbon system was to reach the population balance on both sides of Tigris River (PolSERVICE, 1966, p. 87). The master plan was based on developing the inner city in different directions by having two

ribbons with a major concentration in the direction of north and south toward Hilla and Khalis with a capacity 500-700 thousand inhabitants. A minor importance will be given to another east-west ribbon development (PolSERVICE., 1973, pp. 66-68).

### 3.5.2.1 Residential Area

The comprehensive spatial plan has divided the residential area into three zones. The first one is the outskirt areas and includes 7 districts which are not adjacent to Tigris River (Fig.3.12). These districts differ in parcel area, physical condition, services, and the social level of the inhabitants. The second zone is called the Tigris Belt for the area which is adjacent to Tigris. Those areas have a mix land use rather than pure residential and could be developed to have more other functions or to have more density<sup>76</sup>. The third residential zone is the residential agglomerations in the city centre that has important historical characteristics (PolSERVICE., 1973, pp. 103-105). The comprehensive plan also divided the area according to its attractiveness: the first one is the areas along the river and the second one is the adjacent area while the periphery is considered the third type which has less attractiveness. The comprehensive plan recommended to have multifamily residential units rather than dispersed or in the form of concentrations to cover about 20% of the housing demand. A new housing strategy was developed later to raise the share of the multi housing program to 51% till 2000 (Al-Haidary, 1983). The prevailed housing type is the one family residential unit which should cover 80% of residential units with an approach to increase the unit number and to raise gross density up to 165 / ha. The study recommended to increase the minimum parcel size and decrease the maximum one (PolSERVICE, 1966, p. 87). It suggests a new size division of parcel area with one dwelling to be with an average of 150m, 300m and 600m and not be less than 100,200 and 400m. The reasons behind increasing this type of residential unit is attributed to the social habits and the availability of land in cheap price (PolSERVICE., 1973, pp. 106-116).

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<sup>76</sup> Mostly following the colonial city outline.

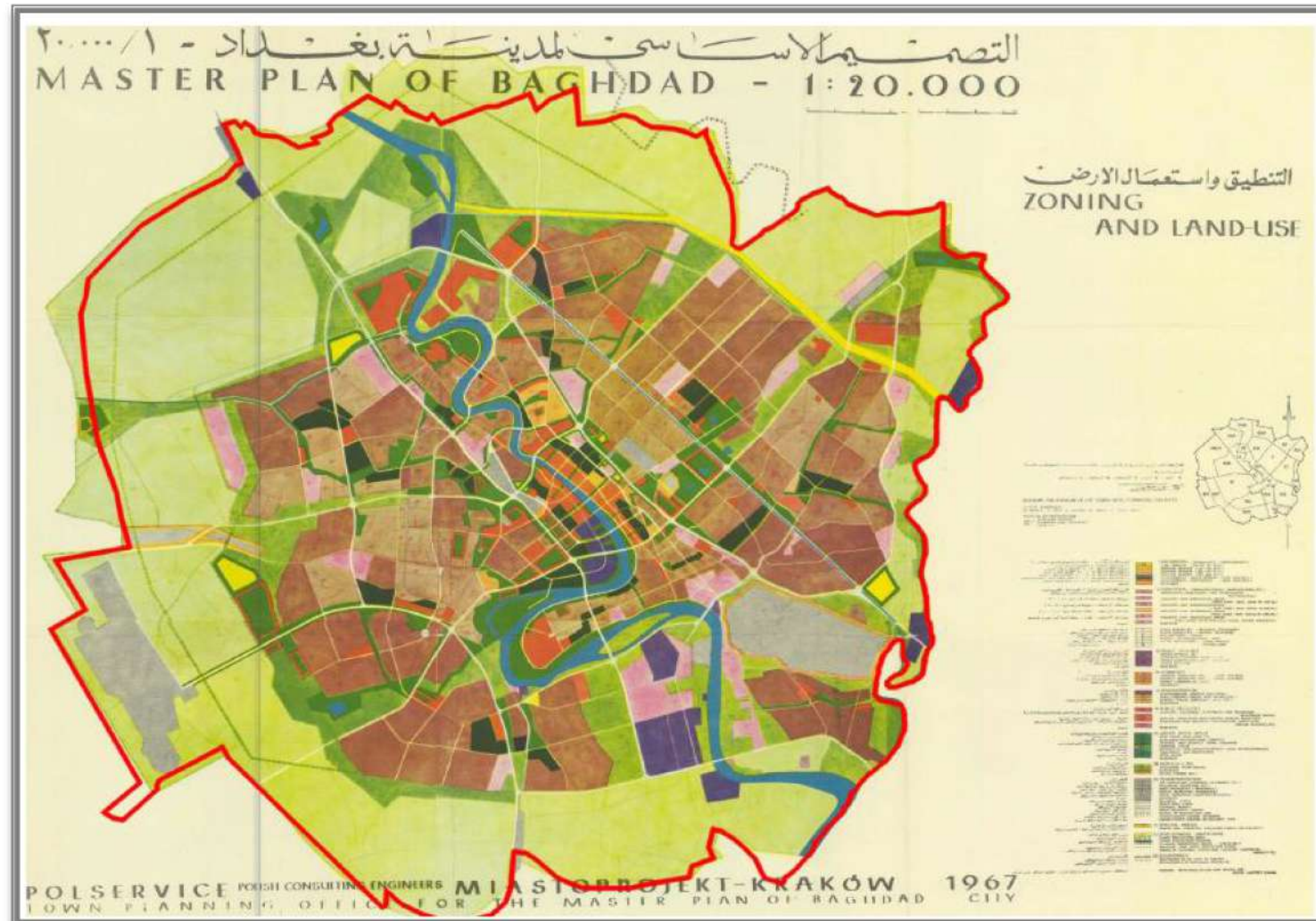


Fig. (3.10): - Baghdad Master Plan in 1967,Source: Polservice, (Miasto Projekt-Krakow-Master Plan for Baghdad) 1967,See Also Stanek 2017:794, See Fig. (7) in Appendix I in A3 size.

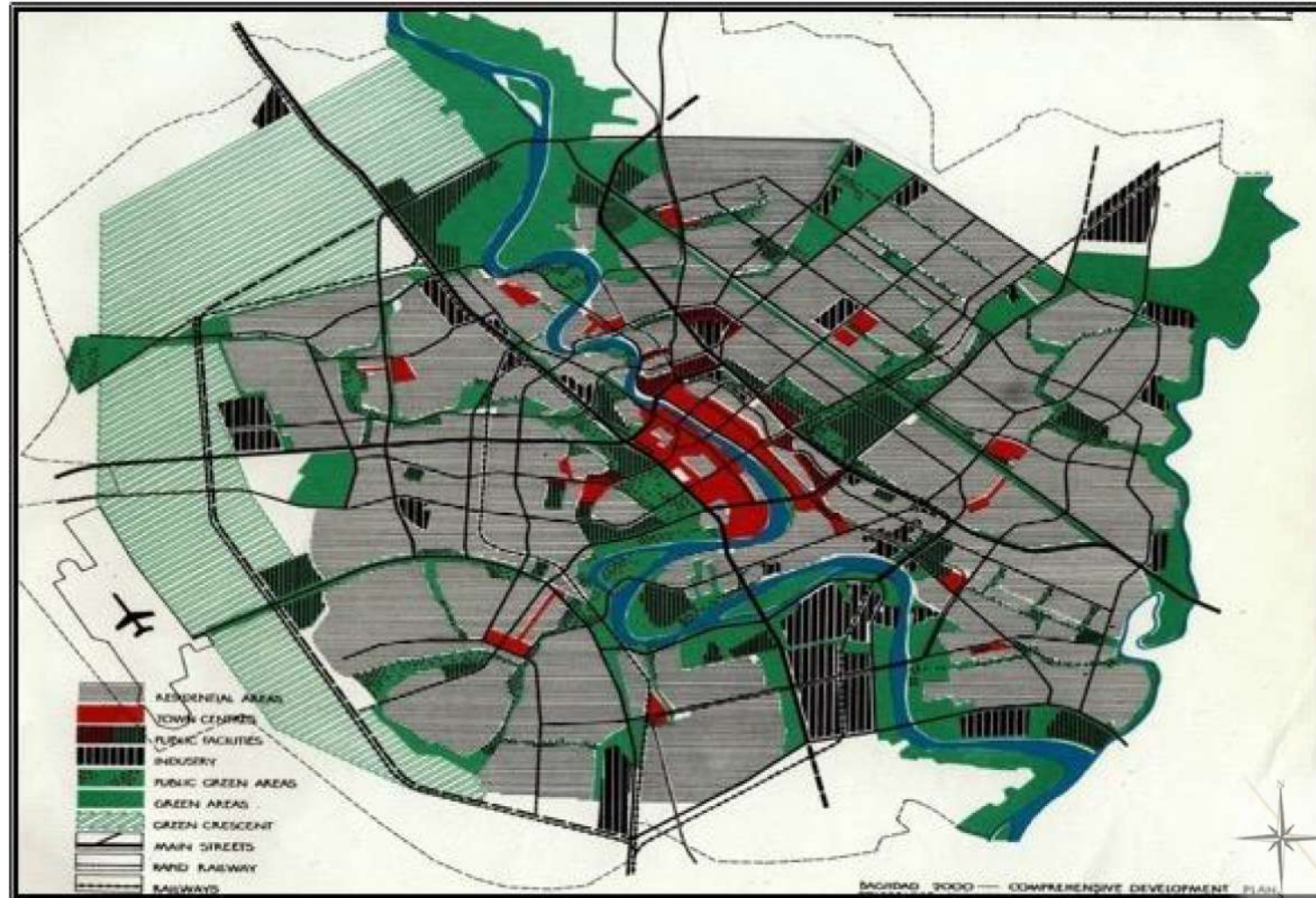


Fig. (3.11): - Baghdad city structure in 1973, Source: Polservice 1973, (Miasto Projekt-Krakow-Comprehensive development Plan for Baghdad), See Also Stanek 2017:796, See Fig. (8) in Appendix I in A3 size.



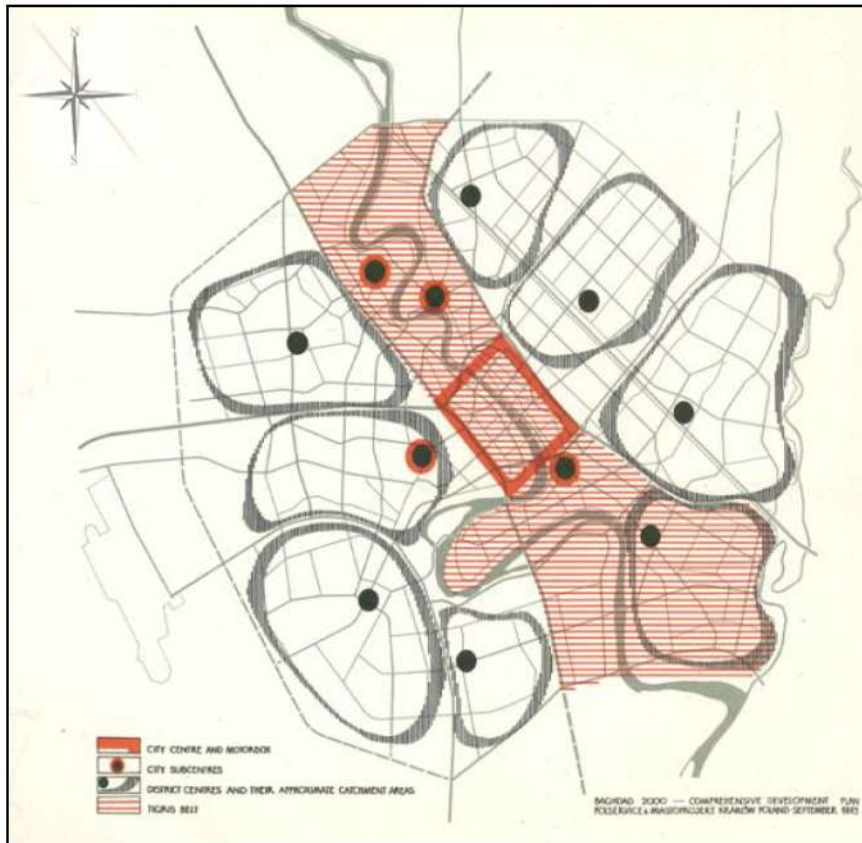


Fig. (3.12): - Polservice concept for Baghdad City Districts, Source: Polservice, 1973, (Miasto Projekt-Krakow-Comprehensive development Plan for Baghdad).

### 3.5.2.2 Neighbourhood Units: -

The comprehensive plan defined the neighborhood unit according to the distance from the residential unit to the primary school or public facilities which are estimated to (250-300m). The plan defined the residential area to be constant with 50 ha varied according to the residential unit type and density which should be approx. (4700-23000). Each neighborhood unit consists of green spaces, primary schools, commerce facilities and parking. Other facilities like secondary school or kindergarten could be located within multi neighborhoods. The neighborhood units should keep a distance not more than (600-800 m) from the bus stop. The road pattern is based on grid cell (1500x1500m) that includes 4 neighborhood units which are integrated or separated by green belts, arteries or other facilities forming the community unit. The community centre located on the street intersection is served by buses to cover 2 - 4 neighborhood units with a distance of (750-800m). Several communities compose the residential district (Fig.3.12). The population in districts is based on land use, green belts and the location within the whole city. Each district represents an autonomous part

of the city and it has its own centre and sometimes it has secondary centres in case that the district is big (PolSERVICE., 1973).

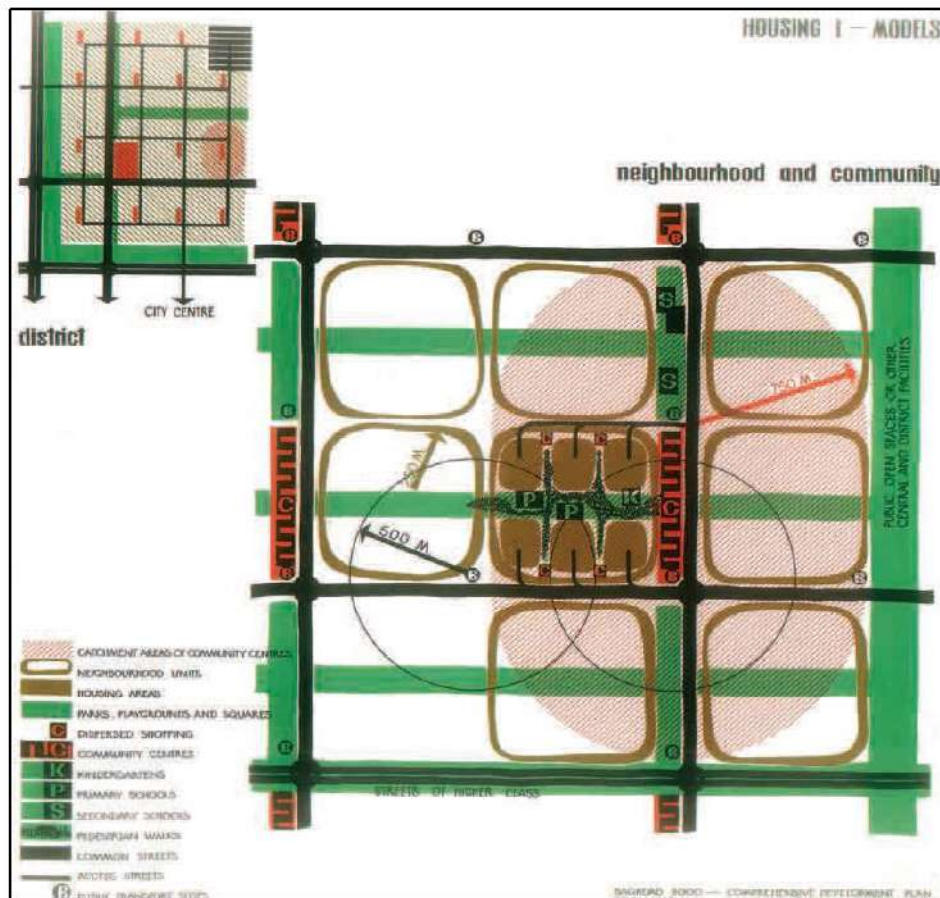


Fig. (3.13): - PolSERVICE neighbourhood concept for Baghdad City, Source: PolSERVICE 1973, (Miasto Projekt-Krakow-Comprehensive development Plan for Baghdad), See Also Stanek 2017:797.

### 3.5.2.3 Industrial and Commercial Areas

The establishment of new industries were proposed to keep the old locations and external city boundary based on the assumption that the industrial development will continue to grow at a lower rate within the city. The service and other market oriented industries were proposed to be kept within the residential community centres and residential district centres along the main street system. The slightly noxious industries were proposed to be located on the outskirts of the residential areas along the major truck roads while heavy industry was proposed to be located in the city fringe areas. The wholesale trade and small industrial establishments were recommended to be concentrated in the city centre periphery (PolSERVICE, 1966, p. 95).

### 3.5.2.4 Civic Centre

A new structure of the central area was suggested in Baghdad having a form of ribbon along the Tigris belt. It includes the main central business districts represented by the old city core, including AL-Rusafa and AL-Karch. The old city could be determined by main arterial streets around with a high concentration of commerce, employment, traffic, intermixed old residential quarters and historical monuments. The master plan proposed to have several multi functional centres within the central core of the city such as a governmental centre, civic centre, business centre, educational centre, tourist centre, social centre and religious centre. The master plan also suggested to clear vast decayed areas with retaining and preserve the historical monuments of the city. The central area was proposed to be assisted by physical and functional sub centres (districts centres) along the Tigris belt and outside the CBD with lower density. Creating new counter magnets in the north and south will lessen the pressure on the city centre, but in the meantime the city centre should continue to play the main role in serving the Greater Baghdad<sup>77</sup>. The plan was recommended to increase the accessibility of the whole central area by ensuring a better system of transportation for vehicles, goods and pedestrians. District centres were planned to bring the main important services near the inhabitants and they include community centres, which varied in their magnitude based on their position within the central area and the connectivity with important routes and public transport (PolSERVICE., 1973, pp. 132-140).

### 3.5.2.5 Public Open Spaces

The master plan proposed to have open spaces as recreational areas and agricultural land on the peripheral zone within the non built up areas. The study proposed three types of recreational areas. The first recreational area type was the fully accessible open spaces like parks and squares. Those spaces concentrated mostly along Tigris River, in the peripheral orchards around the city, AL-Zawra Park, Army Canal area and the area around the railway station in the western part of the city. It also includes the district and community green areas based on population density, ownership and the parcel size for the dwelling unit. The plan proposed to enlarge the open spaces in the area where the density is rather high especially in the suburban area. The second type of recreational area is the partly accessible open spaces like sport facilities, zoo and gardens and etc. The third recreational area type is the private gardens which play an important role in the whole town (PolSERVICE., 1973, pp. 167-

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<sup>77</sup> The Greater Baghdad includes the suburbs that governed by the Baghdad government while the city itself was under the responsibility of Baghdad mayoralty.

180). The master plan recommended to have large weekend centres situated with 1,5- 2 hours driving hours in the form of recreational centres within the north west green belt. It was also recommended to have pedestrian and vehicular promenades linking the city part together. This system will create a kind of continuous pattern to boost the climate of the city (PolSERVICE, 1966, p. 96).

### 3.5.3 Streets Networks

The street network patterns depend mainly on the functional characteristics of the built up areas. Arteries were classified into four types. The first type is the main freeways or expressways to link the city districts to the national roads. The second type is the main streets classified by expressways or ordinary streets to link the districts together or with the primary street network. The third type is the common streets classified by ordinary streets constructed as main traffic roads linking the city centre, residential, recreational to the main streets. The fourth type is local streets classified by ordinary streets constructed as primarily streets. Rapid railway line as a backbone of the whole agglomeration was proposed to cross the city centre linking to the main urban concentrations of the Greater Baghdad (PolSERVICE., 1973, pp. 206-216). The hierarchical and segregated development of traffic was almost similar to Doxiadis work in Baghdad (Stanek Ł. , 2012, p. 376). Many neighborhoods and projects with different functions were inserted in the city out of the official land use distribution that was stated by the official master plan as result of political decisions or personal motivations for politicians <sup>78</sup>.

## 3.6 From 1980-1990 Large Scale Projects

Urban development projects in Baghdad took place as part of the modernization process after the increase of national revenue of Iraq as a result of the looming up of oil prices. Architectural and urban planning projects were the tool to show the power and the identity of the state. Some of the projects implemented by Iraqi architects have reflected the spirit of the traditional architecture .Other projects were done by western architects that carried the international style within Iraqi architects collaboration to cope the local environment like Haifa street project which was implemented inside the old core of Baghdad (AL-Krach) (Fig.3.14) (Amanat AL-Assima, 1985). These projects provide a new spatial structure and nodes for the city outside the city core enhancing the tendency of vertical sky line of the city. Many conservation and

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<sup>78</sup> Those modifications are considered as harmful intervention especially in transforming large green area to residential neighborhoods. This fact was discussed with Prof.Talib AL-Talib (The former dean of the college of Engineering and one of the famous town planner) in January 2015 who mentioned that many modifications occurred rather than the official master plan through direct orders by the former rulers of the Iraqi state.

renewal projects were done in the CBD area and outside where many monumental projects took place. In contrast, some of these projects have destroyed large areas of traditional urban fabric of the 19<sup>th</sup> century especially in the old shrines and AL-Rasheed street to have instead illustrative projects and not urban development projects similar to Haifa street.

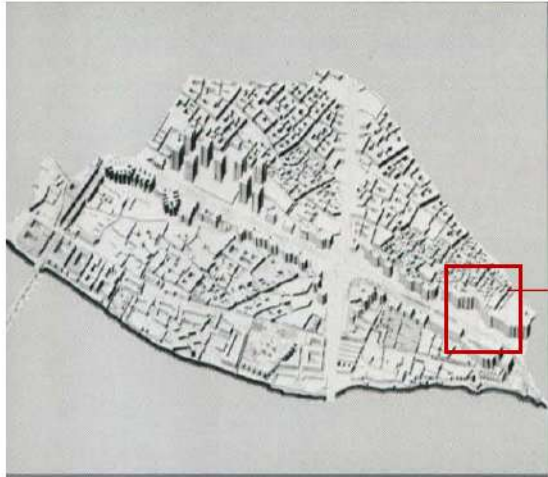


Fig. (3.14a)



Fig. (3.14b)

Fig. (3.14 a,b): - Projects with local architecture style, Source: Amanat AL-Assima (Haifa street Development 1981-1985):7,11.

### 3.7 From 1990-2003 Stagnation Period After 2nd Gulf War

A large-scale destruction occurred in Baghdad during the second Gulf war. The Infrastructure and many buildings were badly demolished during the forty-three days of that war. The city itself suffered from strictly International sanctions for 13 years. However, there were some trials to rebuild the damaged infrastructure, but this was not possible and accordingly there were no more development plans or schemes due to the lack of funds. During the Embargo time there was a severe economic crisis which affects the architecture and urban planning business (Mahdi.S, 1999, p. 108). Most of small architectural projects were done by individual architects and financed by private sectors using foreign architectural elements that somehow reflect modern tendency and this was apparently wanted by the nouveau riche social class members who were trying distinguish themselves from the middle class which almost started to disappear. In this period, famous native architects left the country and this affected the interaction between local architecture and other international styles (Nooraddin, 2004, p. 79). The main architecture and urban development projects after the war were done by state offices and firms and mostly were reconstruction projects of the destroyed buildings and infrastructure. The city experienced a new type of monumental architecture including large

mosques and palaces to show the power of the state. The Presidential Architecture Office is considered the main governmental institute responsible for the new monumental buildings; it introduced large scale projects that mainly focused on building mosques and presidential palaces and some few development projects<sup>79</sup>. They also bid out many closed competitions to design some remarkable monuments and buildings. The projects which were financed by private sector normally were small scale projects that followed modern approaches in architecture like modernism, deconstruction, or modernized traditional themes. The conservation work was stopped due to the lack of financial resources and instead many proposals and studies were done to update previous study and to document the historical areas. However, four big palaces were built during this period: the first and largest one was called Salam Palace (Palace of Peace) in the main governmental centre that is currently known the Green Zone. The palace standing with large scale building covered by a big dome on the top and surrounded by monumental statues glorifying the former president of Iraq and they were installed on the top corners of the palace. The palace was surrounded from one side by an artificial lake and forms together with another series of adjacent palaces and monuments a kind of multi governmental zones. The other two palaces (Faw Palace and Victory palace, were both located at the west border of the city adjacent to the airport with some smaller palaces around them. They stand in the middle of artificial lakes separated by some expressway zone. The fourth palace was in AL-Adhamiya called AL-Adhamiya palace with longitudinal shape along the riverfront area. There is also one other small palace attached to the renewal project, which substituted a traditional urban fabric in AL-Karch. Due to financial shortage the 1990s the conservation and the urban development projects were not ambitious like in the 1980s and the city focused more to have proposals rather than the achievements of conservation and restoration works (Mahdi.S, 1999, pp. 111-113). Mosques were considered the second type distinguished the architecture of Baghdad in the 1990s of that last century. A big mosque was built on the western border to be a model 1:5 from the original one; building started later in order to have a revision and to avoid problems (Alsiliq, 2008, p. 69). The second big high scale mosque was located in Al-Mansour area to substitute the Horse Racing court which became the main focal point of the western bank of the city. Other small mosques spread within the city reflecting the tendency of the religious monumental buildings. One can easily notice that palaces and mosques have dominated the skyline of the city especially in the western part where a good lot of green area was removed and converted to urban use.

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<sup>79</sup> According to interview with Dr. Abd AL-Gafour in 12 July 2016 who was working in the presidential consultancy office.

### 3.8 After 2003 Baghdad: Urban Secure Spaces

After the invasion of Iraq in 2003, the city of Baghdad was heavily under severe military operations which have incurred many terrorist bombings. The city took a defensive position and experienced a substantial dramatic change in its spatial character, demographic scheme, accessibility, space configuration and land use distribution. Cordons of concrete barriers dominated the whole urban scene and shaped neighborhoods, public spaces and administrative buildings (Fig.3.15 a & b). The whole city was fragmented to many isolated zones connected by isolated corridors that look like open tunnels. The structure of urban space has been altered significantly and surrounded by 3m concrete T-Walls instead of geometrical buildings and natural barriers. The travel time became longer from one area to the other due to the interrupted movement on main roads from one side to another and from the secondary roads to the main roads. This was the only possible way to protect the inhabitants and communities from further attacks and control them separately. Historically, T- Walls were the main urban strategy initiated by cities to have more protection against external and internal violence and were one of the fundamental solutions to have more security. Accordingly, an urban behavior was rather introduced in the urban areas that witnessed high rate of criminality and this behavior has given residents the option of either leaving out their places or shifting them to collect more protection. Newman believes that resetting clear definition of public, semipublic, semiprivate and private spaces could limit the outcomes of criminality (Newman, 1972, p. 9). The new schemes of urban sheltered zones in Baghdad explain the necessity for secure spaces idea. The space hierarchy is changed and got back one step by converting free accessible public spaces to semipublic one (AL-Hasani & Wessling, 2012, p. 83). The isolated spaces within the new settings reflected the need to have such pedestrian zones in the city on the one hand and the need to have limitations in vehicular use on the other, especially in some parts inside the old city. One good example is the folkloric AL-Mutanabi Street specialized in the trading of books. The street was destroyed by a car bomb in 2006 and was then rehabilitated by having a pedestrian walkway instead of the vehicular street (Fig.3.16a & 3.16b).



Fig. (3.15a)



Fig. (3.15b)

Fig. (3.15 a,b) : - Concrete barriers in Baghdad districts, Source: AL-Hasani 2012.



Fig. (3.16 a)



Fig. (3.16b)

Fig. (3.16 a,b) : - AL-Mutanabi street reconstruction as Pedestrian Street, Source: AL-Hasani 2012.

### 3.9 The Comprehensive Development Plan 2030 CCDP

The comprehensive development plan for Baghdad 2030 is now under process and focuses on the following items: -

- 1- Creating a sustainable and integrated plan concept which can enhance the social, economic, administrative and physical aspects.
- 2- Manifesting a rapid intervention into the city structure in order to modify the existing land use plan.



- 3- Reorganizing the mutual relationships between the city centre and the adjacent area
- 4- Controlling the informal settlement that started to appear after 2003 and follow an urgent housing policy to overcome the shortage in housing units.

### **3.9.1 Urban Growth**

The population density was estimated to about 6.3 million inhabitants in the Baghdad mayoralty border. The proposed study suggested that population in 2030 will be increased to 11.4 million who should be accommodated within the mayoralty boundary (Khatib&Alami, 2013, p. 22). One of the important objectives of the study is to have a densification and intensification in the new proposed built up areas. The study also recommended to consolidate the existing satellite cities out of the mayoralty border. Additional four compact and mixed use-oriented development areas were proposed with 10 developing nodes, aiming to increase the border of the mayoralty to a total area of about 528 sq. km to accommodate 2.3 million inhabitants. The four areas could be summarized as follows (Fig.3.17): -

- The first area (A) was proposed to be located on the eastern edge in an area of about 104 km. It is bounded by the proposed railway truck, Diyala River and the new Basmaiyah city which is now under construction.
- The second area (B) was proposed to be located on the southern edge in an area of about 141km bounded by the proposed railway truck.
- The third area (C) was proposed to be located on the western edge of about 151 km including some agricultural land.
- The fourth area (D) was proposed to be located on the northern edge including some existing settlements in an area of about 132km.

### **3.9.2 Urban Land Use**

The city land use plan was proposed as follows (Fig.3.18).

#### **3.9.2.1 Residential Area: -**

The current land use for the city of Baghdad has many problems, including the appearance of new scattered slums around the city. The land use plan proposes an expansion of the mayoralty border by adding four additional areas around the existing one with high and medium densities and also proposes medium and low housing densities within the current

mayorality border. The four poles will accommodate the estimated residential growth. The total capacity of the proposed population within the proposed border is exceeding the anticipated growth up to by 2.7 Million inhabitants by 2030. This will provide an opportunity to accommodate the increase in population also after 2030 or to accommodate any urgent needs resulting from the increase of immigration to Baghdad. The master plan recommends to enhance the development of the existing satellite cities in order to accommodate up to 1-2 million inhabitants in 2030. These cities should be well connected with the other city parts inside mayorality border by introducing an effective network of roads and public transportation. The satellite poles have the role of enhancing the decentralization of the city and reducing the pressure on the central business district. The master plan proposes five residential types based on density and number of floors.

- Multi storey housing more than 6 floors with a density of 600 inh/ha
- Multi storey housing with 5-6 floors with a density of 350 inh/ha
- Multi storey housing with 3-4 floors with a density of 300 inh/ha
- Separated housing units with 2 floors with a medium density between 200-250 inh/ha
- Separated housing units with 2 floors with a low density of less than 200 inh/ha

### 3.9.2.2 Informal Settlement

Since the war in 2003 many informal settlements have been mushrooming around the city edge due to the lack of housing development strategies and the increasing number of internal immigrations. Most of the slums spread now near the high-density area in the eastern part of the city and they mostly occupy the agricultural and housing lands which belong to the state (Khatib&Alami, 2013, p. 179). The problem becomes much worse with weak land management policy and weak achievement of the valid legislations. The study recommends to have two solutions to settle the problem:

- The first solution is to give the housing units the required official form by analyzing the possibility to apply this solution to each settlement
- The second solution is to resettle the dwellers in new organized settlements (Khatib&Alami, 2013, p. 168).

### 3.9.2.3 Neighbourhood Concept

The master plan recommends encouraging the multifamily housing with its three types, duplex housing, town housing and apartments with multi storey buildings of more than one single family house. The study currently resides in the third stage and it doesn't recommend a new

type of neighborhood and may be the current official one for single family housing will consider this basis for further prospective development.

#### **3.9.2.4 Industrial and Commercial Area**

The current land use plan indicated a scattered industrial zone and the centralization of commercial and service centres. The land use plan proposed to create four industrial zones within the new developing area where all scattered industries within the current mayoralty border could be located. The heavy industries were proposed to be pushed out of the current mayoralty border along the main roads while the light industries and technology parks could be located outside or within the mayoralty border near the residential settlements. The small industries and crafts were recommended to keep within the residential neighborhoods (Khatib&Alami, 2013, p. 108).

#### **3.8.2.5 Civic Centre**

The densification of commercial and governmental functions in the central core creates a high traffic jam that affected the historical urban fabric. The proposed plan suggests moving the heavy industries and other undesired functions from the old core and designating instead other attractive functions with having more pedestrian area. The study emphasizes having conservation strategies for the four traditional areas (AL-Rusafa, AL-Adahmiya, AL-Karch, AL-Kadhimiya) and to maintain the historical buildings that belong to different historical periods. The study also recommends establishing a new commercial centre in AL-Karch to balance and reduce the pressure on the eastern part. The master plan recommends having more compact and efficient land use in the central business districts (CBD) which are only located for administration, commercial, touristic and cultural use by having an infill process for the vacant area. It was also proposed to designate many architectural monuments in the CBD which could show the modernity of the city (Khatib&Alami, 2013, p. 102).

#### **3.9.2.6 Public Open Spaces**

The current master plan indicates a rapid increase in the urban area within the mayoralty border from 60% in 2004 to 80% in 2011. This means that the current land use has a significant lack of open spaces and green lands. The study emphasizes enhancement and keeping the agricultural land for recreation along the Tigris River in both north and south directions. The master plan also emphasizes keeping the agricultural land, which is estimated to about 15% from the total area, within the city. The current green belt is interrupted by scattered urban areas that interrupted the continuity of this belt. The plan has a new proposal to have a new green belt around the proposed border of the city of Baghdad to minimize the uncontrolled

urban expansion. The new green belt is proposed to be concentrated mainly around the new border of the western part of the city where the old green belt has to move forward in order to provide more protection from the undesired expansion and slums to both the new development area and the adjacent agricultural land. The master plan also proposes to transform the locations of the heavy industries and vacant areas to open green spaces and try to provide as much green area as possible within the city neighborhoods. On the other hand, the master plan recommends to create tourist and green nodes along Tigris River to have more natural recreation spaces within the city (Khatib&Alami, 2013, pp. 25,77,92).

### **3.9.3 Streets Network**

The land use plan proposes to complete the construction of the planned four ring roads and the other main and secondary arterial roads. A fifth ring road has to be established within the new proposed development areas to mesh them with the entire city network and to connect them with the central business districts. Public transportation has to be provided to connect the new satellite poles within the other part of the city. It is also requested to extend the proposed metro lines up to the new developing areas. The master plan proposed to move the planned ring railway track to the periphery of the new area and to add more internal lines to connect the periphery with other parts of the city. Pedestrian walkways within the central business districts could be considered one of the best solutions in having a conservative historical urban fabric enhanced by a multi storey parking around to keep them out of traffic jam. The study proposed to have an efficient bus service from the central business districts to the other parts of the city. One of the study proposals is to enlarge the existing airport by adding more terminals and constructing many other facilities like cargo village, Aviation Academy, Business Park and other projects.

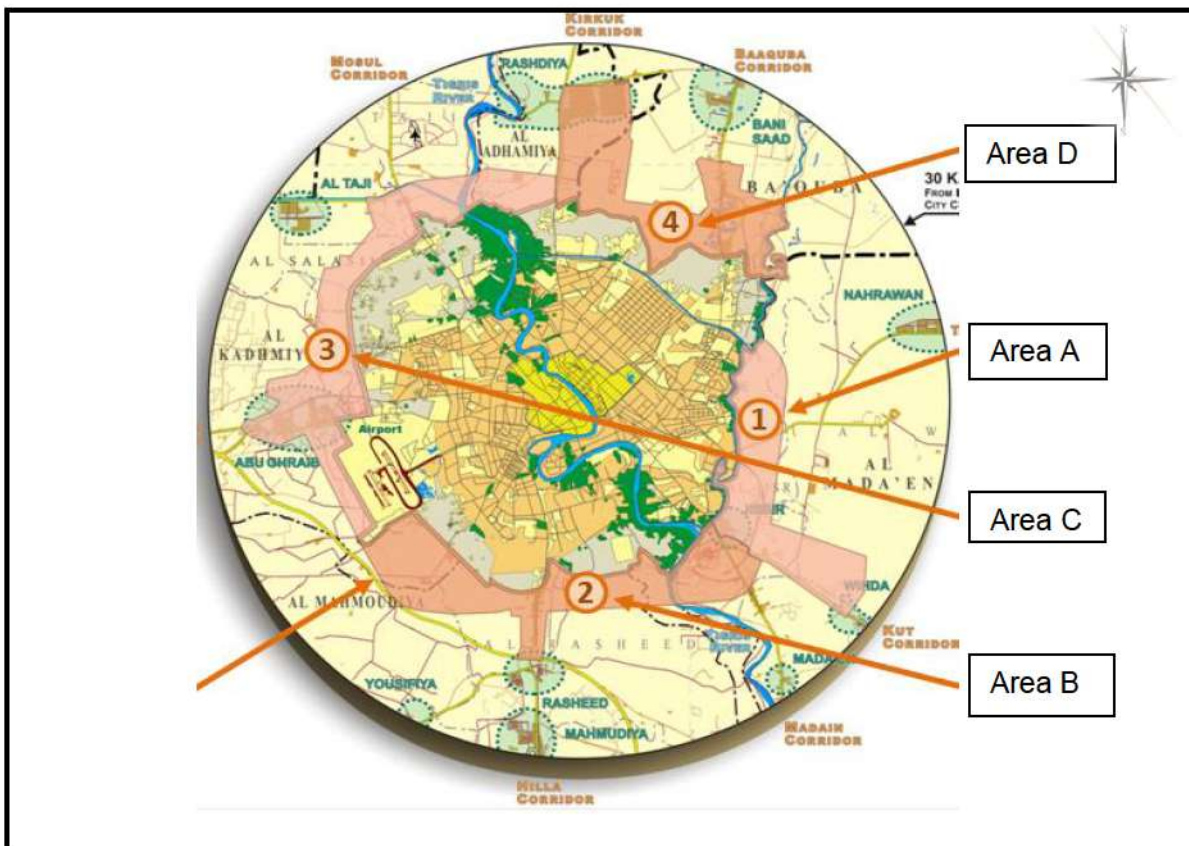


Fig. (3.17): - The proposed extension for Baghdad city layout 2030 created in 2013,Source: CCDP (Part 1 –Phase 3), Mayoralty of Baghdad, Khatib &Alami:23, See Fig. (9) in Appendix I in A3 size

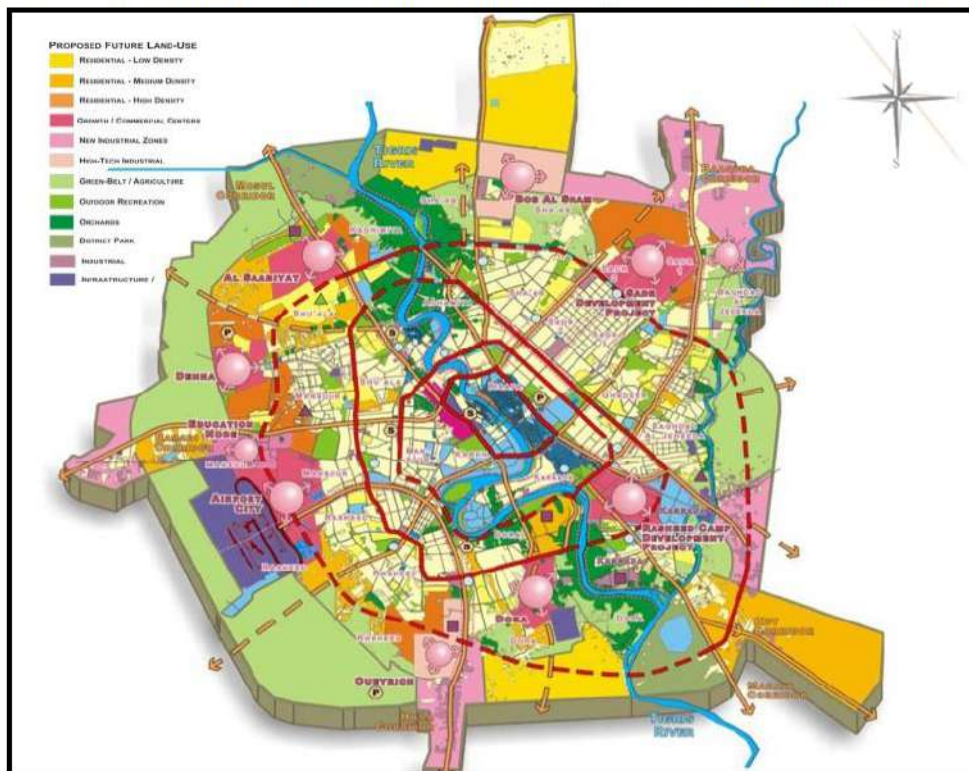


Fig. (3.18): - The proposed Baghdad city land use 2030 created in 2013,Source: CCDP (Part 1 – Phase 3), Mayoralty of Baghdad, Khatib &Alami:26, See Fig. (10) in Appendix I in A3 size.

## **3.10 Conclusion - The Spatial Development of the City and Its Impacts on the Old City Core –Macro- Level Analysis**

### **3.10.1 From Compact to Gridiron pattern –The transitional step between the late Ottoman and colonial period**

The city of Baghdad witnessed dramatic transformation processes since the period when the first map had been drawn in 1845 till the last official survey in 2009. The original compact medieval pattern of the old city was hybridized by different planning approaches altering the main characteristics of the urban growth pattern, urban structure, urban space concept, street network and building types with their blocks and parcel configuration. It was believed that the city, as aforementioned, was shaped by the residence in the light of different beliefs, ethics, religious and tribal references which formed many quarters in small areas and worked together to compose the outline structure. The main factor in composing the city was the distribution of religious buildings like mosques, churches and synagogues which lined the arteries directions by having connectivity between them and within the main public area and city gates. The main streets set from the main gates passed through the neighborhoods in many directions in order to reach the market in the middle which is considered the main dynamic organizer for the urban structure. One big innovation inside the city after 1869 was the investing in the city to benefit from the available local resources within the strategic geographical location at the Tigris river and in the middle of the trade lines. The markets and khans as main storage places were developed after this period to cope with the economic development. One other factor could be noticed in this period and that was increasing of the tendency to invest in public facilities, like schools, hospitals, storages, printings and others. The city became more accessed by other communities and became a hub of trade especially in the midst of the stability in the political situation.

The late Ottoman and the following British colonialist periods participated in regulating the form and reshaping new geometrical blocks inside the built up area especially along the river and in the vacant lands of the medieval city. It was concluded that the geometrical blocks form followed, in first stage, the compact pattern by giving due value to the existing arteries, and enhancing the accessibility to the traditional neighborhoods. The inserted building types matched the existing ones by following the original land use and moved gradually from inward looking plan with internal courtyard to the combined inward and outward looking plan up to reaching the final type in having the outward looking plan within the same old proportion, scale

and material where a new idea of space was found by having wide car streets. The transformations started first to substitute old buildings instead of constructing new ones because of the limitation in ownership as mentioned before and then started to fill the vacant lands especially after the construction of AL-Rasheed street. The street is considered the main connector between the city gates in north and south that substituted some old arteries and destroyed neighborhoods through its corridor creating the first urban and social segregation within the city. Market artery may have been considered the main urban element that provides importance to the street in spite of its interruption by the new car street that contributed to extending the commercial activities to many adjacent neighborhoods. Pedestrian public network has always the role to accommodate the commercial activities in the city core in spite of the new market along the car streets due to their configuration as commuter spaces that were accessed from all city parts. The willing to invest in the city and to reconnect the city within the world was one of the main reasons behind the alteration in both building types and land use. The development of AL-Rasheed street had motivated the creation of many recreational areas at the end of the Ottoman period and the beginning of the colonial period that initiated the modifying of the existed buildings and then initiated others to accommodate the increased numbers of international visitors to the city.

### **3.10.2 The Role of Planning Approaches in Shaping the City of Baghdad**

Many planning approaches had impacts on the existing land use and contributed to shaping the city as it is today. The city of Baghdad is a mixture from different approaches that all together shaped the city pattern as shown in the plan that was layered according to the strategies and master plans that were achieved in each period <sup>80</sup>(Fig. 3.19). The first colonial extension after 1917 set the basic spatial distribution for the city while Minoprio master plan in 1956 set the direction of the growth and development that was adopted later by the following mast plans including the official one done by Polservice in 1973. The following criteria discuss these impacts of the planning approaches on different levels.

#### **3.10.2.1 Urban Growth**

After the British mandate new planning approaches were introduced, they contributed much to replacing the existing fabric and expanding out of the medieval border. The eastern part of the city was rapidly more extended than the western side. The growth was directed to the north and south parallel to the river and connected to both AL-Adhamiya to the north and the

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<sup>80</sup> Not all strategies and polices were completely achieved due to political reasons that participated to alter the spatial concept and the urban pattern several times.

British military barracks in the south. These two locations are considered the potential and the main attraction points where the growth attempted to reach. The eastern expansion was stopped by an artificial dam against flood with the exception of the garden city of the new Baghdad, which set the first trial to expand outside the dam. The eastern dam together with Tigris River provide the longitudinal shape for the eastern part of Baghdad (AL-Rusafa). Almost the border of the north and south extension sets the limitation of further growth outside in the next morphological periods. The tendency to develop the western part of the river started in this period by having scattered development area in the form of garden cities and social housings attached far from the river especially in the south and west of the old city of AL-Karch. During this period the area around the old city of AL-Kadhmiya was developed and set the basis for further development to enhance the connection to Al-Karch. In the proposed master plan submitted by Minoprio, it was intended to have a concentric compact form rather than longitudinal. The city expanded more to the east based on having a grid network up to the new proposed dam. The outline of streets structure and neighborhoods could be shown obviously in the current master plan. The expansion in the western part of the city was proposed to be bordered by green belts and the railway track.

The governmental centre could be considered one of the few examples that was achieved by this plan and set the basis for more development later. This plan stimulates the following proposals to expand more in the western part of the city and along the main roads. The idea of having dam in the eastern part was the basis to build the army water canal which was proposed by Doxiadis. Nonetheless, Doxiadis prepared a new master plan which was not achieved. The master plan aimed to expand the city to the east out of the border of Minoprio master plan where most of slum areas concentrated and to consider Tigris as the main reference for the city growth. The idea was to develop a social and business centre along the main axis based on having the gridiron network. The first big scale social and supported housing projects have taken place in the eastern part of the city. The gridiron concept was also achieved partly in the western part in some scattered projects but not in large scale as in the eastern part. The actual master plan followed the official proposal done by the Polish. They set new limitations for the city to absorb the high expected population. The idea is to combine the concentric growth within the axial one and to set four boundaries of the city. They expand the border of the city which was lined by both Doxiadis and Minoprio and surrounded it by a layer of buffer zone. The plan was recommended to enhance the satellite cities out of the buffer zone. The plan could be considered inflexible because of the high centralization and the static land distribution system.



### 3.10.2.2 Urban Land Use

#### 3.10.2.2.1 Residential Areas

The residential area after the British mandate was spread along the main arteries parallel to the river, especially in the eastern part of the city. This allocation was continued to be followed by Minoprio in the eastern part of AL-Rusafa while in AL-Karch the housing area started to be vertical on the river because of the buffer zone area represented by the airport, orchards and governmental centre. The idea of having separated garden cities in the colonial period was developed in Minoprio master plan to be in the form of attached neighborhoods separated by main roads.

The main regulations of garden cities were followed in the next proposed master plans by allocating houses alongside boulevards changing the traditional housing scheme. The gridiron concept was introduced by Minoprio in a bigger scale and could be considered the basis for later development done by Doxiadis. Social supported housing units were constructed on the western side of the city in the colonial period far from the river as part of reducing the slum areas. This procedure continues in the next periods, especially by Doxiadis. The prefabricated residential units spread on both sides of the river to accommodate different classes of workers. This distribution created four layers of housing in Baghdad:

- The first one is the small size traditional one,
- The second layer is medium size,
- The third layer is big size housing units and
- The fourth layer is the small scale social housing units.

The Polservice master plan resets a new parcel division and plot sizes in order to increase the gross density and the number of units. It was recommended to have seven residential quarters based on having one family houses as a main type shared with multifamily housing. It could be seen obviously in the current master plan that the residential areas were expanded in a scattered way by following Polservice master plan in one side or sometimes by having an arbitrary policy of housing. The new master plan proposed to increase the city border by having several new districts to support the existed residential layout.

#### 3.10.2.2.2 Neighborhood Concept

A new type of geometrical layouts replaced the old medieval one after the British mandate having an organized regular plot size and new road patterns. Garden cities were founded later and set the first idea of having independent neighborhoods based on several residential clusters separated from each other by main roads. Those neighborhoods have their own public spaces and community facilities. The first idea of having supported social housing started in

this period to accommodate the increasing demand for housing. The neighborhood unit within Minoprio Master Plan was almost similar to the composition of the garden city neighborhood. It had an average of about 10000 inhabitants and the residential clusters bounded together without traffic intersection with its own social centre. The size of neighborhood units varied according to the plot size, thus creating kind of social separation. The neighborhood unit size became later the basis for Doxiadis community sector size by grouping four community classes. A large district was formed by adding communities that belong to different social classes and public facilities in accumulative way. The idea was to have a mix of different social classes in one district as part of having social housing. Minoprio aimed to share public spaces with different neighborhoods while Doxiadis was more directed to have independent spaces and functional separation within the neighborhood. The neighborhood concept done by Polservice combined both ideas done by Doxiadis and Minoprio. The neighborhood unit, defined by the distance to the primary school, which estimated up to 300 meters and could be considered similar to what Minoprio proposed. The plan adopted the Minoprio idea to have a social centre within each neighborhood and to share some facilities with others. They also set three types of plot size bigger than what Minoprio proposed in his master plan. It used the gridiron concept to combine four neighborhoods and compose the community district. The recent study by CCDP encouraged significantly the idea to have multi storey housing to cope with the severe housing shortage.

#### **3.10.2.2.3 Commercial and Industrial Area**

The city core continues to be the main commercial centre for the city of Baghdad after the colonial period. The first Minoprio master plan aimed to keep the city centre as main commercial one and locate the other industries in the south and west of the city which still keep their locations till now. Doxiadis initiated the idea of spreading the commercial activities along the main roads and pushing the big industrial locations out of the built up area in the city periphery and along the river. The Polservice master plan also recommended to keep the old city as a main commercial centre and classified the industrial locations according to their importance to the inhabitants. The current position of the whole trade centre in the city core affected the physical structure and accessibility within the area. The industrial location has scattered within the city as a result of multi ideas applied through different master plans. CCDP recommended to have four big industrial areas within the new proposed city edge.

#### **3.10.2.2.4 Civic Centre**

At the beginning of the colonial period most of the main public buildings were concentrated in the old city core. New streets substituted a large area of the historical fabric thus creating new

types of public buildings. The governmental public buildings extended to the north of the old city and to the western part of the city. Minoprio master plan recommended keeping and enhancing the civic centre on those two parts of the city. Doxiadis confirmed the approach to have modernity in the old city as a main civic centre. On the other hand, Polservice master plan tried to propose the old city core as a multi-functional centre and adding more sub centres to bring services to the inhabitants.

#### **3.10.2.2.5 Public Open Spaces**

Minoprio, for the first time set an idea to have green public spaces among the city neighborhoods and to have big public spaces on the city periphery along the river. This idea was enhanced also by Doxiadis especially in having a wide public area along the natural and artificial water surface. The Polservice master plan sets a new classification of the public open spaces within the city. It was recommended to keep the full access area along the river as Minoprio and Doxiadis proposed and to enhance the green open public area within the high-density area. The plan set the idea to have large parks within the city edges and to encourage the private gardens within individual units. It is clear that every master plan proposal shifts the green area more to the edges and converts what was proposed in the city to build up area. The result is less green area and public spaces within the city.

#### **3.10.2.2.6 Streets Network**

The road system in the current master plan is a mix between the grid pattern and the radial pattern. The Minoprio plan proposed to expand the city in the east and west directions and getting rid of the longitudinal road pattern which prevailed in the colonial period. The external streets were radiated from the city centre to ensure a better connectivity toward other regions and intersected with local roads which link the city neighborhoods to each other. A grid pattern was the result to ensure better movement in different city directions. The grid network reduced the traffic jam by introducing more roads and more bridges to connect both riversides. One of the main objectives of Minoprio plan was to ensure the accessibility within the old core by having three rings connected both Al-Rusafa and Al-Karch. The Minoprio plan and ideas could be shown obviously in the following master plans. The Minoprio action plans and solutions for traffic problems were adopted later by having more bridges connecting both city sides, and having wide boulevards and roundabouts especially in the bridge heads. The grid pattern was used by Doxiadis on the neighborhood level to ensure a flexible connection within the city parts. The Polservice master plan proposed to have a new classification of the road system to ensure a better connection between neighborhoods and also to ensure the accessibility within

the regional level. The plan intended to have several ring roads within the city which were not completed in the current land use plan.

### **3.10.3 The old city within the Spatial development strategies**

In the late Ottoman period, the old medieval old core was considered the only existed built up area within both AL-Adhamiya and AL-Kadhmiya districts far toward the north opposed to each other along the river bank. The district of Baghdad situated within the city wall along the river experienced slightly extension to north due to the existence of both holy districts AL-Kadhmiya and AL-Adhamiya. The extensions of the city toward north and south during the British mandate and after was harmful for the old core. The old core became a joint between the extended area where many arteries required to be created inside the old fabric to link the both extensions like both AL-Kifah street and AL-Khulapha street. Both extensions follow the gridiron system and reflect this pattern on the old core that started to follow the same urban pattern instead of the compact one. Minoprio recommended to destruct more fabric inside the old city to create more connections within the proposed new city extensions especially in both east and west. The radial concentric development proposed to create more loops inside the old city increasing the fragmentation in the compact urban fabric. Fragmentation in the existed compact pattern inside the old city created a new setting of the blocks and neighborhoods by dividing them in small islands of the old compact urban fabric bordered by streets.

This process led to more devastation by planting many projects that were different in size, proportion, and building types which created a clash between old and new fabric. Doxiadis in his proposal increased the tendency of fragmentation by following the gridiron system. In spite it was not achieved but his proposal for gridiron system in AL-Thawara housing not too far from the old city motivated to increase the vertical connections toward the river through the old core to reach the western part , causing a significant increase in traffic volume within the tendency to create more projects inside to serve the new residential quarters. Polservice in spite of their idea to expand the city for creating more urban poles for the great Baghdad but they didn't focus to achieve a comprehensive plan for keeping the old core. Their proposal was not clear concerning the agglomeration of commercial and administrative functions in the old core. They kept the commercial and financial centre inside the old core without control and management plans causing more transformation for the residential quarters to be only specified for commercial use within their recommendation to remove the decayed area as were found without a rehabilitation process. No conservation plans were proposed for the old city and the intervention projects that were done and proposed inside had encouraged more devastation. The historical monuments followed the idea of destructing the surrounded fabric that participated to create more fragmentation in the urban fabric.

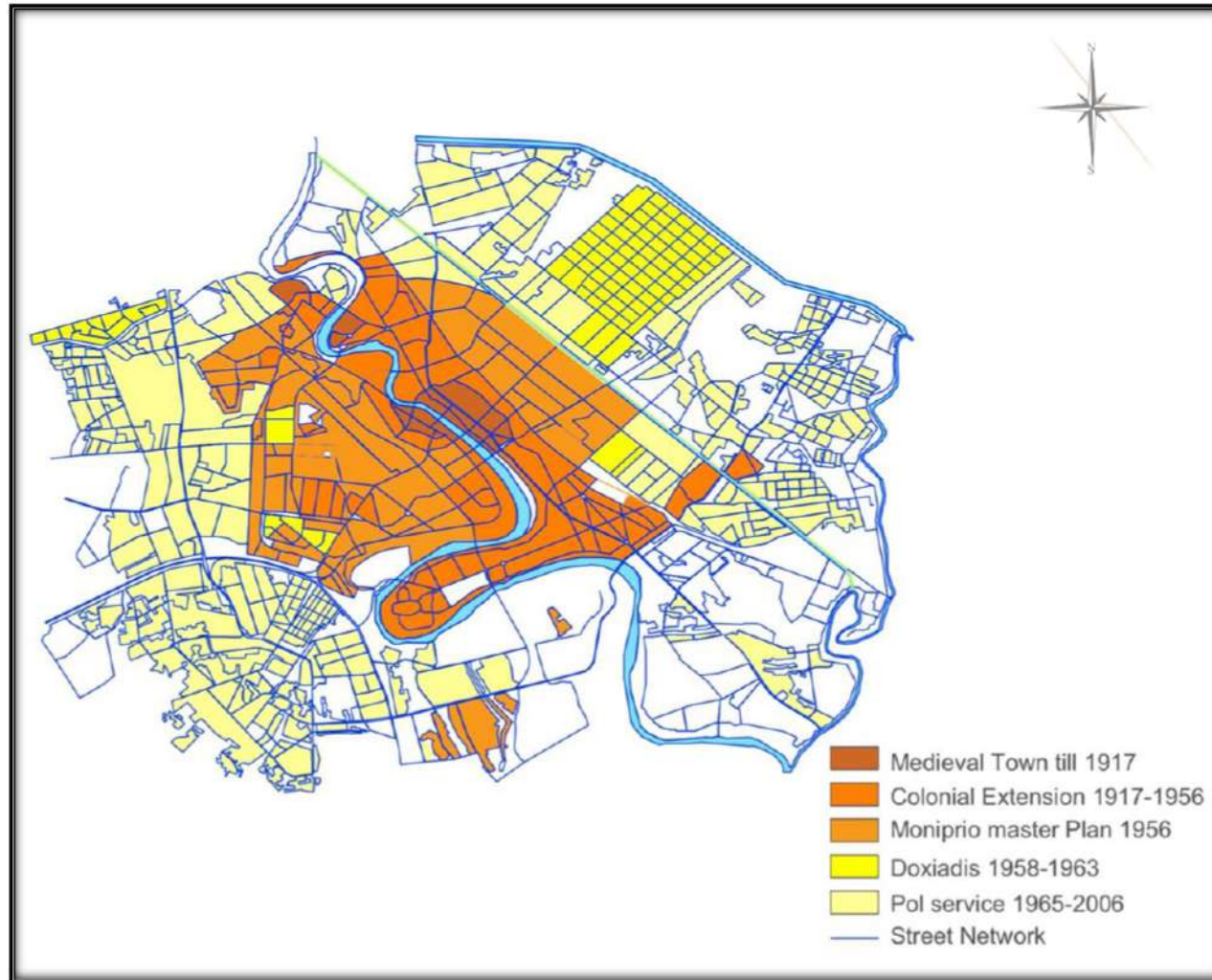


Fig. (3.19): - The role of planning approaches in shaping the city of Baghdad, Source: Digitized and explored by the Author, See Appendix Fig. (11) in I in A3 size.

# **Chapter-4-**

## **The Typo - Morphology Analysis For Baghdad Old City**

## Chapter Four-The Typo-Morphology Analysis for Baghdad Old City

The existing urban form and the characteristics of each morphological period will be analyzed in consecutive time intervals. The analysis will explain the basic spatial elements types and the main potentials and innovations that have contributed to proceeding the transformation in urban components and finding out the reasons behind this alteration. The whole urban structure for AL-Rusafa will be elaborated to discover the main potentials that can be considered the basis for further change in future in to select the right intervention methods that sustain the coherence and the historical context of the historical urban fabric.

*A comparative analysis was done through digitizing the archival maps using AutoCAD software. Those plans were overlapped to explore the development in the urban landscape at each time interval. Based on those morphological plans a detailed analysis was done according to the following Criteria:*

- *The change in the city network structure*
- *Urban space development including the urban space hierarchy, urban space types and the transformation of urban space*
- *Urban components including blocks, plots and building types*
- *Urban Innovations*

### 4.1. The Transformation process from 1845-1917

The old city core had maintained its traditional scheme and urban features since the fall of the Abbasid Empire till the middle of the 19th century due to the stagnation in economy and the chaos in political situation. The eastern part of the city (main core) kept its fortification wall within the main four entrances from the old Abbasid gates as shown in map drawn in 1884 by the cartographer Perron found in Elysée's book (La Nouvelle Géographie universelle) (Elisee , 1884)(Fig.4.1). The city misplaced its role as a capital of the Islamic state and turned out to be a province that belongs to the Royal Ottoman state. The city was Isolated from any International influence and kept its shape and urban structure for long decades. The inhabitation number was more or less constant within the city border for decades due to the unstable political situation represented by the frequent Ottoman and Persian occupations and

also due to the natural disasters like floods (AL-Ashaab, 1974). The current built up structure is an accumulative planning approach resulted from consequent construction process over the ruins of the previous one (Fathi1977). Felix Jones and Colbencode<sup>81</sup> have based their description of the city of Baghdad during 1854 on setting their first detailed map that is considered the clearest map drawn after Niebuhr<sup>82</sup> plan showing the exact main important buildings and alleys (Fig. 4.2). They described the eastern part of Baghdad as follows: (it is surrounded by a huge wall in front of which stands a deep trench surrounded on the side of the desert, strong dams and that the inner wall protects the city from the dangers of being flooded by the Tigris waters running in the trench).

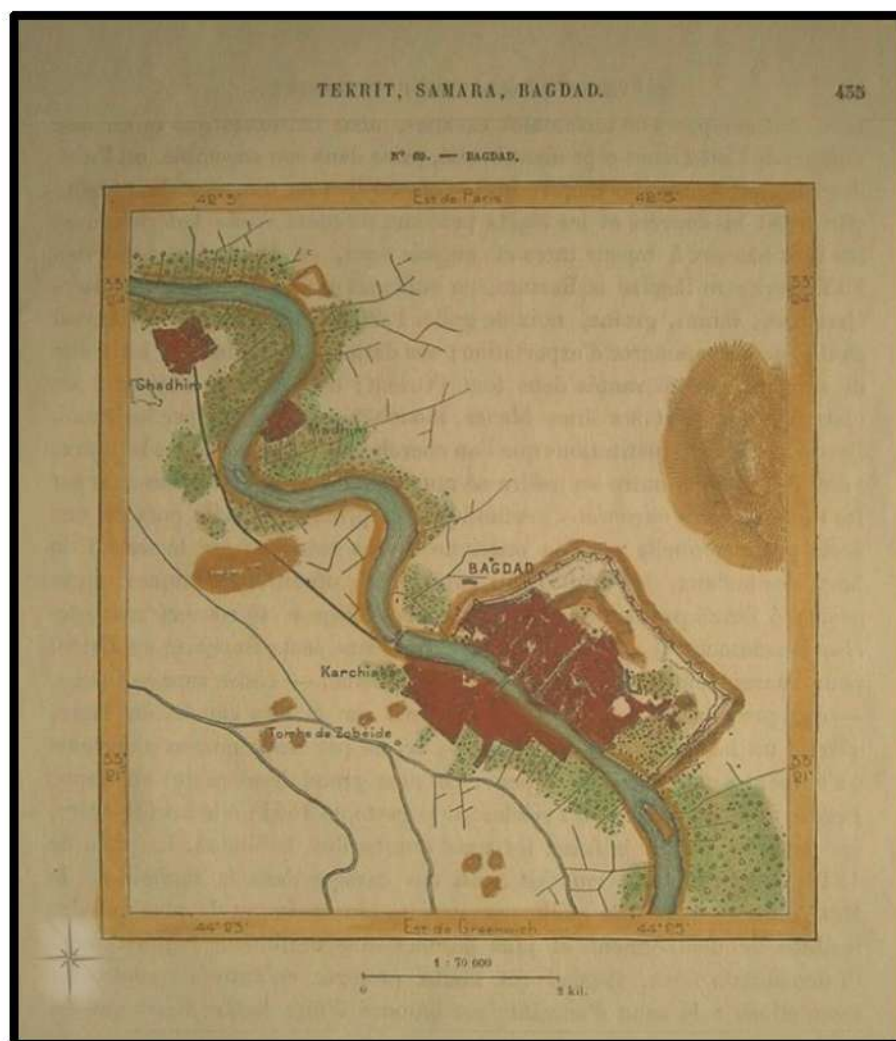


Fig. (4.1): - Baghdad plan in 1848, Source: (Elisee , 1884, p. 435)

<sup>81</sup> Felix Jones (1878), captain in the Indian navy and surveyor who did his travel to Mesopotamia and draw the first detailed map for Baghdad, See [https://en.wikisource.org/wiki/Jones,\\_John\\_Felix\\_\(DNB00\)](https://en.wikisource.org/wiki/Jones,_John_Felix_(DNB00)).

<sup>82</sup> Karsten Niebuhr (1733 - 1815 ) is a German Cartographer and traveler who participated in the Royal Danish Arabia Expedition , See [https://en.wikipedia.org/wiki/Carsten\\_Niebuhr](https://en.wikipedia.org/wiki/Carsten_Niebuhr).



The eastern part of the city (Al-Rusafa) had a rectangular form associated with four gates in the east, north and south and had 63 quarters while the western part (AL-Karch) had also four gates within the wall that was added to the city later and both were linked together by pontoon bridges (Colbencode, Jones , & Colbencode, 1857, pp. 303-402). Another plan drawn by Louis Massignon <sup>83</sup>between 1907-1908 (Fig.4.3) showed the structure of the city and the main components. A detailed military plan was found in German archives which more or less provide a better understanding about the main roads and illustrate the development in the city by having new car streets (Fig.4.4).Herzfeld prepared a plan for the city that was published in 1916 city before the British invasion in 1917as part of illustrating the regional development of the city starting from the Abbasid <sup>84</sup> (Fig.4.5). This plan showed the attempt to modernize the city in the last decades from the 19th century and the beginning of the 20th century revealing many building types and technical facilities that did not exist in the first plan of 1854. A comparative analysis was done to explore the development in the urban landscape at this time interval by overlapping the above-mentioned maps reaching to have morphological plan as shown in (Fig.4.6).

#### 4.1.1 The Change in The City Network Structure

The city structure is based on compact urban fabric and irregular patterns like any Islamic medieval city having the form of compact urban structure to reduce the surfaces that fronted the sunshine. The city skyline is horizontal with maximum two storey buildings showing many mosques that spread everywhere with tall minarets attached to big ornamented domes as shown in (Fig.4.7). The climatic factor played a big role in setting the relations between urban structure elements in having narrow alleys that work as a reservoir for cold air. The walled city is orientated to the north-west direction following the prevailing air movement to allow the wind catchers <sup>85</sup>in residential units to circulate the air as part of the cooling system. Those catchers are considered an important architectural element that works only in the compact urban structure. The traces of urban structure, including pedestrian links, quarters border and building types could be shown in Baghdad plan today in spite of severe devastation that had befallen the city yet. The old structure could still work as a main keystone for facing the fragmentation that occurred after modernization. Several monuments built in the past are still shaping the city scheme now.

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<sup>83</sup> He was one of the scholars who was in Baghdad between 19107-1908 for an archeological mission.

<sup>84</sup> See Fig. (3.1) in chapter 2.

<sup>85</sup> Wind catchers named (Badgirs) in Local language and was orientated within the prevailing wind direction.

In AL-Rusafa the built up area was concentrated in the northwest side attached to the city wall from the north and the river to the west while it set back a distance from the wall in the south and east. The eastern Gate AL-Thafarya is considered the starting point from which many main streets radiate to serve the whole city parts<sup>86</sup>. In the plan of 1854, the hierarchy movement could be seen obviously through moving from public streets to semipublic neighbourhood streets reaching to (cul –de- sac) semiprivate streets. Two main features have determined the shape of the city and played a big role in the morphological process: The main arteries and religious and public buildings which are connected by them as seen in the aerial photo at the beginning of 20th century (Fig.4.8). Other main elements of the urban fabric are the city wall, market, public buildings, citadel, courtyard dwelling houses and symmetries. In contrast to the plan in 1854 a new straight street system was added to the city thus changing the orientation of the road system to north-south in a horizontal way parallel to the river.

During the period between the two plans as showing in Fig. (4.6), there were two kinds of urban transformation process: the first one is the slow accumulative process which occurred during long run period of time and the second is the rapid process that occurred in a short-run stepwise development. Both developments took place, according to the activities done by the residences themselves and the rulers' plans to develop the city. This period is considered the transitional period toward modernity and was the beginning to end the medieval period (AL-Ashaab, 1974, p. 207). The westernization process started to have an impact on the urban life after 1869 during the rule of Midhat Pasha<sup>87</sup> when new ideas were imported from foreign experiences. The city had a dramatic transformation process after the construction of new dams and railway trucks that participated crucially in developing new building functions and urban pattern reflecting the development that occurred in social life, economy, trade, industry, education and the city administration.

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<sup>86</sup> It is the only gate that was survived from destruction and Known as middle gate (AL-Wistani Gate).

<sup>87</sup> See Biography P.435.



Fig. (4.2): - Baghdad map in 19th century in 1854 , Source: Berlin City Library SBB\_IIC\_Plan. 888\_Pages 1,2, See Fig. (12) in Appendix I in A3 size.

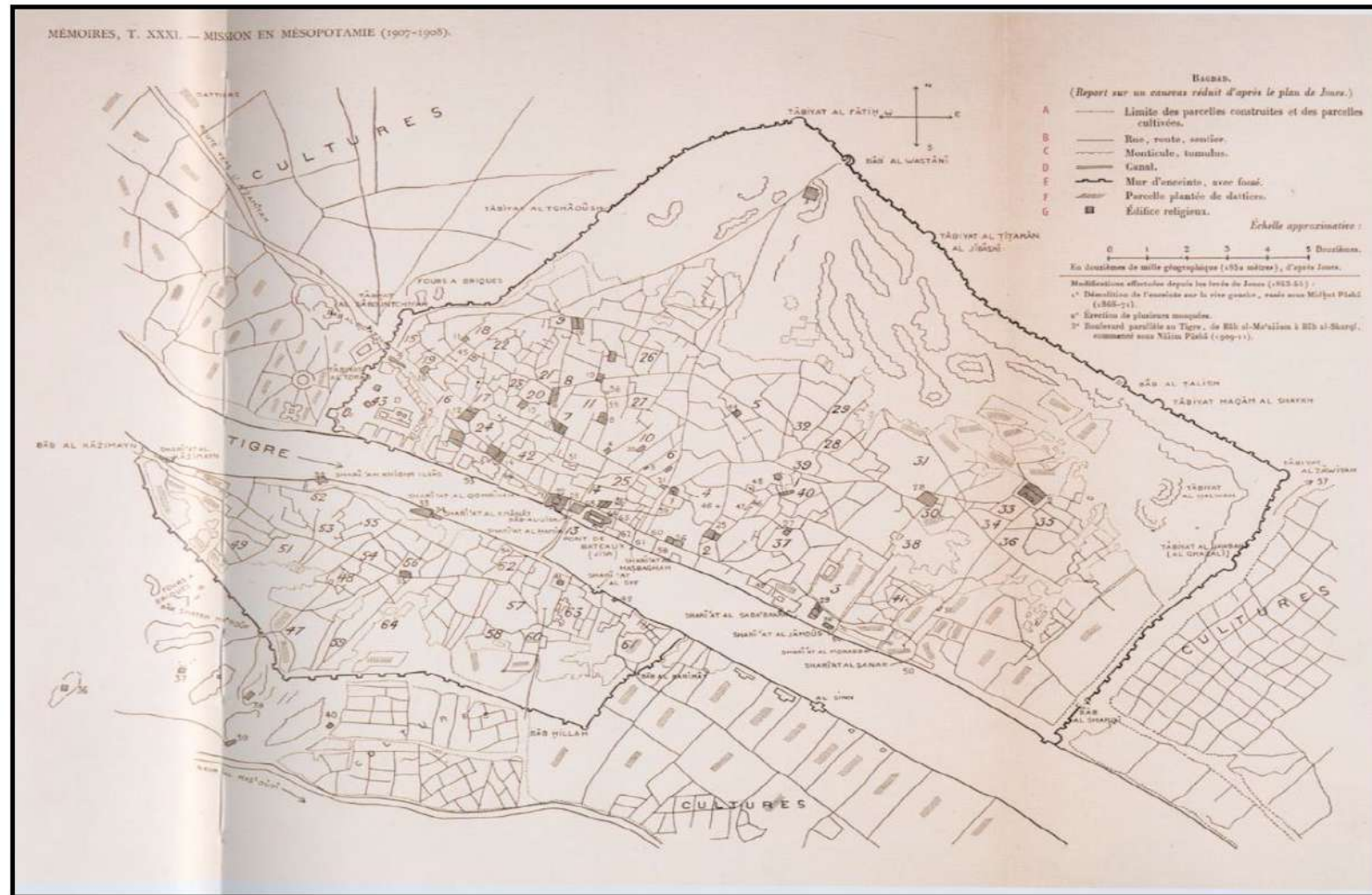


Fig. (4.3): - Baghdad map in the 20<sup>th</sup> century between (1907-1908), Source: Ottoman Archive-Istanbul BOA.HH.THR, See Fig. (13) in Appendix I in A3 size.





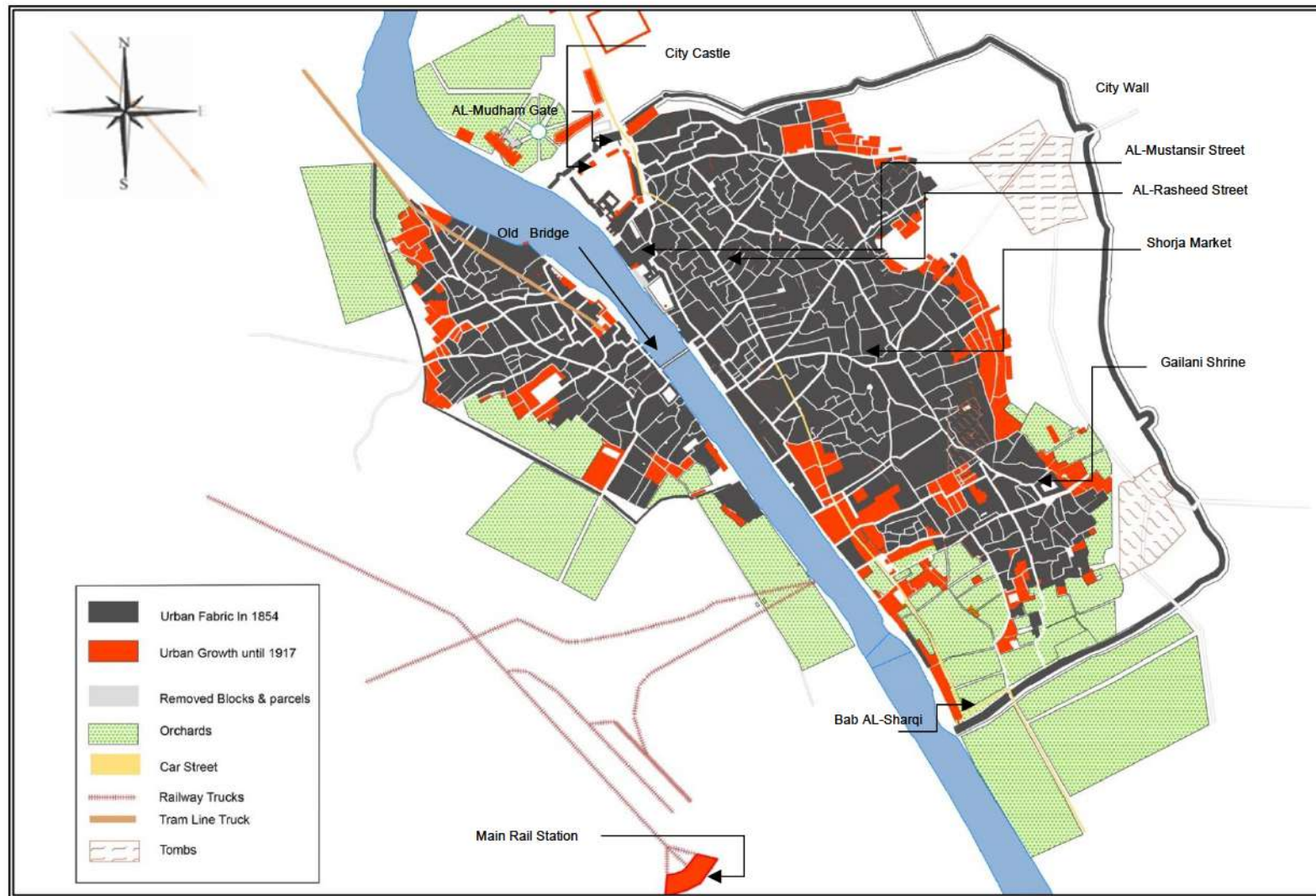


Fig. (4.6): - Urban morphological change from 1854 up to 1917, Source: Digitized and investigated by the Author, See Fig. (16) in Appendix I in A3 size.



Fig. (4.7): - Baghdad Skyline in the beginning of the 20th century, Source: <https://www.gettyimages.com/detail/news-photo/baghdad-iraq-1917-1919-news-photo/463964345?adppopup=true> (accessed 8 Sep.2017)

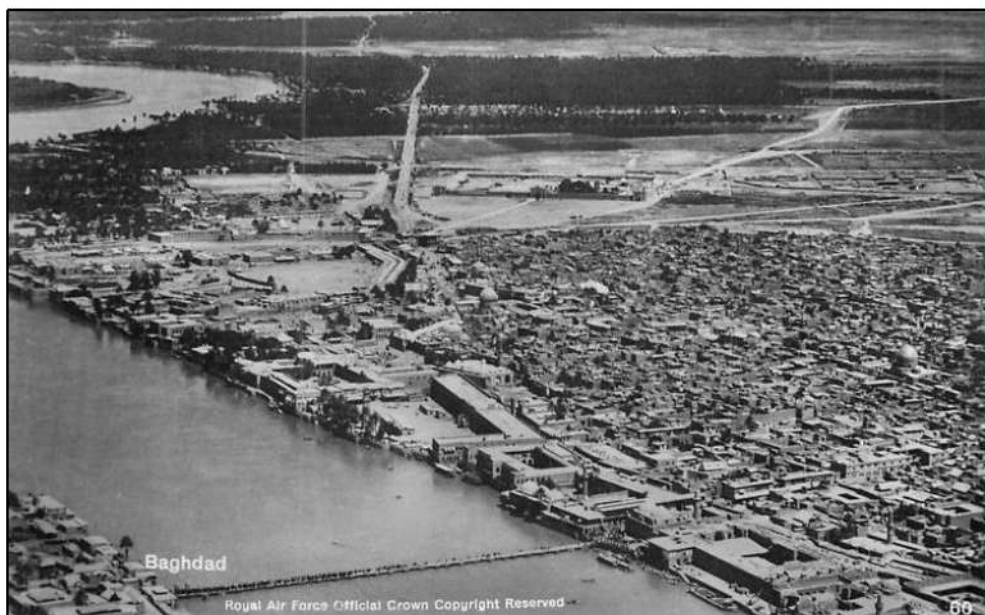


Fig. (4.8): - Baghdad aerial photo at the beginning of the 20th century, Source: Photographed by Royal air force official crown and published on form of Postcard.



## 4.1.2 Urban Space Development

### 4.1.2.1 Urban Space Hierarchy

The hierarchy of urban spaces in 1854 plan could be explored by following the sequences of the main city elements starting from the riverfront area where the city castle and the main public buildings are located along its edge, moving toward the multi specifications markets along the major alleyways. Those major alleyways with Maidan plaza are considered the main public spaces connected to the secondary arteries which worked as semipublic spaces and then linked to small open spaces and streets within the neighborhoods as semiprivate spaces up to the private houses that are clustered along its path and considered the private spaces. There were six main arteries that connected the city neighborhoods in vertical and horizontal directions as in (Fig.4.9a). The first three main roads started from the AL-Wistani Gate in the eastern part of the old wall and moved to the river to provide accessibility to large area of the old city; and they are considered the main vertical arteries that feed the neighborhoods. Higher priority was given to the second one which passed both residential neighborhoods and Shorja market up to the river and is considered more public than the others. Many horizontal sub walkways had connected those arteries from north to south on different directions and levels. The fourth artery lined parallel to the eastern part of the wall through the symmetries area and its priority could be considered less than the others. The fifth street started from Maidan and penetrated the city fabric horizontally to the south passing and connecting the first three vertical arteries together with main Shorja Markets, residential neighborhoods and big mosques up to AL-Gailani shrine. This artery could be considered the main connector that links many neighborhoods. It became more public when it turned to market artery in Sadriya area and then moved again as pedestrian walkway up to Gailani shrine. The sixth main walkway AL-Mustansir (AL-Mustansir street) started from the north to the south parallel to the river and could be considered with high priority because it bounded the main public area together with the market network and the residential neighborhoods. This artery together with the public functions along its path compose the main public sector that extended parallel to the river and not far from the south gate. The city had several neighborhoods which have no natural boundaries and was integrated with each other by moving through the public and semipublic alleyways. The major alleyways connected the main gates to the city parts thus providing accessibility to reach the whole built up area (Fig.4.10). They were twisted and not straight with different width along their path and normally are suitable as walkways for pedestrians and carriages drawn by animals. They connected neighborhoods with each other

and also linked the main public buildings and market area. The secondary alleys normally existed in all directions and are shorter and narrower than the main alleys (Fig.4.11). The local alleys are the cul-de-sac alleys where the residential units are lined along. Those streets have different directions and width. The old city has small spaces in each neighborhood that gathered different local alleys called (Fadwa)<sup>88</sup> and works as semipublic spaces to provide accessibility to reach the residential units. The city kept the traditional characteristics of the built environment and urban space structure till the beginning of the 20th century. A newly constructed street as a main public space was inserted with other space types through the compact structure of the walled city, introducing new building types that differ from the traditional one. This alteration caused a disarrangement of the urban morphological elements regardless of the socioeconomic impacts. The main commercial part extended from the centre to the main gates and also near the bridgehead that directed to the western part of the city AL-Karch as shown in the street hierarchy in 1910 Fig. (4- 9b). High traffic volume also found along the main roads that directed to the main gates (Wirth. E. , 1975, pp. 55-57) .

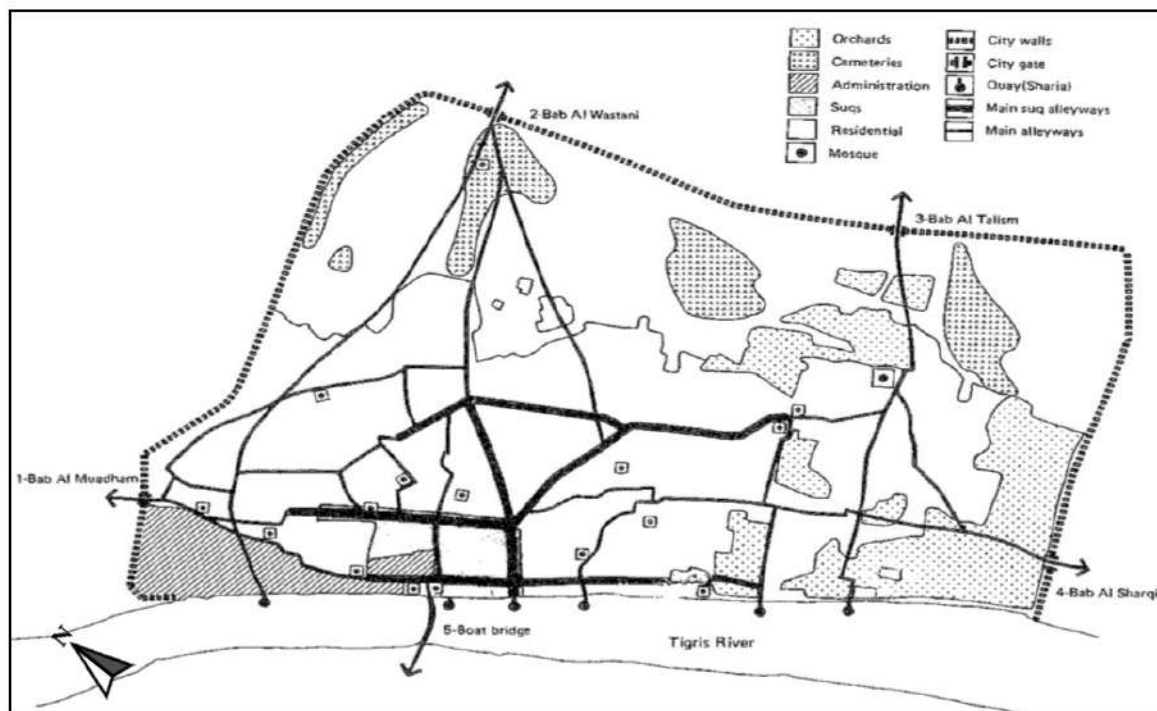


Fig. (4.9a): - Traditional street hierarchy in old Baghdad city, Source: Bianca1984:249.

<sup>88</sup> Local dialect and mean in Arabic the rest space.

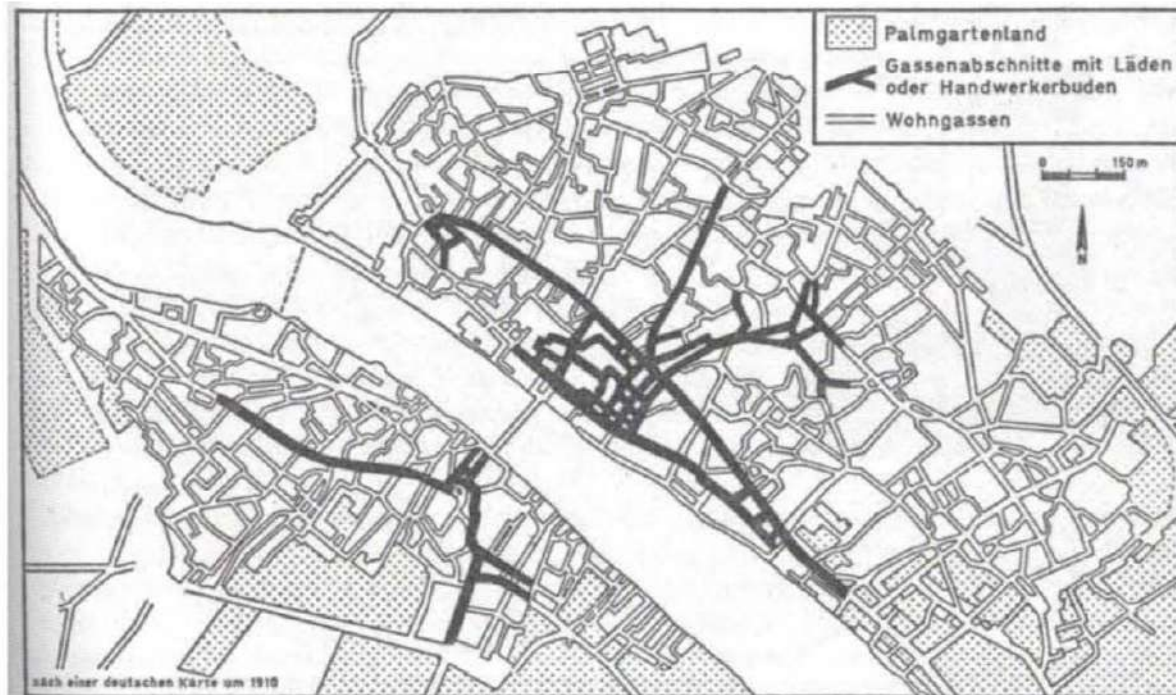


Fig. (4.9b): - Traditional street hierarchy in old Baghdad in 1910, Source: (Wirth. E. , 1975, p. 56).

The city cut the continuity of urban fabric and divided the market in several parts. The new street changed the hierarchy of the urban public spaces and became the main transportation hub rather than the pedestrian walkways which their continuity had interrupted it. The new street passed Maidan and altered its historical function from public Pedestrian Square to a vehicle passage. The market was extended to the new established street in spite that the bazaar is still the main economical core of the walled city. Those new parts are disintegrated from the traditional city, but in general the city kept the general morphological elements and its mutual interrelationship. The traditional traffic and transportation system had totally altered from pedestrian walkways to vehicle-based roads changing the circulation system within the new spaces and functions. The street pattern changed from narrow, twisted roads to wider and more linear ones in order to adapt the vehicle movement in the traditional structure. The function of the northern gate (AL-Mudham gate) and the eastern gate (AL-Bab AL-Sharqi) was modified from pedestrian orientated gateway to the vehicle main entrance heading to the new shortcut through the city parallel to the river. As a result of this modification the hierarchy of streets changed significantly and the new paved street started to own higher priority than AL-Mustansir street which turned to be more specified for public and administrative functions and led gradually to transform partly into a vehicle based one rather than a pedestrian walkway.



Fig. (4.10)

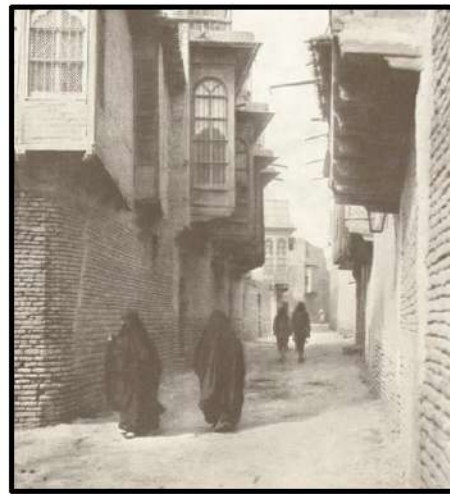


Fig. (4.11)

**Fig. (4.10): - Al-Mustansir public pedestrian street, Source: The national Geography Magazine 1914:553. Fig. (4.11): - Local Semi-private pedestrian street, Source: The National Geography Magazine 1914:554.**

The street network ranged in size from semipublic alleyways to more widely public one. The cul-de-sac alleyways connected houses together forming the small sectors, which are connected with others by bigger alleyways. The biggest alleyway is considered the public pathway that connected big neighborhoods together. The spatial volume of alley was graded in section. In ground level, the street looks wider for flexible movement and natural ventilation while on the first floor it becomes narrow with the existence of wooden bays. On the roof level, the street section looks so narrow with a small gap to provide environmental protection in both hot and cold seasons. One of the most important features in the alleyways is the chamfered or rounded corners at the external houses walls on the ground level, which prevent interruption of pedestrian movement (AL-Azzawi, 1984, p. 53).

#### 4.1.2.2 Urban Space Types

The urban public space was configured in two main forms as was explored in the city plan of 1845, the first one shows the streets and plazas that were surrounded by public buildings like castles, shops and mosques and the second one shows the inward-looking spaces (courtyards) inside the public buildings. The North Gate (Bab AL-Mutham) faces Maiden that is considered the main public space. Maiden is the main entrance to the city and is considered the only urbanized public square. In the city plan of 1854, the space starts with a narrow section parallel to the eastern wall of the city castle and then was enlarged up to AL-Ahmadiya mosque, which is considered the main focal point at the end of the visual axis which has a geometrical semi rectangular shape. The movement direction turns to the right where the first

part of the main covered market starts from Maidan and ends up with the main public alley parallel to the river that includes all public facilities mosques, Sarai, Markets, banking offices, schools and embassies that reach to the open green orchards near the south gate. Maidan has developed later and experienced fluctuated transformation process. According to the plan drawn by German army, the semi rectangular space was reformed and so it got narrower than before by adding new public building near AL-Ahmadiya mosque. Maidan was surrounded by one- or two-story buildings, including mosques, retail shops and coffee shops that extended their seats in front of their shops as seen from the archival picture (Fig.4.12). The aligned buildings from the right side were rowed along the castle wall with regular distance from the streets while from the left side there were more scattered buildings and had more left-over spaces used for public use to serve the shops behind. By the end of 1917 and during the construction of the new street, Maidan became more vehicular and had the shape of linear narrow street as shown in aerial photo in 1917 (Fig.4.13).

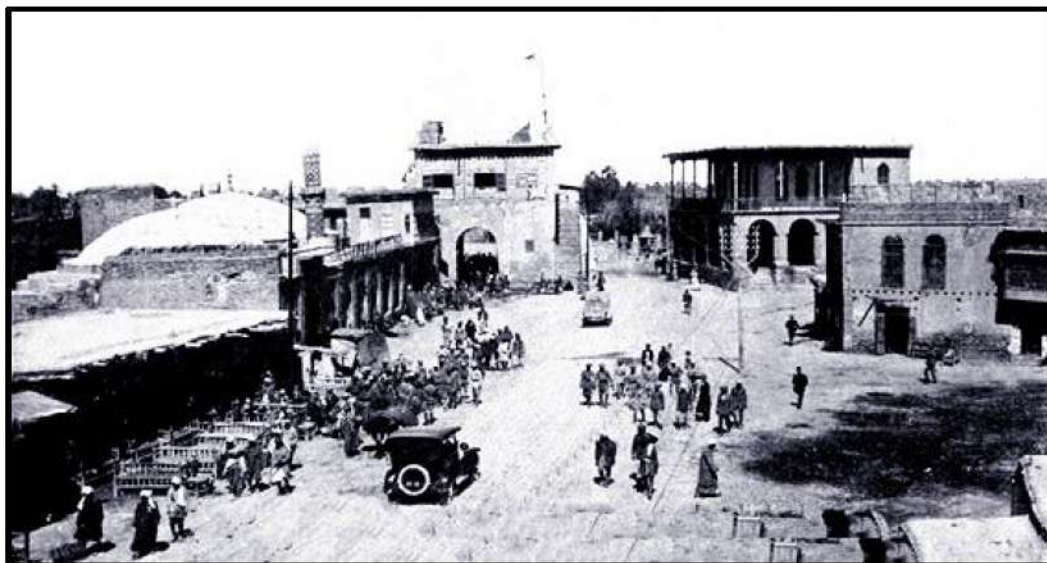


Fig. (4.12): - Maidan boundaries in 1917, Source: (Menzies, 1920, p. 49)<sup>89</sup>

<sup>89</sup> See also:- <https://archive.org/details/sirstanleymaudeo00menz/page/48/mode/2up>.



**Fig. (4.13): - Maidan after the construction of AL-Rasheed street in Baghdad aerial photo in 1917 .**  
 Source: <http://dislocatingtheorient.com/figure-8-4-photo-compilation-of-the-baghdad-city-plan-1917/>  
 (accessed 10 Jan. 2016)

The north gate became the main entrance to the pedestrians and military vehicles. Mosques are considered the main public buildings with inward looking spaces used for Friday and regular daily prayers. However, there existed no big mosque to be the main landmark as is the case in the other Islamic cities, and all big and small mosques are distributed within public and semipublic streets in the city neighborhoods. Even AL-Gailani shrine which is considered the biggest shrine mosque is located at the city edge and it religiously represents a point of attraction to multitudes of foreign visitors and locals. One other main public space is the market that bind the whole city parts. The market starts from Maidan in a covered form and then stops at an open main street parallel to the river where the main administrative buildings are located along. Meanwhile, a specific arcaded market, Sarajeen, professional in leather handicrafts erupts there to be attached to AL-Wazir mosque and ends with the city floating bridge. Besides, a new specific market for textile stands just parallel to AL-Mustansiryia school and then turns deeply inside the urban fabric to the east reaching the main Shorja market with

many secondary multi specific market alleys mushroomed in different ways and intersectional with each other by main and sub arteries. The market alleys are covered by vaulted roofs or folded corrugated sheets and accommodate different public functions. They are normally having one floor or two floors where the first ground level is used as retail shops and the upper one used as storages or a place for accommodation (Fig.4.14). The Market connects the main public buildings and mosques together and links them to the main gates with direct and indirect arteries. It is considered the main socio-economic core of the city and the main morphological element that keeps the cohesion of urban fabric in spite of the multi transformation process which was done since decades. In spite of the interruption in market continuity caused by the new street (AL-Rasheed street) as shown in the 1912 and 1916 plan, the city has kept the old market structure regardless of the new market type which was added by having regular retail shops along a vehicular street. The stability in old market structure and their branches is due to its location in the centre of urban fabric that allows to be more accessible from different city parts. The multi market branches extend to include the new market requirements and specifications that provide more flexibility within the rapid transformation process. The new street with retail shops follows, in many parts, the traces of the old market branches and works as a complementary part of it and according to some available old photos, it engulfs one or two storey-buildings with decorated or solid facades on the first floor (Fig.4.15). The architectural style of the shops was altered later and covered by arcaded passages to keep more privacy, straightness and to provide climatic protection.



Fig. (4.14)



Fig. (4.15)

Fig. (4.14): - Covered market in Baghdad Leather Market (Sarajeen), Source: circa 1918  
<https://www.gettyimages.com/detail/news-photo/the-entrance-to-the-bazaar-in-baghdad-iraq-with-the-ghilani-news-photo/50820148?adppopup=true> (accessed 8 Sep.2018).

Fig. (4.15): - AL-Rasheed street in 1913, Source: <https://www.gettyimages.com/detail/news-photo/baghdad-fron-the-north-gate-iraq-1917-1919-news-photo/463972487?adppopup=true> (accessed 8 Sep.2018).

### **4.1.2.3 The Transformation of Urban Space**

The new artery (AL-Rasheed street) has followed the traces of the horizontal secondary traditional streets which are classified as public and semipublic spaces. The first trace was a connector street which is sited in the business public area and considered the hub for seven pedestrian arteries that move vertically to the river from the right side. Three other main streets are connected to this semipublic street from the left side far from the river with many local collectors. Two of them are connected directly to the Middle gate (AL-Wistani Gate) and the third one is connected to AL-Gailani mosque. This artery is considered the main collector that could be modified, widened and transformed to a main vehicular street due to its accessibility and connectivity to the other main parts of the city and also to its location adjacent to the north gate up to the market area with more or less straight line with little deviation. This could be considered the main reason behind developing this trace instead of AL-Mustansir artery which was easier to develop as it already existed as the only straight and direct link in the city. The second trace was found as a small connector linking two main arteries which are heading to the river. The third street trace is a small connector parallel and closed to the river frontage area that separates the private orchards from the houses along the river.

The connection between these three traces within the north and east gates has composed the basic structure of Khalil Jadesi which was later called AL-Rasheed street. One may think of two other reasons that influenced the planning of street: the first was the tendency to keep as much as possible the religious buildings along its course, and the other was to have an access to the new diplomatic area along the river that erupted at the end of 19<sup>th</sup> century. A new concept of space was initiated based on having vehicular street with new building types and a new neighborhood structure. The river front area is considered the main public zone, where all public facilities were built later along its course. Accordingly, this part has experienced a transformation in urban structure through different periods. As shown in 1912 plan and the one which was drawn by Herzfeld in 1916, there was a tendency to establish a frequent connection between AL-Rasheed street and AL-Mustansir street in different positions along their both courses.

## **4.1.3 Urban Components**

### **4.1.3.1 Blocks & Plots**

The blocks in 1854 plan were compact like all traditional Islamic cities and relatively small with inward courtyard housing system. The agglomeration way of residential plots to form the block



was based on sharing the land by a group of residences to form one sector. The plots distribution within the block ensures that each one has the accessibility to the cul -de -sac, secondary and major alleyways. The agglomerations of plots depend on the social relations, economic condition, religious factor and the available public buildings and monuments. The blocks were bound by the major and minor arteries and took place in unregulated and non-geometrical forms with different sizes. Big blocks were surrounded by main arteries while their parts were combined with the local one. They were established according to social bonds and relationships or sometimes by the agglomeration of different ethnic groups. The mix-land use blocks are normally located along the riverfront area and within the market branches while residential blocks normally took the position behind the market far from the river. One or more blocks has shared one mosque as a main public building and space. Sometimes one or more block was composed around the main important shrine and mosque like in AL-Gailani shrine. In the plan drawn in 1912 and 1916 the block form and definition were changed to have more geometrical shapes with defined boundaries. The new blocks took place in the city periphery as an extension of the old fabric and sometimes to fill the voids in the existing fabric but never exceeds the city border. In AL-Rusafa, the riverfront area blocks have continued to have a rectangular shape in different sizes due to the short distance between the river coast and AL-Mustansir street which is lined as a straight pedestrian walkway. A new tram line in Al-Karch has changed the shape of blocks to geometrical and regular pattern.<sup>90</sup> As a result, the riverfront blocks were subject to adopt new land uses and building types. Introducing the new space of AL-Rasheed Street has changed the form of the blocks and the relationship between urban public space and buildings. The shape of blocks tends to be more regular within the new straight pedestrian and vehicle streets. The internal composition of the block and its shape depend mainly on the arrangement of urban elements and the type of buildings. The blocks are not separated and each one depends on the other as an integrated component. The new blocks outside the built-up area follows the border and the division of the surrounded orchards inside the city wall and also follows approximately the same direction and size.

#### 4.1.3.2 Building Types

Baghdad City has kept the same characteristics of traditional physical structure and the way of construction for both private and public buildings since the 11th century. The harmony in fabric, the interaction between city components and the socioeconomic structure have worked together to keep the physical outline and the main principles that enhance the compact system for the city fabric. The urban fabric kept the physical form with less and acceptable change

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<sup>90</sup> The tramline has wooden carriages moved on truck and was drawn by horses.

due to the stagnation in social, political and economic life in the time of the Ottoman period (Alashab1974,206). All buildings before the 20th century, were built by complete masonry construction to reduce heat transfer, especially in hot and rid zone like Baghdad. The concept of open inward-looking spaces was developed in all types of building to cope with severe hot climatic condition. Apparently, many buildings have started to be erected after 1869 with different types and functions inside the old fabric and some new buildings outside the walled city near the north gate. The Ottoman buildings adopted new functions mostly specified for military purposes which were also used sometimes to accommodate other functions. The city started to have wide boulevards and European architecture style as a result of the western influence that occurred due to the strategic location of Baghdad. The Ottoman buildings were normally agglomerated in compact pattern and have two storeys without basements. The Ottomans built their public buildings attached to each other and also attached to the existing neighborhoods or they were positioned in a detached way with no direct connections within the next buildings that have an outward looking plan with external facades. The detached buildings are new approach introduced by the Ottomans that was inserted in the city with four facades reflecting the start to change the idea of the relation between space and mass.

There are three systems of building types: the first is the traditional inward-looking plan with large decorated facades facing the internal big courtyard system where all rooms are distributed around it. The second is the inward- outward looking plan having semi open courtyards and large colonnaded facades with big windows overlooking toward the external space. This type could be adapted from the idea of Iwan in the traditional courtyard buildings where the space is closed from three sides and overlooking to large courtyard space. The third type is the outward looking plan with more decorated openings in the external facades. The building facade details were extended with horizontal and vertical small openings, groves and arches that are repeated regularly along the elevation and sometimes decorated with brick ornamentations. Many buildings used the traditional Abbasid entrances by having a pointed-arch surrounded by an ornamented rectangular brick box inlayed with Arabic calligraphy as in tram station building in Al-Karch. Many buildings were affected by the neo-classical architecture Which, especially in the facades, incorporates various elements like triangle cantilevers above both windows and main entrances. The open courtyards, semi closed courtyards and the totally closed courtyards were sometimes surrounded by arcaded and vaulted walkways which represent a transitional zone between external and internal spaces (Abd Ali, 1987, p. 70).

It could be seen obviously in the plan of 1912 and 1916 that new public building types were added without central courtyards hence neglecting the mitigation of the local climatic condition. The building types started to have outward looking plan after the cooperation between the

Germans and the Ottomans to establish a new military and civil infrastructure. The plan shows many building types added to the city like statues, clubs, public garden, consulates, hotels, military fabrics, banks.... etc. Other establishments were also built by the Germans to provide more potentialities that might develop more area within and outside of the city wall. The German old style merged with some local and Turkish architectural details resulted in a unique architectural style for Baghdad. The building construction used the steel as new material for roofs in addition to the wood and bricks. Many other wooden details like handrails in balconies, ceiling details, windows and doors were used as main decorated features. Many buildings were destroyed when the Ottomans left Baghdad and the rest which survived are now in bad condition. The building types belong to this period could be shown as following: -

**Schools:** - During their rule in Iraq, the Ottomans were so interested in building and renovating mosques and religious schools. Therefore, at the end of the 19th century, new types of military and primary schools were introduced to cope with the need of enhancing the military power and to improve the education level. Several schools were established such as the High Imperial School, which was later converted into a Military school. The High school is totally independent in its own building. This new approach in design was different from the traditional religious schools that were attached to mosques or shrines. The plan of the school had copied the traditional courtyard building with an inward looking plan that was found in the traditional local architecture, yet with significant differences in having an external view and orientation toward the river with a typical E shape plan (Fig 4.16 a, b,c).

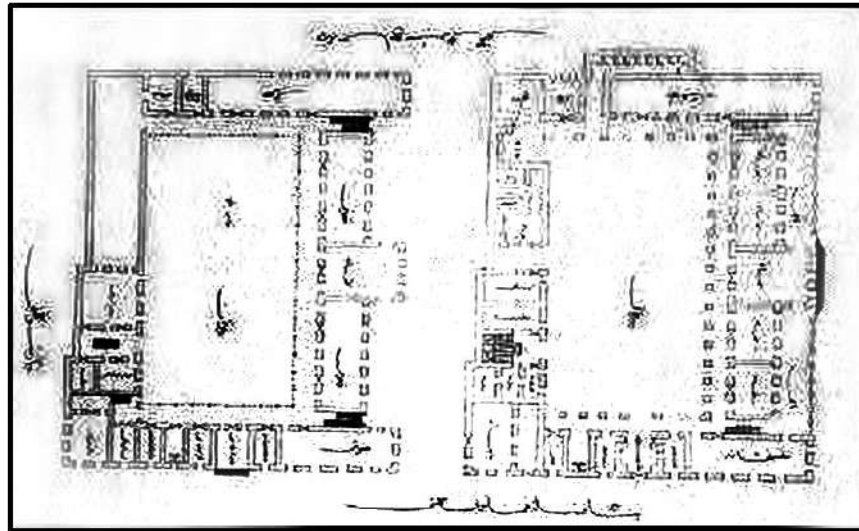


Fig. (4.16a)

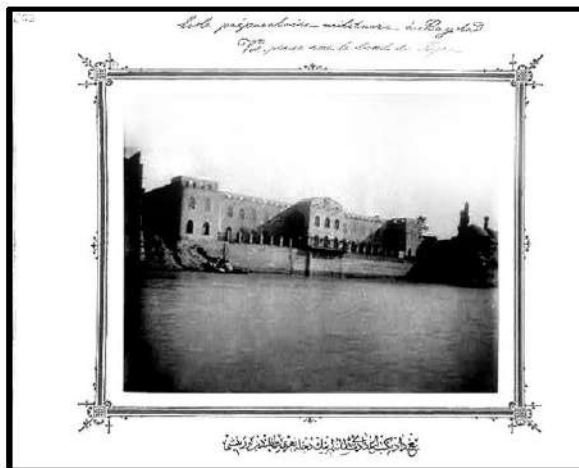


Fig. (4.16b)

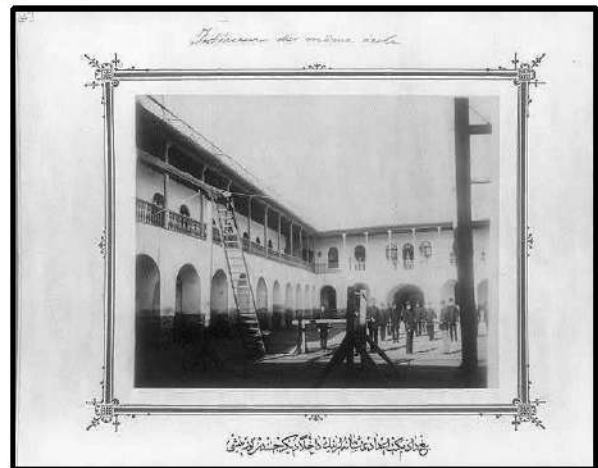


Fig. (4.16c)

Fig. (4.16a,b,c): - Imperial military school, Source: Library of Congress <https://www.loc.gov> (accessed 15 Oct.. 2015)

One of the main educational buildings in Baghdad is Aliya School. Dr. Emad Raouf<sup>91</sup> renowned historian, believed that the arrangement of the internal spaces and the hierarchical movement starting from bending entrance up to the private hall rooms was similar to what had been done in the Abbasid school types as is the case in Al-Mustansirya. As a result, Raouf justified that this building might belong to that era. He assumed that many changes occurred due to removing and adding many parts during the last historical periods till the reconstruction of the school by the Ottomans (Raouf, 1986, pp. 23-28). Some historians, however, refused this suggestion and believed that this school was destroyed and built again totally in 1871 by

<sup>91</sup> See Biography P.432

Midhat Pasha as many manuscripts show. It is possible to consider this building as the first stage in changing the school's type gradually from inward looking spaces into more outward. It considered as a new development and as a transitional approach in having a new Military school type instead of a religious one (Fig.4.17).

This school is thought to be very important due to the following characteristics: -

- The change in function through having specified industrial school instead of the prevailed religious and educational schools.
- The orientation toward the river by having an open public space along the riverfront area used for recreation.
- The linear distribution of rooms along a longitudinal corridor which has an external outlook instead of the orientation toward the internal courtyard (Fig.4.18).
- The flexibility in changing the building characteristics and function.
- Introducing new features in facades and getting rid of the solidity.
- Giving right to the public to access the governmental area which shows the potential to use the river area for more public facilities.

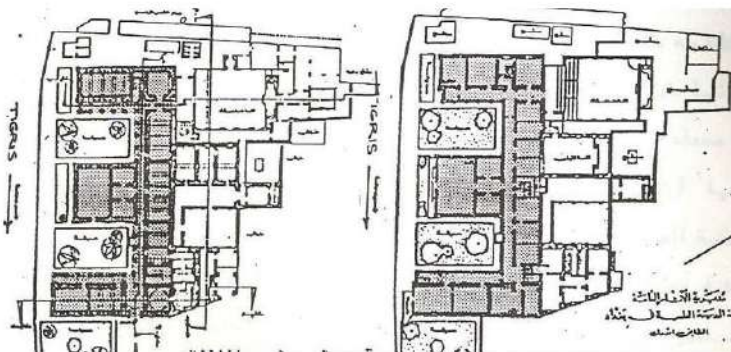


Fig. (4.17)



Fig. (4.18)

Fig. (4.17): - Aliya school in Baghdad in 1871 Ground floor & 1<sup>st</sup> floor, ,Source: Raof 1986.

Fig. (4.18): - Aliya School riverfront façade in Baghdad in 1871,Source: Photographed by the Author

Following the example of Aliya School, a new school was built called Rushdiya military school. It was orientated in the opposite direction of the river and has the same E shape plan like Aliya School with longitudinal along the external facade. The rooms distributed along a linear corridor on both sides. It was attached to Sulaimania Mosque and modified according to the border of the mosque parcel (Fig.4.19 a & b). The construction of the school together with the attached mosque and the post office on the opposite side enhanced the main axial public

street (AL-Mustansir street) connecting the castle within the old Sarai up to the market and also provide accessibility to Aliya school along the river. The school was built by Abd AL-Rahman Pasha<sup>92</sup> in 1879 as a military school and converted later with significant modification in design into a secondary school after the constitution of the Iraqi state.

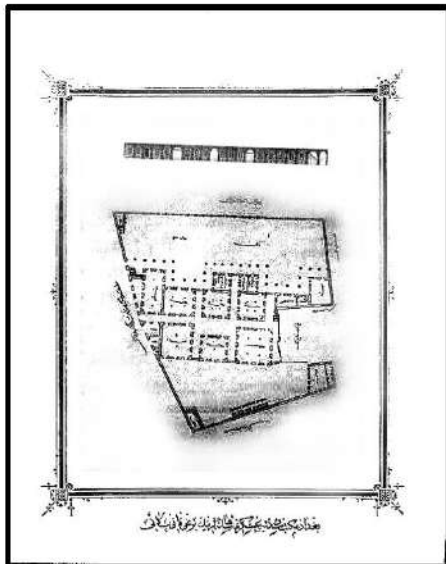


Fig. (4.19a)

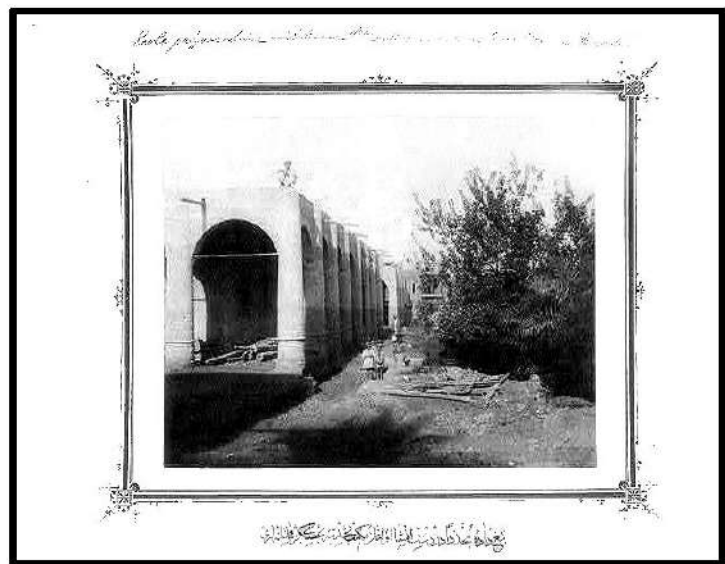


Fig. (4.19b)

Fig. (4.19 a,b): - Rushdiya military school, Source: Library of Congress <https://www.loc.gov> (accessed 15 Oct.. 2015)

The Ottomans later developed new types in constructing schools. They started to build typical primary schools within the region of Baghdad outside the old core. In Musseyeb south of Baghdad, a primary school was designed in 1902 to reveal a new type as found in the Ottoman archive. The building design was based on having a big open courtyard as a main space surrounded from three sides by an external fence where the main gate is located in line opposed to the building. The courtyard was directed to a small semiprivate space like Iwan from the fourth side that all classes overlooked on it (Fig. 4.20). Other schools were designed to be built in Baghdad in 1903 and 1904 to reveal that the whole building mediates the entire parcel and surrounded by an external fence. The design was based on having a main entrance directed to a big internal closed hall. The class rooms were distributed symmetrically

<sup>92</sup> See Biography P.431

on the sides of the hall by moving through a close end corridor which starts from the middle part that leads to the classrooms on both sides. The classrooms overlook on both the main internal hall and the external yard through vertical windows (Fig.4.21 &4.22).

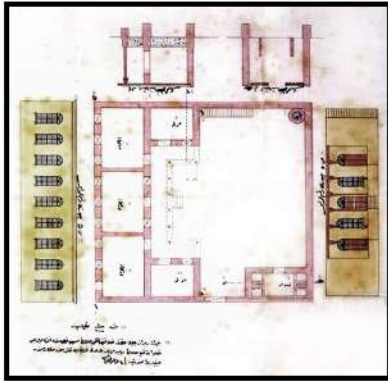


Fig. (4.20)

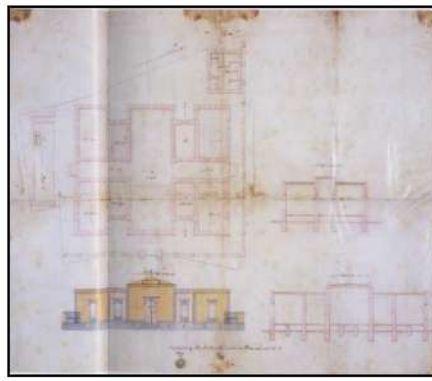


Fig. (4.21)

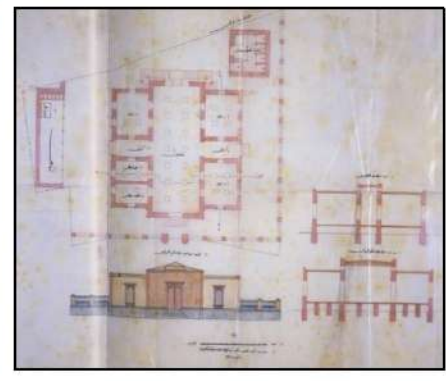


Fig. (4.22)

Fig. (4.20): - Musseyeb Primary school in Baghdad in 1902, Source: Ottoman Archive-Istanbul BOA.HH.THR 352-43.

Fig. (4.21): - Primary school in Baghdad in 1903, Source: Ottoman Archive-Istanbul BOA.HH.THR 352-44. Fig. (4.22): - Primary school in Baghdad in 1904, Source: Ottoman Archive-Istanbul BOA.HH.THR 352-44.

**Residential Units:** In Baghdad medieval city plan, the traditional courtyard houses are the prevailing type of the housing system; and this is the product of urban life in most of the Islamic cities. The majority of houses were built in the 19th century and they were formed in an accumulative and compact way of long series of an evolution process that occurred through decades and based on the old city structure. A detailed survey in the 1980 showed that less than 9% of the traditional houses belong to the period prior of 1869. The houses lined along narrow streets and distinguished by the wooded balconies. The City under the Ottomans declined too much in population and estimated to have only 18,407 houses, but this number increased significantly during the last years of the Ottoman rule due to the development in the economic sector especially after the construction of the railway system. The compact pattern of the residential sectors is attributed to the tendency of each house to be part of short defensive circle, taking the minimum required land to get always a better option for low rise housing (Fig.4.23). The compact system reduces the heat penetration to the dwelling unit and provides an adaptation to cope with the significant disparities in the daily temperature in both summer and winter seasons. The houses were not limited to be planned in regular plots, but they were shaped by certain constraints. The final product would fit together in a coherent

fabric in spite of the difference in size, shape and orientation of each unit, thus having a regular texture of the city (Warren & Fethi, 1982, pp. 28-29).



Fig. (4.23): - The distribution of residential units in compact urban fabric, Source: <https://www.loc.gov/pictures/item/2007675857/> (accessed 8 Sep.2018)

The courtyard as a private central space is considered the main object to control the received sunlight, ventilation and the physical communication. The rooms and other facilities were opened to the courtyard and sometimes the courtyard was doubled based on the house size (AL-Azzawi, 1984, p. 34). Many travelers described the houses during their visit to Baghdad when it was under the Ottoman rule. Carsten Niebuhr<sup>93</sup> in 1765 wrote that the city had houses with small square courtyard opened directly to the chambers. The houses were constructed by brick and looked unimpressive from outside with few windows. Another traveler, John Jackson, visited Baghdad little later and described the internal form of the houses. He vividly gave an image of the living habits in the house where people intend to sleep on the roofs in summer time to have cooler air. The ground level included the kitchen and main reception while other rooms were located on the second level which has a gallery supported by pillars. Another traveler, Tristram Ellis<sup>94</sup>, confirmed in the early of 19th century what other travelers described and showed that the style of the Houses is universally built with quadrangle form.

<sup>93</sup> See Biography P.432

<sup>94</sup> See Biography P.436



The courtyard house accommodates the hot and environment by having one or two rooms in basement, which can ensure a comfortable thermal degree in hot summer. The traditional houses in Baghdad are grouped in four categories based on the number of courtyards: one courtyard houses, two courtyard houses, three courtyard houses and finally four courtyard houses. The number of courtyards depends mainly on the economic power, social level and the number of inhabitants (Fig.4.24). The courtyard is always rectangular in spite of the irregularity in plots border. It was the main social space which provides the main circulation of movement and is considered the main source of light and ventilation. Due to the low number of wealthy inhabitants, one-courtyard houses were the majority in residential urban fabric in the old city of Baghdad ( (AL-Azzawi, 1984, pp. 57-58).

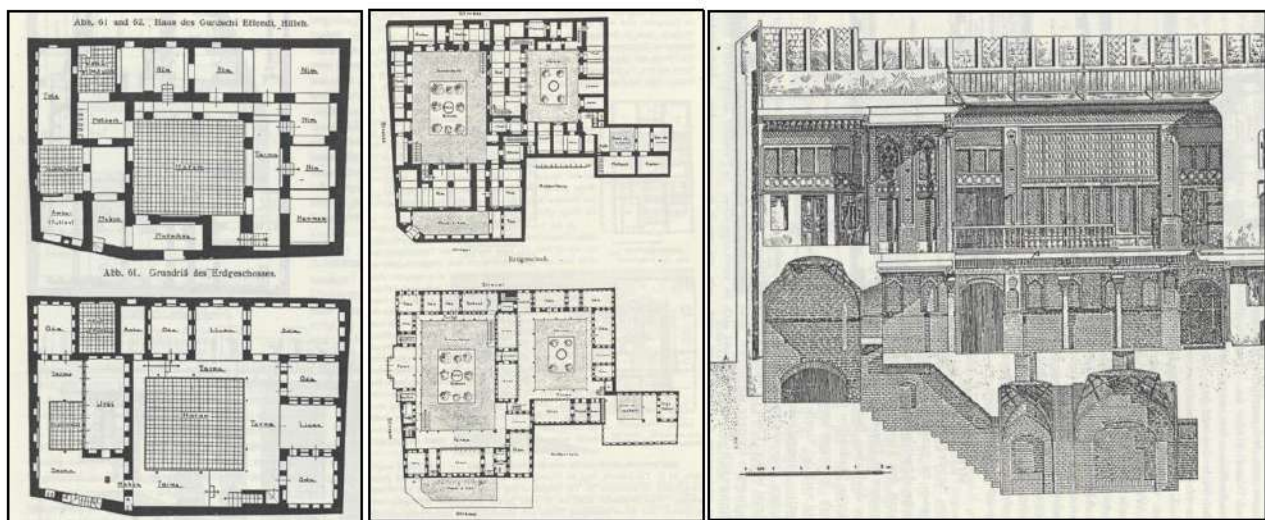


Fig. (4.24): - One courtyard house and two courtyard houses in old Baghdad, Source: Reuther Oscar 1910:28-29,36.

The houses in Baghdad could be divided also according to the size and number of inhabitants into large, medium and small houses. The rooms took almost the vestigial form to achieve a symmetrical arrangement in smaller and in irregular plots. The houses with long plots were divided into two parts facing each other through the courtyard. The other services like bathrooms and kitchens were located in the one of the house corners or under the stairs. The ideal courtyard locally called (Hosh) have more or less the shape of square with two opposed spaces facing each other: the first one is called Ursi and the other called Talar. Staircases near the domed vestibule lead to the second floor where the colonnaded corridor moves around the courtyard. The house form was based on the division between private zone which is used for family and the guest zone, and both are combined by lobby entrance called

(Mabain).<sup>95</sup> The lobby is connected to the entrance (Mejaz) and then to the narrow street outside the house. The entrance was bent or arranged in a way that guests could not see the courtyard from the doorway. In larger houses, the entrance could be a domed room separated from the internal parts with a locked door. One additional feature which distinguishes the Baghdadi house is the existence of colonnaded space that overlooks to the courtyard in the ground level called Tarma. The origin of this feature as shown by Oscar Reuther<sup>96</sup> could be found in the farmhouses in the countryside by having several rooms connected together by a semi enclosed space. This feature had also belonged to Hiri style<sup>97</sup> in Arab architecture. There are three types of Tarma space: The first one is located between two flanked rooms and one other room behind. The second type has two rooms behind while the third type is connected to an open space called Iwan which is placed between two rooms. The internal facades of Baghdadi house are more important than the external ones as the privacy is always highly concerned. The roof is flat which is sometimes used for sleeping and it is isolated by parapets from the attached roofs of the neighbors.

The vertical air channel is located through the external walls and is considered the main part that is used for cooling the habitable rooms and spaces in summer dry weather; it is also associated with thick walls attached to the next house wall. The compact urban fabric and the attached houses provide a better isolation for the ducts from the continuous heating via sun radiations and participate significantly in cooling the air that moves through. It has an upper outlet in roofs pointing to the north- west, according to the prevailing air movement and works to catch the hot air to the lower cold basement. Most of the houses have brick vaulted basement as an underground level. It has a living room and reception overlooking the courtyard as a main lighting source and it is air-conditioned through the air channels. The central courtyard houses are sometimes built either with one floor (ground floor) or with two floors associated with subterranean level. The first floor has wooden extension toward the alleyway called (Shanashil). This bay has an external view but at the same time isolated and not accessed visually by other street users. The grouping of these bays along the street provides a natural protection from the extensive sun radiation in summer and rainfall in winter. Most of the houses were built randomly by local craftsmen and renovated several times as result to frequent floods. The financial ability and the owner's wishes were the main factors in houses reconstruction after each flood period ( Al-Taie, Al-Ansari, & Knutsson, 2012). The construction materials were clay, bricks, gypsum and hay as binders. The same raw materials

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<sup>95</sup> According to the discussion with Dr. Sahir Alqaisi on 10 March 2016. Those houses were so flexible and designed on the basis of separating private rooms from the public ones. Many sectors from the big houses could be rented for people in the occasion times and they were well separated from the original or inhabitation.

<sup>96</sup> See Biography P.435

<sup>97</sup> Having central Iwan (space opened from one side) that mediated two rooms with gates on both sides.

like brick were used since the establishment of ancient Mesopotamia. The renovation process in the city started at the end of the Ottoman period due to the need of insert new functions to the city. The idea of the house has started to have another approach that copes with new urban structure represented by the new idea of public space (vehicular streets and plazas). The house of the Ottoman ruler, Jamal Pasha, along the river Tigris could be considered a good example that explains the new design concept. In this house, the idea of having external spaces began to spread and compete with the internal courtyard. They are designed to be in front of both external elevations from both sides along the river and the main street as private gardens. The internal courtyard in this house is surrounded by a colonnaded corridor that leads to the chambers from three sides while the fourth side is occupied by internal stair attached to the external side wall. It is obvious that the position of this stair in front of the main entrance is intended to create a kind of separation between both floors for privacy concern (Fig.4.25). However, the function of the (Shanashil) has slightly changed to be more decorative and lost its role to create shades and protect the city (Fig.4.26).

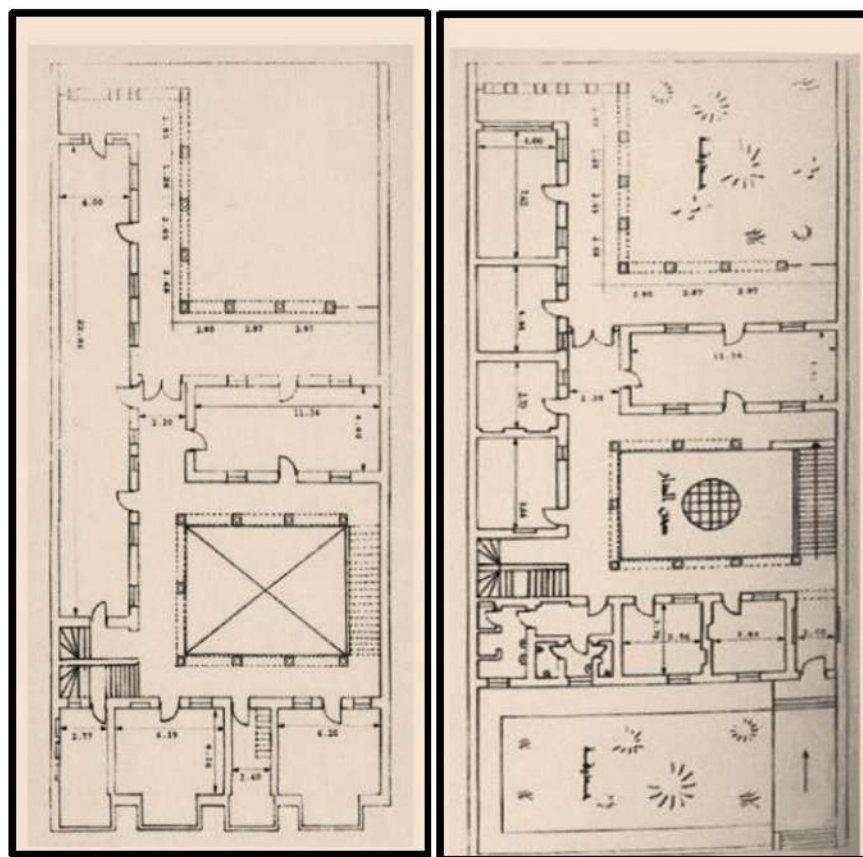
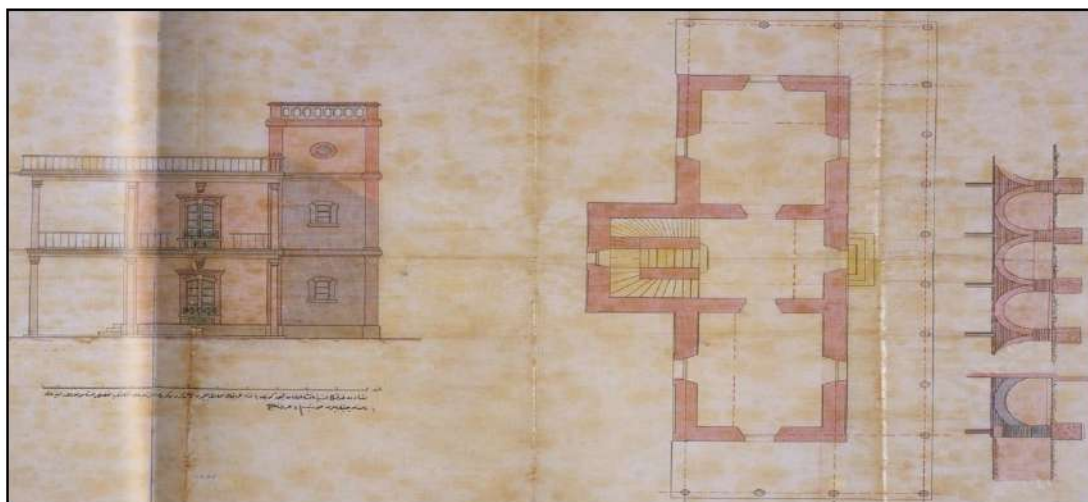


Fig. (4.25): - Jamal Pasha House-New housing type in Baghdad Ground floor, 1<sup>st</sup> floor, Source: Baghdad Mayoralty 2007.



**Fig. (4.26): - Jamal Pasha House-Shanashil as decorative element, Source: Photographed by the Author.**

Another house plan was found in the Ottoman archive showing a new houses type. It was designed as a guard's residence near Hir bridge in 1898 outside Baghdad old core. It shows the tendency to include new design approach by neglecting the courtyard totally and substituted by an external arcaded space surrounded the house façade from three sides. This house also disclosed the need to have a new idea of special housing for workers (Fig.4.27).



**Fig. (4.27): - Guards residence near Hira bridge in 1898,Source: Ottoman Archive-Istanbul BOA.HH.THR 299- 3.**

The Ottoman design and construction of buildings started to be affected directly by the European style through importing the architectural details in facades and adopting the new

ideas of the relation between the internal and external space. The cooperation between the Germans and Ottomans at the end of the 19th century and the beginning of the 20th century participated significantly to import many building types to the city of Baghdad. One of these types was the tendency to build modern houses in Baghdad (Fig.4.28). The four external façades for the houses started to be more important than the internal courtyard which became smaller or sometimes disappeared. The whole circulation inside the house was modified by following the corridor as a main distributor toward the private rooms instead of the courtyard. The hierarchy of space between the dwelling units and the vehicular streets outside were changed by reducing the privacy concern in movement from public streets toward the residential units. The new houses started to be more representative to show their facades along wider and more straight streets and the external, not the internal, spaces became the main gathering place.

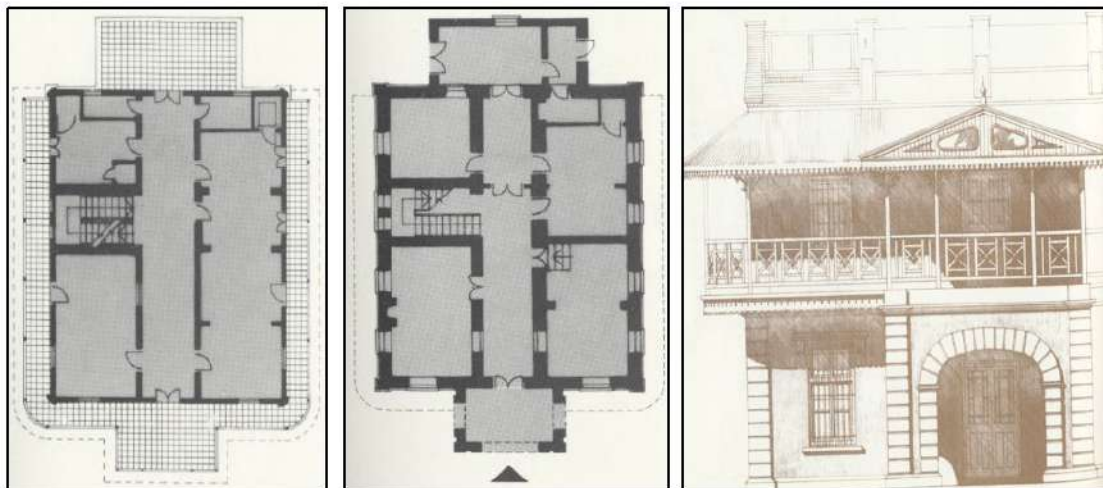


Fig. (4.28): - The German house. 1st floor, Elevation, Source: Amanat AL-Assima:70,71.

**The religious buildings:** - The old city of Baghdad had many mosques that were constructed during the rule of the Ottoman Empire period and each mosque played a big role in forming each city neighborhood and the entire city network. Indeed, these mosques are of four types: The first type represent the shrines which have been the cornerstone in forming the city neighborhoods, like AL-Gailani shrine and mosque (Fig 4.29). The second type represent the most public and big mosques normally located along the main public arteries and not far away from the market and the government buildings like AL-Ahmadiya mosque (Fig.4.30). The third type are the neighborhood mosques located along the main and secondary arteries that connect neighborhoods with each other. The fourth type are the local mosques located within the residential blocks. It was also estimated that 42% of the listed mosques in old Baghdad are built on tombstones of famous clerical figure. The function of mosques does not stay with

religious tributes but has extended to include social, organizational and political duties and missions.



Fig. (4.29)



Fig. (4.30)

Fig. (4.29): - Gailani shrine in Baghdad (Grand mosque) in 1914, Source: <https://www.alamy.com/stock-photo-first-published-1914-sheik-abdul-kadir-mosque-baghdad-47512894.html> (accessed 12 Aug.2018).

Fig. (4.30): - AL-Ahmadiya mosque within the main market artery in Baghdad, Source: <https://www.loc.gov/item/2019706771/>,(accessed 8 Sep.2018.)

The mosques are headed southwest facing Mecca (Qibla: the praying direction). The mosque design maintained the main principles of having an open courtyard and the main prayer building with niche and pulpit located at the southeast corner. A portico with arches is always used as a gathering space in front of the prayer zone. The prayer zone is normally rectangular covered by arcaded roofs and main big dome like in Haidar Khana mosque along AL-Rasheed street (Fig4.31 &4.32). The minaret is located on one of the prayer corners and in Iraq it has a cylinder shape based on octagonal base and end with one circular balcony except for AL-Asifi mosque which has two balconies. Those balconies are ornamented with Muqarnas while the summit of the minarets has mostly fluted cupolas. The mosque domes have different forms and range from pointing type, shallow, raised on a drum, to the conical one and covered by tiles with turquoise color and some of them are ornamented with geometric or foliated forms. Most of the mosques have public water fountains which may be normally adopted from Roman or Hellenistic tradition. Most of local mosques in Baghdad have no external elevations and small mosques could not be easily distinguished from the ordinary houses yet the big mosques are rather different (Fathi, 1977, pp. 402-406). The tombs are surrounded by glazed bricks with Kashani<sup>98</sup> and could be distinguished from the normal mosques. There is no obvious main Friday mosque in the city and this may belong to the competition among many mosques built in different periods. However, AL-Gailani mosque is still considered the biggest and has a

<sup>98</sup> A glazed tiled of bricks spread in Iran and named Kashi or Kashani

saintliness position for the inhabitants. The majority of mosques in Baghdad belong to the Ottomans while some others were influenced by Persian tradition or kept the original Abbasid style (Fathi, 1977, pp. 391-395).

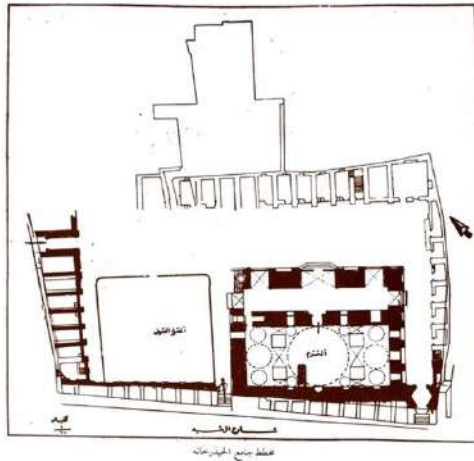


Fig. (4.31)



Fig. (4.32)

Fig. (4.31): - Haider Khana mosque within the Al-Rasheed street in Baghdad, Source: Mayoralty of Baghdad Archive.

Fig. (4.32): - Haider Khana mosque within the Al-Rasheed Street in Baghdad, Source: <https://www.loc.gov/item/2019702743/>, (accessed 8 Sep.2018).

Other religious buildings like churches and synagogues participated to provide coherence to the urban fabric within the city; they, in other words, are looked at as one of the main urban components that have shaped the urban structure of the city. Churches were concentrated in two areas: the first is within the Shorja market area adjacent to the Christian residential quarter. There are already three important churches located in this rather commercial area. The first important church is the Syriac catholic church built in 1841 with decorated facades. The internal hall has big and high windows and vaulted roof with skylight. The second is called the “Lady of Sorrow” which overlooks on some external courtyard attached to priest houses. The church is also built with vaulted roofs and big windows (Fig.4.33). The third church is the Latin Church<sup>99</sup> with 32 m height and a big dome that stands parallel to AL-Khulapha mosque minaret<sup>100</sup>. Amazingly, the existence of the Church Dome and the Mosque Minaret in adjacent areas nicely forms the urban scene in Old Baghdad and reflects a high degree of religious tolerance and not competition (Fig.4.34). The second position is in Maidan area where Church of Virgin Mary is located within the residential neighborhood and has been renovated many times in the 20th century. On the other hand, the Synagogues are located in Tawrat quarter, yet almost all of them have deteriorated after the Jewish immigration.

<sup>99</sup> The Latin Church was built in 1866 located near Suq AL-Gazil Market.

<sup>100</sup> The minaret is the only trace that was remained from the historical Abbasid mosque that mediated Shorja market artery.



Fig. (4.33)



Fig. (4.34)

Fig. (4.33): - Lady of sorrow church near Shorja market, Source:

<https://www.mesopotamiaheritage.org/en/monuments/leglise-om-al-ahzane-mere-des-douleurs-de-bagdad/>, (accessed 10 Dec.2018).

Fig. (4.34): - Latin church dome combined with AL-Khulapha minaret, Source: (Photo Paszkiewicz Family) <https://www.nickmetcalfe.co.uk/iraq-photo-36-baghdad-panorama-november-1942/>, (accessed 10 Dec.2018).

**Barracks and Castle:** - The city started to develop military functions like barracks and military fabrics after the compulsory military law in 1869 ( (AL-Ashaab, 1974, p. 209). There were four types of the military and administrative buildings in Baghdad. The first type is the city castle inside the old city which was the main military centre for the whole city and currently substituted by the assembly of the Ministry of Defense. It is considered the main internal fortification for the city. The castle is located at the northwest corner of the city and bordered by the city wall and AL-Mudham Gate from the north, the riverfront area from the west, and an internal wall from south and east attached to several retail shops overlooking on Maidan. The castle was surrounded by a deep ditch and supported by towers. The external towers had a rectangular shape while the internal towers had the shape of half cylinder. The castle was destroyed through the construction of the Ministry of Defense assembly and now only a part from the external wall remains standing is located within the assembly of Ministry of Defense and attached to AL-Shaab Theater. In Baghdad plan of 1854, the castle used to include many functions like prisons attached to the eastern wall along Maidan and two tombs as main focal points in the north along the original city wall. The main entrance to the main Sarai street which is now called AL-Mustansir street starts from the corner between the southern and the eastern side of the wall within the area of AL-Ahmadiya mosque. It passed first through a roofed market located within a recreational area. The main entrance kept its position also in the plan drawn in 1916. This part of the city is considered the main governmental zone and kept its position and role within city up to the modern phases of Baghdad.



The military buildings occupied the area attached to the wall and along the riverfront area with small military fabric. There were two buildings attached to each other with very small courtyards, probably for security reasons. This cluster occupied a large area from the barrack; perhaps they were used by the army leaderships as main administrative centre and military leaderships. Meanwhile, by looking at the Baghdad plan of 1912 and 1916, a big barrack building is located out of the wall as a second type of military and administrative buildings (Fig.4.35). It had a rectangular shape surrounded by palm orchards with big internal courtyards used for training purposes. The entrance is located in the middle leading to the training court which is surrounded by one and two storey buildings with some additional parts as noticed in the outstanding small buildings with domes in the memorial picture (Fig.4.36). The built-up area is considered less than the area of the courtyard in order to provide sufficient space for the army activities. Outside the city there was a training German military school to teach firearms shooting to new recruits (Frederick & Margaret, 1914, p. 556). The Qushla is the third main building used as a camp for the Ottoman soldiers and later become very important administrative building after the Ottoman rule. The building is located along river Tigris, and firstly was built in 1850 with one storey and closed courtyards as shown in the Jones Plan of 1854 (Fig.4.37). Another storey was added in 1869 by Midhat Pasha. The façade is about 200 m along Sarai street and built by brick with colonnaded courtyard in the middle. In 1912 plan it is obvious that the construction along the river was removed and the L shape was the final result with a monumental clock tower (Fig.4.38). The building has a main entrance in the middle of wall façade roofed by half circular arch. The internal walls are supported by half cylinder towers while the external has rectangular towers, like in the castle wall (Fig. 4.39). The colonnaded corridor is considered a transitional space between the chambers and the open courtyard that overlooks directly toward the river. This building with Aliya school showed the tendency to change the type from closed courtyard to semi-open one with more orientation toward the river (Fig.4.40). Another administrative building of Sarai, attached to Qushla, has occupied a rectangular lot of land and engulfs many functions used by the Ottoman rulers. Sarai has a big arcaded entrance with internal corridor connected to the other building parts. The building has inward looking plan with balconies that stand on wooden columns and it was used as almost a pulpit to deliver the speech of the rulers yet it was transformed like Qushla to be opened toward the river by removing many parts during following decades.

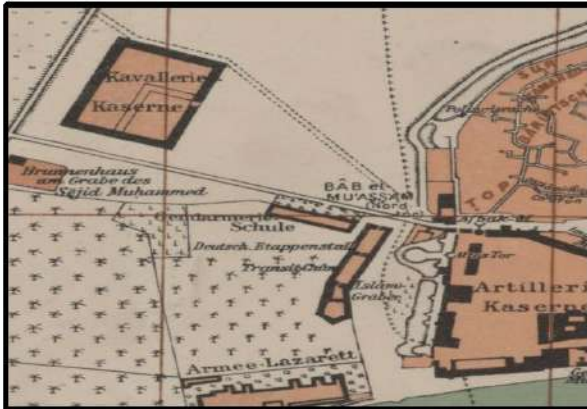


Fig. (4. 35)



Fig. (4.36)

Fig. (4.35): - The location of military barrack in 1912 map, Source: Berlin City Library SBB\_IIC\_Kart. 892.  
 Fig. (4.36): - The military barrack outside the wall, Source: The National Geography Magazine 1914.



Fig. (4.37)



Fig. (4.38)

Fig. (4.37): - The location of Qushla in 1854 map draw by Alex Jones, Source Berlin City Library SBB\_IIC\_Kart. 888.  
 Fig. (4.38): - The location of Qushla in 1912 map, Source: Berlin City Library SBB\_IIC\_Kart. 892.



Fig. (4.39)



Fig. (4.40)

Fig. (4.39): - The main entrance of Qushla, Source: <https://www.loc.gov/item/2019706778/> (accessed 8 Sep.2018).  
 Fig. (4.40): - Qushla, with Aliya school directed toward the river, Source: The Mayoralty of Baghdad Archive.

**Industrial and trade buildings:** - At the end of the 19th century and the beginning of the 20th century, the city started to develop an industrial area in the fringe belt and in some area inside

the city wall. The area of Abba-Khana near Said Sultan Ali mosque is considered the main industrial zone attached to the residential neighborhood and developed to place both the military textile fabrics and later the electricity station. New Chimneys started to mushroom near the mosque minarets later and they represent new elements in the city skyline (AL-Ashaab, 1974, p. 210). The Area of Abba-Khana is situated along Al-Rasheed street to ensure accessibility within the other city parts and the river. The new development was a good potentiality to develop new quarters around the area and make the new industrial landmark in the city. Another fabric for military purposes is located within the city castle along the riverfront area. This fabric has less effect on the surrounding area. It has an L shape plan form as a main building type heading to the west direction. Other small fabrics are found with E shape plan following the Ottoman buildings type like the German fabrics in Al-Rusafa and the ships fabrics in Al-Karch. Other areas started to develop gradually to adopt new functions like press and printing area near the official offices and schools in Hasan Jadeed Pasha quarter near Qushla. The bank industry near the bazaar area was also initiated as part of trade development at the beginning of the 20<sup>th</sup> century. Many light industries like jewelry, textile, carpentry still occupy the old bazaar and the adjoining area.

**Tram and Train stations:** -The tram station is one floor building and has two garages with arcaded gates (Fig. 4.41). The Germans lined a new Baghdad- Berlin railway truck and established many facilities and functions in order to have a better integration with other city parts. The Baghdad main station is considered one of the important buildings that reflect the German way in designing the train stations. The building is located in the western part of the old city to the south of the city wall. It represents the first building type that is based on using curvature form (Fig.4.43& 4.44). The truck line branches to the harbor toward Tigris river and to Sammara<sup>101</sup> from the other side as a part of the whole line structure. Berlin-Baghdad railway sub stations were added as new building types by having rectangular buildings constructed by brick and roofed by triangle steel panels (Fig.4.42). Those stations outside the city wall are regarded as a potential trial that participated in changing the planning approach and in developing the city. Some of the buildings like Taji and Mashahda <sup>102</sup>stations used the traditional types in having an internal courtyard where all rooms and facilities overlooked on it. It is thought that the Germans used the Ottoman details in train stations due to the closed contact with the natural and physical environment during the construction of Baghdad- Berlin truck line (Abd Ali, 1987, p. 70)

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<sup>101</sup> Sammara located 125 north of Baghdad.

<sup>102</sup> located out of the old city core to the direction of the north.

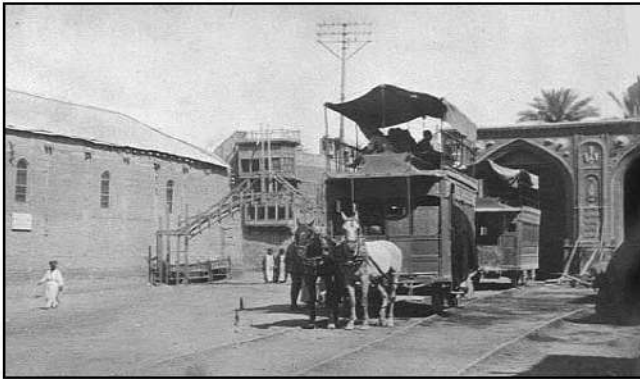


Fig. (4.41)

Fig. (4.41): - Tram way without roofed area,Source: <http://www.tramz.com/tva/iq.html> ,(accessed on 14 Nov.2017).



Fig. (4. 42)

Fig. (4.42): - Baghdad rail station,Source: <https://www.agefotostock.com/age/en/Stock-Images/Rights-Managed/MEV-10423408> ,(accessed on 10 Feb.2020).



Fig. (4.43)



Fig. (4.44)

Fig. (4.43): - Baghdad main station in 1917 map,Source: Iraqi national Archive.  
Fig. (4.44): - The location of Baghdad main station in 1912 map,Source: Berlin City Library SBB\_IIC\_Kart. 892

Two kinds of ships were found in Baghdad. The first one, called Guffah, had a 6 feet circular basket coated with bitumen and used to float people and agricultural products to the other bank of the river (Fig.4.45). The second type is the Kelek that is made from inflated goatskins and covered with straw mats and used to carry goods from the other cities along the Tigris river ( (Frederick & Margaret, 1914, p. 546)). The Ottomans developed a shipping fleet from Baghdad to the Arabic gulf for goods transfer in addition to some British companies such as Lynch House Company which was operated in Tigris river (Fig.4.46).



Fig. (4.45)



Fig. (4.46)

Fig. (4.45): - River small boats (quffa )in Tigris in 1914,Source: <https://www.gettyimages.com/detail/news-photo/men-and-children-watch-as-a-man-weaves-a-very-large-basket-news-photo/514907644?adppopup=true> ,(accessed 8 Sep.2018).

Fig. (4.46): - Lynch brothers shipping company,Source: Iraqi national Archive.

**International Diplomatic area:** - Baghdad, during the mid of the 19<sup>th</sup> Century, enjoyed a prestigious position among the neighborly capitals due to the commercial prosperity and political coherence and settlement. Accordingly, many international states such as German, British, American and French had been inaugurated to consolidate the diplomatic, trading and foreign relationships with Baghdad. Therefore, the construction of the railway truck to link the East with the West would serve this purpose (Frederick & Margaret, 1914, p. 556). In the plan of 1854 there were two residencies, the French and the British, which were located along the river far away from the governmental area and these residential houses were surrounded by orchids and residential neighborhoods. The British residency is also found in the plan of 1912 along with other residencies like German, Hungarian, American along one side of AL-Rasheed street and they were overlooking on the river from the other side near the South Gate (Fig.4.49). AL-Rasheed street deviated and loosed its linearity providing more accessibility to the diplomatic area along the river. The British residency kept its position by a change in building type probably due to the change in function to hospital as indicated in the plan and then to costume building as indicated in the memorial photos (Fig.4.50). The new British residency occupied another part of the city in Kuraimat quarter and located in the area that was occupied by the Red Cross as written in the of map 1912.



Fig. (4.47)

Fig. (4.47): - The location of British consulate in Baghdad in 1912, Source: Berlin City Library

SBB\_IIC\_Kart.892.

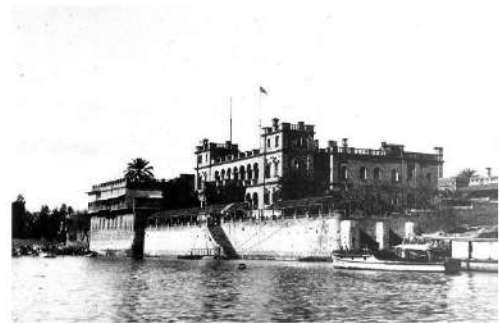


Fig. (4.48)

Fig. (4.48): - British consulate in Baghdad, Source: <https://roomfordiplomacy.com/baghdad-before-1958-test/>, (accessed 17 Feb.2019).

**Hospitals:** - In the middle of the 19<sup>th</sup> century a new hospital called AL-Gurba was found that was built by Midhat Paha in 1869. The hospital form followed the same Ottoman type in having outward looking plan with E shape like in Aliya school. This hospital was used later as an imperial school as shown in Fig (4.49 & 4.50). This kind of building type was repeated and used for multi functions due to its simple and flexible form that could occupy a small area with symmetrical distribution for the internal chambers. Another hospital, called Majidiya, was founded outside the North Gate of the city (Fig.4.51 & 4.52). This hospital is a new type of having a specific well designed building that can cope with many hospital specific sections. The hospital included many parts and occupied a large area in longitudinal form. Building outside the wall allows more flexibility in size, orientation, adding functions and variation in architectural details. The hospital showed that the buildings orientation was not only tracing the river but tracking the main roads and monuments as the hospital was located in front of the north gate parallel to the wall.



Fig. (4.49)

Fig. (4.49): - AL-Guraba Hospital estimated between 1869-1917, Source: - Iraqi national Archive.

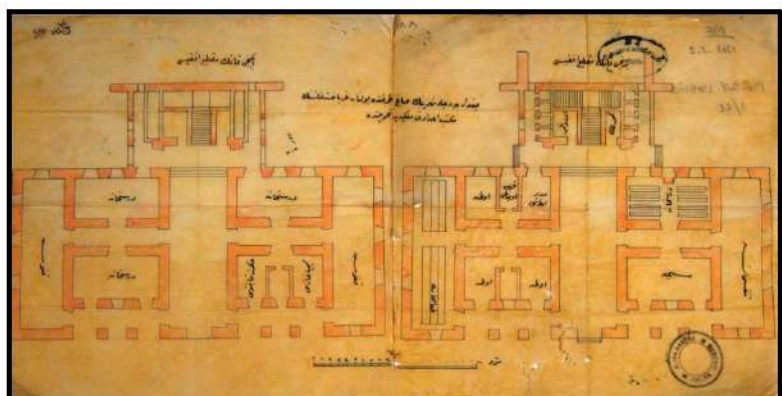


Fig. (4.50)

Fig. (4.50): - AL-Guraba Hospital estimated between 1869-1917, Source: Ottoman Archive-Istanbul documented by Dr.Fazil Bayat.



Fig. (4. 51)

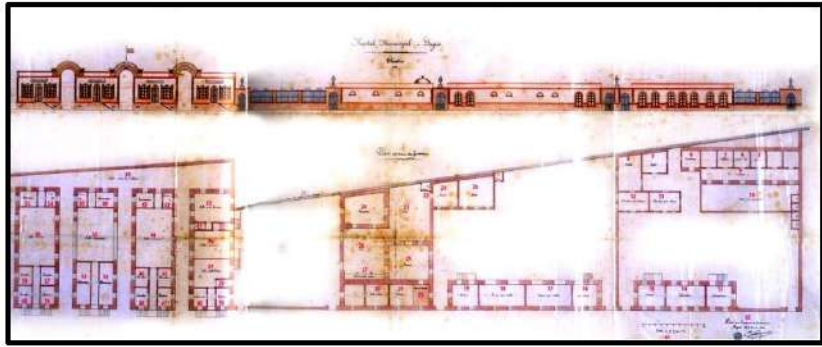


Fig. (4. 52)

**Fig. (4.51): - AL-Majidiya Hospital in 1900, Source: <https://www.iraq-archive.com/-160515881575160716101585-1575160415711591157615751569-16081575160416051587157815881601161015751578-16011610-157516041593158515751602.html> (accessed 17 Feb.2019).**

**Fig. (4.52): - AL-Majidiya Hospital plan in 1900, Source: Archive-Istanbul BOA.HH.THR 285-1.**

**Post office:** - A new post office was constructed in front of Aliya school as a part of creating a modern cultural and governmental complex for the city. The Post office was closed from all sides with only front facades that have several arcaded windows and one arcaded gate in the middle. The type is different by having skylight instead of internal courtyard with many openings to the façade (Fig.4.53). A new type of having a big dome used as private bath for Basha (The Ottoman ruler) was found in the city in front of Sarai called Hamam AL-Basha as shown in Fig. (4.54).



Fig. (4.53)

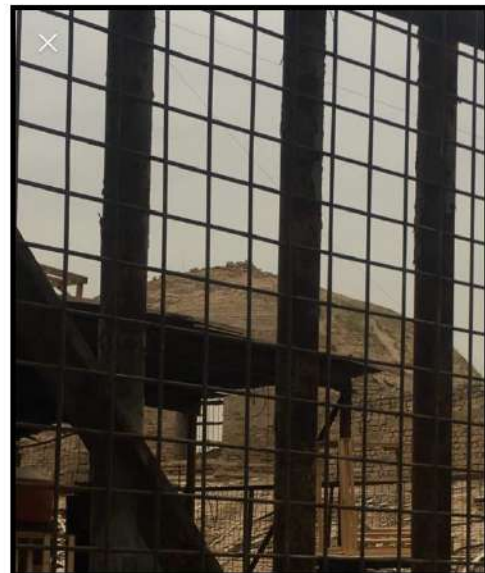


Fig. (4. 54)

**Fig. (4.53): - The Ottoman Post office, Source: Photographed by the Author.**

**Fig. (4.54): - The Ottoman bath (Hamam AL-Basha), Source: Photographed by the Author.**

#### 4.1.4 Urban Innovations

- 1- In 1909 the Germans lined up a railway track from Baghdad to Samarra and in 1918 a new metric track was lined to Hilla in the south of Baghdad. In the western part of the city, a train service as a new mode of transportation, was introduced connecting the city within other regions and states as part of the Berlin - Baghdad train (Fig.4.55, 4.56,4.57). The main station is located far away from the city wall and is connected directly to the river Tigris which has a port for goods transportation through big ships. This river connection tends to improve a revolutionary and innovative development in shipping goods on board of big ships run by British companies in the middle of the 19<sup>th</sup> century (Fig.4.58 & 4.59). It is possible to believe that the need to line railway network is the basic reason to demolish the western part of the city wall. The location of the port in AL-Krach was opposed to the British Consulate along the river in AL-Rusafa with a straight visual axis that created a transport line which could lead to the main roads heading to AL-Gailani shrine.

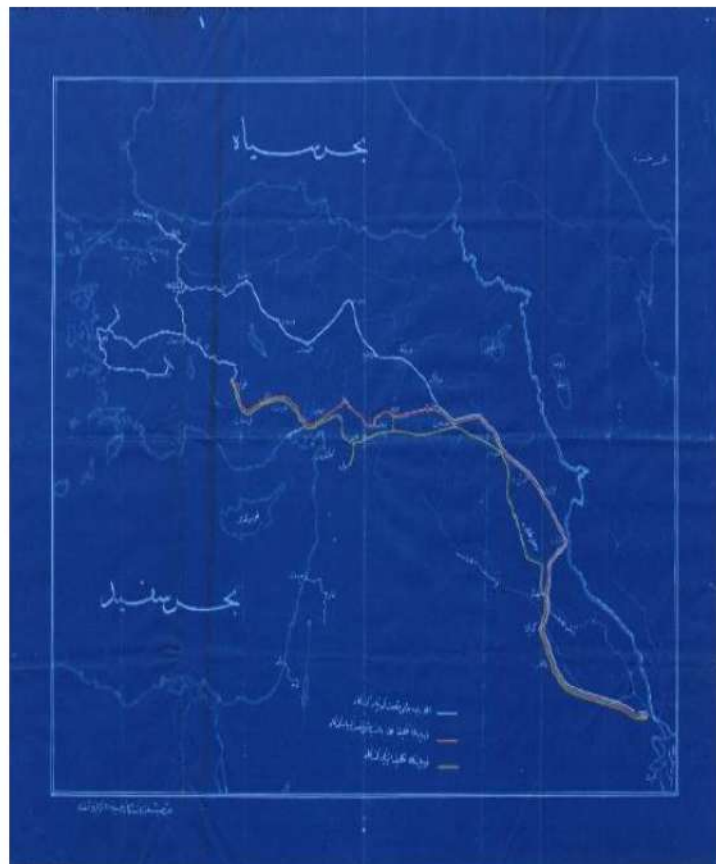


Fig. (4.55): - Baghdad-Berlin railway plan, Source: (BOA.HRT. 1614/2/ 2-4-1911).





Fig. (4.56)



Fig. (4.57)

Fig. (4.56): - Baghdad-Istanbul railway Contract in 1902,Source: Ottoman Archive, BOA.A.DVN.MKL.34/7.

Fig. (4.57): Baghdad-Berlin railway between 1900-1910,Source: American Colony (Jerusalem) <https://www.loc.gov/item/2019694966/> (accessed 8 Sep.2018)



Fig. (4.58): - Steamship in Tigris in 1918, Source: (R. E. , 1923)

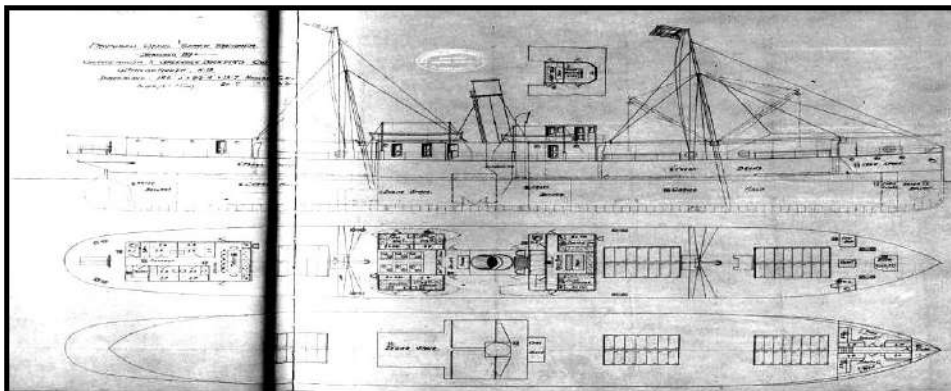


Fig. (4.59): - Steamship designed to run in Tigris in 1904,Source: Ottoman Archive-Istanbul BOA.HH.THR 278-27.

- 2- Another connection that was innovated inside the old fabric was the tram line that penetrated the historical part starting from the main station in Al-Karch and located not far from bridgehead and headed toward AL-Kadhimiya in parallel to the river. This tram was initiated to cope with the increased number of visitors to the shrine city in north of Baghdad. Tram line is extended about 7Km length parallel to the river and ended in AL-Kadhimiya near the Istarabadi market. Being a significant innovative transport tool in the city, the tram line generated a new function that affected the building types of the city by adding new basic infrastructures affiliate to the tram line such as stations, maintenance workshops and other related services centres. This innovation later provided the potential to have many new facilities on the river frontage area. The tram, it is believed, is considered the first direct and hard intervention in the urban fabric which caused a severe demolition of housing blocks between the bridge and the new hospital (AL-Guraba). The construction of the track split the residential fabric from the river frontage area. This process resulted in concentrating all public buildings along the river as in the eastern part of the city. The line was single at the beginning and was doubled only in the middle of the track to avoid intersection between the ascending and descending carriages. Moreover, the existence of both shrines in AL-Kadhimiya and AL-Adhamiya worked as big potentials to develop the inner city on both sides and later the surrounded area. The location of the tram near the old bridge in Al-Karch was probably chosen to provide accessibility for the majority of people who live in the eastern side and to give a new potential to extend the public area to the other side of the city. The tram encouraged the willing to have another connection to AL-Adhamiya as a main religious pole near Baghdad opposite to AL-Kahimiya on the other river side. A document from Ottoman archives reveals that a new tram was suggested to be built connecting the Eastern part from North Gate to AL-Adhamiya. These trams had possibly initiated the first attempt to have a wide connection between the central administration and commercial core to both religious poles and reflected the idea of having extension to the North part of the city on both sides (Fig.3.60). The tram construction also reflects the willingness to invest locally rather than externally by foreign companies which had already left its imprint on controlling the shipping service by steam boats which sail from Baghdad to all parts of the country via Tigris and Euphrates rivers thus transporting goods and passengers.

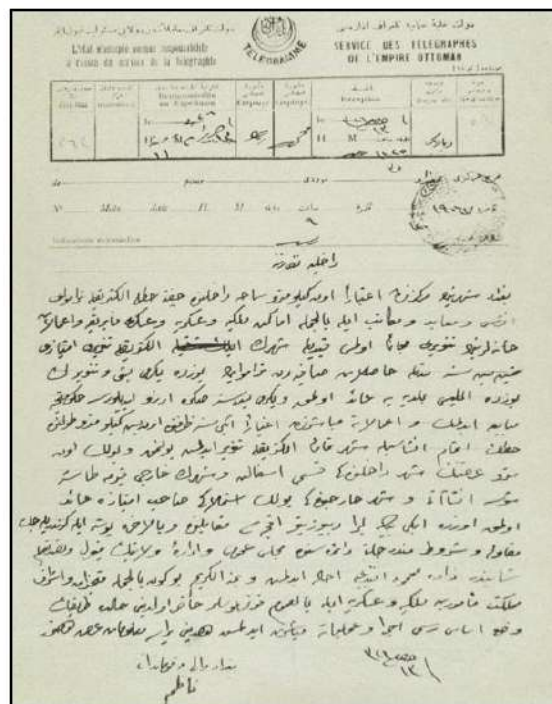


Fig. (4.60): - Tram construction consent to AL-Adhamiya, Source: Translated from Ottoman archive by IRCICA 2008:74,7.

- 3- The Ottomans were so interested in building many dams and barriers along the Tigris and Euphrates rivers using new structural solutions. At the beginning of the 20<sup>th</sup> Century the Ottomans started to build dams and water barriers on the Tigris sector in Baghdad. Those construction works contributed to controlling the water level in the annual flood time, allowing the possibility of growth outside the wall border. New public buildings therefore grew along the main road towards AL-Adhamiya adjacent to the northern gate. The new palace outside the castle influenced many that are located outside the wall. In spite of the significant interventions as a result of the new constructions, the city kept, more or less, its form and shape with little extension outside the city wall along with infilling the voids and spaces inside the built-up area. The reason behind the infill process inside the city instead of the expansion outside could be referred to the existing of many vacant lands and private orchards in spite of having many cemeteries and tombs that belong to Muslims, Christians and Jewes attached to the wall. In the Western part of city (AL-Karch) more extension was done to the west up to the traces of the old wall trace which converted later to main ring road around the built-up settlement and surrounded by the rail track.
- 4- The New artery was used mainly to facilitate the movement of the military troops in more flexibility and less hustle through the city. It has an extension to connect

the city through the north gate to AL- Adhamiya where Abu Hanifa shrine is located and to the green orchards to the South through the east gate .The new artery motivates the creation of other sub arteries to serve the governmental area. It was also suggested to extend new road from the area between AL-Qushla and the Aliya Military School up to the new artery (AL-Rasheed street) following small sub traditional arteries that were broadened later to construct the street. This could be seen obviously in the dotted line in the plan found in 1912 as a suggestion which was constructed few years later.

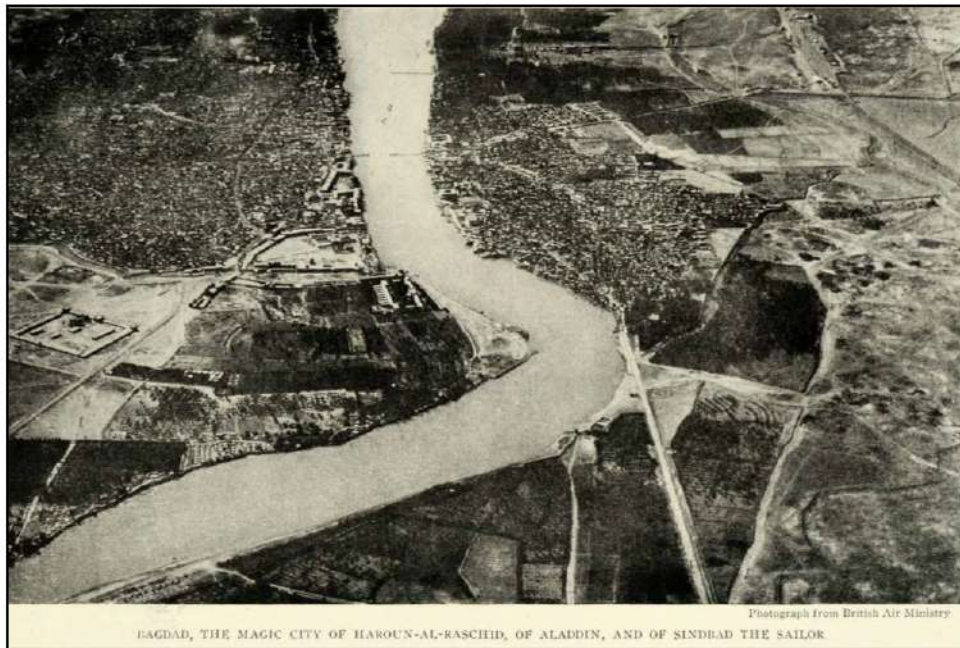
- 5- The communication service, on the other hand, was rather developed to cope with the development of transportation. This was mainly done through telegram lines and post office as seen in the plan of 1917. The telegram line passed through the castle and across the river to extend to both Sulaymania region in the north of Iraq through AL-Rusafa area and to Falluja through AL-Karch. The post service was introduced for the first time by having an official building within the governmental assembly.

## **4.2 The Transformational Process in the Colonia Decade and the Advent of Royal Rule (1917-1936)**

Urban growth stagnation during the Ottoman rule started to be skipped gradually (see the aerial photo of Baghdad in 1921) for the benefit of alteration from the medieval semicircular pattern that had been shaped through several decades to linear growth (Fig.4.61). The city left the provincial structure to adopt more functions, expansion and activities as a capital of the Royal Iraq with significant British influence (AL-Ashaab, 1974, p. 254). Modern planning ideas were introduced in the expanded area during this period like the gridiron network inlaid with garden city approach (Alsiliq, 2008). The city started to adopt new building types inside the old core and fill the blanks that were occupied by orchards and arable lands (Fig. 4.62 & 4.63). A detailed map, found in the Iraqi archives, shows only small parts of the new structure in 1936 as the other main parts of the other plans for were lost in the war (Fig.4.67). Those maps show the tendency to extend the city out of the wall in both north and south directions in compared to the plan found in 1921 in the British Archive (Fig.4.66). A comparative analysis was done to explore the development in the urban landscape at this time interval by overlapping the above mentioned maps reaching to have morphological plan as shown in (Fig.4.68).

### 4.2.1 The Change in The City Network Structure

It was obvious in the morphological plan in (Fig.4.68) that the new urban structure filled the vacant plots and orchards especially in the southern side of the city and started to surround the whole old core. A new break through street (AL-Kifah Street) was penetrated inside the structure of the old fabric, parallel to AL-Rasheed Street, but from the other side of the city far from the river and participated to enhance the centrality of the old core as the main civic centre for the whole city. The first perpendicular street was start from AL-Rasheed street that was constructed in vertical direction towards the river to connect AL-Rasheed Street to the bridge and to the other part of the city (AL-Karch) as a first step and then used to connect AL-Kifah street to the other side, hence establishing the first physical barrier to separate the old fabric on the East-West direction as seen in (Fig.4.64& 4.65). Another street was also constructed from AL-Kifah street to the riverfront area through AL-Rasheed street at the point where it became closer to the river as seen in the plan of 1936. Those two streets were constructed to link the city to AL-Karch across river Tigris through two fixed bridges that were under construction in the period from (1936 to 1940). As shown in 1936 plan, both float bridges existed then were moved far away from their original positions because of the construction work for those bridges. The first one moved to Qushla place and the other moved to the south. The old and new streets had been integrated together to create a movement within the old core. The new artery AL-Kifah street penetrated the private neighborhood and had more impacts on the residential neighborhoods than AL-Rasheed street most of whose pathway was passed already through an old public area. Many documents like AL-Aashaab 1974, Fathi 1977, Pieri 2008 and others have mentioned that there was a master plan prepared by German engineers but there is no evidence or any documents to prove this fact, neither in German Archives or German National Library nor even in the Iraqi Archives. The only plan found was done by the British and called (The New Baghdad) as mentioned in chapter two.



PHOTOGRAPH FROM BRITISH AIR MINISTRY  
BAGDAD, THE MAGIC CITY OF HAROUN-AL-RASCHID, OF ALADDIN, AND OF SINDBAD THE SAILOR

Fig. (4.61): - Baghdad Aerial view in 1921, Source: <http://modernbaghdad.tumblr.com/post/130395111584/aerial-image-of-historic-baghdad-c1921> صورة جوية - (accessed 26 Dec.2018).



Fig. (4.62): - Baghdad aerial view in 1924, Source: <http://www.combatreform.org/colonialairpower.htm> , (accessed 26 Dec.2018).

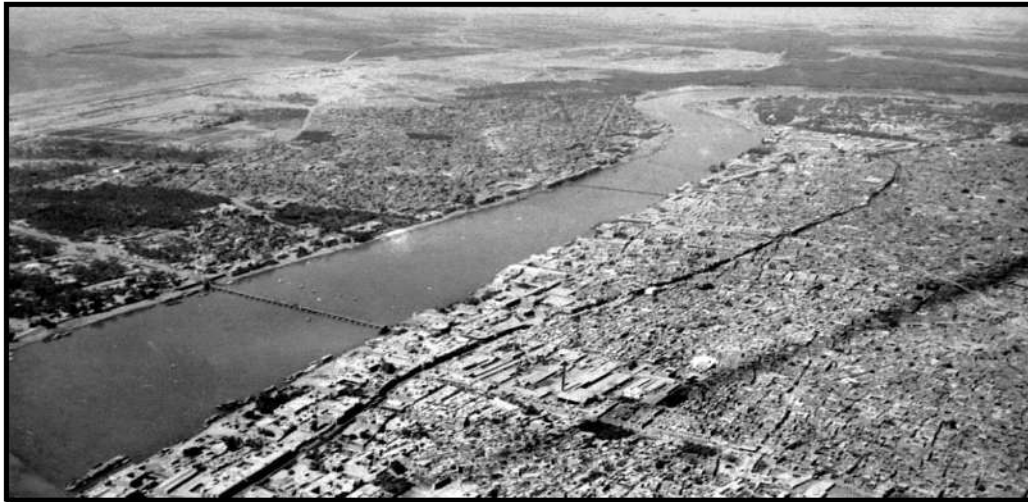


Fig. (4.63): - Baghdad aerial view in 1935, Source: AFP/Getty.  
<https://www.citymetric.com/fabric/pictures-bridges-baghdad-2236> ,(accessed 26 Dec.2018).



Fig. (4.64): - Baghdad urban landscape from residential area up to the public area along the river in 1924, Source: Abdul hadi 2007:74.



Fig. (4.65): - New street from the AL-Rasheed street up to the river in 1924,Source: Iraqi national Archive.



Fig. (4.66): - Baghdad map in 1921, Source: British National Archive WO 302/551, See Fig. (17) in Appendix I in A3 size.



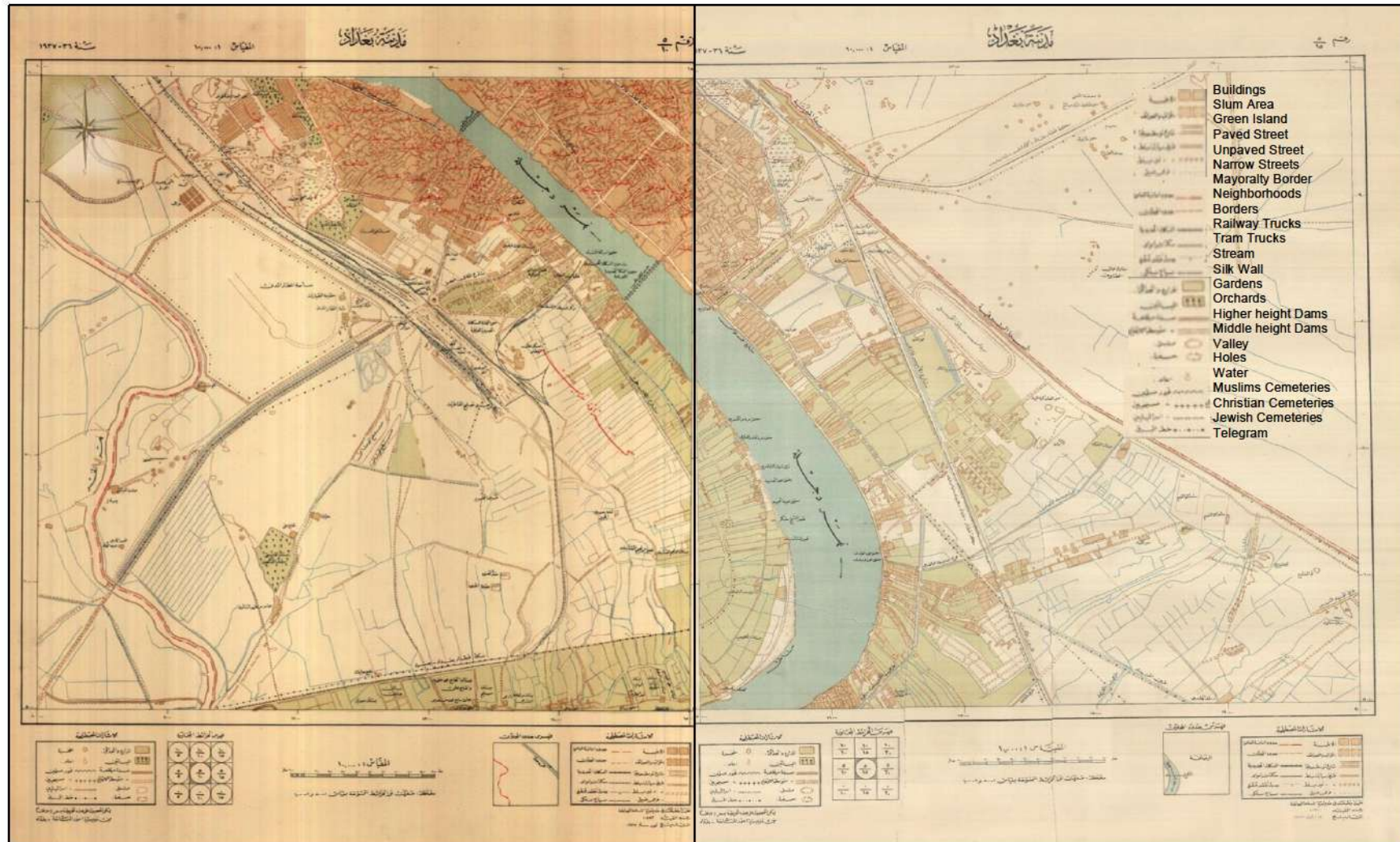


Fig. (4.67): - Baghdad map in 1936,Source: Iraqi National Archive, See Fig. (18) in Appendix I in A3 size.

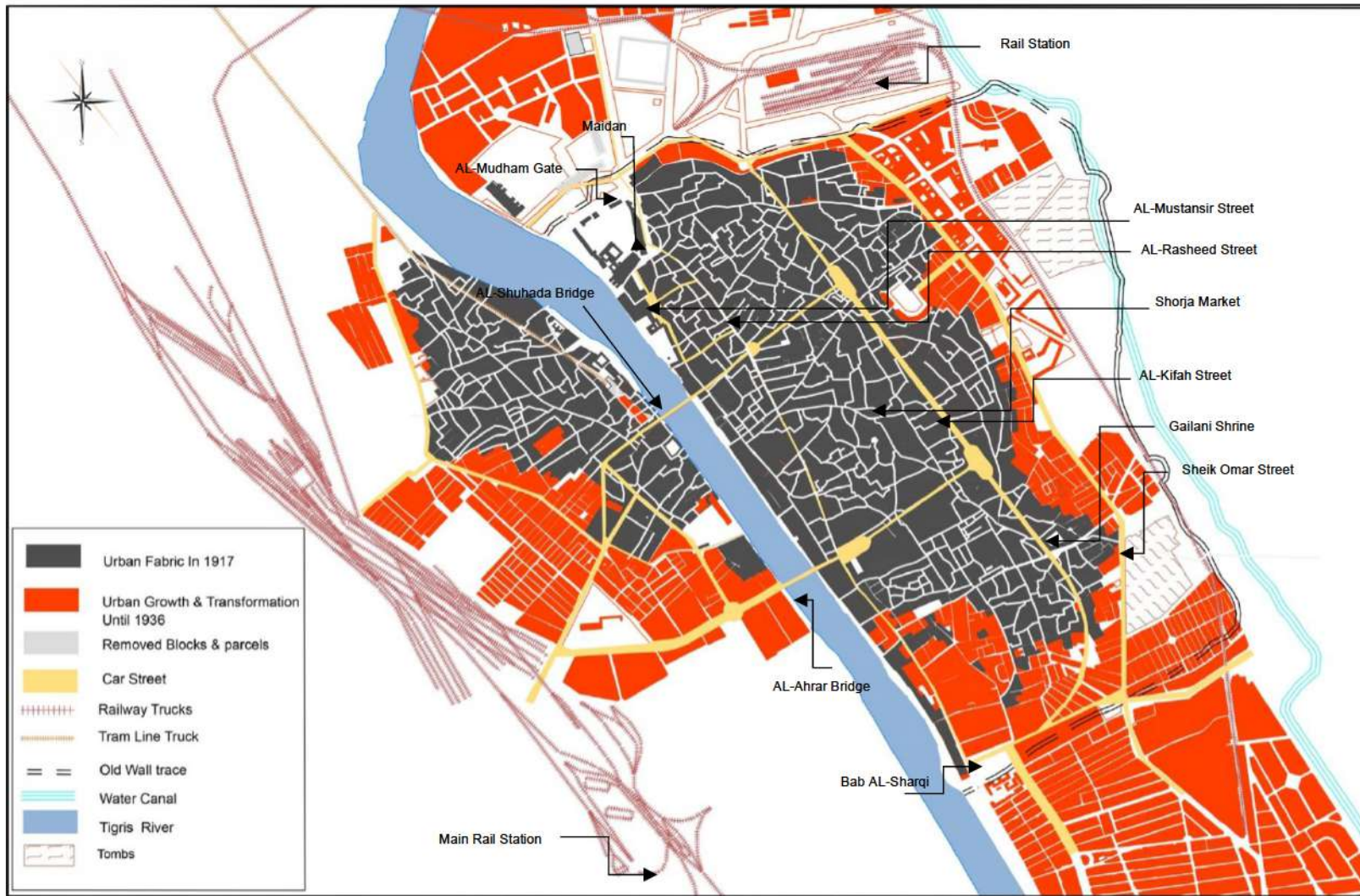


Fig. (4.68): - Urban morphological change from 1917 to 1936, Source: Digitized and investigated by the Author, See Fig. (19) in Appendix I in A3 size.

## 4.2.2 Urban Space Development

### 4.2.2.1 Urban Space Hierarchy

This revolutionary tendency in creating new spaces reflected the change in economic and social activities as a basic tool for any innovation process. New types of alleyways were paved and added inside and outside the old core to the north and south thus changing the morphological characteristics of the whole old traces and provide potentials for further development. A direct clash between privacy and publicity occurred by introducing a new idea of space that changed the whole hierarchy of urban public space. For the first time a new idea of neighborhood was introduced to be bordered by vehicular streets with geometrical shapes.

- 1- The new street (AL-Kifah street) was paved inside the city parallel to the traces of the old east wall (Fig.4.69). It comprised a linkage of three main points starting with the one where the old wall traces curved near the north train station and passed near AL-Fathil mosque reaching AL-Gailani shrine to form the main focal point inside the city then turned directly to the east gate (Bab AL-Sharqi gate) to meet AL-Rasheed Street. The result was a new ring in the old city shared together by AL-Kifah and AL-Rasheed streets. The priority was kept to AL-Rasheed street as a main connector for the city expansion on both sides. According to AL-Ashaab daily, AL-Rasheed street remained the main commercial artery and the main connector from 1917 till 1936 (AL-Ashaab, 1974, p. 261). This priority is rather assumed to be continued until the construction of the third artery, AL-Khulapha, because the main market which represented the chief economic centre along with other public buildings have concentrated in this area. The market was extended with another type and large buildings, that contains offices or companies with new storages. Currently this priority was handed back again to AL-Rasheed street due to the high expansion of Baghdad city.
- 2- A new traffic and transportation system were introduced to accommodate the highly increased number of vehicles. The concept of establishing shortcuts through the historical fabric could be considered the easiest and fastest solution to connect both streets to the other part of the city across the river by extending two streets horizontally to connect AL-Rasheed street to the bridges in a straightness and linear shape (Fig.470).

- 3- Another peripheral road (Sheik Omar Street) <sup>103</sup>was founded around the old city following the relics of city wall in order to increase the adaptation and the integration between the north and the south expansion of city and to reflect the ambition to have a modern city centre.
- 4- The city experienced a new level of connectivity by extending the train track line from AL-Karch to AL-Rusafa and providing two stop stations at the periphery of the old city parallel to the remains of the old walls. Those stations created additional attraction points and worked as new entries to the old city enhancing the accessibility and the pedestrian movement within the vehicular streets (AL-Rasheed street, AL-Kifah street and Shaik Omar street (Fig.4.71)

#### 4.2.2.2 Urban Space Types

New types of urban open public space reflect the need to interfere more into the old urban structure and correspond to the new demand that was imposed by the new streets. Many public space types were introduced like commercial Streets, public gardens and public squares at the intersection between streets (Fig.4.72a, b,c). The north gate was pulled down in 1925 to provide more accessibility to AL-Rasheed street from Bab AL-Mudham area that became more open street in 1927 and ready for further development (AL-Ashaab, 1974, p. 281). One main square substituted the old north city gates (AL-Mudham gate) at the start of AL-Rasheed street which extended to the other side, outside the remains of the old wall end near the south gate, Bab AL-Sharqi. New large public space was initiated at the border of the old wall remains in south. The space was designed to be the first public garden adjacent to the old historical wall. Both squares composed the main basic nodes in the city centre and worked as a junction point between the old city and the new expanded areas outside the old core to the north and south. Both the square and public garden are considered as new types of urban public spaces and became later the focal points of further development. Other squares, used as public gardens, were also found in the intersection points between the main streets (AL-Rasheed street and AL-Kifah street) and the vertical connectors toward the river. As showing in the Map found in the Iraqi National Archives and printed in 1936, There are oval and longitudinal squares divided into four parts and surrounded by the streets used for organizing the traffic (Fig.4.72a).

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<sup>103</sup> Located along Sahik Omar Shrine and specified for light industry.



Fig. (4.69): - Lining AL-Kifah street estimated between 1934 -1936, Source: Mayoralty of Baghdad Archive, See Fig. (20) in Appendix I in A3 size.

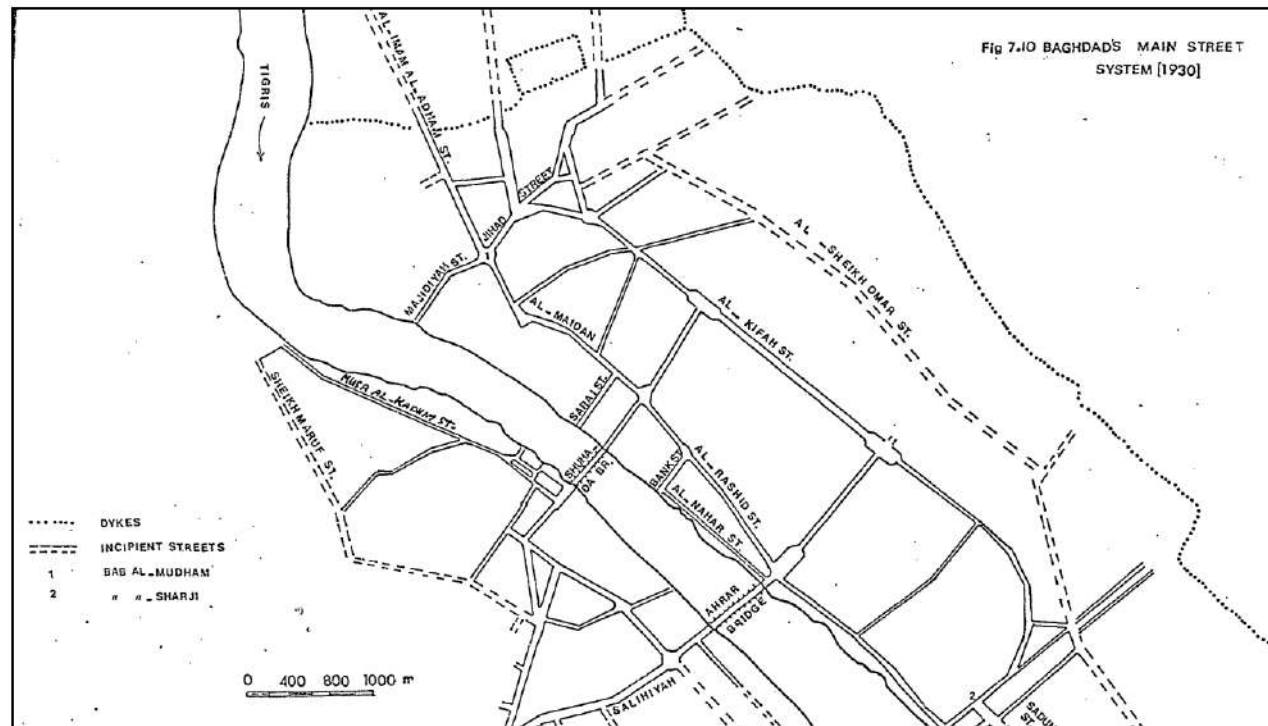


Fig. (4.70): - Street Network in old Baghdad Core in 1936, Source: AL-Ashaab 1974:256.

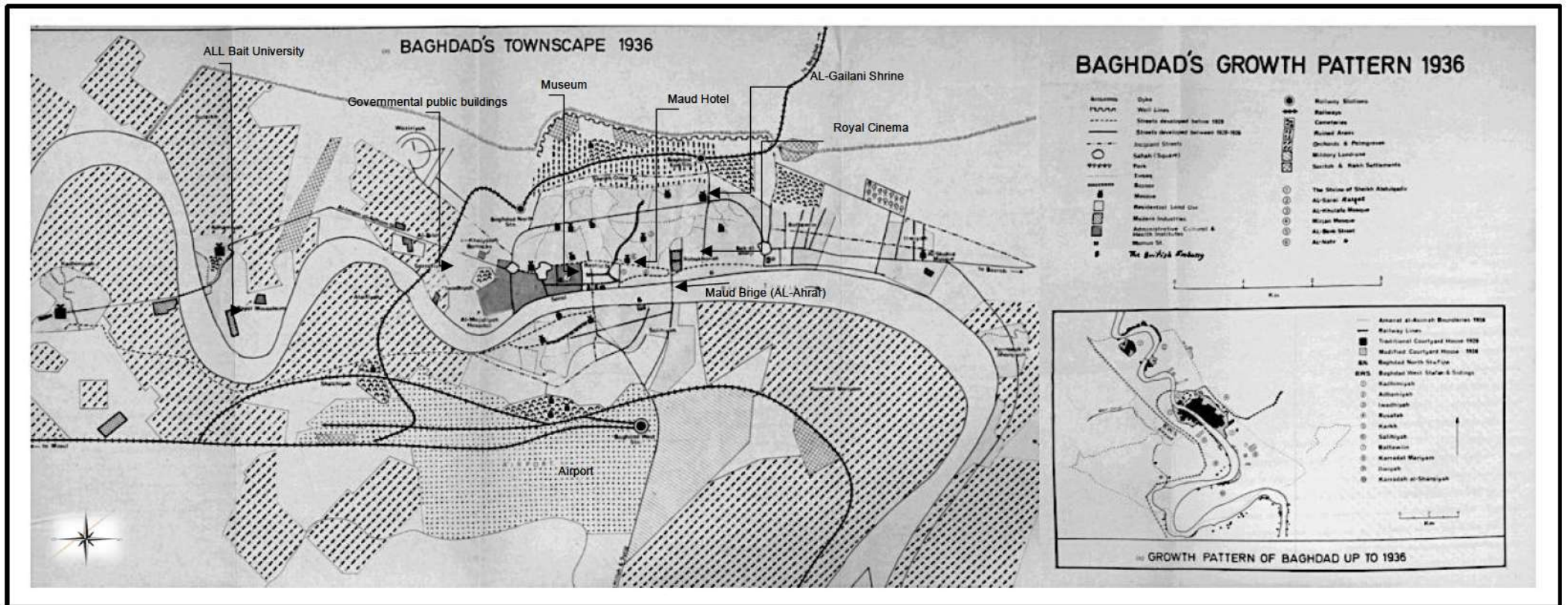


Fig. (4.471): - Baghdad main streets in 1936,Source: AL-Ashaab 1974:256, See Fig. (21) in Appendix I in A3 size.

The intersection square used to reflect the western approach which used the surrounded buildings as main focal points rather than the traffic to create clear access and orientation towards all the street directions. Maidan was developed as a public vehicular node (Fig. 4.74) and lost its potentiality to gather people as a public space for pedestrian and as recreational area full of coffee shops like it was before (4.73). The main public facilities around Maidan spread all over the city and contributed to diminishing the role of the market artery nearby as the main entry to the old pedestrian street (AL-Mustansir street) of the city. A new type of horse racing arena as recreational space was found also out the city wall and parallel to eastern protective dam (Fig.4.72c).



Fig. (4.72a)



Fig. (4.72b)



Fig. (4.72c)

Fig. (4.72 a,b,c) : - Public space types in Baghdad map in 1936 (Two Part), Source: Iraqi National Archive.



Fig. (4.73)



Fig. (4.74)

Fig. (4.73): - Maidan restricted for pedestrian in 1894,Source: Iraqi national Archive. Fig. (4.74): - Maidan restricted for traffic, Source: Iraqi national Archive.





## 4.2.3 Urban Components

### 4.2.3.1 Blocks & Plots

New blocks were inserted inside the urban fabric especially in the orchards and non built up area. Filling out the existed urban fabric was the main approach to cope within the rapid development of the city especially after the construction of both streets. Those blocks are oriented perpendicular to the two new streets and designed to have geometrical shapes with small size and maximum two rows of back to back attached plots like in Fig (4.76). Public buildings started to occupy the designated big plots along the main streets on the recent developed area with big facade inside the old core and along the periphery area. The plots inside the old city adjacent to commerce area started to be demolished and transferred to large buildings. The new economical hub street accelerates the transformation process in this area as many old Khans and historical monuments were removed and substituted by big commercial centres as seen in the 1974 survey done by AL-Ashaab (Fig.4.77). The frontage plots along the main streets was considered le ftover plots resulted after the demolish process during the time of the street construction. Many existed plots became subject to separation and merge process according to the function, location, property and land value.

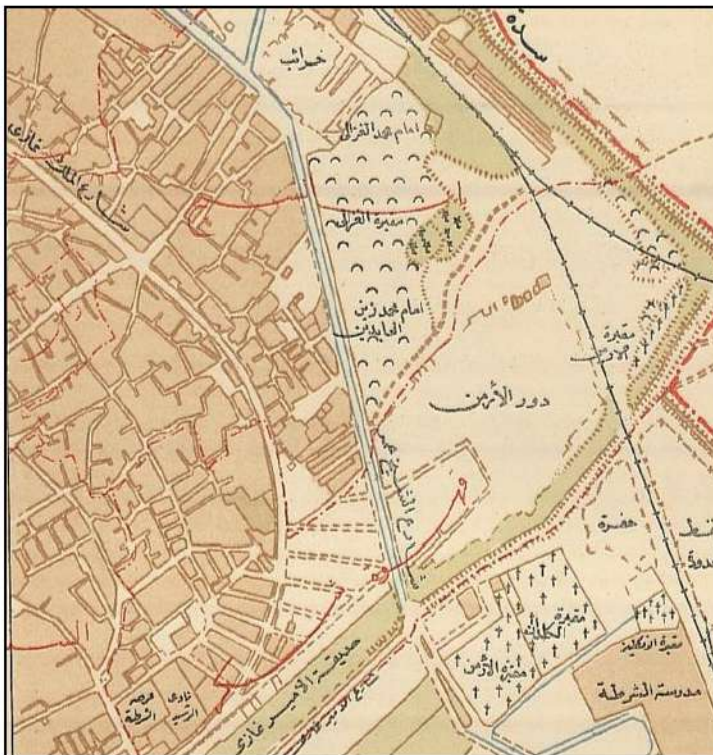


Fig. (4.76)

Fig. (4.76): - New Geometrical Blocks in old core of Baghdad in 1936,Source: Iraqi National Archive.

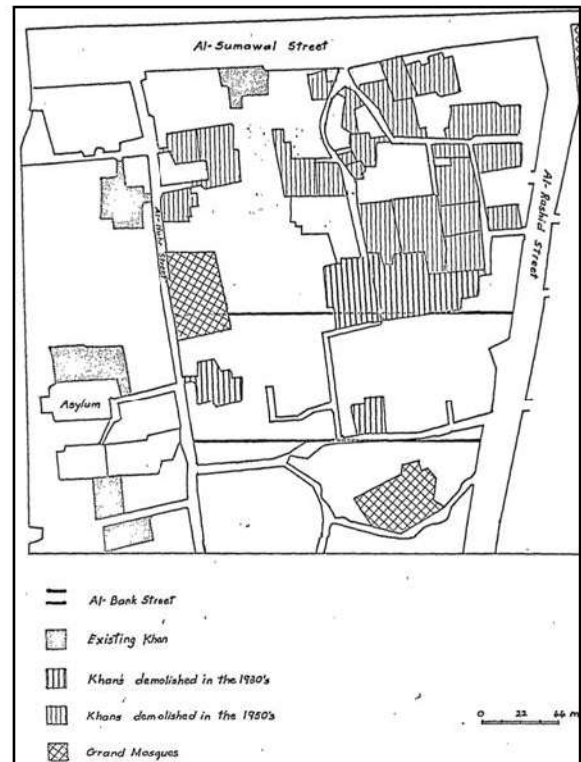


Fig. (4.77)

Fig. (4.77): - Blocks transformation In Banking street,Source: Al-Ashaab 1974:281.

### 4.2.3.2 Building Types

Many changes in social and economic conditions provided the potential to have new types within the transformation process in urban structure. Gentrification trouble arouse when the wealthy part of the population started to leave the old core to the new suburban areas and were substituted by immigrants who were looking to have jobs in the centre. Most of the new building types that were planted in Baghdad are located out of the city core. This may be attributed to that most of the new functions need more space to be accessed than the limited space in the old core and some of them were serving not only the city but the whole region around, like the train station, university colleges, hospital airport, and other public institutes.

#### Public Buildings

Many buildings were initiated in the late Ottoman period and were used by the British as main public buildings. One of the important buildings, the Iraqi museum, was originally built as an old Ottoman printing house. The building was modified to be more representative along AL-Mamoon street which was lined to have a clear and straight access to the bridge. The building had a massive main entrance located far away from the main street and overlooked on an external small space. The main gate took the shape of big arch on the ground level with a balcony covered by a triangle roof on the second level above the gate reflecting the western style that was prevailing at that time (Fig.4.78). The two storey building Museum kept the traditional type of multi courtyards inside. The first level has longitudinal and arcaded windows while the second level has small and square windows. The size of windows reflects the need to have secured openings to provide more protection for the museum (Fig.4.79). Another unique building type inside the old core was the electric generators in Abakhana area which had many military fabrics when the city was under the Ottomans. It is not clear whether the building was implemented before the British or not, but it is clear that it has a western style with a triangle roof which was used in fabrics and service buildings (Fig.4.80). Another building was the fire-station, which also reflects the impacts of western style. The building was one storey building and contained an administrative part with arcaded tall windows and arcaded gate in between. The main garage of the fire station was attached to this part covered by triangle roofs (Fig.4.81). Other Governmental public buildings were constructed outside the city along the city wall as showed in (Fig.4.71) especially in the northern side to be near the governmental area inside the city. The new buildings had totally innovative functions that were constructed with a western architectural style following the outward looking plan approach but with local traditional details like the Royal College of Medicine (Fig.4.83), the Royal Agricultural Society (Fig.4.82).



Fig. (4.78)



Fig. (4.79)

Fig. (4.78): - Old Iraqi museum gate,Source: Iraqi national Archive. Fig. (4.79): - Old Iraqi museum in 1926,Source: Iraqi national Archive.

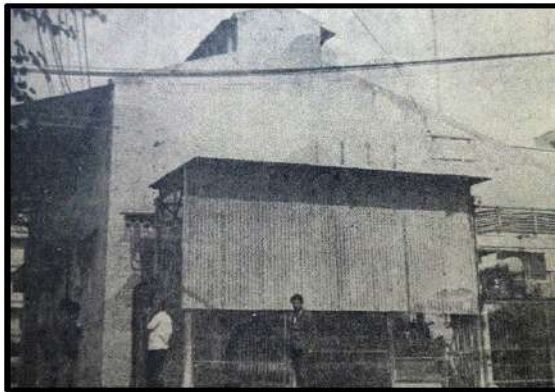


Fig. (4.80)

Fig. (4.80): - Electric generator in Abakhnaa, Source: Iraqi national Archive.



Fig. (4.81)

Fig. (4.81): - Fire station in old Baghdad in 1920, Source: Iraqi national Archive.



Fig. (4.82)



Fig. (4.83)

Fig. (4.82): - The royal college of medicine H. C. Mason,Source: Jackson.L2016:406.  
Fig. (4.83): - Royal agricultural society H. C. Mason,Source: Jackson.L2016:406.

All buildings, designed by Mason<sup>104</sup>, expressed the way of combining classism and neo Islamic style to cope within the context of the local urban scene. Wislon<sup>105</sup> also in his design for ALL Beit university used the local material with Islamic decorations in a British model of educational institutes (Fig.4.84 &4.85) ( Jackson, 2016, p. 405).



Fig. (4.84)



Fig. (4.85)

Fig. (4.84): - All Beit University, Master plan,Source: British National Archive MPG 1/1207.

Fig. (4.85): - All Beit University Elevation,Source: Jackson.L2016:390.

Many other new functions were built in the old city reflecting the tendency to have recreation functions like the Royal Cinema which was built in 1930 as shown in Fig. (3.86). Other types which were added were basically hotels to accommodate the increasing number of visitors like Maud Hotel that is located in the same place of Sinak bridge. Maude<sup>106</sup> hotel reflected modern types in having solid façade with rectangular windows (3.87).



Fig. (4.86)



Fig. (4.87)

Fig. (4.86): - Royal Cinema,Source: Iraqi national Archive. Fig. (4.87): - Maude Hotel in 1928,Source: (Abbass, 2018)

<sup>104</sup> See Biography P.433

<sup>105</sup> See Biography P.433

<sup>106</sup> See Biography P.433

The idea of having commercial buildings with retail shops in the first floor and apartments for residential and commercial functions started to appear and spread widely within the development of both Al-Rasheed Street and AL-Kifah street. The idea of closed buildings that cover the whole plot area with external openings was so common in this period and established the tendency to start neglecting the courtyard system. This approach was imported from the housing types that was prevailing in the 20s of the last century. The architecture of the buildings in this period was a façade architecture that carried the style of Art Noaveau with decorated and ornamented facades using bricks and steel in construction (4.88 a). At the beginning of the 30s the façade became simpler with more linear elements in a style called Art Déco using also steel and bricks in construction (4.88 b).



Fig. (4.88a) Art Nouveau

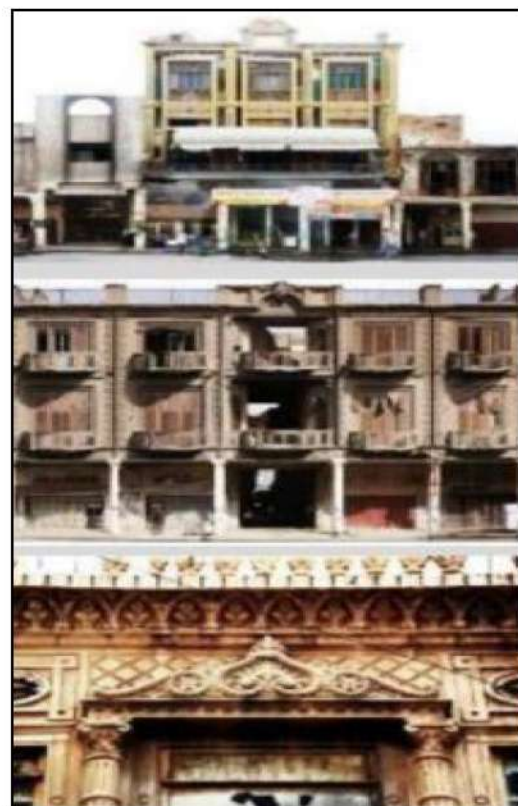


Fig. (4.88b) Art Deco

Fig. (4.88 a,b): - Art Deco & Art Nouveau building in AL-Rasheed street, Source: Abul Hadi.T 2007,188.

#### Residential Units: -

The type of houses started to be more or less similar to that of the last Ottoman period and also to that of the German style. Many houses were built to contain the increase in population and to reflect the social disparities. After some economic prosperity and financial blooming many social classes erupted into the social matrix and most of the original inhabitation moved to the new area to show off their wealthy wellbeing; they on the other hand underestimated

and diluted the previous social integration which was the basis of composing the urban neighborhood. The environmental issues were ignored and the privacy was changed to be more public than before. The houses were rowed along wide streets and attached to each other in back to back form opposite to the houses in the 20s which were mostly of two storeys with open wooded or closed balconies (Sometimes arcaded verandah) or sometimes both. The houses in the 30s were too much highly decorated with intricate brick works and arcaded verandah or brick balconies. The courtyard became smaller and lost its social function and privacy as its location was exactly in front of the main entrance hence neglecting the bend entrance. All other rooms and even the stairs are accessed from the internal corridor that surrounded the courtyard and overlooked on the external space through openings in the external wall. The elevations are much ornamented with details normally imported from classical European and local architecture and most of them had four elevations with an external outlook. Some of houses like Al-Bahiye house merged both styles with big courtyard and small one and this may belong to the plot shape which was long, narrow and opened from front and back sides (4.89). Suwaidi house presents another example of the neglect of the central courtyard which was substituted by a roofed space that worked as distributor to other rooms around and directed to open space outside the house (4.90).

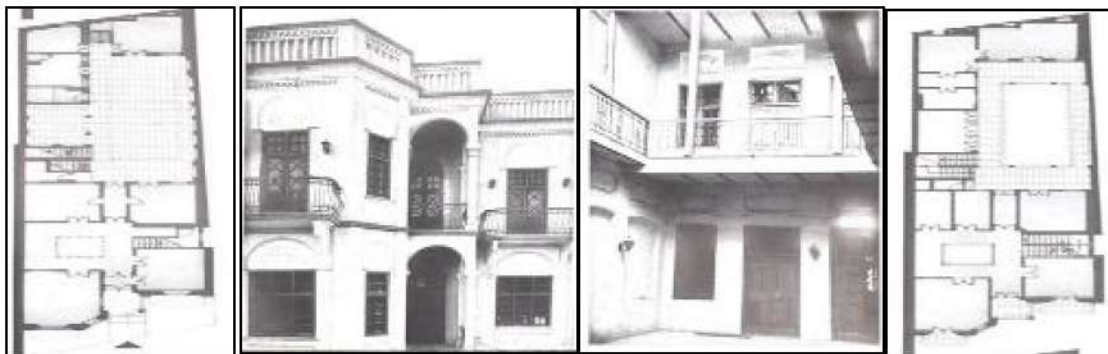


Fig. (4.89): - AL-Bahiya House Ground floor. 1st floor,Elev., Source: Amanat AL-Assima1984:64,65.

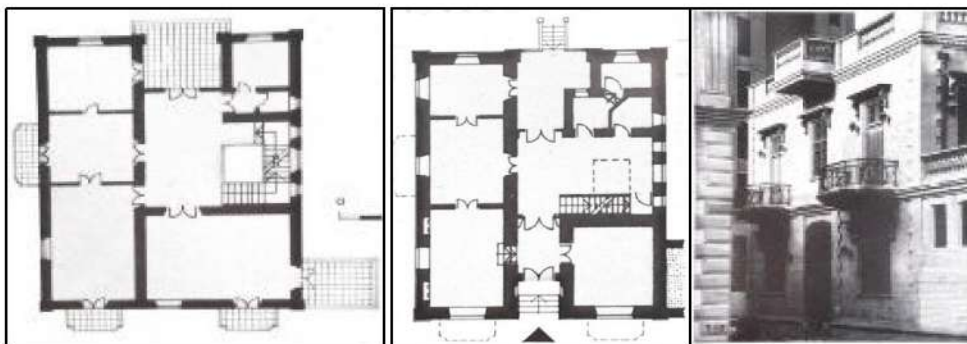


Fig. (4.90): - AL-Suwaidi House Ground floor. 1st floor, and elevation,Source: Amanat AL-Assima1984:64,65.

#### 4.2.4 Urban Innovations

- 1- In this morphological phase the old wall had vanished and the city expanded to the north toward AL-Adhamiya and to the south of the old city toward AL-Karrada along the river. New western building style and urban planning approaches started to appear within the existed traditional one. Both AL-Rasheed Street and AL-Kifah street composed the first ring inside the city to create more flexible linkage to the extension on both sides.
- 2- New built-up area conquered the orchids, and the available vacant area within the ring road. New streets penetrated the city in vertical direction connecting and passing AL-Rasheed and AL-Kifah streets up to the new fixed bridges on the river creating two public squares as new types that regulate the traffic intersections.
- 3- New second fixed bridge was decided to be built near Samir Amis hotel at the end of the historical AL-Mustnasir Street and adjacent to the military fabrics. The new bridge moved toward the residential quarters and orchids across the river in AL-Karch creating a new potentiality for further urban development. This location of the bridge provided more accessibility to the new British Embassy from one side and to the city centre in AL-Rusafa from the other side as a main gathering point better than the location which accessed AL-Gailani shrine directly. The reason for leaving out this position was perhaps the existence of train track along the river in AL-Karch which was located opposite to this position across the river and used to transfer goods to the local ships.
- 4- A new airport was founded in the western part of (AL-Karch) not far from the old core that participated in adding an international level to the city.
- 5- Another station was added in AL-Rusafa near Bab AL-Mudham that played a big role in enhancing the connection within the western part of the old city and to the other far regions providing more accessibility to the old core.
- 6- The city was connected to other states and enhanced its international position by extending motorway streets. The first step was the initiation of Baghdad-Damascus motorway service that was run from 1925-1929 (AL-Ashaab, 1974)).
- 7- In 1922 a new communication service using the Telephone was introduced in three places Sarai, Mirjan mosque near the commercial centre and in AL-Karch.
- 8- In 1932 new urban guidelines were regulated to handle and organize the rapid urban development. The new urban law affected the inhabitant's privacy through introducing a new housing system instead of a traditional one.

### **4.3 The Transformation Process at Late Royal Time (1936-1959)**

As shown in Baghdad map in 1942 (Fig.4.91), the old urban structure kept the same structure in the last morphological period up to the beginning of the 50s when new plans and interventions were decided to be done inside the old core. The city development up to 1950 was based on the old plan done by the British that was called New Baghdad as previously mentioned. The coherence in urban structure was altered significantly after the last morphological period as shown in the maps which were found in both Texas Library for the city in 1957 as seen in (Fig.4.92) and the other prepared for aero exploration by the German company based on air survey in 1959 (Fig.4.93). A comparative analysis was done to explore the development in the urban landscape at this time interval by overlapping the above mentioned maps reaching to have morphological plan as shown in (Fig.4.94).

#### **4.3.1 The Change in The City Network Structure**

The city fringe expanded to be occupied by new buildings so as to meet the modern requirements and to cover the higher demand in land while the historic neighborhoods experienced a rapid modification and transformation process. The city started to grow in both west and east directions due to the land availability substituting a large area of palm groves after the successful settlement of and control on the annual flood crisis (Pieri C. , 2008). In the 50s of the last century a proposed plan for new street type in the old city was suggested according to proposal found in Mayoralty of Baghdad archives (Fig.4.95). New boulevard was planned to be constructed as part of developing a modern civic centre and central business districts with totally new building types and modern architecture reflecting the prosperity and the booming in the Iraqi economy. A new artery (AL-Khulapha street) was lined to penetrate the old core in AL-Rusafa after 1957 and it was located just about in the middle distance between AL-Rasheed and AL-Kifah streets. Three stages of destruction occurred in the old city. The first stage was done by removing large parts from the traditional area to be substituted by wide boulevard represented by AL-Khulapha street. The second stage was done by removing large parts of existed neighborhoods to create new Maidan plaza that was used as bus station and car parking to be shared by both AL-Rasheed street and AL-Khulapha street creating a direct link between each other. Other intervention was done near the Shorja market in the area that extended from Mirjan mosque up to the river creating the first modern



economical centre with multi storey buildings as the first new type inside the compact old core that affected the city skyline. The third intervention stage was destructing many residential neighborhoods to be substituted by public buildings like the civic centre along AL-Khulapha street, and Maidan which currently includes the National Library, AL-Rusafi area which currently includes multi storey park along AL-Rasheed street and finally the current the Shorja area which currently includes AL-Arabi shopping mall centre. In the proposed plan it was suggested to destruct more buildings from the banking area up to AL-Khulapha street which is now occupied by AL-Arabi market and then extend the destruction to the other side from the street which was not obvious in the plan whether those destructions proposed to create another wide street connected to AL-Kifah street or to be substituted by other public buildings (Fig.4.95). Normally the decision of destruction and adding new functions are subject to be changed according to authority. According to Monopirio master plan, the destruction on the area of the current AL-Arabi shopping mall and on the opposed side was planned to be a connector street. The old city continued to lose its role as a main official site for the government because the governmental buildings shifted gradually towards north and then to the south of the old city (Gulick, 1967). The construction of AL-Khulapha street started through establishing a node near AL-Khulani shrine to be connected to AL-Tahreer square (Fig.4.96). A third square was founded at the old city fringe later to be connected with the other two, creating a triangle area bordered by large boulevards. The destruction continued in straight line up to AL-Mudham area and then connected to north part of the city (Fig.4.97). Another proposal was found in the mayoralty archive showing some proposals about the detailed design of AL-Khulapha street. It indicates the willing to have separate blocks along the street with secondary streets behind, having traffic node in Shorja square with vertical links to both AL-Kifah street and AL-Rasheed street (In the same position of AL-Arabi shopping mall centre) (Fig.4.98).





Fig. (4.92): - Baghdad map in 1958, Source: Texas Library <https://legacy.lib.utexas.edu/maps/iraq.html>, (accessed 14 Nov.2012) ,See Fig. (23) in Appendix I in A3 size.

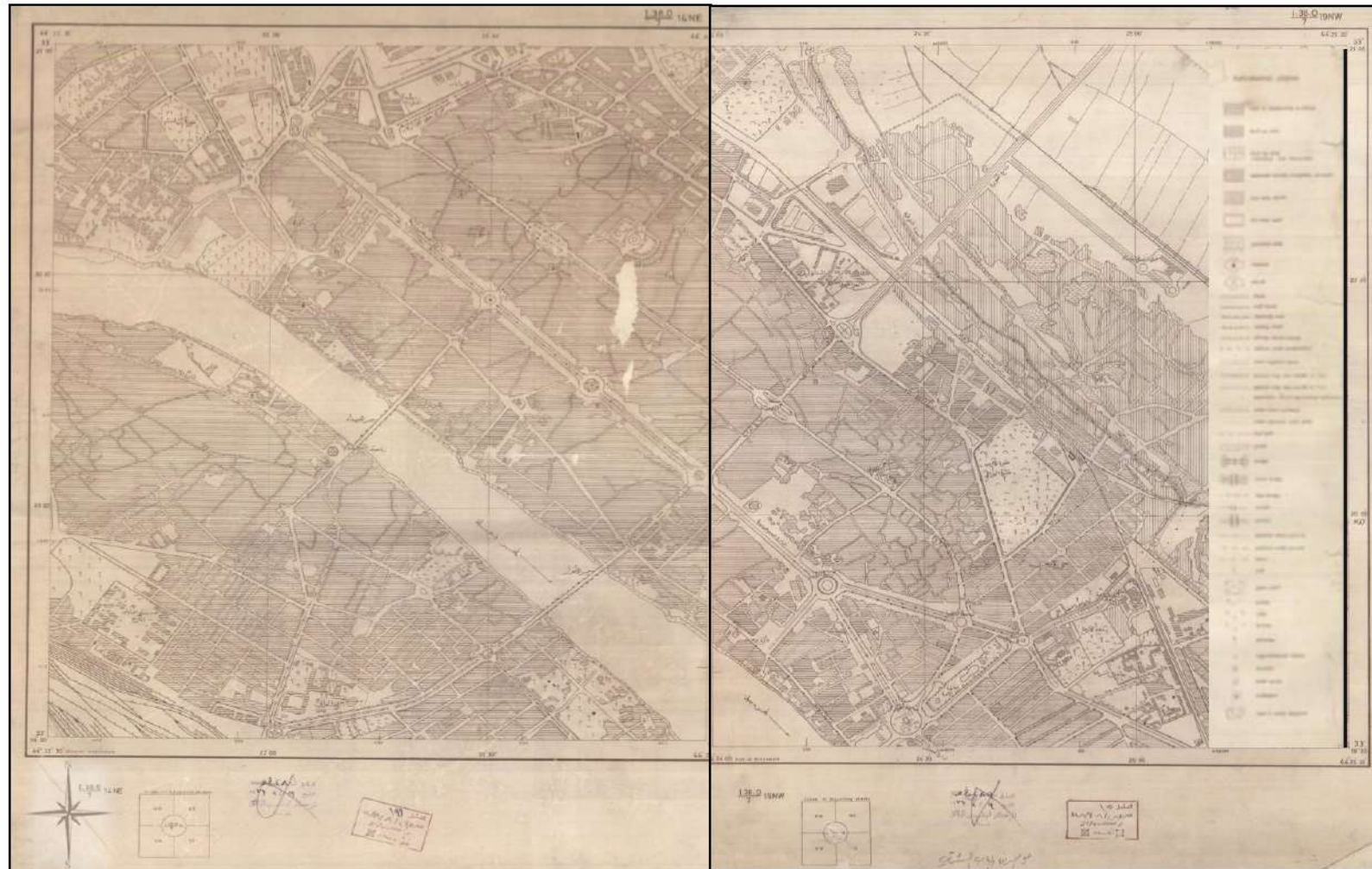


Fig. (4.93): - Baghdad map in 1959 (Two Parts), Source: AERO Exploration (Frankfurt), Iraqi National Archive, See Fig. (24) in Appendix I in A3 size.

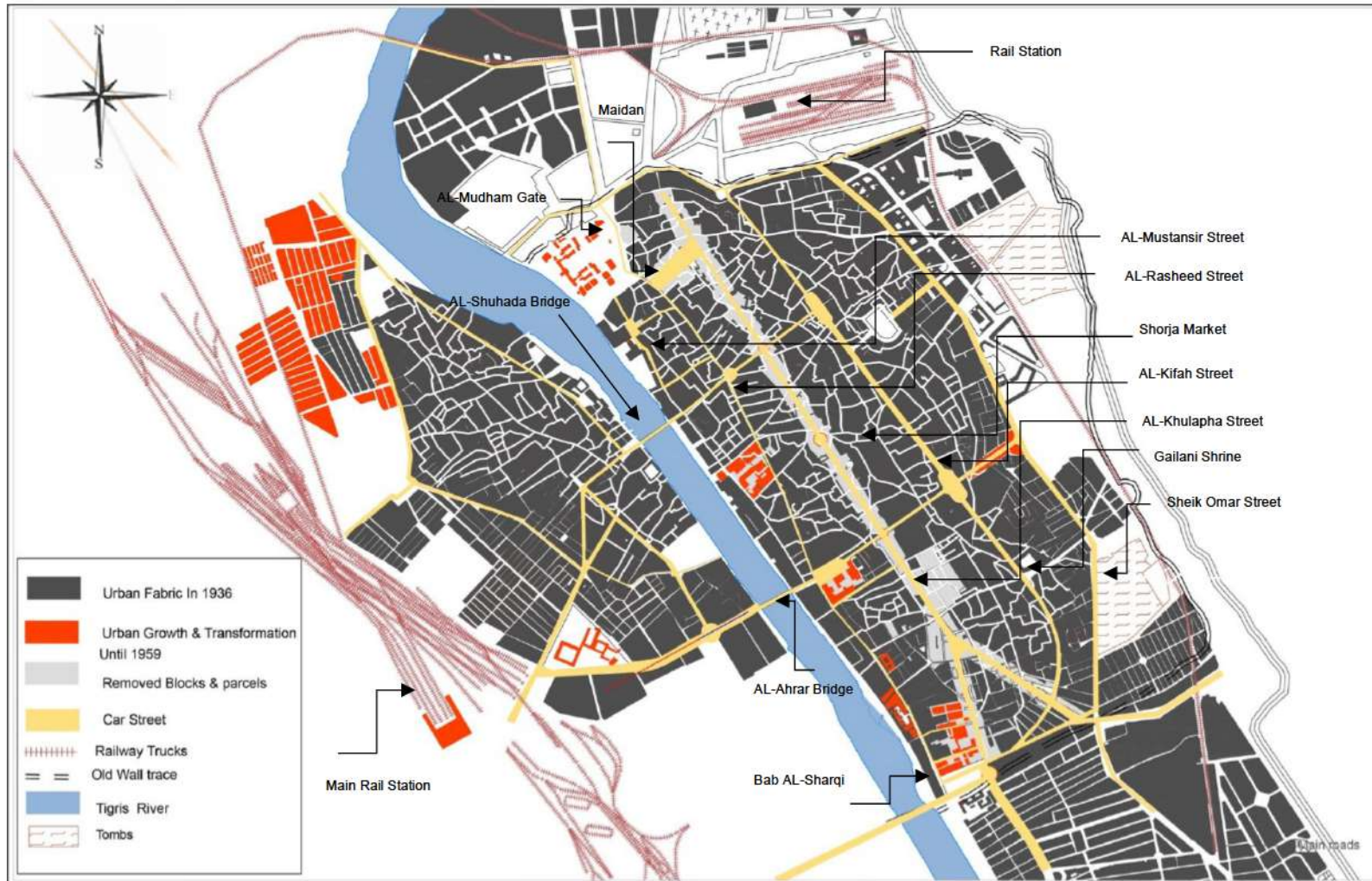


Fig. (4.94): - Urban morphological change from 1936 to 1959, Source: Digitized and investigated by the Author, See Fig. (25) in Appendix I in A3 size.



Fig. (4.95): - New AL-Khulapha street proposal in old core of Baghdad estimated before 1957 · Source: The Mayoralty of Baghdad Archive, See Fig. (26) in Appendix I in A3 size.



Fig. (4.96): - AL-Khulapha Street –The first part in AL-Khulapha street construction in 1957,Source: Texas Library <https://legacy.lib.utexas.edu/maps/iraq.html> ,(accessed 14 Nov.2012).



Fig. (4.97): - The construction of AL-Khulapha street in Baghdad map in 1959,Source: Iraqi National Archive.

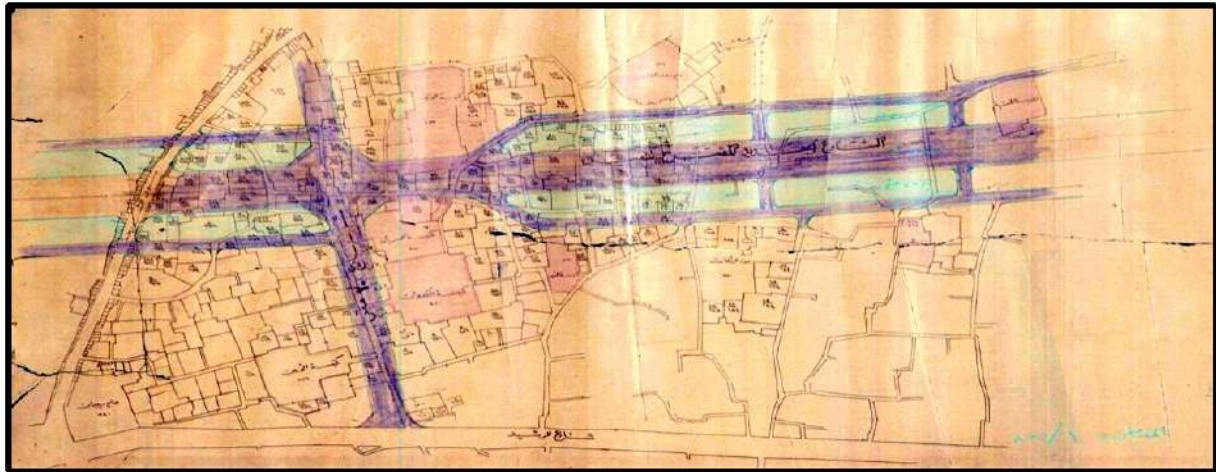


Fig. (4.98): - Secondary streets proposals behind AL-Khulapha street, Source: Iraqi National Archive.

## 4.3.2 Urban Space Development

### 4.3.2.1 Urban Space Hierarchy

The new AL-Kifah street is considered a complementary path for Al-Rasheed street which still enjoys a higher priority for creating a gradual move from the main public artery to the more local one. Indeed, the significance of AL-Rasheed street lies in its commercial and banking status since it engulfs the Central Bank of Iraq campus alongside with other affiliate banks without undermining the most actively commercial lot represented in Shorja traditional market. AL-Khulapha street, on its part however, competed with the other arteries through having a wide section and different structures that combine both pedestrian and vehicular movements. It worked to attract the mobility from other city parts to pass through and provided the possibility to create modern business districts or economic hub for both the local and international investors. By adding a new street, each period has imposed construction of more vertical streets toward the river to create more flexible connections among all horizontal streets. The urban segregation initiated in the compact fabric within the physical barriers and has divided the old core into 19 parts. AL-Khulapha street, moreover, is regarded with a higher priority as a main rapid commuter that connects both the city extensions from the north and south. The boulevard width reached to 40 meters with 4 lanes on each side. The hierarchy of pedestrian streets was altered by combining the pedestrian walkways of the inserted vehicular streets within the interrupted main traditional public arteries as complementary part and also within the interrupted semipublic ones which were transferred gradually to be more public by adapting the demand for extending the commercial area.

#### 4.3.2.2 Urban Space Types

New circular roundabouts were found in the intersection points between the new street (AL-Khulapha street) and the existed vertical crossed streets to ensure a flexible accessibility to move to the other part of the old city (Fig.4.99). The circular roundabouts were also used as a main traffic organizer at the joints between the new streets in the old core and their extension outside. Sometimes they were affected the shape of the surrounded plots as indicated in the plan done by the mayoralty showing the decision to create tabor plots around the squares in order to control the traffic by adding traffic lights (Fig.4.100). Meanwhile, they were also used to substitute the triangle traffic island in old Maidan area to have more flexible vehicular movement in all directions (Fig4.101, 4.102, 4.103, 4.104). New type of public garage was initiated near Maidan, which is used as bus station with parking lots. The Garage was imposed inside the old city instead of historical quarters to link both AL-Rasheed street and AL-Khulapha street together. The circular roundabouts substituted by an oval island connected within new round square inside Maidan Parking as seen in (Fig.4.105, 4.106). The other urban space type was the green public space within the old core located between AL-Kifah street and Shaik Omar street having an oval longitudinal shape (Fig.4.107, 4.108). The green open public space is also used at the edges of old core like the ) Nation Garden) which was named King Ghazi garden near the eastern gate and AL-Amana garden along the old castle as a main urban public space that separated the old city from the norther and southern extension (Fig.4.109, 4.110). Another oval public space was found in Hafuth AL-Qathi area along AL-Rasheed street as main public garden and traffic organizer (Fig.4.111). Large roundabout was invented in the southern part in Bab AL-Sharqi within King Gazi public garden to connect AL-Kifah street, AL-Rasheed street within the new AL-Khulapha street and to form a large square and green area occupied by fountains and other landscape accessories (Fig.4.112).





Fig. (4.99)

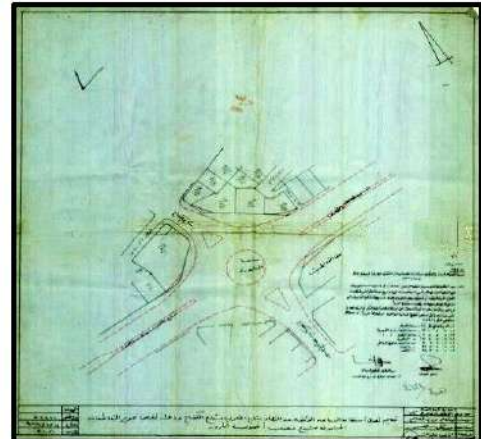


Fig. (4.100)

Fig. (4.99): - Roundabouts in AL-Khulapha street in the fifteenth, Source: AL-Ashaab 1974.  
 Fig. (4.100): - The role of roundabouts in shaping the surrounded plot,Source: The Mayoralty of Baghdad Archive.

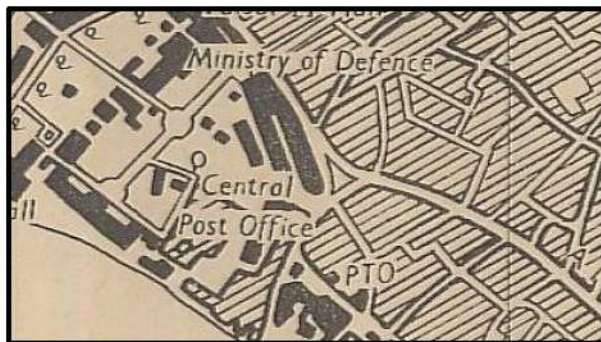


Fig. (4. 101)

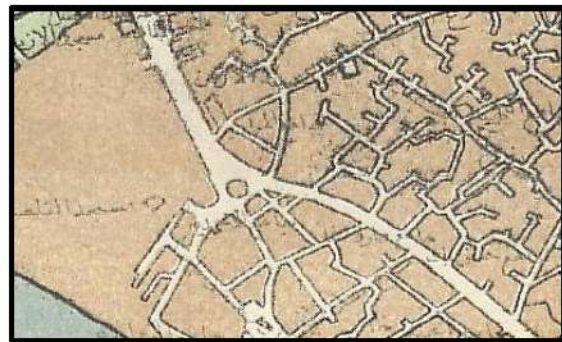


Fig. (4.102)

Fig. (4.101): - The triangle traffic island in Maidan in Baghdad map in 1942, Source: Iraqi National Archive. Fig. (4.102): - The Circular roundabout instead of the triangle in Maidan estimated in the beginning of fifteenth, Source: Iraqi National Archive.



Fig. (4.103)



Fig. (4.104)

Fig. (4.103): -The triangle traffic island in Maidan in 1943,Source: Iraqi national Archive.  
 Fig. (4.104): - The circular traffic roundabout in Maidan in fifteenth,Source: Iraqi national Archive.

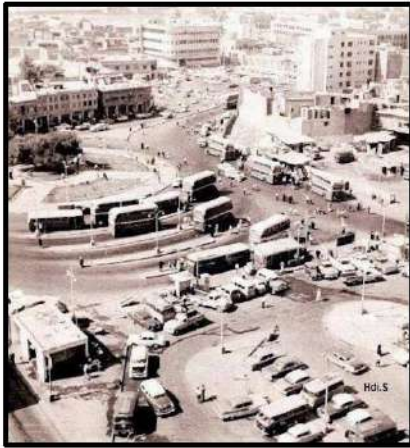


Fig. (4.105)



Fig. (4.106)

Fig. (4.105): - Maidan Parking with Circular square in Baghdad map in 1959,Source: Iraqi National Archive. Fig. (4.106): - Maidan Parking with Circular square photograph in Baghdad in 1955,Source: Iraqi national Archive.

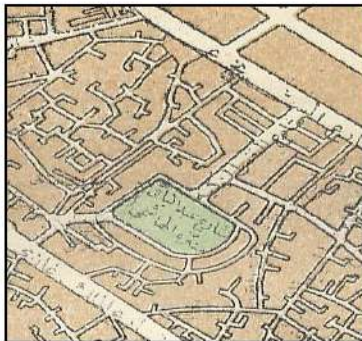


Fig. (4.107)



Fig. (4.108)

Fig. (4.107): - The oval Public garden (Sibaa square) in a map estimated in the beginning of fifteenth, Source: Iraqi National Archive.  
 Fig. (4.108): - The oval Public garden (Sibaa square) a photograph estimated in 1948 with lines statues,Source: Iraqi national Archive.



Fig. (4.109)



Fig. (4.110)

Fig. (4.109): - The Public Garden (AL-Amana garden) along the city wall in Baghdad map estimated in the beginning of fifteenth,Source: Iraqi National Archive.  
 Fig. (4.110): - The Public Nation Garden (King Gazia garden) within AL-Tahreer square in Baghdad in 1959, Source: Iraqi National Archive.



Fig. (4.111)



Fig. (4.112)

Fig. (4.111): - The oval Public garden (Hafuth- AL-Qathi) photograph estimated in the beginning of fifteenth, Source: Iraqi national Archive.

Fig. (4.112): - The round square in Bab AL-Sharqi photograph in 1959, Source: (AL-Chalabi M. , 2018).

#### 4.3.2.3 The Transformation of Urban Space

The first trial to connect Shorja market to AL-Kifah street was done in 1940 through lining cul de sac connector following the traces of old small pedestrian street which was widened and straighten up to big square used as garage for trucks as shown in the plan (Fig.4.113, 4.114). The idea of creating a direct in touch within Shorja started by proposing AL-Khulapha street regardless the connectivity between the old pedestrian streets (Fig.4.115). The street firstly curved out from the eastern side by creating a roundabout square near AL-Khulani shrine called (AL-Khulani square) in the middle between AL-Kifah street from the east and AL-Rasheed street from the west and from the connector street that is lined from Wathba square towards AL-Ahrar bridge in the north and the vertical street that bordered the old city parallel to the public garden from AL- Tayaran square up to AL-Tahreer square from the south see also (Fig.4.99). AL-Khulani square is also connected to AL-Rasheed street through a new vertical street in the direction of the river as shown in the map of 1959. This new square was connected to both AL-Tahreer square and AL-Tayaran square through large boulevards forming a triangle area in between. A boulevard was completed and extended horizontally from AL-Khulani square to the other side the in north direction up to Wathba square parallel to the river. This part of the street was lined in a relatively modern urban structure that was built after the British mandate. The street proceeds with wide section path through a large area of traditional urban fabric passing in the middle point between AL-Khulapha mosque and Latin church, both of which are supposed to be the main potentials in choosing the current street path. The boulevard extends till the peripheral road around the old core in AL-Mudham area without any attention paid to the remains and the traces of the historical urban fabric and motivated to destruct more area of the residential neighborhood around like in Maidan which used as parking space linked to AL-Rasheed street (Fig.4.116).

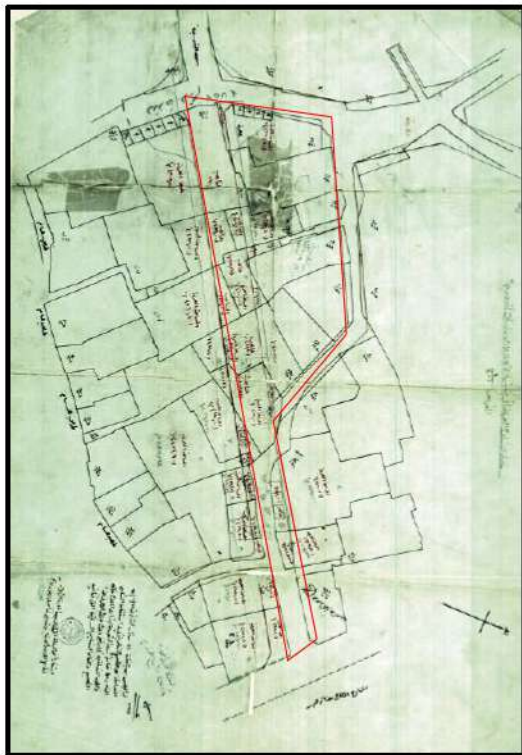


Fig. (4.113)



Fig. (4.114)

Fig. (4.113): - The plan of street from AL-Kifah street up to Shorja in 1940, Source: The Mayoralty of Baghdad Archive, See Fig. (27) in Appendix I in A3.

Fig. (4.114): - The satellite image of the street from AL-Kifah street up to Shorja in 2010,Source: google earth map, (accessed 12 Jan. 2018).



Fig. (4. 115)

Fig. (4.115): - The ignorance of historical streets through lining AL-Khulapha street,Source: AL-shaab1974

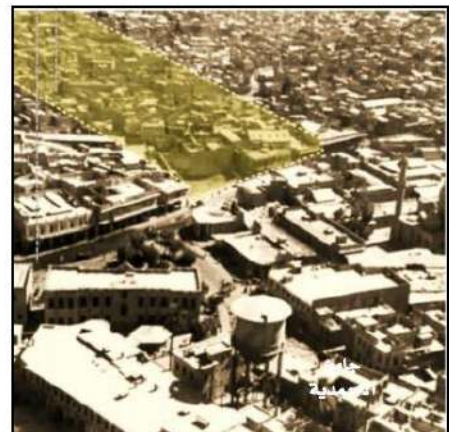


Fig. (4. 116)

Fig. (4.116): - The traditional fabric which replaced by Maidan,Source: Abul Hadi.T 2007.

### 4.3.3 Urban Components

#### 4.3.3.1 Blocks & Plots

The first destruction occurred in the area of Hafuth AL-Qathi near AL-Ahrar bridge where new hotels and some recreational facilities were built along AL-Rasheed street. The area was already used as an old Ottoman military fabric and was removed gradually to be substituted by many new functions. Twin buildings with modern architecture were mediating the collector street up to Wathaba square. They were surrounded by secondary streets which are considered part of Al-Rasheed Street zone and are bordered by modern frontage building that substituted part of the residential area (Fig.4.117 & 4.118). The other destruction was the banking zone along AL-Rasheed street. The area was deducted from the compact commercial and residential urban fabric having a geometrical shape. It was rebuilt with large scale multi storey buildings that substituted the old banking area of the Ottomans, the old Khans, parts of the market and residential area (Fig.4.119 & 4.120). Traditional blocks were penetrated by large boulevards that substituted a large area of residential units and interrupted the traditional pedestrian arteries. The boulevard was designed to have multi storey buildings along its path on both sides. Strip of plots with 20 m width was allocated along the streets on both sides having rectangular or square shapes. Those plots were filled gradually by multi storey buildings and separated from the residential quarters by a secondary street used for services and providing accessibility to the area behind. The definition and the border of the residential blocks had been altered within the new street following the new hierarchy that was set by the boulevard. New large blocks with multi storey buildings substituted a large area along the main streets. Many new building types substituted old houses and buildings which already have a large plot size especially in the area along AL-Rasheed street and the river, which was built at the end of Ottoman period and after the British mandate.

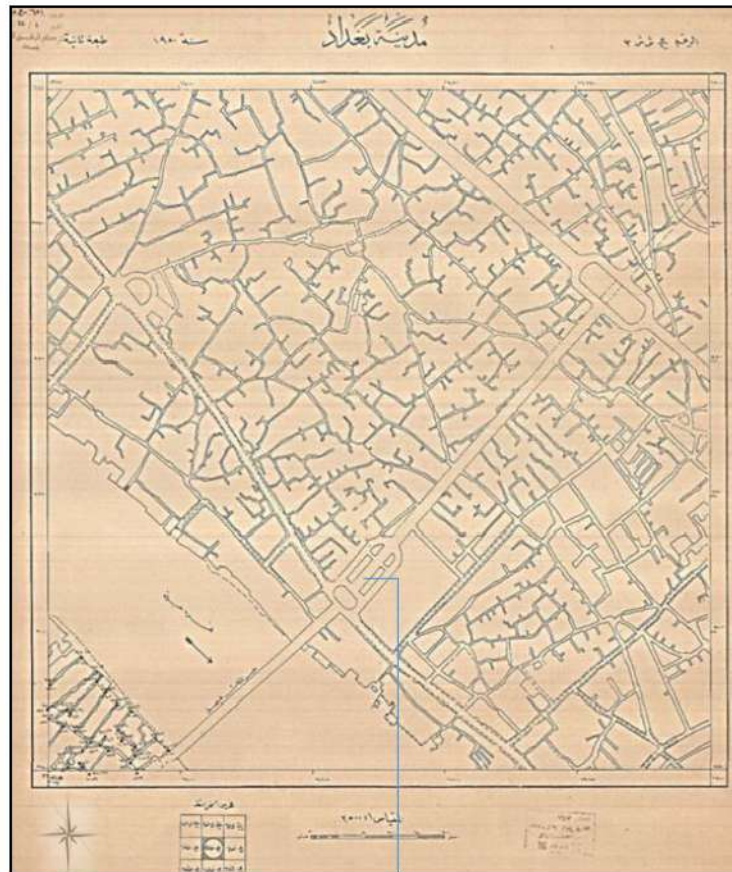


Fig. (4.117): - Hafuth AL-Qathi square and the twin buildings, Baghdad Plan in 1950, Source: Iraqi National Archive, See Fig. (28) in Appendix I in A3 size.



Fig. (4.118): - Hafuth AL-Qathi square and Twin buildings photograph, Source: Iraqi national Archive.

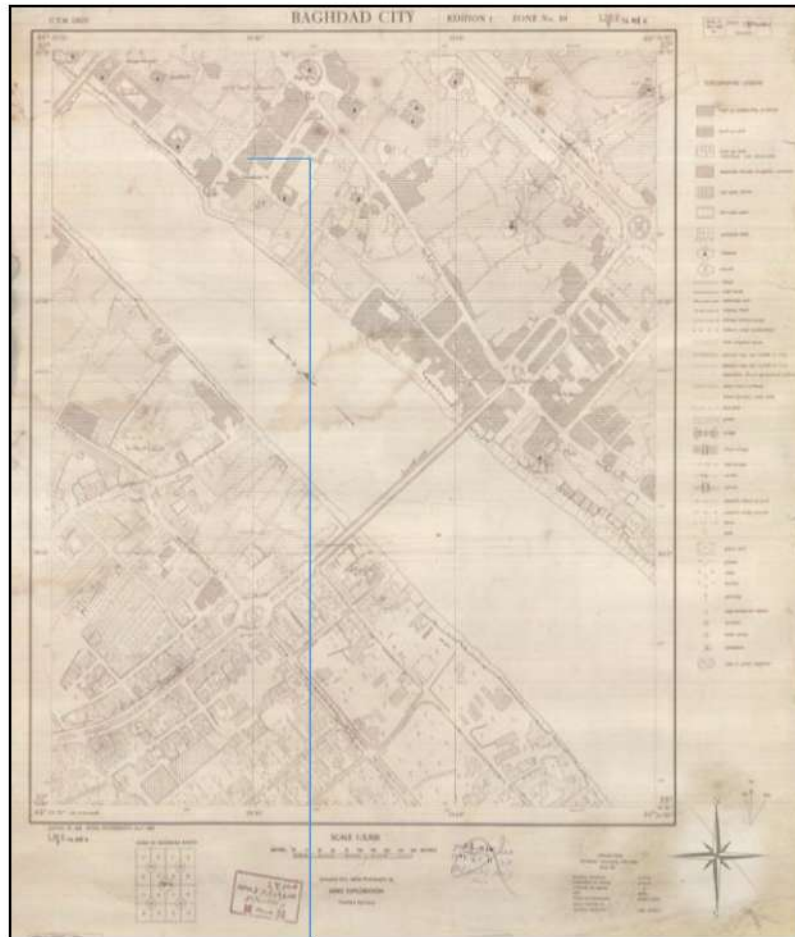


Fig. (4.119): - Banking assembly in Baghdad plan in 1959, Source: Iraqi National Archive, See Fig. (29) in Appendix I in A3 size.



Fig. (4.120): - Banking assembly in Baghdad in 1959, Source: Photograph by Latif al-Ani <http://www.middleeastdigest.com/pages/index/24288/baghdad-through-latif-al-anis-lens> (accessed 18 Nov.2018).

### 4.3.3.2 Building Types

The buildings followed suit the modern architecture and were done by foreigners or Iraqi architects who studied abroad. Two building types were constructed in this period to reflect the tendency of importing the western style instead of the traditional one. The first one was constructing a row of frontage buildings attached to each other showing different facades that belong to different architectural styles. The modern style started to be curtailed within the old Art deco and Art Nouveaux along AL-Rasheed street (Fig.4.121). AL-Kifah street also followed the same infill process like AL-Rasheed street by having colonnaded walkways along the frontage buildings that belong to modern architecture. AL-Khulapha street was recently constructed in this period and was ready to adapt multi storey buildings in the frontage area like AL-Ruhon bank Building that was design by Iraqi architect Qahtan AL-Madafai (Fig.4.122) The second type was that of the multi storey and free standing buildings that substituted wide traditional area like the Defferdar building along the river frontage which is considered the first one which was built in Baghdad and followed later by the Banking zone behind it (Fig.4.123). Wide areas were destructed from AL-Rasheed street up to the river to be substituted by an assembly of new modern buildings of Banking assembly that aligned the old pedestrian walkway which was straightened and widened to accommodate the car movement. The historical buildings in this area was maintained as single monuments detached from the surroundings. There was an approach to destroy all surrounded buildings to show the monument regardless its relation within the traditional urban fabric as in AL-Mustansiriya school, the Abbasid palace and Mirjan mosque which surrounded by multi storey buildings belong to the banking area and the adjacent commercial buildings in the Shorja market area (Fig. 4.124). Public buildings were increased inside the old city especially along AL-Rasheed street like hotels to accommodate the increased number of the visitors like the Tigris palace hotel which was built by the first Iraqi architect Ahmed AL-Muktar. The building matches the international style by having circular balconies along its facades (Fig.4.125). Another Cinema were built with AL-Rasheed street called AL-Zawraa cinema enhancing the recreational activities that match the new modern life that the city experienced (Fig.4.126). The first housing project (Fig.4.127) was introduced in the vicinity of the old core along Shaik Omar street for sanitary station workers. The plot was split into 4 parts by crossed street to accommodate all facilities and all related buildings distribution followed the plot shape and oriented along the cross streets together within the frontage area far from the tomb behind (Fig.4.94).





Fig. (4. 121)



Fig. (4.122)

Fig. (4.121): - Modern Buildings within traditional one in AL-Rasheed street, Source: Iraqi national Archive.

Fig. (4.122): - AL-Rohon bank built after the construction of AL-Khulapha street,Source: (AL-Chalabi 2018).

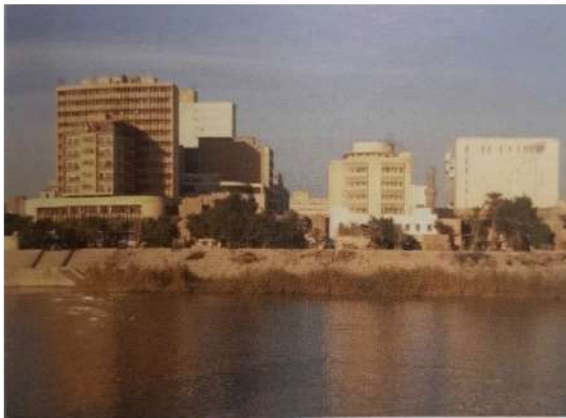


Fig. (4.123)



Fig. (4. 124)

Fig. (4.123): - Deftardar the first multi storey buildings in 1935 along the river, Source: (AL-Chalabi M. , 2018)

Fig. (4.124): - Mirjan mosque surrounded by multi storey buildings in fifteenth,Source: <http://www.middleeastdigest.com/pages/index/24288/baghdad-through-latif-al-anis-lens> ,(accessed 18 Nov.2018).



Fig. (4.125)



Fig. (4.126)

Fig. (4.125): - Tigris Palace designed my Ahmed AL-Muktar, Source: (AL-Chalabi M. , 2018).

Fig. (4.126): - AL-Zawaraa Cinema in AL-Rasheed street,Source: (AL-Chalabi M. , 2018)



Fig. (4.127): - The Plan of the workers housing projects along Shaik Omar street estimated in 40<sup>th</sup>,  
Source: The Mayorality of Baghdad Archive.

#### 4.3.4 urban Innovations

- 1- The flood control dams in north of Baghdad, constructed after 1956, contributed significantly to more expansion of the city toward the east and the west instead of the north and the south directions.
- 2- Introducing a new bus and traffic control system had encouraged people to reside outside the old core so may residential areas erupted as a result.
- 3- Architectural modernist movement led by local and foreign engineers was apparently reflected in the rise of modern stylish buildings and modern types with multi storeys and new functions that disclosed the booming in social and economic conditions of Iraq state.
- 4- Master plans for Baghdad, prepared by Moniporio 1956 and by Dioxides later on, are looked at as an innovative step to set the city for a prospective development. These plans were rather prepared to solve the rapid expansion of the city and the increasing in the housing demand (Nooraddin, 2004).

- 5- New residential projects started to overcome the informal settlement in the eastern part as a result of a rapid immigration process.
- 6- The construction of AL-Khulapha street as a wide boulevard influenced the approach to create many boulevards within the expansion area. It was considered a unique and representative street that motivates the development in many parts within the old city.
- 7- Introducing new types of public urban space by having new wide streets, public garden spaces, traffic roundabouts and national squares like AL-Tahreer square which included the freedom monument.

## 4.4 The Transformation Process From (1959-1983)

In 1960 a new approach of modern architecture was planted in the old city along with the tendency to ignore the restoration of the historical fabric as shown in the aerial photo in 1962 (Fig.4.128) and the plan of Baghdad in 1973 (Fig.4.129). At this stage, a map based on the investigation and analysis of the comprehensive planning approach was prepared by the JCP<sup>107</sup> consultant office in 1982 (Fig.4.130). A comparative analysis was done to explore the development in the urban landscape at this time interval by overlapping the above-mentioned maps reaching to have morphological plan as shown in (Fig.4.131).

### 4.4.1 The Change in The City Network Structure

The old city was well connected the other city parts to both north and south directions of AL-Rusafa and to the other part of the city AL-Karch across the river Tigris by having modern street Network with a new system of public bus system (Fig.132). This morphological period shows many modern projects and interventions within the old city. AL-Watba square became the main focal point within the whole city as an intersection point for both AL-Khulapha wide boulevard and the collector vertical street that connects the far new built-up area in the east to the other part of the city. Many new projects and proposals were designed and prepared to substitute the large devastated area along the main streets. The first concern was to design a new civic centre around AL-Khulani square and along AL-Khulapha street.

The famous AL-Khulafa Street was developed with high rising buildings that represented the focal attention of many economical and governmental activities and was subject to many interventions. A commercial new centre called AL-Arabi shopping centre mall was accordingly constructed and completed parallel to the traditional artery which is a direct connection to the

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<sup>107</sup> Japanese consultant and partners who was committed by Baghdad Mayoralty to prepare a comprehensive rehabilitation strategy for the old city of Baghdad.

banking assembly along AL-Rasheed Street. Al-Rasheed street, in fact, has experienced many other projects that led to creating another governmental area at the end of its path where the street comes closer to the river between Hafuth AL-Qathi area up to the end. The development normally was achieved near the crossed bridge where multi storey public buildings and parking were located to ensure more accessibility and to serve the increasing number of visitors to this area which is traffic jammed. A new Art museum with recreational cinema and theatre centres were found along AL-Kifah street at the point where AL-Kifah street curved down to meet AL-Khulafa street. The connectivity between the two street was hindered later by converting the meeting point between them to big buses garage. However, there was a tendency to create more streets inside the old structure and to propose more linkage to AL-Karch by suggesting a new bridge in Bab AL-Mudham area which had the same position of the current Bab AL-Mudham bridge as shown in the map found in the Iraqi Archives of about 1959-1963 (Fig.4.132). The constructed and proposed streets could be referred by Monopirio who was committed to prepare a master plan for Baghdad in the same period. It follows the same approach that he found in creating gridiron structure in the city old core (Fig.3.6)<sup>108</sup>.

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<sup>108</sup> See Chapter 3 P:85



Fig. (4.128): - Baghdad aerial view in 1962, Source: Dutch KLM AEROCARTO, Former Iraqi ministry of Agrarian Reform, survey department, See Fig. (30) in Appendix I in A3 size.



Fig. (4.129): - Baghdad master plan in 1973. Source: HIC (Humanitarian Information Centre), Reference:332, See Fig. (31) in Appendix I in A3 size.



Fig. (4.130): - Baghdad old core plan in 1983, Source: JCP& Mayoralty of Baghdad:3-4, See Fig. (32) in Appendix I in A3 size.

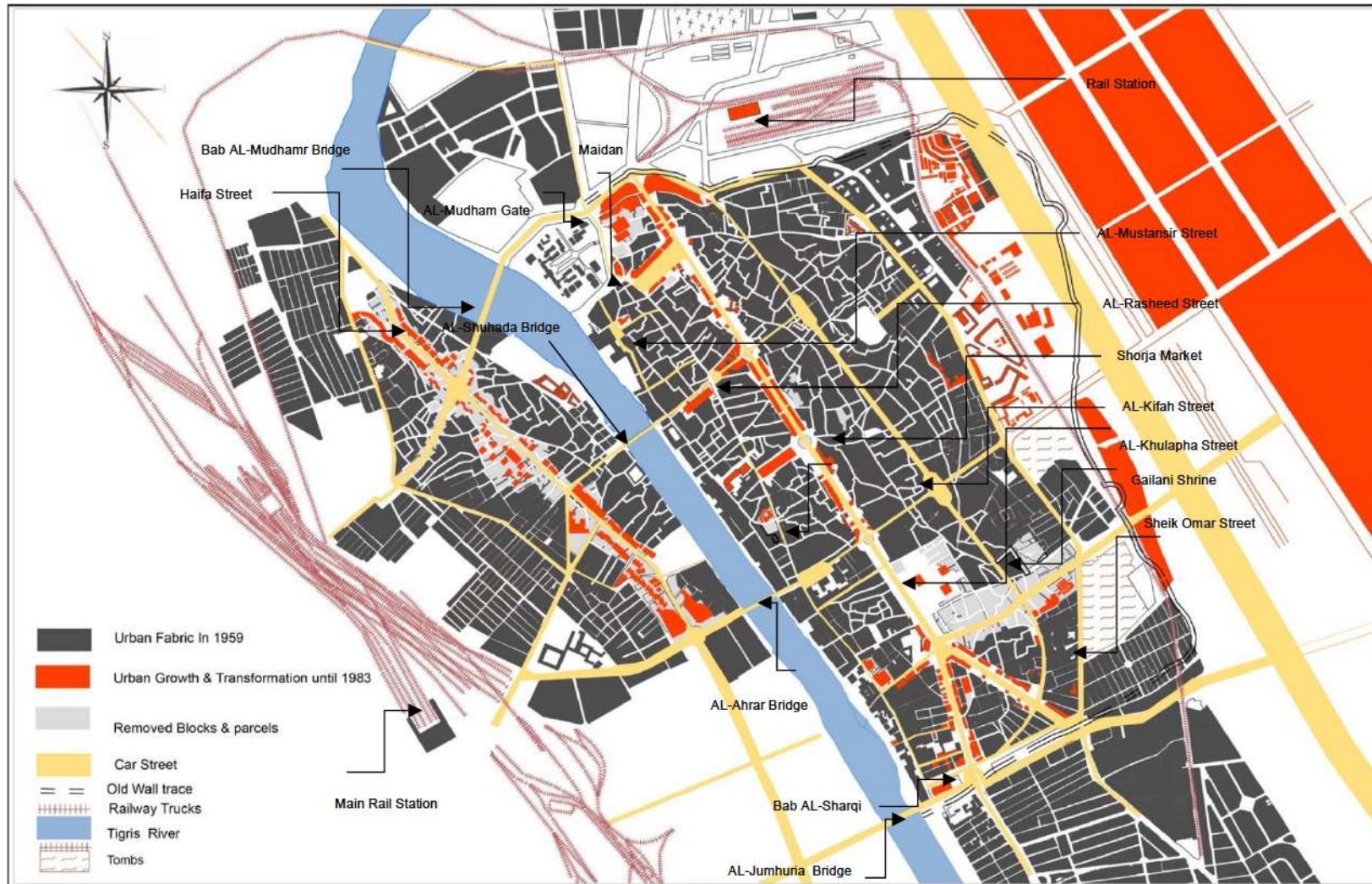


Fig. (4.131): - Urban morphological change from 1959 to 1983, Source: Digitized and investigated by the Author, See Fig. (33) in Appendix I in A3 size.



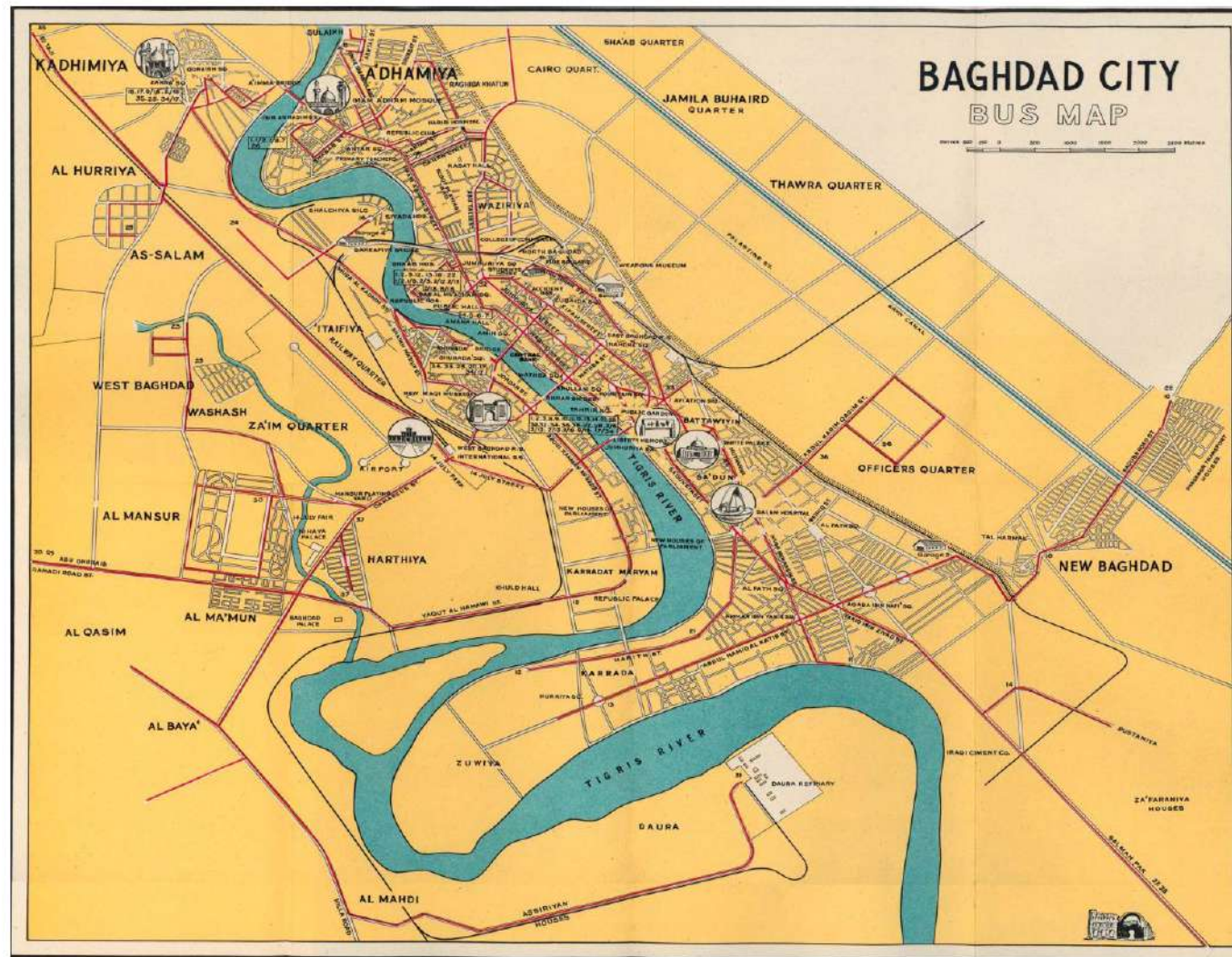


Fig. (4.132): - Baghdad Bus Map in 1961, Source: <https://mapcruzin.com/free-maps-iraq/baghdad-bus-1961.jpg>, (accessed 20 Feb.2019), See Fig. (34) in Appendix I in A3 size.

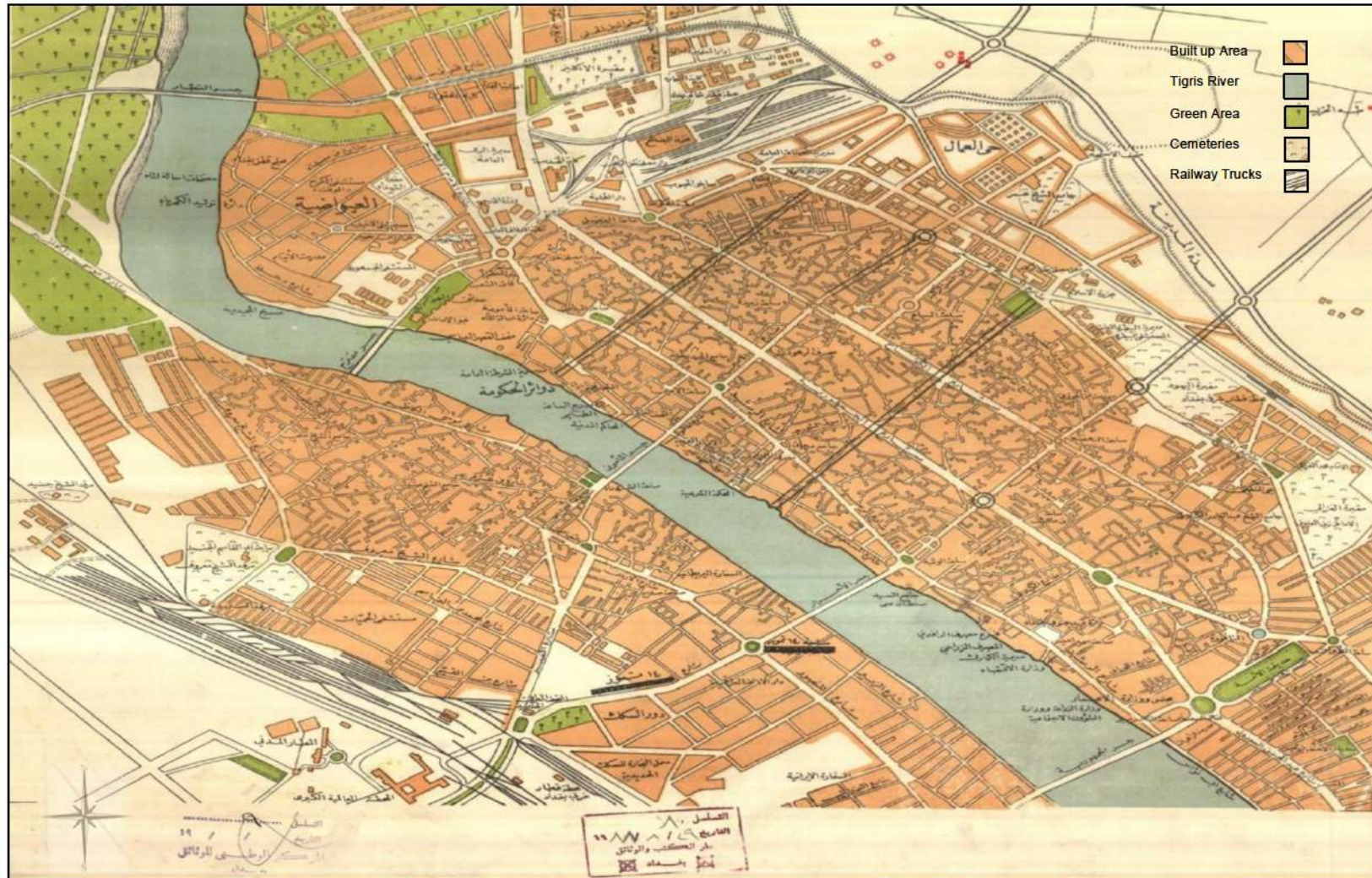


Fig. (4.133): - New streets proposal for Baghdad Old core, Estimated between (1959-1963), Source: Iraqi National Archive, See Fig. (35) in Appendix I in A3 size.

## 4.4.2 Urban Space Development

### 4.4.2.1 Urban Space Hierarchy

The city started to increase the accessibility to the new AL-Khulapha street by destructing wide area along AL-Gailani shrine to connect both the eastern outskirts area from one side and to AL-Khulani square from the other side. A new bridge across the river was added to link both AL-Khulapha street and AL-Khulani square to AL-Karch passing through AL-Rasheed street (Fig.4.134). This new artery increased the number of traffic that passed through the old core and enhanced the mobility of AL-Khulapha street to be with higher priority regarding streets hierarchy. However, no more changes have occurred since then in the traffic hierarchy. The pedestrian streets kept the same as in the last morphological periods with more interruptions due to the increase of traffic volumes in the city which becomes the main wholesale trading centre. Many challenges erupted and resultantly impacted the old core of the city mobility such as the mushrooming of the small cargo carts drawn by humans or animals that have obtrusively impeded the car traffic that copes with the booming of the commercial land use that substituted a good deal of the residential area in there. The final result come with dominating the car street the whole movement in the city core (Fig.4.135).



Fig. (4.134): - New AL-Sinak bridge crossing AL-Rasheed street,Source: The mayoralty of Baghdad Archive



Fig. (4.135): - Old Pedestrian network (red color) with new street network (white color) ,Source: Abul Hadi.T 2007.

#### 4.4.2.2 Urban Space Types

There was no change in the main urban space ideas and types but many lost and not defined spaces were shown in this period due to the large destruction process which was done in many parts inside the city. The lost spaces were either non built up areas pending to be constructed later or resulted from the clash between old and new urban structures. The main historical monuments kept to be surrounded by public streets or spaces like AL-Khulapha mosque along the main boulevard and Latin church in front of Shorja market. The idea of having large open urban space surrounding the main governmental buildings were introduced in this period like in the assembly of governmental buildings near AL-Khulanii area. The roundabout kept only at the main junction points that gather many streets from different direction like AL-Khulani square and AL-Tahreer square (Fig.4.136 & 4.137). The others located at the intersections between two streets was removed to keep the straightness of the street like the big roundabouts that was located front of Shorja area and was removed in eighteens of the last century (Fig.4.138 & 4.139).



Fig. (4.136)



Fig. (4.137)

Fig. (4.136): - AL-Khulani roundabout square in the fifteenth, Source: [https://  
\(accessed baghdad.tumblr.com/  
26 Dec.2018\)](https://accessed.baghdad.tumblr.com/)

Fig. (4.137): - AL-Tahreer square and the public garden in the fifteenth, Source: Iraqi national Archive.

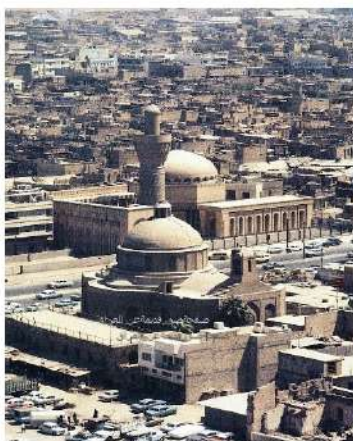


Fig. (4.138)



Fig. (4.139)

Fig. (4.138): - Shorja Area after removing roundabout square in eighteenth, Source: The mayoralty of Baghdad Archive

Fig. (4.139): - Shorja Area with roundabout square in fifteenth, Source: Iraqi national Archive.

#### 4.4.2.3 The Transformation of Urban Space

During the above mentioned period, the old city had many devastated areas which were substituted by large scale projects. The destruction process was done regardless of its connectivity to the adjacent area and to the old main and secondary streets. The area around the AL-Gailani shrine was planned to be removed to provide more space for the visitors as main gathering area (Fig.4.140). New connector street proposed to extend from AL-Rasheed

street via AL-Khulani square and AL-Gailani shrine up to the far east substituting a large traditional residential area as shown in (Fig.4.141). The destruction area included many remains of the old public, semipublic and semiprivate pedestrian walkways. The idea of implementing large scale projects was continued by placing new functions and building types instead of the old fabric. The projects that were placed along the main vehicle streets had no integration within the adjacent urban elements and always was surrounded by secondary streets or leftover areas like what could be found in the civic governmental centre, the National Library campus, AL-Arabi market, multi storey parking lots and many individual multi storey buildings within the old traditional building types. The old market of Shorja which penetrates the city fabric motivated many new commercial centres to take place around or parallel in order to cope with the increasing demand of more commercial land use. New market type was added following the orientation of the main existed passages in the adjacent area but not the traces of the old site. The new passage for example (AL-Arabi shopping centre mall) has connected both AL-Rasheed street to AL-Khulapha street parallel to the old artery which remained dominant within the city. The deducted area bordered by keeping the main churches (Latin and Syrian churches) from one side and the buildings that located approximately with one line on the other side which was straighten later to have pure rectangular as found in the plan (Fig.4.142).



Fig. (4.140)



Fig. (4.141)

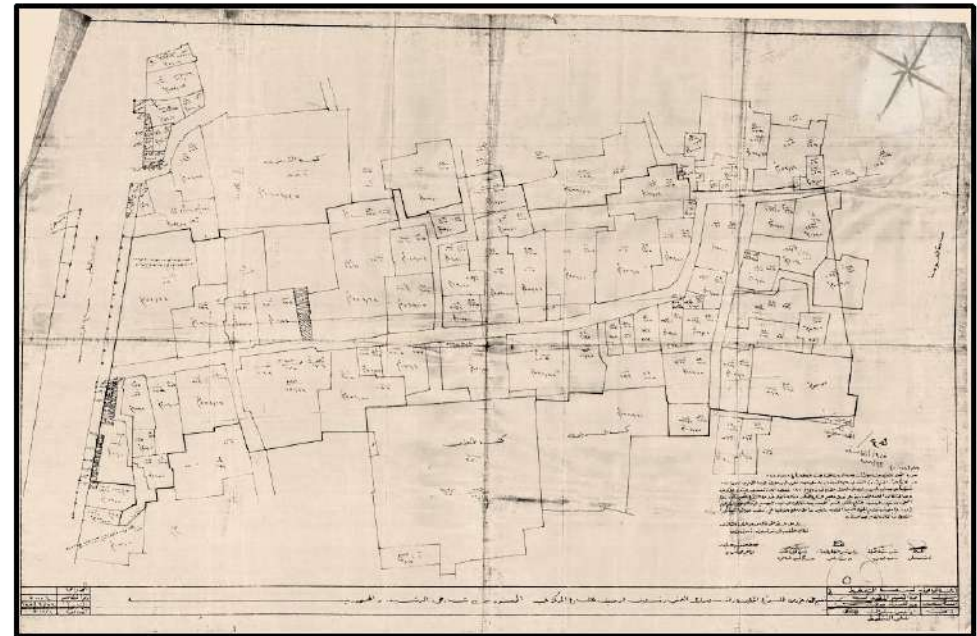


Fig. (4.142)

Fig. (4.140): - The destroyed area before the construction of the connector road from AL-Khulani square to AL-Gailani shrine in 1972, Source: The Mayoralty of Baghdad Archive, See Fig. (36) in Appendix I in A3 size.

Fig. (4.141): - The destroyed area around AL-Gailani shrine in 1981, Source: The Mayoralty of Baghdad Archive, See Fig. (37) in Appendix I in A3 size.

Fig. (4.142): - The destroyed area before AL-Arabi shopping centre construction in 1970, Source: The Mayoralty of Baghdad Archive, See Fig. (38) in Appendix I in A3 size.

### 4.4.3 Urban Components

#### 4.4.3.1 Blocks & Plots

Large traditional residential blocks were removed totally and many parts were deducted according to the new inserted blocks which have geometrical shapes and rectilinear border that was implanted inside following the western approach. There was a tendency that new blocks were occupied by one or more buildings. The new blocks have normally rectangular or square shapes and varied in size according to the form of the project that was chosen to be implemented. Some blocks were occupied by only one building such as that of the multi storey parking in Sinak and AL-Rusafi. The blocks could also be bigger when large scale projects are inserted inside like the governmental civic centre and the National Library. They were surrounded and enclosed by large public space or separated by public gardens in case of having multi buildings like in the governmental centre. The main streets are still bordered by linear plots to be filled having rectangular or square shapes attached to each other like in AL-Khulapha street (Fig.4.143). The blocks had covered totally with the large multi storey buildings that were aligned within the small traditional buildings along both AL-Rasheed street and AL-Mustansir pedestrian street in order to keep the continuity of the market and to get the maximum benefit from the expensive land in this area. The plots shape in AL-Rasheed street was not regular and depends on the border of the deducted areas through the destruction process while the plots shape in AL-Mustansir street was more regular and bigger in size as it was main traditional commercial market and this resulted in motivating new commercial centres and public buildings to substitute its original one.



Fig. (4.143): - Linear parcels along AL-Khulapha street, Source: Iraqi national Archive.



#### 4.4.3.2 Building Types

Several projects were inserted in this area with different building types. They could be detected as the following: -

##### **First Design Proposal TAC -AL-Khulapha Street**

The first part of the project aimed to develop AL- Khulapha Street in a way that reflects the aim to have modern Baghdad by separating the old and new fabric. This project was designed by TAC (The Architects Collaborative of Cambridge) and was not just an infill project for the vacant plots along the street, but it was aimed to create a kind of mega structure projects along the boulevard and around its traffic nodes and urban spaces. This project reflects the American style and ignored totally the historical context of the city by distinguishing the street as a main corridor than the traditional ones around and considering the traffic nodes as the main urban public spaces in the old city (Fig.4.144). They tried only to restore some historical monuments without dealing with whole historical urban fabric as a unified urban form (Bianca, 2000, pp. 245-255). The proposal of AL-Khulapha street proposed a new regulation for design associated with the aim to ensure the uniformity of facades and building height. The projects focused on the design of many street parts in a modern way excluding the Shorja square design which matches the historical approach by proposing to expand the accommodation capacity of the historical AL-Khulapha mosque to 10000 worshipers and keep the height of the original minaret (Yamada, , 1985, p. 28). An Iraqi internationally well-known architect Muhammed Makiya<sup>109</sup> was also of a thought of creating an eminent and arcaded plaza that gathers both the church and the mosque that were committed to be designed, but his scheme unfortunately witnessed demise even before it was born (Fig.4.145) (Makiya, 1990). A series of residential and administrative buildings was constructed and surrounded the area of Maidan designed by Energoprojekt Yugoslavia and supervised by TAC as complementary part of AL-Khulapha street ( AL-Chalabi M. , 2016) (Fig. 4.146 & 4.147). Within those examples of international style though most of them were not achieved, the local architects also participated to reflect the national trend in the streetscape.

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<sup>109</sup> See Biography P.435



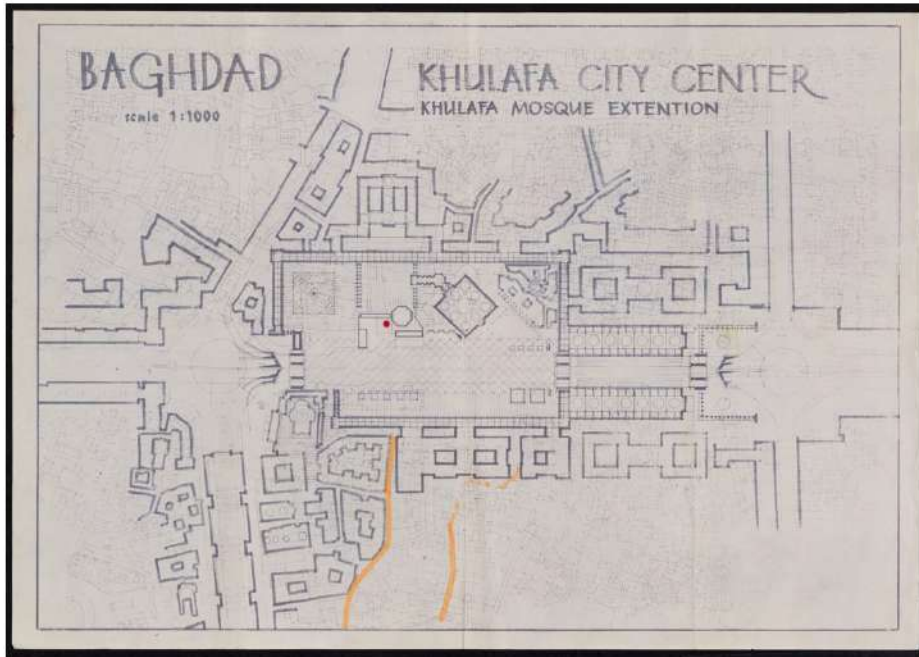


Fig. (4.145): - AL-Khulapha plaza designed by Makiya, Source: The Mayoralty of Baghdad Archive



Fig. (4.146)

Fig. (4.146): - The residential and administrative buildings elevation in Maidan along AL-Khulapha street, Source: AL-Chalabi 20.

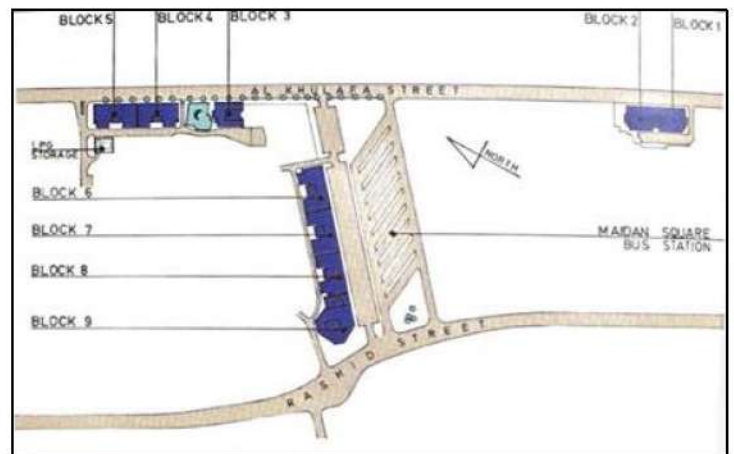


Fig. (4.147)

Fig. (4.147): - The residential and administrative buildings plan in Maidan along AL-Khulapha street, Source: AL-Chalabi 20.

### The Governmental Campus

Three buildings located within a large area in Sadriya old quarter which were deducted from the traditional residential urban fabric in order to construct the proposed civic centre which had been planned in the 70s. Three buildings were initiated inside: The Mayoralty of Baghdad, the Water Directorate office and Taxes Directorate Buildings Fig. (4.148 & 4.149). These buildings followed both inward and outward looking plan as a new tendency to have the traditional elements of Iraqi architecture meshed in a modern style. For example, the building of Water Directorate office was designed by Iraqi architect Mahmood AL-Ali and introduced the traditional courtyard system in the multi storey buildings by using the local materials. These buildings are situated within an external urban space used as public garden and surrounded by external fence to isolate them from the adjacent neighbourhoods.



Fig. (4. 148)



Fig. (4.149)

Fig. (4.148): - The proposed civic centre in seventeenth along AL-Khulapha street,Source: AL-Chalbi

Fig. (4.149): - The water board office in seventeenth along AL-Khulapha street,Source: Yamada 1984:44.

### The National Library Project

This building, located within a large plot, that was deducted from the residential area near Bab AL-Mudham area in front of the Ministry of Defence assembly and along AL-Rasheed street. It was designed to reflect the modern trends by using traditional local elements of facades in modern cultural buildings that have already followed the western design model (Fig.4.150). Many additional library buildings were attached to it creating an assembly of libraries with different specifications (Fig.4.151). The main entrance, located in front of the monumental gate, belongs to the Ministry of Defence and it has also a back entrance within the surrounded fence with an access to AL-Khulapha street from behind. The adjacent area varied from having relatively public modern buildings along AL-Mudham street from the left side and the remains of the residential quarters from the rest parts which mostly deteriorated and decayed.

The assembly is attached to a variation of cultural and residential frontage buildings that surrounded the whole area along AL-Rasheed street from the front, Maidan Parking from the right side and AL-Khulpha street from behind. It was totally isolated from the old pedestrian artery that connects two main historical monuments both Maskanta historical Church adjacent to AL-Khulapha street and AL-Muradiya mosque along AL-Rasheed street.



Fig. (4.150)



Fig. (4.151)

Fig. (4.150): - National library project,Source: Iraqi national Archive.

Fig. (4.151): - National library assembly location,Source: google pro maps, (accessed 12 Jan. 2018).

### Multi storey Parking Lots

Multi storey parking buildings along AL-Rasheed street and AL-Mustansir street are considered main solution to meet the increasing demand for parking lots in the central commercial area so as to placate the traffic jam in this area. The first one located in AL-Rusafi along AL-Rasheed street combined both parking with commercial wholesale trade centre (Fig.4.152). It was surrounded by secondary streets to provide a better accessibility for cars. The surrounded street separated it from the adjacent traditional area that experienced later a rapid transformation in building types to be converted into commercial centres as part of the old new market area. The other one along AL-Rasheed street in AL-Sinak was only restricted for cars and located among many governmental buildings in this area and commercial streets. It was also surrounded by secondary streets to provide accessibility for exist and entry (Fig.4.153). One other multi storey parking located behind the governmental frontage buildings along AL-Khulapha street within the triangle area that were located among AL-Tahreer square, AL-Khulani square and AL-Tayran square serving the increasing demand of car parking lots within this area where many governmental and commercial buildings are located. This multi storey park motivates the residential area

adjacent to it to experience a rapid transformation for commercial land use. Other parking buildings are now under construction in the devastated area opposite to AL-Gailani mosque along the collector street that is heading towards the far east and adjacent to the residential area behind. It is considered a complementary part for the multi storey buildings along AL-Khulapha street.



Fig. (4.152)



Fig. (4.153)

Fig. (4.152): - AL-Rusafi multi storey parking and commercial centre along AL-Rasheed street, Source: Photographed by the Author.

Fig. (4.153): - AL-Sinak multi storey parking along AL-Rasheed street, Source: The Mayoralty of Baghdad Archive

### AL-Arabi Market-Shopping Centre

A large portion of rectangular land between AL-Rasheed street and AL-Khulapha street was deducted from the old traditional area regardless of its old traces creating a new artery within Shorja market and it is used as retail shops in the first floor and wholesale trade offices and storages in the second floor while basement is used as a parking space (Fig 4.154). The passages go through four buildings with square shapes connected with each other with crossed small passages creating a series of similar connected buildings from AL-Rasheed street to AL-Khulapha street (Fig.4.155). It was surrounded by pedestrian street from the left and car street from the right that links AL-Rasheed and AL-Khulapha streets. Both secondary streets affected the building types along them by having large and multi storey commercial buildings and big storages yet keeping some old monuments like the churches on right side.

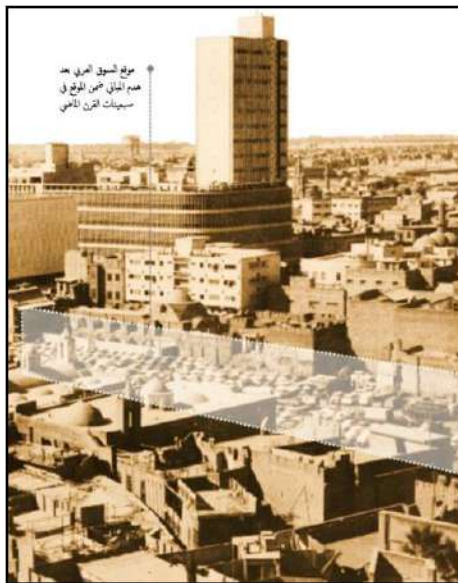


Fig. (4.154)



Fig. (4.155)

Fig. (4.154): - The urban fabric that was substituted by AL-Arabi shopping centre mall, Source: Abul Hadi.T 2007.

Fig. (4.155): - AL-Arabi shopping centre mall, current location, Source: google pro map, (accessed 12 Jan. 2018).

### Public Buildings

Multi storey buildings along the main streets differ in their types showing a variation in architectural style. Some of them belong to many Iraqi architects who tried to achieve their ideas in reflecting the modern architecture in the city of Baghdad. Some of them tried to explore the potentiality of traditional architecture through their modern compositions like in the industry union building designed by Iraqi architect Rifaat Chadrji <sup>110</sup>(Fig.4.156). Some trials started to keep and develop the historical monuments and their surrounded area like building a new mosque in AL-Khulapha street to keep the existed Historical Specimen Minaret of Al-Ghazl which was part of the grand mosque in the Abbasid period. M. Makiya, a renowned Iraqi architect, was involved in rebuilding the grand complex, which had no remains at that time (Fig.4.157). It was difficult to build such a historical mosque in a bustling area full of activity and modern buildings. The mosque was built not as one mass, but as assembled units dominated by big domes standing with the old minaret which is considered the main focus of the design. The new monument opposite to the Latin Church has motivated to propose a mutual connection by having a large urban public space in between. Some

<sup>110</sup> See Biography P.435

buildings also belong to the international style and were done by different foreign and local architects or architectural companies (Fig.4.158)



Fig. (4.156)



Fig. (4. 157)

Fig. (4.156): - Industry union designed by Chadri (National modern style),Source: Iraqi national Archive.  
 Fig. (4.157): - The construction of AL-Khulapha mosque,Source: Iraqi national Archive.



Fig. (4.158): - A combination from International and national modern architecture along AL-Rasheed street,Source: Abdul Hadi.T 2007.

#### 4.4.4 Urban Innovations

Many projects were planted inside the old city based on the erosion of traditional fabric. The construction of Mayoralty campus, Central Bank campus, housing project and commercial centres were built to cope with the global economic power and urban development, but on the other hand, it has enlarged the urban segregation process and gentrification problems. During this period the idea of conservation projects started to appear. An attempt to balance between conservation projects and development trend was considered in the Baghdad master plan done by Polservice 1973 but it was not well achieved. The main focus was to get back to the traditional urban structure which disappeared in many parts in Baghdad after the huge



transformation process (Yamada, , 1985). In 1982 the Iraq government launched an ambitious renewal project with different and new vision in the old city by implementing monumental structure inside the old part (Binaca, 2000, p. 245). Three projects were proposed, the first was to develop part of the main city artery AL-Khulapha street within revitalization a part of historic centre AL-Ahmadiya area and the second was to prepare a general conservation plan done by JCP while the third one was the development of Bab AL-Shaik historical area project.

#### 4.4.4.1 Conservation Proposals

##### AL-Ahmadiya Historic Area 1982

The study area only included one neighbourhood located in the northern part of the old city bordered by AL-Rasheed street from east, the Ministry of Defence in the north, Tigris river in the west and finally Hassan bin Thabit street <sup>111</sup>and Sarai in the south (Fig.4.159). The main objective was to have a master plan to include both the reconstruction and revitalization process at same time and to restore the old Baghdad architecture and looking forward to achieve the prospective requirement. It was focused on analysing the transformation of the city structure and aimed to identify the mutual relationship between circulation and related activities. The study analysed each block by conducting the types for each building. Architectural, aesthetic, structural and historical values were examined in order to classify the type for each area. According to the survey and data collected from the site, the area had a variety of land use from commercial and residential in AL-Rasheed street to academic near the Markayiza school<sup>112</sup> and the second one tended to be more public and extended up to the riverfront area. Each block experienced a modification in its cell units that belong to different construction periods, like the houses which are either traditional courtyard or modern with more western influence (Fig.4.160,4.161). The Market is also formed from narrow streets with retail shops on both sides and transformed from covered shops to open streets after 1940. The commercial function is thought to be the major land use and moved inside the residential blocks by converting many houses into warehouses. The main points in the master plan according to the TAC report were to preserve the old types of the historical buildings, improve the services and the physical conditions, solve the circulation and parking and make AL-Ahmadiya area as a prototype to develop the whole historical core (Fig.4.162). It had been proposed to have a path from Bab AL-Mudham square up to Al-Ahmadiya area separated from the assembly of the Ministry of Defence. The master plan also enhanced the residential use and the traditional market as part of the conservation approach associated with clear

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<sup>111</sup> This street started from the traditional Zahawi coffee shop along AL-Rasheed street up to the properties bank along AL-Mustansir street.

<sup>112</sup> It was an Ottoman school which was modified later to be as secondary school.

definition of the street patterns. The proposed land use followed suit the existed one by having commercial activities, especially in blocks peripheries on the ground level while the first level worked as an extension of the ground with a mixed use (TAC, 1982). AL-Rasheed street frontage part was treated as distinguished section following the whole urban street scale and had a substantial influence in designating the land use of the attached blocks behind. The frontage blocks are to follow the arcaded type of AL-Rasheed street by having a continuity in land use and visual axis.

### **Second Design Proposal JCP 1984**

It was aimed to prepare a master plan that could generate a balance between having a conservative approach to keep the historical remains and adopting the modern development by managing interventions and traffic system. The plan was taken into account to have a clear definition and a correlation between the old historic area and the central business districts. They found that 50% of inhabitation is working in CBD in 1982. It was indicated that the historic area consists of about 5.5 km<sup>2</sup> from the CBD with 15700 buildings and about 50% from those buildings which were in bad physical condition. The transport and residential land uses were considered the majority in the area compared with others. The proposed land use plan enhanced the socioeconomic plan for the inhabitation in educational, cultural and economic levels and set a conservation strategy to ensure the maintenance of the historical monuments and urban fabric by setting a clear management plan and urban design approaches for the important parts like the riverfront area, the historical spine, AL-Rasheed street, and Sheik Omar zone. The strategy recommended to restore and conserve 24,8% (about 3891) from the total number of buildings in AL-Rusafa. Most of the listed buildings, estimated of about 66.3%, were residential buildings most of which were in bad condition with 11 Khans, 36 Mosques, 6 paths, 5 tombs, 6 schools and 4 churches. For the river frontage area, it was obvious that this area contains many architectural monuments which have a variety of architectural and functional characteristics. The proposed plan was aimed to have a continuous axis along the river with main cultural and recreational functions. The strategy also recommended to substitute some modern buildings with new ones or filling the gaps in vacant area by keeping the traditional city skyline and providing extra architectural elements in order to make the river more accessed to the public and transform it from abandoned area into a recreational zone. Another idea, under focus, was to find design guidelines for the traditional AL-Rasheed street. The guidelines encompass a set of regulations which should be applied to keep the harmony and to adopt the new supposed interventions. They are concerned with architectural elements, height and material. It is

proposed to unify the skyline by filling the voids. The additions should carry the same traditional elements to ensure the visual continuity. The height should not exceed 3 floors with the possibility to build the 4<sup>th</sup> floor back from the frontage (JCP, 1984, pp. 32-44). The study also proposed to provide public transportation facilities to improve the environmental quality and reduce the traffic jam (JCP, 1984, pp. 1,37). In addition to the river spine, the study also proposed and defined five spines based on historical survey to be developed connecting different parts of city : The first spine lined from the city castle to the middle gate passing through the historical shrine of Sheik Omar. The second spine is lined from AL-Mustansiryia school and Market network (Suq) to the middle gate passing through Mirjan mosque and Shorja (the main market). The third spine is lined from the destroyed Talsam gate to the Sinak area and Said Sultan Ali mosque passing through AL-Gailani shrine. The fourth spine is lined from the old Castle to AL-Gailani shrine passing through several small mosques as shown in (Fig.4.163a) & (Fig.4.163 b). The fifth spine is lined from the Castle and extends till the end of AL-Mustansir Street connecting the main historical and monumental buildings like Sarai, Qushla, and Mustasiryia School. In order to keep the continuity of these spines along the interrupted urban streets, transitional plazas were proposed as junction nodes to ensure the visual and functional interconnection. The design of these spines should have taken into account implementing many criteria like having Identified gates, harmonization in the infill process, connecting the main monuments, keeping the continuity elements in the residential areas and finally ensuring the physical and natural landscape (JCP, 1984, pp. 1,70). The study defined different market (Suq) types and proposed different strategies regarding their historical importance, location, physical condition, and the relation within the old spines and the adjacent area. The proposed study introduced the idea of a physical buffer zone by identifying a developed area in the eastern edge around the old city Fig.(4.164) (Yamada, , 1985, pp. 46-47).

#### **The development of Bab Shaik Area (AL-Gailani Shrine) 1981-1984**

After the construction of the AL-Sinak bridge, new road was lined from AL-Khulani square penetrating the old area adjacent to AL-Gailani shrine, known as Bab Shaik. Several proposals were submitted to the Baghdad Mayoralty: the first one done by the Architectural and Planning Partnership & Mahmood Ali in London which seems to be before lining the new street. The project aimed to conserve the area and to develop a line of buildings along the new street. The proposal intends to develop a mixed land use by creating public spaces around the shrine that could be integrated within the

surrounded markets and the neighbourhood streets. The main objective of the study was to conserve the remained traditional buildings and encourage people to live in by providing modern living facilities like underground parking spaces reachable by the users and also keeping the pedestrian movement in the main corridors and streets and retaining the human scale and the traditional buildings pattern. Social participation and adaptive reuse were the main strategies that were suggested to revitalize this main religious area (Fig.4.165 &4.166). Another completion was done in this area after lining the new street but in a different way by dividing the area into 7 zones to be designed by companies and architects in collaboration with TAC who belong to different background but with general unified regulation from the Mayoralty. The first and second zones were developed as a main commercial centre in the first floor and secure living in other floors which amount to 2-6 floors where they stepped down from behind until they reached the traditional area. The third zone was designed to conserve the area around AL-Gailani shrine by introducing the idea to hide all services and facilities under ground. The fifth zone was designed by to have an office building surrounding AL-Khulani mosque and should combine many scattered conservative traditional houses. In the fifth zone two similar buildings are extended along the new connector street and connected to each other through bridges. Both of them are used as dwellings which are connected to each other through square courtyards as main communal space. Many public facilities were designed in the vicinity of this zone as a main entrance for the old city (Yamada, , 1985).



Fig. (4.159)

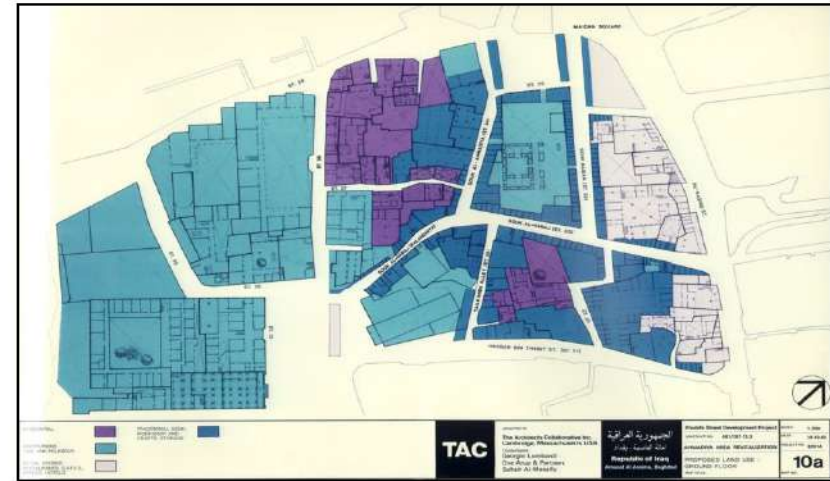


Fig. (4.160)

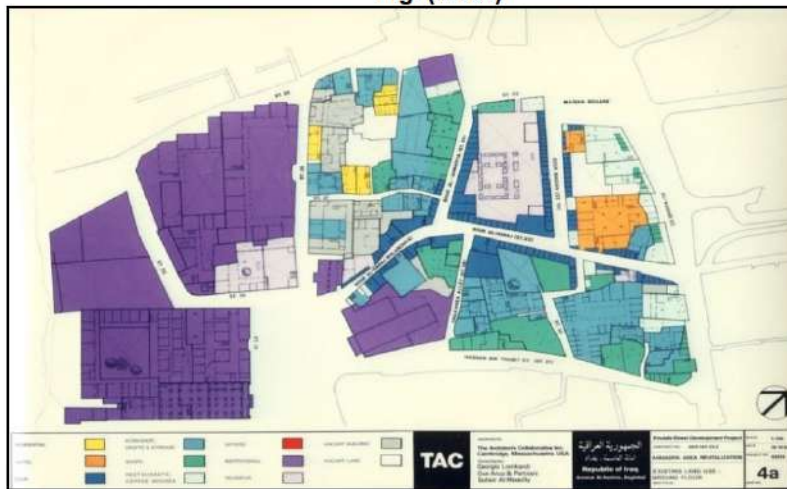


Fig. (4- 161)



Fig. (4.162)

Fig. (4.159): - The proposed development plan for AL-Ahmadiya area, Source: Tac1982:7.

Fig. (4.160): - The Proposed Land use for AL-Ahmadiya area, Source: Tac1982:11.

Fig. (4.161): - The Actual Land use for AL-Ahmadiya area, Source: Tac1982:31.

Fig. (4.162): - The proposed market for AL-Ahmadiya area, Source: Tac1982:26.

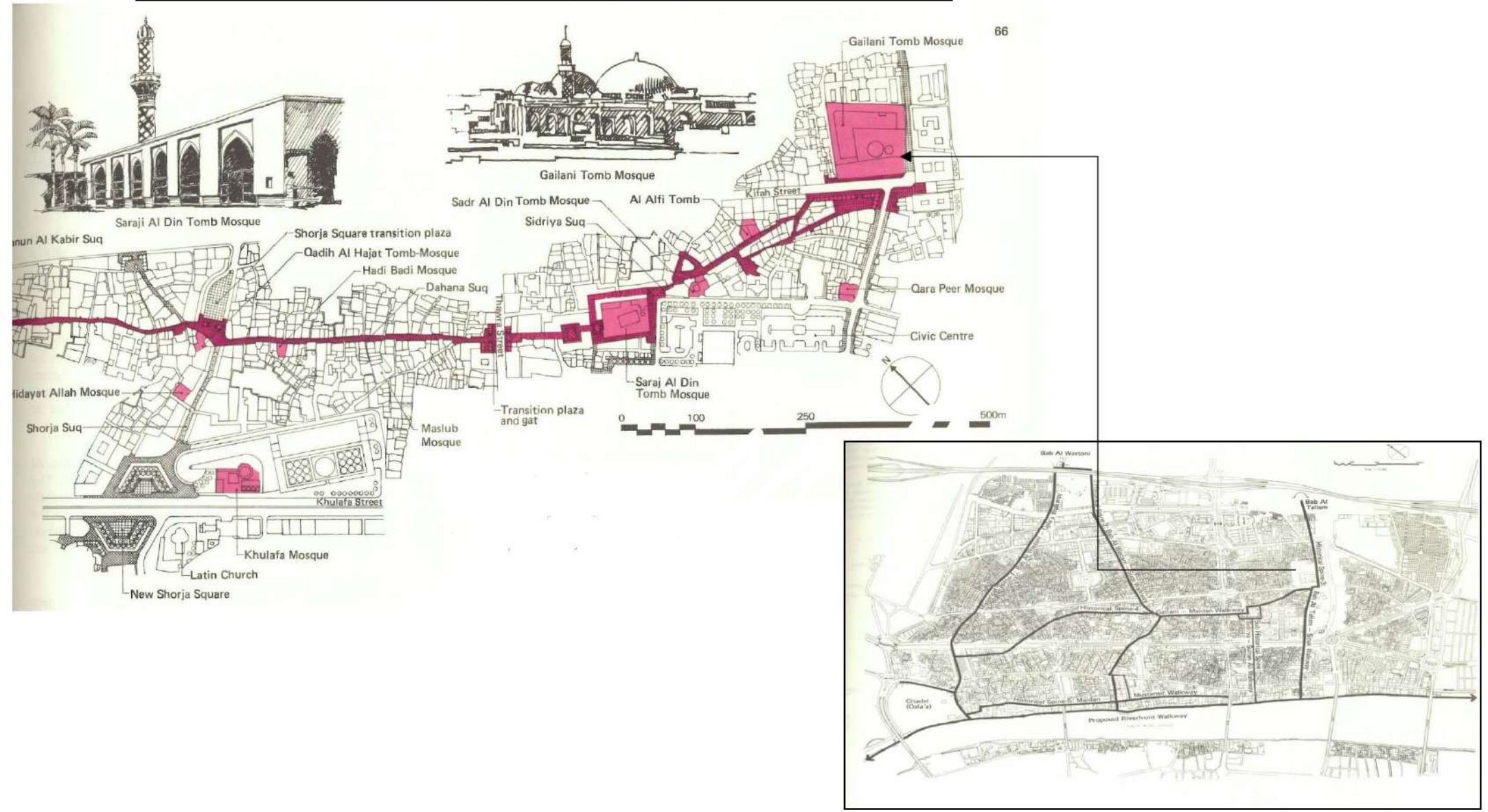


Fig. (4.163a): - The proposed development plan for Old Baghdad - Gailani shrine , Source: JCP,1984:65.

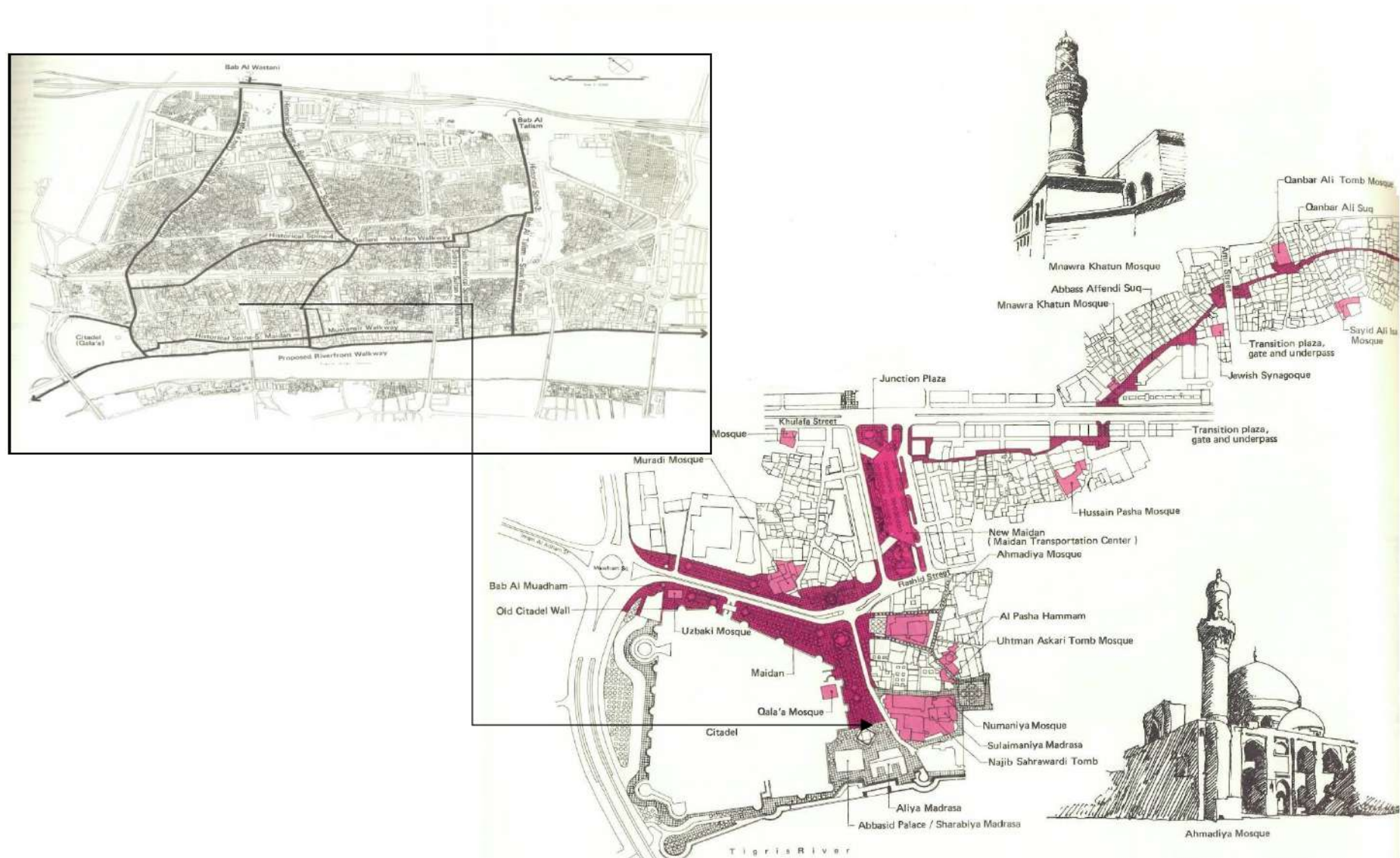


Fig. (4.163b): - The proposed development plan for Old Baghdad- Maidan Area, Source: JCP,1984:66.

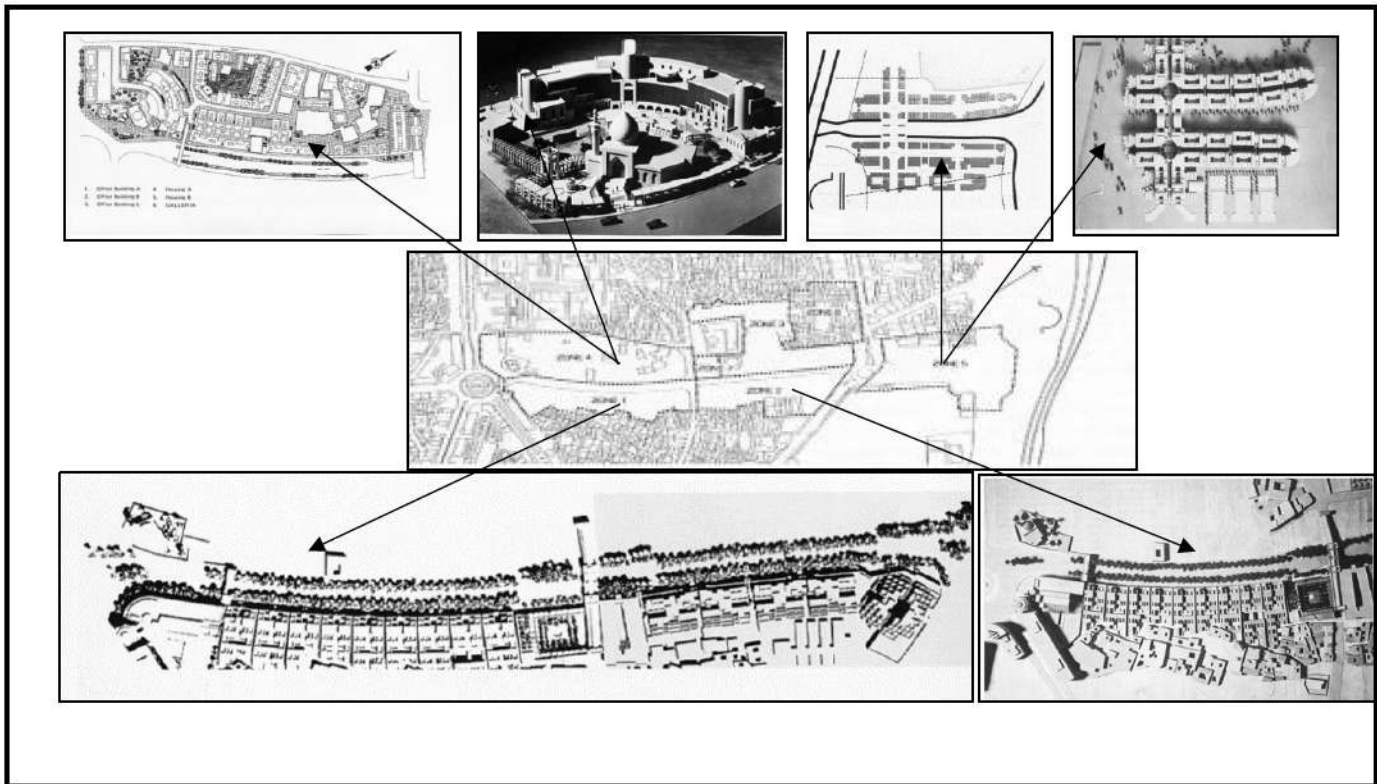


Fig. (4.164): - The Bab Shaik development projects proposed by Baghdad mayoralty, Source: Yamada 1984:45-58.

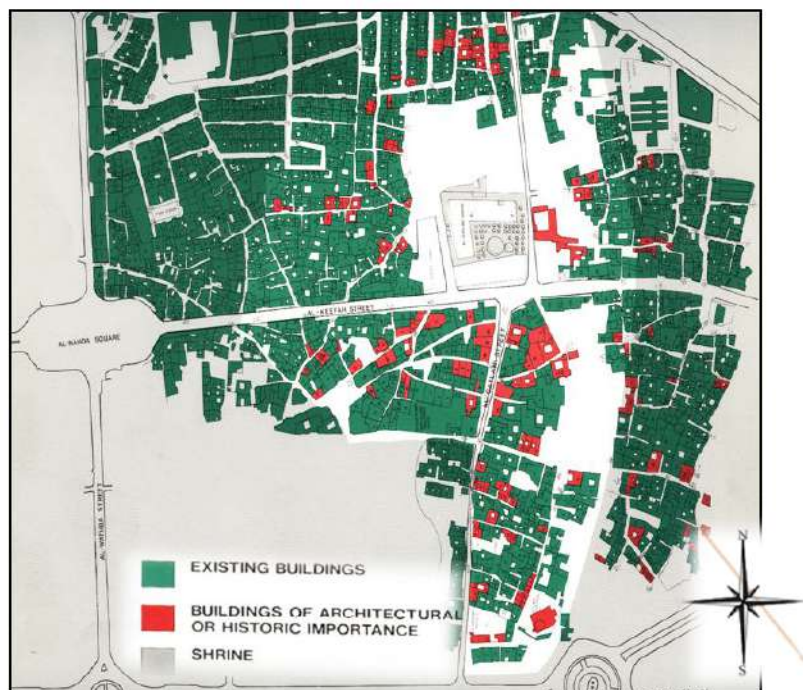


Fig. (4.165): - The Bab Shaik land use survey done by the architectural and planning partnership & Mahmood Ali, Source: Baghdad Mayoralty 1981:6.



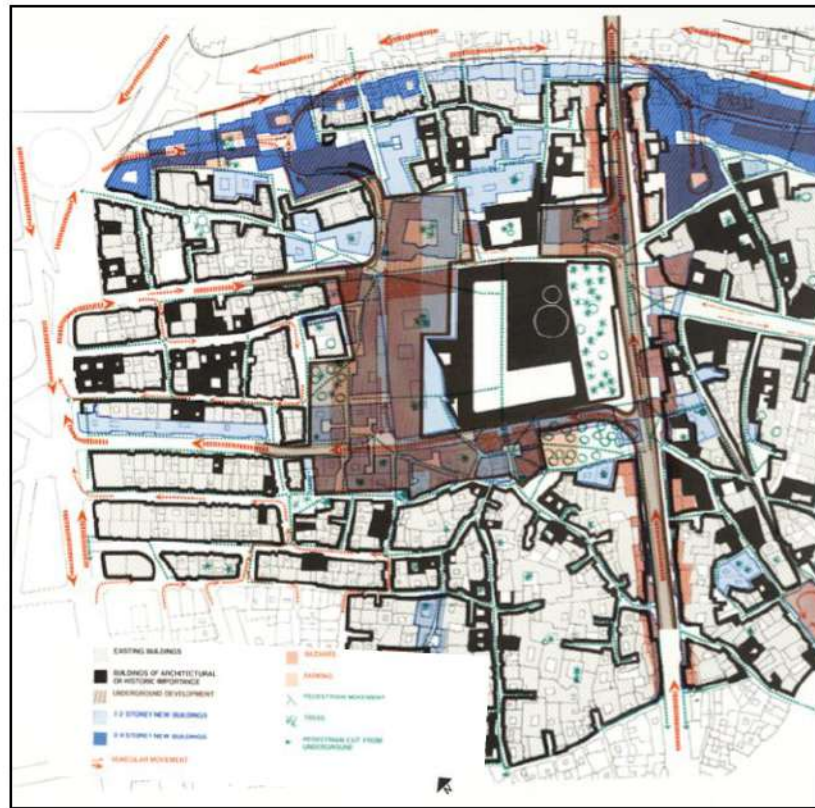


Fig. (4.166): - The Bab Shaik development projects proposed by the architectural and planning partnership & Mahmood Ali, Source: Baghdad Mayorality 1981:1 (Baghdad Mayorality , 1981).

## 4.5 The Transformation Process from 1983 to 2009

The city kept the general structure without any significant modification. The growth within the whole country in general and Baghdad in particular experienced a stagnation period due to the international sanctions after the 2<sup>nd</sup> Gulf War in 1990 and the American invasion after 2003. No more streets penetrated the old city fabric, but the destruction in the traditional area was filled by individual projects without any consideration for the historical values. Based on the plan initiated in 2009 surveyed and prepared by the ministry of planning, comparative study was done within the last morphological period (Fig.4.167). A comparative analysis was done to explore the development in the urban landscape at this time interval by overlapping the above mentioned maps reaching to have morphological plan as shown in (Fig.4.168).

### 4.5.1 The Change in The City Network Structure

In the period between 1983-1990, many governmental and commercial buildings along AL-Rasheed street, AL-Kifah street and AL-Khulapha street were initiated to cope with the economical and administrative rule of the old core. The boulevard of AL-Khulapha street was filled by many buildings that belong to different architectural styles but this is not completed till now and has many vacant parcels. The wholesale trade was enhanced and as a result the transformation process was accelerating in the urban components. The rail stations in the north and east of the old city were neglected and later removed with all railway tracks and substituted by express ways altering the street hierarchy. The removal of railway tracks allowed to develop more specified land uses for educational, industrial and services functions for the whole city of Baghdad. In the period between 1990-2003 the city kept the whole structure without any changes and many of development projects were stopped due to the international sanctions after 2<sup>nd</sup> Gulf War. Few projects were implemented inside the old city in order to develop the main religious buildings like the enlargement of AL-Gailani shrine. A large quarter that contained many traditional residential units ( Suq Hamada ) was removed on the other part of the city (AL-Karch) along the river and adjacent to AL-Sinak bridge<sup>113</sup>. The area had been substituted by new residential blocks designed in linear and rectangular blocks that had back to back parcels surrounded by vehicular streets. This style is the common pattern in all new quarters in Baghdad but in this project it was applied to be more compact reflecting the characteristics of the traditional fabric and considered a good example of development in this period despite its being located out of the study area AL-Rusafa (Fig.4.169 & 4.170)

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<sup>113</sup> This project was designed by the presidential consultancy office according to political decision done by the former ruler Saddam Hussein where he spent his childhood in this area.



Fig. (4.167): - Old city urban structure after an initial survey in 2009, Source: Ministry of planning-Gis centre, See Fig. (39) in Appendix I in A3 size.

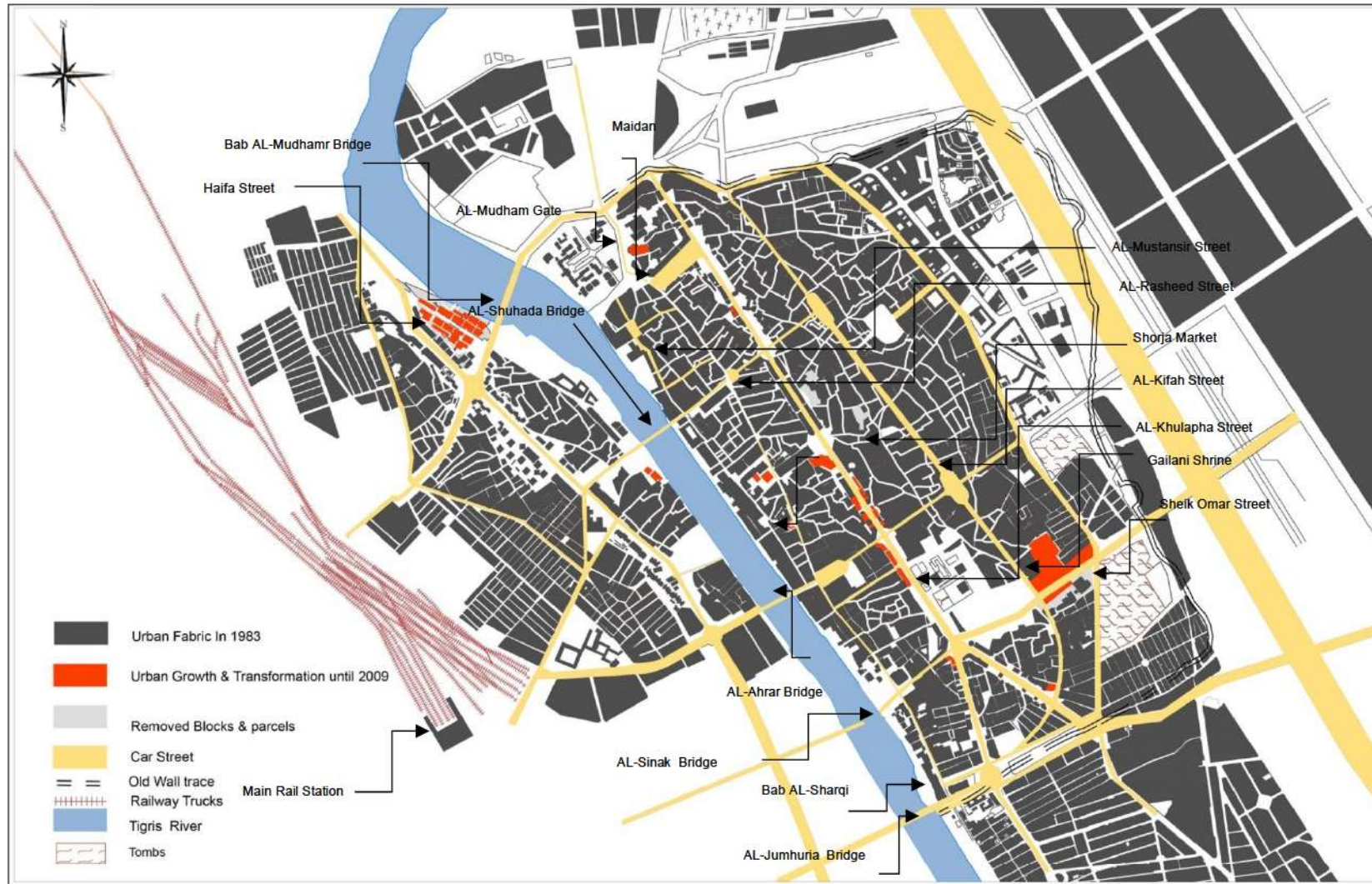


Fig. (4.168): - Urban Morphological change from 1983 to 2009, Source: Digitized and investigated by the Author, See Fig. (40) in Appendix I in A3 size.

After the American and allied invasion of Iraq the old core was severely under threat by terrorist attacks; this was the reason to isolate neighborhoods from each other and from the other part of Baghdad by cement T-walls. AL-Rasheed street, for example, was rather aligned by many concrete barriers around many buildings. The car movement was hindered and the street was kept only for pedestrians. The hierarchy of traffic was changed by having an interrupted street network to keep as much as possible of safe passages for pedestrians. The urban public space became inaccessible and fenced by T-walls substituting the built-up area around. Each district has assumed some independent character from the other adjacent areas, with somehow separate functional obligations that meet the area requirements per sector.



Fig. (4.169)



Fig. (4.170)

Fig. (4.169): - Urban development for Suq Hamada area, Source: Engineering department in presidents. office 1992.

Fig. (4.170): - Urban Scene for the new developed area in Suq Hamada, Source: Baghdad Mayoralty 2014.

## 4.5.2 Urban Space Development

### 4.5.2.1 Urban Space Hierarchy

The main constructed streets in the last morphological periods were still dominating the urban scene with few modifications. From the period between 1982-1990, a new express way was achieved on the east side at the border of the old city and it enjoyed a higher priority than the others streets in the old core, connecting the different parts of Baghdad without passing through the old city. The centrality of AL-Khulapha street was enhanced by completing partly the construction process of the buildings along the street. After the 1990 only one or two floor buildings that was not compatible within the characteristics of the street by having multi storey buildings were constructed because of the hard post war economic situation and the

international sanctions. Most of the squares and street walkways were transformed gradually into places for peddlers and were integrating within the traditional market network (Fig.4.171). AL-Khulapha street still had a higher role in connecting the old core with the other part of the city and resulted in a high traffic volume. The traffic increased in parallel with the higher increase in the number of traders after the international sanctions. After 2003, the accessibility and function of the urban public space as a main gathering point was altered. People used to avoid meeting in such big and open places and chose to gather from one place another through safe passages which were concrete cordons around streets and neighborhoods .Back to old approaches, the compact urban form was a successful solution in planning for Baghdad to provide safe and not easily accessible places for strangers or any threats and indicate the necessity to produce such a secure space in the future. The spaces hierarchy had a new order by converting the public spaces into semipublic spaces . They were like having protected tunnels of spaces inside the bigger ones and connected to each other through the old traditional market arteries which became again the main backbone for the city movements. The car movement was hindered in many parts, for example in AL-Rasheed street the car mobility was blocked at the start of its segment where the Ministry of Defense assembly was isolated totally by concrete barriers and also blocked at the middle at the Central Bank area. People moved through narrow corridors that isolated the frontage buildings from the entire street section and then connected to the central market. AL-Khulapha Street was isolated from its both walkway sides creating new corridors which are used as a market place that is linked with AL-Rasheed street (Fig.4.172). Just few openings were left available in the concrete barriers to make for the entrance to these secured corridors (AL-Hasani & Wessling, 2012).



Fig. (4.171)

Fig. (4.171): - Peddlers in Shorja square, Source: Photographed by the mayoralty of Baghdad.



Fig. (4.172)

Fig. (4.172): - The concrete barriers along streets, Source: Photographed by the mayoralty of Baghdad.

#### 4.5.2.2 Urban Space Type

The urban public square and plaza always work to sustain the continuity of the street. The approach after 80s was to have monumental and representative projects in architecture and urban planning in Baghdad to extol the VIP people. One of the main projects in developing urban space was the design of AL-Gurairy square in AL-Rasheed street which is considered a memorial place for the Iraqi regime at that time (Fig.4.173 & 4.174). The design was based on having curvature building shape mediated in quadratic parcel and surrounded a semicircular square along the streets similar more or less to the Old Mirjaniya mosque shape that surrounded by streets with an inward looking space inside. The square is surrounded by a curvature arcaded passage surrounded by retail shops to have a continuity within the arcaded passage of AL-Rasheed street. A statue representing some nationalist officer, Abdul Wahab AL-Gurairy, was installed in the middle of the square then to be replaced by another statue of another national officer, Abd AL-Kareem Qasim, who was the prime minister in the 50s of the last century. This project is considered the first to create a fatigue point in the middle of the longest segment along AL-Rasheed street as a main public space for pedestrians. The peddlers convert the public streets to be part of the market arteries like in the below figures that show the differences between the 60s of the last century and the current situation. The tendency to strength the structure of AL-Khulapha street continued in spite of the slow development process that resulted from the low economic growth in the capital in general. After 2003 war the concrete barriers had surrounded the main public squares and streets and isolated pedestrian from any possible car bomb attacks. Many collector streets were transferred from car based to pedestrian-based streets trying to reduce car mobility as much as possible.



Fig. (4.173)

Fig. (4.173): - Urban development for semicircular public square along AL-Rasheed street, Source: Photographed by the mayoralty of Baghdad.



Fig. (4.174)

Fig. (4.174): - The semicircular public square along AL-Rasheed street, Source: Google earth maps, (accessed 12 Jan. 2018).

The street that surrounded the old Mirjan mosque was skipped cars to accommodate the huge number of peddlers who scattered along the main streets and squares in search of their living after the international sanctions during 90s up to now (Fig.4.175 & 4.176). The same situation was also found in Shorja space along Al-Khulapha street where peddlers covered the whole square which was occupied by a former statue of Saddam Hussein (Fig.4.177 & 4.178).

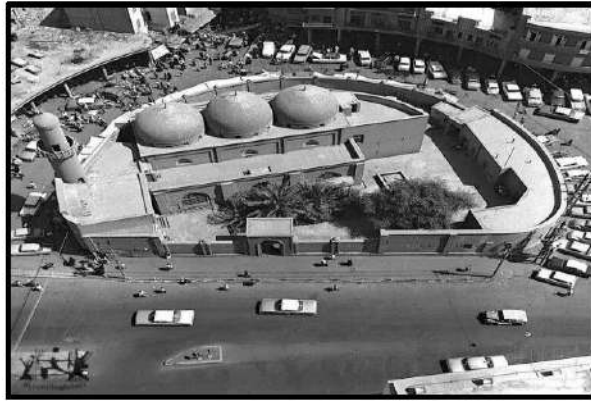


Fig. (4.175)



Fig. (4.176)

Fig. (4.175): - Car street surrounded Mirjan mosque, Source: Iraqi National Archive.  
 Fig. (4.176): - Peddlers surrounded Mirjan mosque, Source: Photographed by the Photographer Mohammed Ala AL-Din.



Fig. (4.177)



Fig. (4.178)

Fig. (4.177): - Sharjah square in 2002 along AL-Khulapha street, Source: The mayoralty of Baghdad Archive.  
 Fig. (4.178): - Peddlers occupied AL-Khulapha street and Shorja Square, Source: The mayoralty of Baghdad Archive.



### 4.5.2.3 The Transformation of Urban Space

The idea of secured spaces showed the urgent need to get back again to recreating a pedestrian network and to hinder the vehicular movements even in normal situation after the end of the war. AL-Rasheed Street showed, by experiment during war time, that pedestrians could create more vital space and participate in restructuring the mix land use inside the old city. A new design was done in AL-Mutanabi street<sup>114</sup> to transform it again to be only for pedestrians back to its old trace in 1917 where a pedestrian artery was widened to be a book-market street. This street was subject to a heavy car bomb attack in 2006 and was accordingly rehabilitated to be a main pedestrian artery rather than car street as it was before. It has become now more attractive as a main gathering urban public space where many pedestrians have accessibility toward the river. The need of having free open public spaces became a main requirement in the old core especially when many concrete barriers were removed after the relative improvement in security situation (Fig.4.179 & 4.180).



Fig. (4. 179)



Fig. (4.180)

Fig. (4.179): - The rehabilitation of AL-Mutanabi street as main pedestrian public space,Source: Photographed by the mayoralty of Baghdad.

Fig. (4.180): - AL-Mutanabi street bombing in 2006,Source: Photographed by the mayoralty of Baghdad.

## 4.5.3 Urban Components

### 4.5.3.1 Blocks and Parcels Types

A large area was demolished in the period of the 80s and 90s and replaced by many large-scale projects. That means many neighborhoods which are composed by an agglomeration

<sup>114</sup> This street was specifying to sell books and considered the main cultural place in Baghdad and Its name was belong to the famous Poet Abu-Tayab AL-Mutanbai.

of many parcels were moved to be one plot or multi big plots occupied by large scale buildings. This has encouraged the tendency to create new geometrical blocks within the old compact one, having later an alteration in space hierarchy and a clash between both patterns of the built up area that participate in accelerating the transformation process in the plots shape and their building types by enlarging or reducing its size. After the international sanctions, there was lack in the maintenance of the classical houses and the main buildings in the old core. The majority of such houses, after 2003, were removed due to the lack of urban management strategies and control (Fig.4.181). The willing to transfer these houses into big storages for the wholesale trade was spread widely and the owners have many times burned their houses to remove them totally from the conservation list according to the law <sup>115</sup>(4.182). The empty plots became a parking space to cope with the will to hinder the car movement inside the city against the terrorist attacks and to cope later with the increase for parking lots after the improvement of security situation when main streets became free again for car movement.

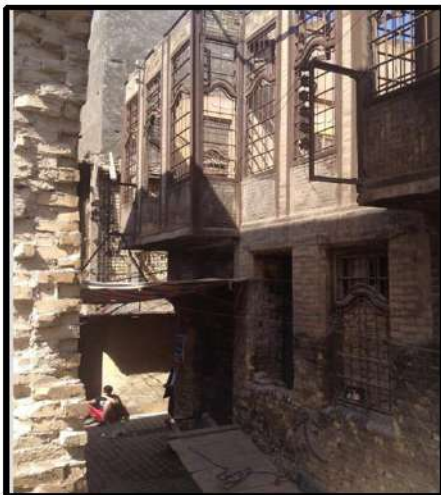


Fig. (4. 181)



Fig. (4. 182)

Fig. (4.181): - AL-Mutanabi street bombing in 2006,Source: Photographed by the Author.  
 Fig. (4.182): - Burned houses in the old core of Baghdad,Source: Photographed by the Author.

#### 4.5.3.2 Building Types

The city continued to follow the international style up to 1990 where many projects have been done by Iraqi and international architects and companies. However, after the 2nd Gulf War many world companies were banned from working in Iraq due to the sanctions<sup>116</sup>. Iraqi

<sup>115</sup>According to the interview within architect Muafaq AL-Tae in January 2018, it was mentioned that the law does not obligate the owners to rebuilt it again or have an approach of adaptive reuse.

<sup>116</sup> International sanctions from 1991-20103 that isolate Iraq from the international community after 2<sup>nd</sup> gulf war.

architects, on the other hand, sufficed to work with the accumulated knowledge they had with no serious attention they could pay to updating their work technologies nor depending on new building methods other than the ones they used with the same local materials in their projects. Large projects were designed and built by the constructional section in the Presidency Office with main concentration on building palaces like in the old city of AL-Karch or expanding the most important old religious institutions and mosques like the expansion projects of AL-Gailani mosque and the shrine and Said Sultan Ali mosque. In AL-Gailani shrine some historical parts like the old library and the western Minaret were removed totally to enlarge the external square that is used for prayer<sup>117</sup>. New buildings as religious schools and institutions were added along the connector street that heads towards AL-Khulani square on both sides. The trend to use stones as a main finishing material in this period was not matching the original building material in spite of using many architectural details that belong to the original shrine like having an arcaded passage along the square but with totally new façade details with new minaret at the corner (Fig.4.183 a,b,c).



Fig. (4.183a)



Fig. (4.183b)



Fig. (4.183 c)

Fig. (4.183 a,b,c): - Urban development for Gailani shrine and its adjacent area,

Source: Engineering department in president's office 1992.

<sup>117</sup> According to the interview within architect Muafaq AL-Tae in January 2018, it was mentioned that many historical parts were removed to be substituted by the new extensions.

This approach was also done with Said Sultan Ali mosque along the river where the enlargement covered the whole plot, narrowing the river frontage distance and interrupting the continuity of the river path. New architectural details were added to this extension using also the stone panels material with many ornamentations that covered the internal and external facades (4.184 & 4.185). Few buildings along AL-Khulapha street were also built but with maximum two storey buildings covered also by stone panels like in the commercial building along AL-Tahreer square (4.186). After the war in 2003, many buildings including the traditional ones were physically in bad conditions and covered with multi colored aluminum panels that were far from the original architecture design (4.187).



Fig. (4.184)



Fig. (4.185)

Fig. (4.184): - The development of Said Sultan Ali along AL-Rasheed street up to the river, Source: Photographed by Endowment Authority.

Fig. (4.185): - The satellite image of Said Sultan Ali along AL-Rasheed Street up to the river, Source: Google map, (accessed 12 Jan. 2018).



Fig. (4. 186)

Fig. (4.186): - Commercial building along AL-Khulapha street built in nineteenth, Source: Photographed by the Author

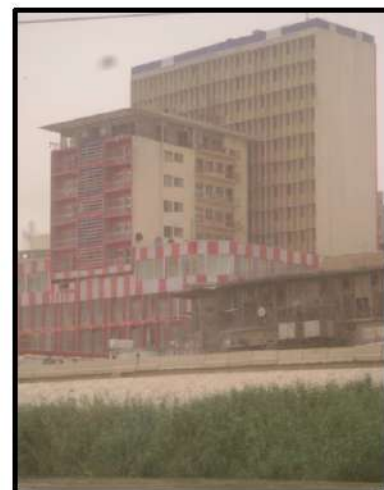


Fig. (4.187)

Fig. (4.187): - Distortion in building facades with colored panels, Source: Photographed by the Author.

#### 4.5.4 Urban Innovations

New land use plan was proposed in 1989 as shown in the archival plan done by the Mayoralty of Baghdad for Sadriya area around the governmental assembly buildings (4.188). The plan concentrated on transforming many residential areas into parking and green areas. In the 90s of the last century and during the international sanctions, the developmental and the revitalization work was restricted only to managing things per se. After 2003 a new approach was initiated to revitalize the historical pathways of AL-Mutanabi street as previously mentioned. An ambitious revitalization plan was introduced in 2009 for the area from AL-Rasheed street up to the river as pilot study. The main objectives were to enhance the pedestrian movement inside the area especially through revitalizing the old arteries and AL-Rasheed street. The existing physical entities were surveyed in the action area and were found to need an urgent work to maintain the remained old monuments and urban fabric; this in fact needed a starting strategy of adaptive reuse process for the existing buildings and an infill process of the collapsing area with a total improvement of the infra structure (4.189). The strategies were based on developing the existed squares along AL-Rasheed street and the river in addition of having new plazas and public spaces especially around the main historical monuments. The objective was to link the main interrupted parts of the city in a horizontal and vertical way. The proposal encouraged to have green public spaces to enhance the environmental condition of the old city. The idea was to restrict the car movement inside the old AL-Rasheed street by integrating the public transportation and pedestrian movement within the market network as a main activity in the old as shown in Fig.( 4.190) (Abdul Hadi, 2017, pp. 338-474).

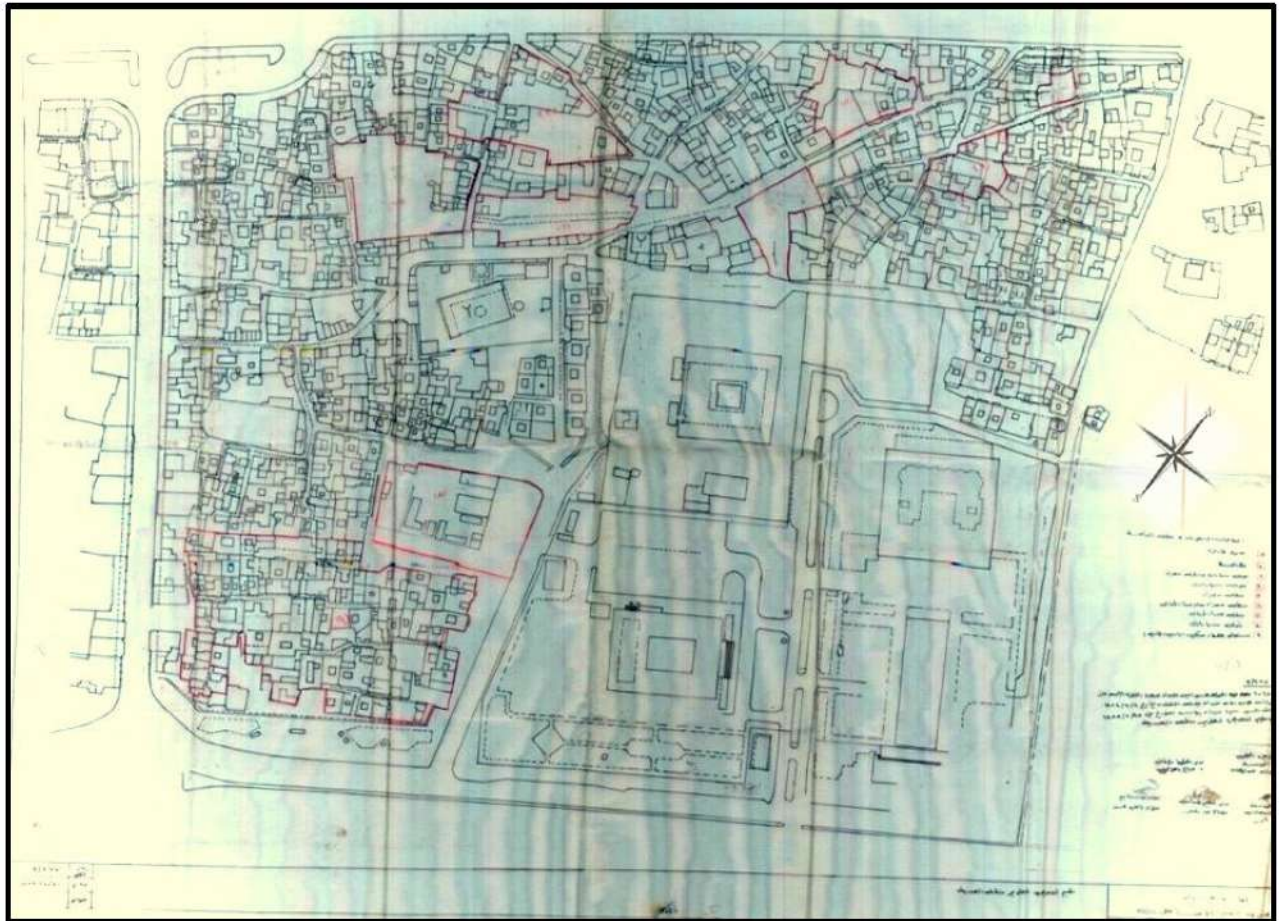


Fig. (4.188): - Sadryah land use plan proposal in 1989, Source: The Mayorality of Baghdad Archive, See Fig. (41) in Appendix I in A3 size.

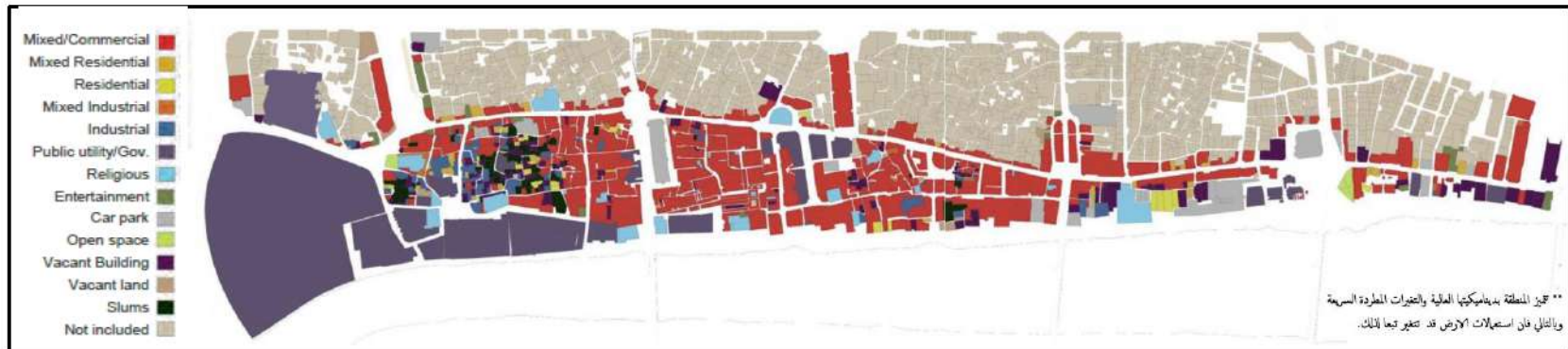


Fig. (4.189): - Urban land use survey done by AL-Mimar company to develop and rehabilitate the area between AL-Rasheed street up to the river, Source: Abul Hadi.T 2007.



Fig. (4.190): - Rehabilitation proposal proposed by AL-Mimar company for the area between AL-Rasheed street up to the river, Source: Abul Hadi.T 2017.

## **4.6 Conclusion - Typo –Morphological Analysis for The Old City of Baghdad**

### **4.6.1 Evaluating the Impacts of Modernization in Morphological Time Intervals in Old Baghdad City**

The first morphological period from 1854-1917 could be relatively considered the most integrated one where the new structure is more or less inserted in the old one especially in the public area between AL-Rasheed street and the river frontage area and also in the periphery area around the old structure that restricted now from the current AL-Sinak bridge to AL-Jumhuriya bridge and from the river up to Shaik Omar street (Fig.4.131). The gradual change in building types from inward looking to the outward looking along AL-Mustansir pedestrian street and even after the construction of AL-Rasheed street were adjusted and reformed to fit within the old residential neighborhoods as the traditional urban space hierarchy in the majority of area were still followed. Although the new breakthrough street penetrated the old core, the initial impacts could be managed as the majority of its distance followed the traces of the public and the semipublic area from the north gate up to Mirjan mosque. Afterwards, it went through few residential neighborhoods until it reached again a public area parallel to the river. Its impacts increased and became greater through the following time intervals. The study concluded that AL-Rasheed street had higher impacts on the old city structure and motivated many interventions later to destruct large areas and to be substituted by new streets and large-scale projects.

The riskiest factor was creating a traffic loop within the city in the next morphological period where the vehicle movement broke the privacy of the residential quarters by the construction of AL-Kifah street that was linked to AL-Rasheed street and to the city expansions from north and south. The buildings in the frontage area along the main vehicle streets started to follow the plot size and shape that survived from the destruction process following the outward looking plan building type. The urban public space changed totally and started to have both main pedestrian streets and vehicle streets with pedestrian walkways and both were connected to each other through Shorja traditional market artery that penetrated the city vertically in the middle. The market artery of Shorja is still considered the main public space that connects the split parts of the urban fabric. The scale and building types in both AL-Rasheed street and AL-Kifah street are accompanied by keeping the frontage buildings attached to the behind structure, kept the traces of the destructed area to be followed by crossing the streets. The priority for vehicle movement is still for AL-Rasheed street but the



artery that was dominating the city was the main Shorja artery market which provides the motivation to convert the local economical centre into international.

The new AL-Khulapha street had the hazardous impacts by lining wide boulevard inside the old core instead of having shorter local street, splitting the whole old city into two parts from right and left. The impacts in the area between AL-Khulapha street and AL-Kifah street is less than the impacts of AL-Rasheed street and AL-Khulapha street because of the initiative of having several additional linkages within AL-Rasheed street, mainly along Shorja market and Maidan. The new boulevard was planned to be the main commercial and business centre for the whole capital and it was logically motivating the tendency to be integrated within the main economical poles along AL-Rasheed street, especially the main financial centre. The role of the street and its development were determined by the existence of the potentials in the adjacent area. The buildings that were inserted along the street changed the hierarchy of space within the whole city in each street segment and altering the level of impacts on the adjacent area. The infilling process was not done in a regular way by having a concentration of multi storey buildings near the governmental centre as part of the proposed civic centre and within the area of Shorja market. Modern building types along the new urban public spaces hindered the connectivity between the main historical monuments as people always prefer to walk for a long distance along the vehicle street sideways instead of going through the old pedestrian network.

All mentioned conservation proposals from the 80s up to now mostly were not achieved in spite of having variant approaches. They tried to follow and revitalize the old spines but they neglected the impacts of the actions that were taken during the modern development. They focused always on having pilot studies for a small area in the old core instead of providing a complete solution of the entire old city as each part reacted in a different way during the transformation process depending on the hierarchy of the space in this part and its historical values. Revitalizing the old spines should be compatible with minimizing the impacts of car streets. The destruction of the city was more intensive and was implemented to create a gap between the old and new structure that interrupted the connectivity between the remained old parts and the removed traces of the city. After a series of wars, a stagnation in investing inside the old city participated in reducing the hierarchy of AL-Khulapha street. No more streets were curved through the old core but the transformation process and the destruction in the inner structure have increased due to the lack of maintenance and urban management rules. The urban structure moved from vernacular compact one to be mixed within the geometrical pattern after the colonial period. The new structure started to overlay on the compact oriental pattern and substitute large area of it. That motivated the remained compact oriental pattern to react in two directions: first, horizontal reaction represented by shrinkage in its borders

within the cordon of the new structure while second is the vertical reaction which is represented by the transformation in building types inside to have more than two storeys. The new urban space structure overlaid on the old pedestrian network changing the hierarchy in each part of the city and also change the role of old public area and the connectivity among historical monuments. The hybrid urban space types reacted in two levels: The first is to organize the traffic inside the city and the second to create safe pedestrian walkways. The inserted public streets were not considered as gathering point and streets lost its social impacts like it was in the old city. The present study attempts to conduct the traces of the old fabric and find that historical monuments and the connecting nodes within the modern expansions outside the old core. These are the main factors that determine the direction and the route place for both AL-Kifah street and AL-Khulapha street while the old pedestrian public and semipublic streets play a big role in shaping AL-Rasheed street.

## **4.6.2 The spatial impacts of the modernization process**

### **4.6.2.1 The Change in the City Network Structure**

The compactness of the medieval pattern has been threatened in different morphological periods by continuous cutting in the unified urban structure. The process was done in an accumulative way by adding more modern streets until reaching the final fragmented urban form that combined both unintegrated oriental compact and geometrical patterns. The first morphological interval period from 1845-1917 had more damaging impacts as a result of inserting new geometrical blocks filled by new building that impose the need to create the first crack represented by AL-Rasheed street. The second stage was the morphological period between 1917-1936 which focused on filling the vacant lands within the old city core and expanding the city outside in the north and south rather than changing the inner structure in spite of inserting AL- Kifah street within the residential quarters. This street later motivated the urgent need to have a vertical connectivity toward the river in the next periods on the long run. The Third morphological period from 1936-1959 experienced the embedding of many large-scale projects that substituted many historical neighborhoods. At the end of this period, a large boulevard split the old structure and hindered the continuity of the old arteries in the city by creating a series of large blocks along the boulevard that hide the traces of the old structure behind. The fourth morphological period 1959-1983 was the stage of inserting different geometrical blocks which were filled with multi building types that accelerated the transformation process in the adjacent compact neighborhoods. The last morphological period, perhaps the more stable, was to keep the entire network yet it was considered the most harmful in accelerating the transformation process due to the political conditions

represented by the wars and lack of financial resources. In the first and second morphological intervals, the city moved from the compact pattern to have more hybrid structure. The new streets of AL-Rasheed and AL-Kifah have bordered the compact fabric and they kept at same time the visual connectivity among the interrupted parts by following the human scale and keeping the connectivity with the main Shorja market; they are regarded as two additional feeding points which could be accessed by cars. The third, fourth and the fifth morphological periods have up to now more fragmented hybrid patterns where new structures hindered the linkage among the interrupted parts of the city core. Several factors participated in increasing the devastation within the old core: the first one was the economical booming and prosperity especially in the third and fourth morphological periods. The second one was the political situation which normally affected the decision makers to impose different development approaches and at the same time it hindered the process to manage the clash between the old and new structures especially in the post war period when no heritage regulations were particularly valid. The last one was the social interaction between residence and the public area which was interrupted due to the increase of gentrification problem.

#### **4.6.2.2 The Urban Space Development**

The hierarchy of pedestrian streets moved gradually to be combined within a network of car street. By analyzing the morphological periods, the car streets moved to be the main public area that compete with the public pedestrian one. The main car streets and the secondary connectors surrounded the residential or mixed land use neighborhoods and changed their urban space hierarchy by reducing the level of the privacy degree. The car streets are varied in their hierarchy based on economic, social and administrative one. AL-Rasheed street is considered the main economical part that contains multi market specifications as a complementary part of the traditional ones. It is also considered the main social place that contains many recreational facilities. It is surrounded by the main governmental buildings that are more in touch within the people.

AL-Khulapha street, on the other hand, has the highest hierarchy in mobility and it is a governmental centre which has less daily contact than the area in AL-Rasheed street. The economic importance has diminished within the following years as a result of the city expansion. However, AL-Kifah street on its part has surrounded the more mixed land use serving the local communities around and in the main religious centre for AL-Gailani shrine. The role of the street within the city in general and the old city in particular was diminished after the destruction of the railway stations in the 80s. The space types afterwards started to follow the organization of the traffic more than creating a public urban space as gathering and

meeting points. They varied in shape and size according to the traffic regulations inside the old city. The traditional corridors were so obvious in both AL-Kifah street and AL-Rasheed streets as they always provide visual and physical accessibility to connect within the compact pattern of the interrupted neighborhood around; but those corridors has disappeared totally within the courses of AL-Khulapha street where linear blocks hindered the accessibility for the area behind. Both AL-Rasheed and AL-Khulapha streets motivate more internal demolishing inside the large area of blocks with prior role of AL-Rasheed street because many demolished parts around AL-Khulapha street were done in order to have connectivity within AL-Rasheed street.

#### **4.6.2.3 Urban Components**

Plot types are differentiated in size and shape within each morphological period. They ranged from small plots that were the cell of the compact neighborhoods up to large plots that were placed in the vacant and the destructed lands. After the destruction process by the new streets and large scale projects, parcels shape and size started to react according to the new setting of the space hierarchy within the border of the deducted areas and their infill by new building types. Two kinds of parcels were found after the transformation process: the first was the parcels that belong to the remained neighborhoods and the second one belongs to the new inserted blocks where both have mutual impacts on each other in many times. The remained neighborhood blocks in the aftermath of destruction are divided to internal residential parcels and external mixed land use. The internal one was subject to merge or subdivision process based on the property ownership while the frontage external one was modified to have straight frontage line along the deducted areas. Some of the parcels merged with others to create relatively bigger plots especially along the AL-Kifah and AL-Rasheed streets while AL-Khulapha street has attached geometrical blocks separated from the remained neighborhoods structure on the backside by secondary streets creating a clash area between old and new structure. This clash accelerated the transformation process in the remained area by having a second level of semipublic buildings behind those blocks. The remaining old traditional blocks were altered to have geometrical or irregular shapes depending on the destruction border in addition of having few non modified compact ones. The new parcels for the residential use in the vacant areas tend to keep a small size within a geometrical big block while the parcels for the public buildings are oriented along the main streets with bigger size than the residential one. The public building types ranged from the traditional inward looking plan to the modern outward looking and rowed in a form of attached buildings showing only one facade connected to the other facades or free standing buildings located within large

blocks as especially is the case for governmental buildings. For residential buildings, some houses started to have external spaces within or without the internal courtyard along main secondary car streets following the idea of modern garden cities in the area out of the old compact pattern. In the compact fabric, the houses gradually neglect the courtyard system as it doesn't work anymore physically and environmentally due to the alteration of compactness in urban structure and the exposure of multi storey buildings on the surrounded houses. The new inserted big blocks within the old neighborhoods normally bordered by external fence and streets around with multi entrances around and was not integrated within the surrounded area.

#### **4.6.2.4 Urban Innovation**

Innovations are considered the main dynamic interventions that provide motivations to change the city structure. The first morphological period between 1853-1917 experienced many new facilities that altered the life style in the city and provide many totally new requirements that altered the urban structure in the next morphological period especially the development in transportation using rail and cars. The third morphological period between 1936-1959 had new multi storey building types that altered the skyline of the city for the first time. In this period the floods were controlled by many dams built on Tigris to provide an expansion for the old city and provide a manifestation to prepare several master plans for the city that altered the role of the historical core and its structure in each morphological period by setting predetermined decisions. All renovation plans as new innovation in the last morphological periods 1982-2009 were not achieved and the city now needs an urgent intervention to keep the historical structure.

#### **4.6.3 Following the Old Arteries – A Methodology for an Integrated Urban Structure**

Following the traces in the transformed areas is considered a better integrated method than the others because it gives a clear overview of the old situation and the former urban space hierarchy; it also finds out the potentials to reconnect the interrupted spines and reintegrates the space hierarchy between the new and old urban elements. The clash between old and new urban structure has led to destruct many parts outside the new one. The old blocks adjacent to the new structure has tried to be reshaped to match the new urban development by composing a cordon of new buildings in the remained frontage plots facing the inserted new streets and they are still attached to the old fabric behind. Old blocks were divided into several ones that were not far from each other keeping the traces of old connections to be

observable as in both AL-Kifah street and AL-Rasheed street. After the construction of the wide boulevard of AL-Khulapha street, new blocks ranging from small to large ones were inserted along the street regardless of the area behind by having another secondary street. The new blocks and their building types differ in shape and scale and were isolated totally from the area behind which experienced a long and harmful process of transformation to adapt the new situation. Some of the plots along the secondary streets behind the new structure have moved to be merged or split based on the ownership to match the new development by having new buildings which later extended inside the remained compact pattern. In some cases, a surrounded fence was built to keep the privacy for the residential area from the new urban structure. In both cases the frontage buildings always tend to shape a mixed land use cordon around the private houses and to get always the benefit from the prevailing commercial activities in the old core.

#### **4.6.4 Type as a Cornerstone for Recreating a Cohesive Urban Structure**

Building types in the first morphological period were altered especially for the public area along the river. AL-Rasheed street, on its part, triggered the creation of new types for houses and public buildings. Meanwhile, inserting multi storey buildings with outward looking plan affected the privacy of the area and motivated a large transformation process around. Those multi storey buildings have occupied the whole plot and kept the compactness of the blocks. AL-Khulapha street, on the other hand, brought a new type of having multi storey buildings along the large boulevard that also occupied the whole plot but was separated from the attached compact urban structure behind by another street. The variety in the storey numbers altered the impacts on the surrounded area that was always more negative amid higher buildings. New buildings with free standing types were introduced and have become main monumental buildings which were conducive to the destruction of many areas and creation of many leftover spaces in the compact structure around. Multi storey buildings have indeed accelerated the transformation process even for the small plots in the remained compact pattern that tend to match the new structure. As a result, the study concluded that the compact system could be regenerated by adopting the inward looking buildings types that matched together the traditional human scale and the modern requirements.

#### **4.6.5 The Analysis of conservation strategies trials in Baghdad**

The conservation strategies that were proposed and previously mentioned (AL-Ahmadiya, Bab Shaik and AL-Rasheed Street) from 80s up to now except for JCP focused on having a pilot study to conserve one neighborhood as proto type example. All conservation strategies should deal with the whole city as a unified urban structure that need to be reconnected after the modernization process through comprehensive management system. All strategies should be based on a real and historical survey based on exploration the old traces which will be the basis for any further development. The proposals should pay attention also to link the old traces of the semipublic and private arteries and enhance their revitalization similar to the strategies that concentrated on enhancing the development of the main arteries. Urban space is the main media that could connect the interrupted arteries. Any proposal should focus on redefining the hierarchy of spaces and streets through reintegration strategies starting from determine the main public spaces up to move toward the private residential area with paying attention to create green area within the more accessible corridors rather than planting them instead of the destructed area within neighborhoods. Infill procedure should be adopted by preparing strategies for redesign the urban elements and buildings taking into account the modernity that always have to be carried within the historical context

# Chapter-5-

## **The Modernization Impacts in Baghdad Urban Landscape**

(Urban Spaces Characteristics & Urban  
Section Analysis)



## **Chapter Five-The Modernization Impacts in Baghdad Urban Landscape**

### **5.1 The Transformation Analysis of Old Baghdad Traditional Urban Space (AL-Rusafa)**

A fundamental transformation in urban space characteristics and hierarchy was done in an accumulative way. The alteration overlapped in different layers in old Baghdad core through many intervals' periods. The homogeneity of the traditional urban fabric was affected by the new inserted urban patterns that were imported from modern movements in planning and architecture. Therefore, new urban space types were designed and planted inside the old core producing a kind of clash among all urban elements. The impacts often varied between damage, removal or reshaping the urban form elements. Two types of both traditional and modern urban space competing with each other have composed a kind of hybrid spaces. The variation in the urban space pattern altered the continuity, coherence and integrity within the surrounding area.

The modification of the spatial concept in Baghdad provided an alteration in urban structure, land use, building types and urban space patterns. Up to the 19th century, the city kept the hierarchy in urban space moving from public urban space to the private one. The main public buildings and arteries were located along the river or in parallel having a high connectivity to the market area with its specialized branches. Both public area and market formed a well-defined and active public space that were connected to the semipublic and semiprivate levels up to the residential unit. In the 20th century, the modern colonial urban spaces pattern was implanted in a mandatory way instead of the previous spontaneous development for the urban spaces that were based on the experience of the users to create their urban form according to their requirements. The geometrical spaces with new wide streets became artificial barriers that hindered the continuity in the traditional urban fabric and worked as cordons around neighborhoods. They created multi districts isolated from each other and not integrated to the other urban elements. The new urban structure extended rapidly in the old core, causing a significant alteration in the economic, social and spatial levels. Meanwhile, the new streets accelerated the conversion of private residential units to be commercial and altered the hierarchies of spaces as the privacy started to be less concerned.

The implanted urban public spaces caused a fragmented urban structure and were not integrated within the old existed one. They worked more as segregated places rather than

gathering both social and physical activities. The segregation led to more urban decay in the absence of rehabilitation plans as an integration planning and management system that could adopt the recent contemporary need. Urban space is more related to the relation between user behavior and the physical urban structure and could express very well the social, economic and political development in different periods. It is subject to be modified within time and place to overcome the human need and demand for different urban patterns. Urban space management is the best integration method that is urgently required to contain the clash between urban elements by managing their hierarchy and connectivity. Redefining the space among different urban patterns could solve the physical and social interruption and could also work to reset the hierarchy in movement from public space to private one.

***The intervention in altering the characteristics of old traditional urban spaces could be explored as following based on the frequents decision that was taken by the Mayoralty of Baghdad<sup>118</sup> through different historical periods: -***

- Maidan as a traditional open public space was modified to be roundabout and a space to organize the car traffic to both AL-Rasheed street and the street that is parallel to the Castle wall toward the river as shown in (Fig.5.1). A new large size public space was found by destructing a wide area of traditional urban fabric and converted to parking space and bus station to serve the increase demand on parking facilities as shown in (Fig.5.2). This space motivated new building types to surround it matching the same characteristics of AL-Khulapha street to have more multi- storey buildings.
- Widening and straitening many Semi -public and semiprivate arteries was done to be integrated within the big new inserted car streets and to provide manifestation to be more accessible than before when it has more privacy as shown in some examples in (Fig.5.3 & 5.4). These streets became more public and motivate many public functions especially the commercial one to be built on both sides as a complementary part of the market network.
- Private cul de sac streets started to front the new constructed streets and experienced a highly extensive alteration in form, size, orientation and accessibility. New extensions and loops were initiated for these streets to be connected with the entire network. Some of them were removed and allocated as part of large plots to be built along the main new streets like the old streets along Maidan as shown in the archival map

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<sup>118</sup> The decision was written over the old plans that were digitized without an archival index by the mayoralty of Baghdad.

(Fig.5.5). Some others were removed to initiate new streets changing the whole street hierarchy for the adjacent area like removing large area adjacent to AL-Gailani shrine to connect AL-Khulani square to the far east part of the city as shown in the archival map (Fig.5.6).

The old city core in AL-Rusafa is now a mix of old pedestrian streets represented by Shorja old market artery and AL-Mustansir street within three main car streets represented by AL-Rasheed street, AL-Kifah street and AL-Khulapha street that were penetrated the historical urban fabric having different characteristics that altered the entire hierarchy of the city network (Fig.5.7). Those streets showed a variety in building types where many new inserted buildings varied in heights with different types that were inserted inside the traditional old arteries and along the new streets as shown in height survey plan that was done in the old city streets (Fig.5.8)<sup>119</sup>. It was found that the concentration of multi storey buildings were sited in three main zones along Maidan at right side in Bab AL-Mudham area, Shorja traditional market in the middle of the old core and the new civic centre at the left that motivate and accelerate the transformation process.

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<sup>119</sup> The height survey was done by the Author for Shorja old artery, AL-Khulapha street and AL-Kifah street which was done partly due to the critical security situation. In AL-Mustansir street and AL-Rasheed the height survey was reviewed and corrected in many times based on old survey done in 2008.

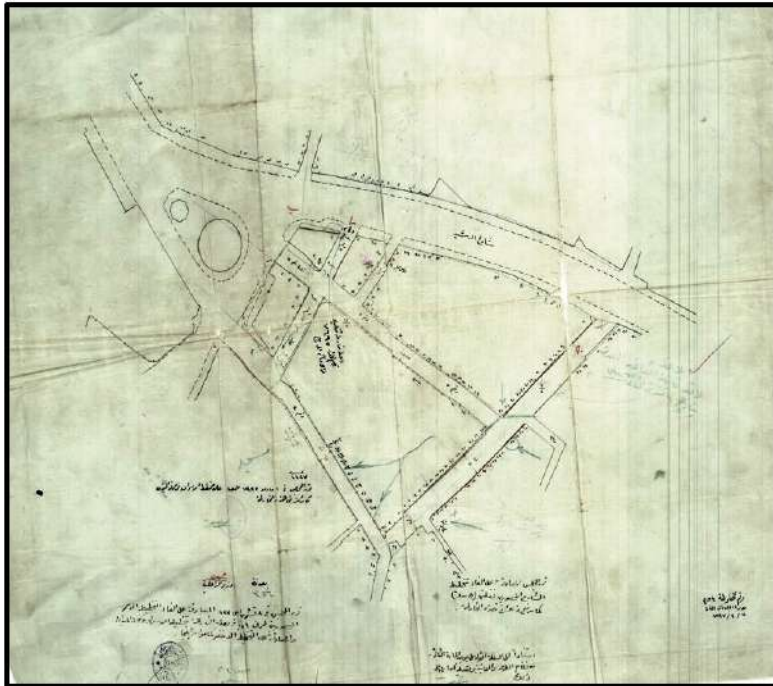


Fig. (5.1)

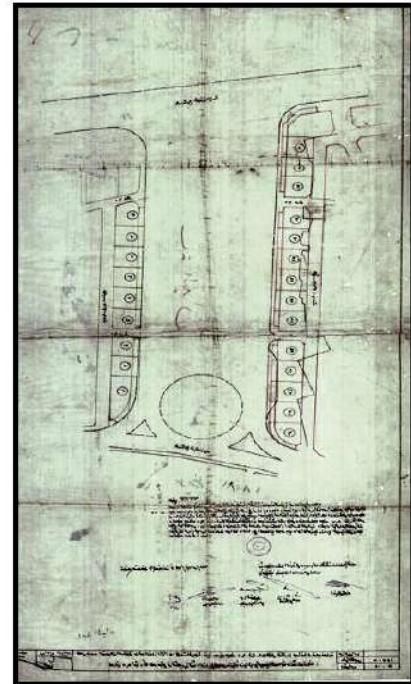


Fig. (5.2)

Fig. (5.1): - The modification of old Maidan area to adapt the car traffic in 1947, Source: The Mayorality of Baghdad Archive.

Fig. (5.2): - The new Maidan space aligned with rectangular blocks, Source: The Mayorality of Baghdad Archive.

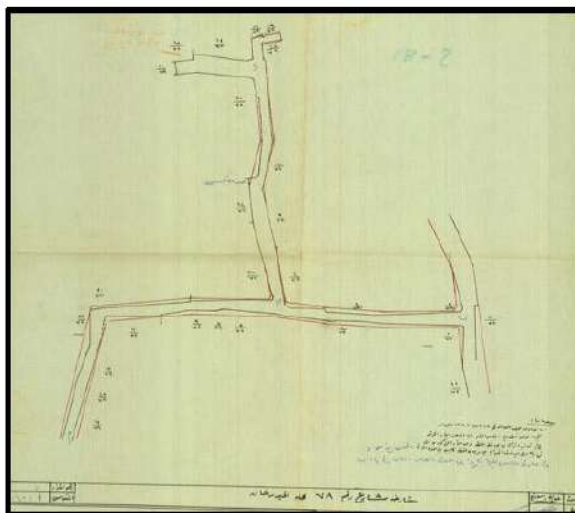


Fig. (5.3)



Fig. (5.4)

Fig. (5.3): - Straitening and widening residential street in Haidar Khana quarter in 1928, Source: The Mayorality of Baghdad Archive.

Fig. (5.4): - Straitening and widening residential street in Dahana quarter in 1938, Source: The Mayorality of Baghdad Archive.

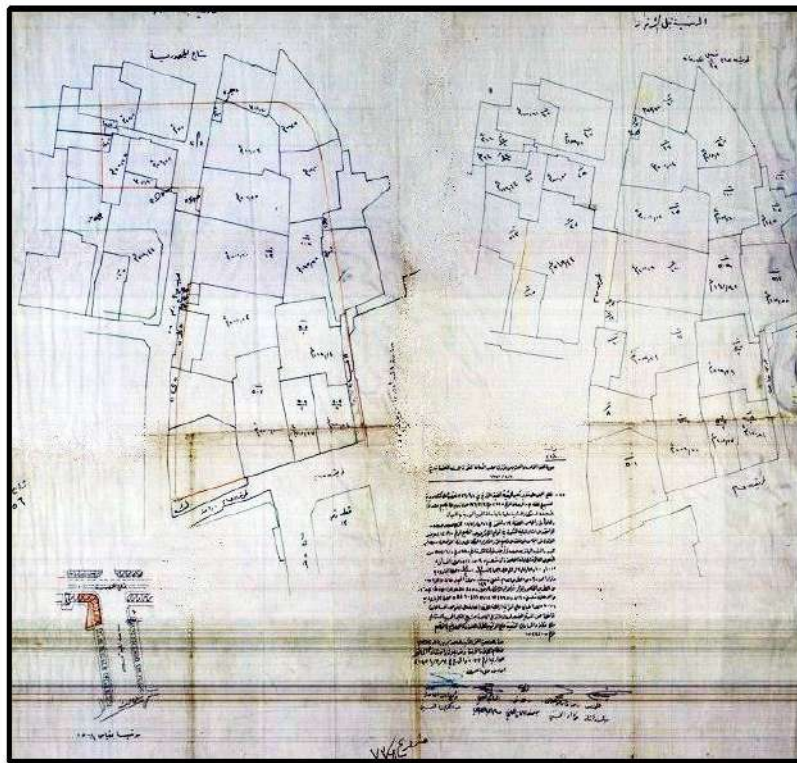


Fig. (5.5): - The removal of residential units with cul-de sac streets to be substituted by big blocks in 1973, Source: The Mayoralty of Baghdad Archive, See Fig. (42) in Appendix I in A3 Size.

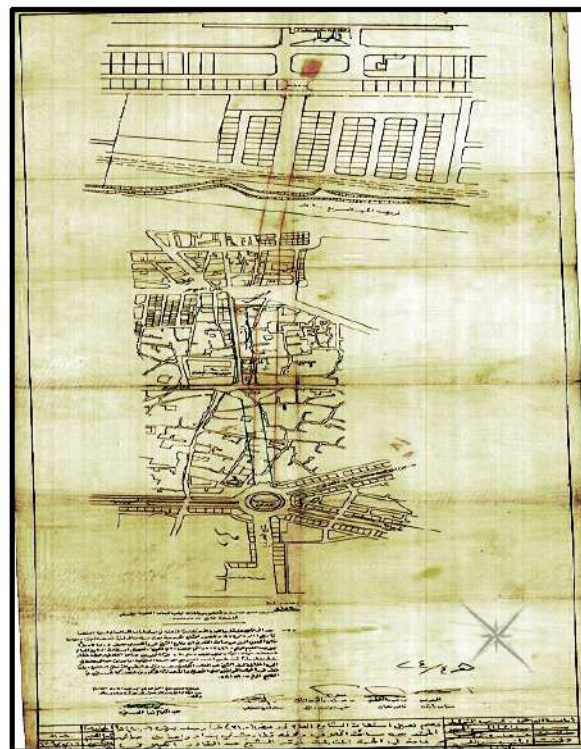


Fig. (5.6): - Lining new breakthrough street from AL-Khulani mosque to AL-Gailani shrine in 1974, Source: The Mayoralty of Baghdad Archive, See Fig. (43) in Appendix I in A3.

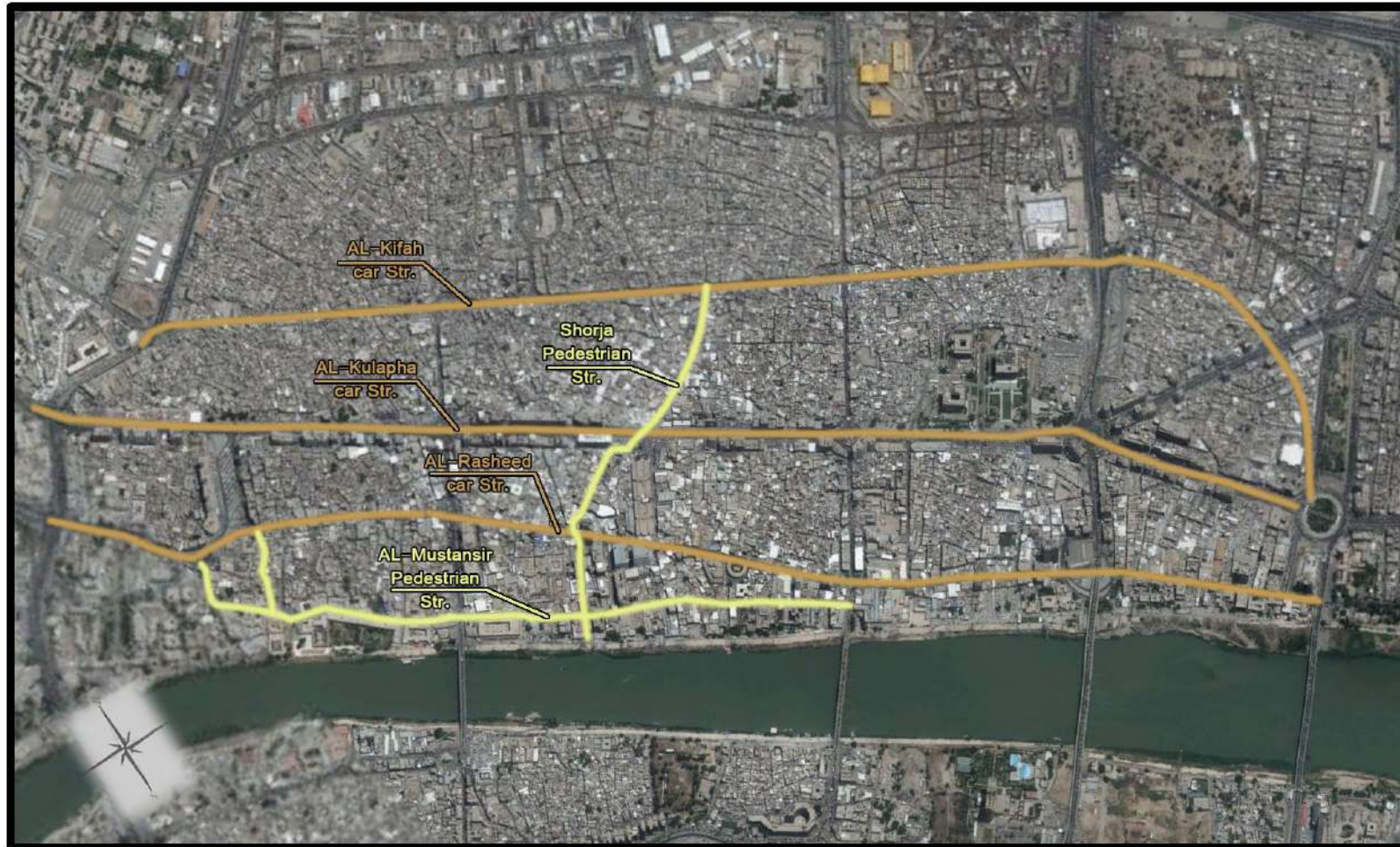


Fig. (5.7): - The main pedestrian and car streets in the old city of Baghdad, Source: Drawn by the Author based on google map (accessed 12 Jan. 2018), See Fig. (44) in Appendix I in A3 Size.



Fig. (5.8): - The height survey for the buildings along the main pedestrian streets (Shorja and AL-Mustansir streets) and car streets (AL-Rasheed street & AL-Khulapha street) in the old city of Baghdad, Source: Drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017,14, See Fig. (45) in Appendix I in A3 Size.

## 5.2 The Analysis of the old Streetscapes in Old Baghdad / AL-Rusafa

### 5.2.1 Shorja Traditional Pedestrian street

The main market artery (Shorja) <sup>120</sup>is considered the central traditional Public urban space in the old city. It was lined in vertical way starting from the river up to the far east passing AL-Khulapha mosque and its historical minaret (Suq AL-Gazil Minaret) providing a coherence for the entire compact urban fabric as shown in the archival picture in (Fig. 5.9). Shorja market artery was experienced a modification in its path by widening and straighten its lane especially after the construction of both AL-Rasheed street and AL-Kifah street as shown in the development plan of the part that passing Suq AL-Gazil minaret in 1937 (Fig.5.10), modifying the geometry of the aligned blocks. It was interrupted two times by a wide street (AL-Rasheed street) and a boulevard (AL-Khulapha street) that both worked as a new or complementary part for the commercial centre. This interruption has motivated the market to spread its diversity and growth on the adjacent area. The characteristics of the market street structure and form were altered by straitening the bended paths and widening the narrower sections through different periods accompanied by adding new building types along its course.

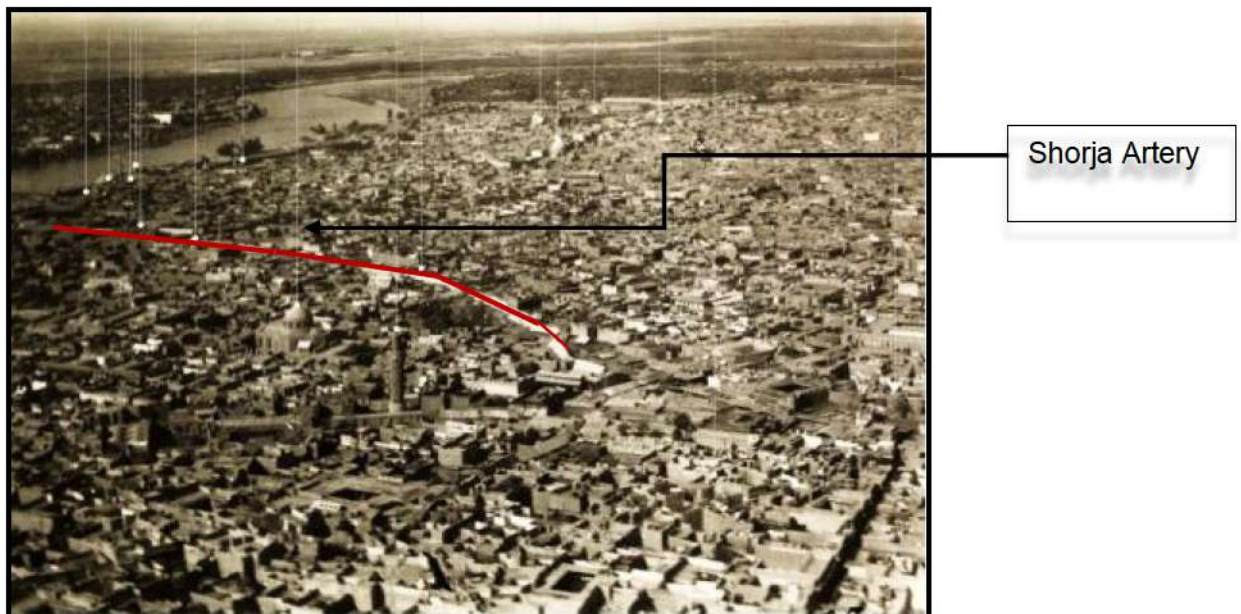


Fig. (5.9): - The old Shorja market pathway estimated in end twenties,Source: Abdul Hadi. T 2017,95.

<sup>120</sup> The research considers the Samawaal street that starts from AL-Mustansir street aligned to the Rafidain Bank is the first segment from Shorja market due to the historical continuity as shown in the map belong to 1854 before the construction of AL-Rasheed street.



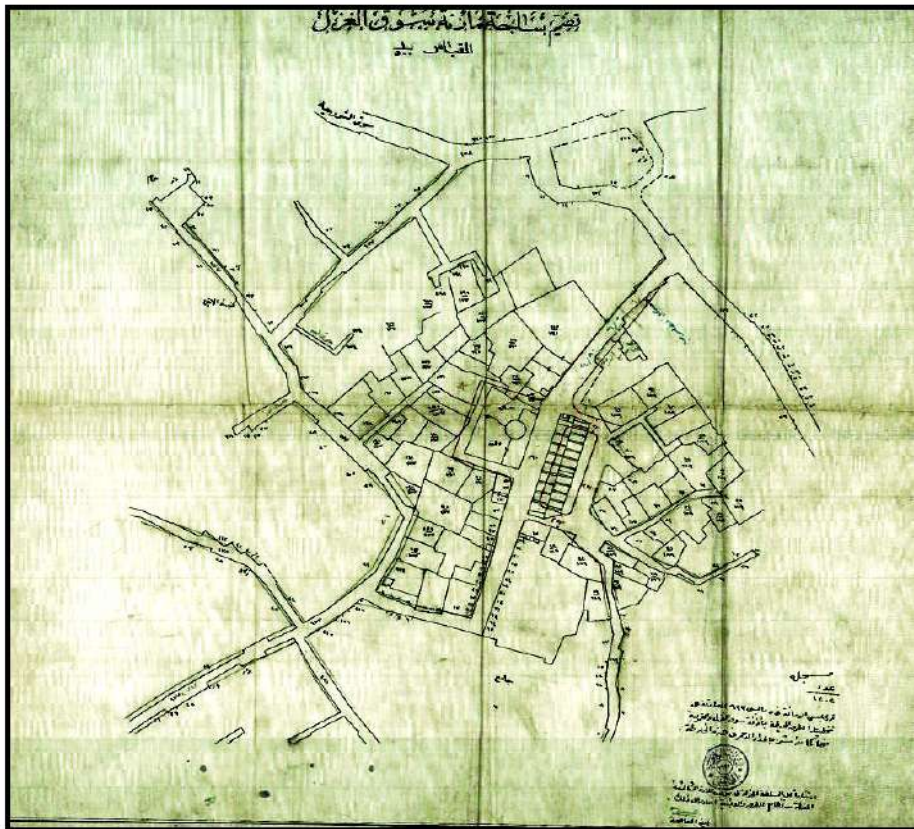


Fig. (5.10): - The modification of the old Shorja market pathway in 1937, Source: The Mayoralty of Baghdad Archive.

According to the survey for the buildings along the main pedestrian street (Shorja streets) regarding their height, types and relation to the surrounding as shown in (Fig. 5.11), the street could be analyzed according to the following criteria.

### 5.2.1.1 Street Structure

The market starts from the end of the covered horizontal market part that extends along AL-Mustansir street and then turns in a vertical way within Samawal vehicle street where new commercial buildings are lined up in a straight way for cars up to AL-Rasheed street which interrupts the movement and the combination between both monuments Mirjan mosque and Mirjan Khan. The traditional pedestrian market artery is lined straight with a covered form up to AL-Khulapha street where large parcels with multi storey buildings block the continuity of the street to be turned to Shorja square. Shorja square combines the old artery together within the internal vertical passage of the shopping centre (AL-Arabi Shopping centre) and their aligned streets on both sides which were converted later to be for pedestrians. Shorja square

is split into two parts which are connected together by a pedestrian bridge and are recently converted to peddler's market. The artery continues up to AL-Kifah street only for pedestrian where cul-de sac passage exists as a big garage for the trucks. Old Shorja used to move up to the city border and is connected to the horizontal pedestrian artery that links the old north gate to AL-Gailani shrine at the far southern east edge of the old city.

### **5.2.1.2 Parcels, Building Types and Land Use Pattern**

There is a variation of building types with different heights and parcels size along the traditional Shorja market artery reflecting the impacts of modernization in accelerating the transformation process as shown in (Fig.5.11). The first part mostly continues up to AL-Rasheed street with the large rectangular parcels of multi storey buildings on both sides (especially the right side within the financial assembly) as part of the commercial and financial centre. Old Khans were destructed in this area and transformed into a main commercial one. The only Khan that survived and was subject to renovation was Khan Mirjan which is considered the main historical monument in this part. The segment is interrupted by AL-Rasheed street where AL-Rafidain Bank 13-storey building faces Mirjan mosque from the other side. The mosque has a half circle shape and surrounded by a secondary street. Multi storey buildings ranging from 2-6 floors lined along this street to shape the entrance of the covered market. The market moves up with covered type surrounded by commercial buildings which are mostly built in modern architecture with relatively big parcels that were mostly have 2-3 floors. The old commercial buildings have transformed rapidly in this area as a result of the increasing demand for big commercial retail shops and storages for the whole trade centre. The artery is branched to the adjacent area that also witnessed change in usage. The parcels size area is relatively big and has extended to large area along and beside the old traditional arteries. The street moves across AL-Khulapha street with a parcel size relatively smaller than the previous sector up to AL-Kifah street. The buildings along the street follow the modern architecture and have recently experience severe changes in types and floor numbers by having more floors up to 4 especially for the small parcels to accommodate the large demand of commercial shops and storages in this area.

### **5.2.1.3 Urban Public Space Types**

The first public space is the street that surrounds Mirjan mosque which was later used as a space for peddlers as illustrated in (Fig.5.12). This street is considered the start point for the second part of Shorja Market by having a variety of multi storey buildings that surround the

main historical Mirjan mosque along AL-Rasheed street. The second main space is Shorja square which is split into two parts by AL-Khulapha street and is connected together by a pedestrian bridge. The first part is polygonal having a statue in the middle that was removed after 2003. It provides a space to collect pedestrian from both Shorja market and AL-Arabi shopping centre (Fig.5.13). The second part also has polygonal and not regular shape filled recently by peddlers. The third space is the large oval space used as a garage for trucks from the side of AL-Kifah street that acts as cul de sac access for the whole trade area<sup>121</sup>.

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<sup>121</sup> See Chapter 4, Fig (4-116) & (4-117).

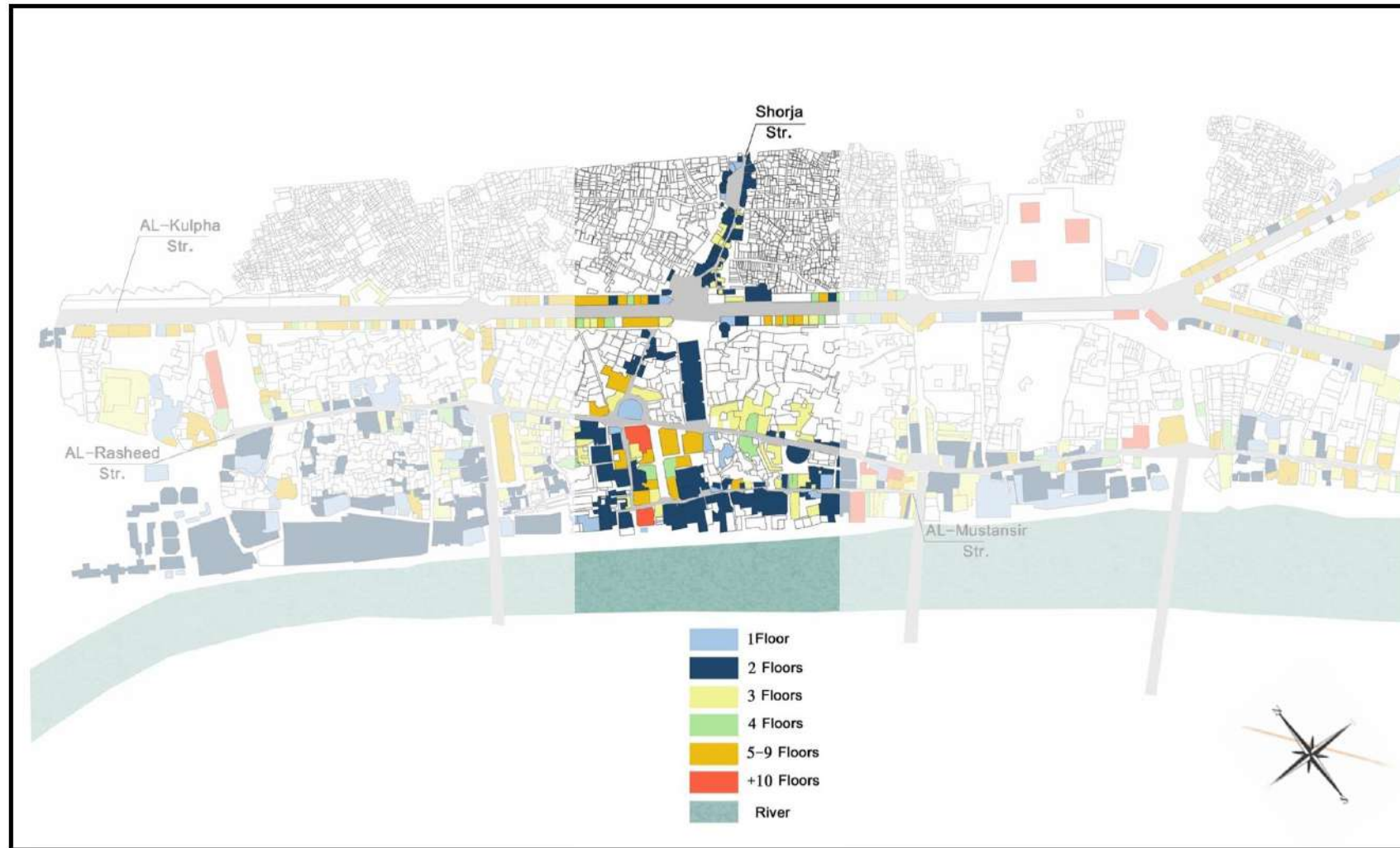


Fig. (5.11): - The height survey for the buildings along the main pedestrian street (Shorja street) in the old city of Baghdad, Source: Drawn and surveyed by the Author, See Fig. (46) in Appendix I in A3 Size.



Fig. (5.12)



Fig. (5.13)

**Fig. (5.12):** - The street around Mirjan mosque in the end of fifteenth, Source:

<http://www.middleeastdigest.com/pages/index/24288/baghdad-through-latif-al-anis-lens> .(accessed 18 Nov.2018).

**Fig. (5.13):** - Two parts of Shorja square separated by AL-Khulapha street, Source: Photos were taken from Part of documentary film prepared by AL-Forat TV, <https://www.youtube.com/watch?v=MYgdi64K2qM>, (accessed 18 Nov.2018).

### 5.2.2 The Historical Spine (Sarai Street & AL-Mustansir Street)

This artery was the main and the oldest one in the old historic city of Baghdad and it was lined in the direction of North-South parallel to the river Tigris. It is considered the main open public space that sustained its importance through history and kept its hierarchy as the main pedestrian one within the new developments represented by wide car streets. Consequently, it has potential impacts on the city development as a main political and economic centre in spite of the intensive transformation process that occurred in some parts of its course. It was believed that this artery was found in the late Abbasid period due to the location of many monuments along its path like the Abbasid palace, AL-Mustansiriya school, AL-Kafafin mosque and the traces of old markets. The street path started first with Sarai street and continued within the complementary part of AL-Mustansir street headed towards Hafuth AL-Qathi Square. The street path is used now as pedestrian walkway as it was initiated except the part along the main Ottoman governmental buildings which became accessible by vehicles in the Royal period. The street land use varies between being commercial as in Maidan up to Sarai Building through old Haraj Market<sup>122</sup> and then continues with main governmental and cultural functions up to Sarai and Sarajeen market where it mushrooms again into another market route. The street encompasses different building types that varies in height from one segment to the other depend on its historical period, function, the distance to the river and the impact of AL-Rasheed street that was initiated after as illustrated in the building's height and types survey (Fig.5.14).

<sup>122</sup> Haraj Market is normally used for second hand market and antiques



Fig. (5.14): - The height survey for the buildings along Sarai street & AL-Mustansir street in the old city of Baghdad, Source: Drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017,14, See Fig. (47) in Appendix I in A3 Size.

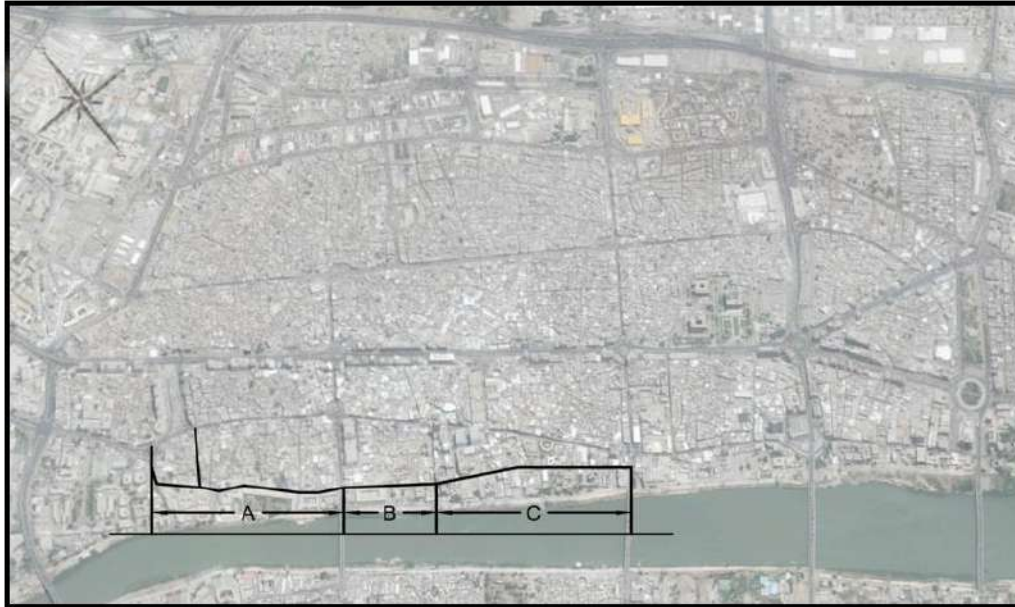


Fig. (5.15): - Segments A, B,C for AL-Mustansir street and Sarai street, Source: determined by the Author based on google map image for Baghdad city ,(accessed 12 Jan. 2018).

The street could be divided into three segments as shown in (Fig.5.15) according to the interruption which occurred in its continuity by the inserted vertical car streets that headed towards the bridges across the river.

**According to the survey for the buildings along the main pedestrian streets (Sarai and AL-Mustansir streets) regarding their height, types and relation to the surrounding as shown in (Fig. 5.14), Fig (5.16 a,b), (Fig.5.19 a,b) and (Fig.5.20 a,b) the street could be analyzed according to the following criteria.**

### 5.2.2.1 Segment A (Sarai Street)

#### 5.2.2.1.1 Street Structure

This segment started from Maidan node through two passages to form the main street course parallel to the river that is used for both pedestrians and vehicle. The first pedestrian pathway was used as a traditional Market for old antiques called Al-Haraj Suq and the other one curved out for vehicles parallel to the trace of the old city wall castle and then turned left up to the central secondary school to meet the first one. Both of them composed a linear bay parallel to the river with about 12m width used as two-way vehicle street. A third local car street branched from AL-Rasheed Street to meet this bay in a rectangular space shaped by the surrounded monumental buildings of Sarai, Sulaimaniya religious school, Modern multi storey property bank, Ottoman Pasha bath and traditional houses. The street bay proceeded on up to Sarai market passing through the main public buildings, in the Ottoman period, on both sides and turned left to the main cultural artery (AL-Mutanabi Street) to be reconnected again with AL-Rasheed street.

This vehicular loop had provided accessibility and flexibility in movement to the public area along the river. However, AL-Mutanabi street was converted recently to be only for pedestrians and it starts from AL-Rasheed street up to the riverfront area after it was partly subject to demolition as a result of a huge terrorist car-bomb explosions. The pedestrian path moves again and stops at the connector vertical car street that crosses the river to the western part over AL-Shuhada bridge <sup>123</sup>. This connector hindered the continuity of the covered-market in spite of the existence of the pedestrian tunnel that crosses to the other part of the market which has no visual continuity<sup>124</sup>. The whole path is the hub for three old pedestrian arteries from the eastern side (Jadid Hasan Pasha quarter) and connected to the river by four passages. The movement toward the river was hindered in three of these passages and allocated only for the users of the public buildings along the river. Only the passage that is located between Qushla and Aliya school and extended to AL-Mutanabi street was accessible for the public and it ends with open public space along the river.

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<sup>123</sup> Initiated in the twentieth of the last century and called first AL-Mamoon Street.

<sup>124</sup> The tunnel used as a complementary part of the Sari market specialized for painting stuff.



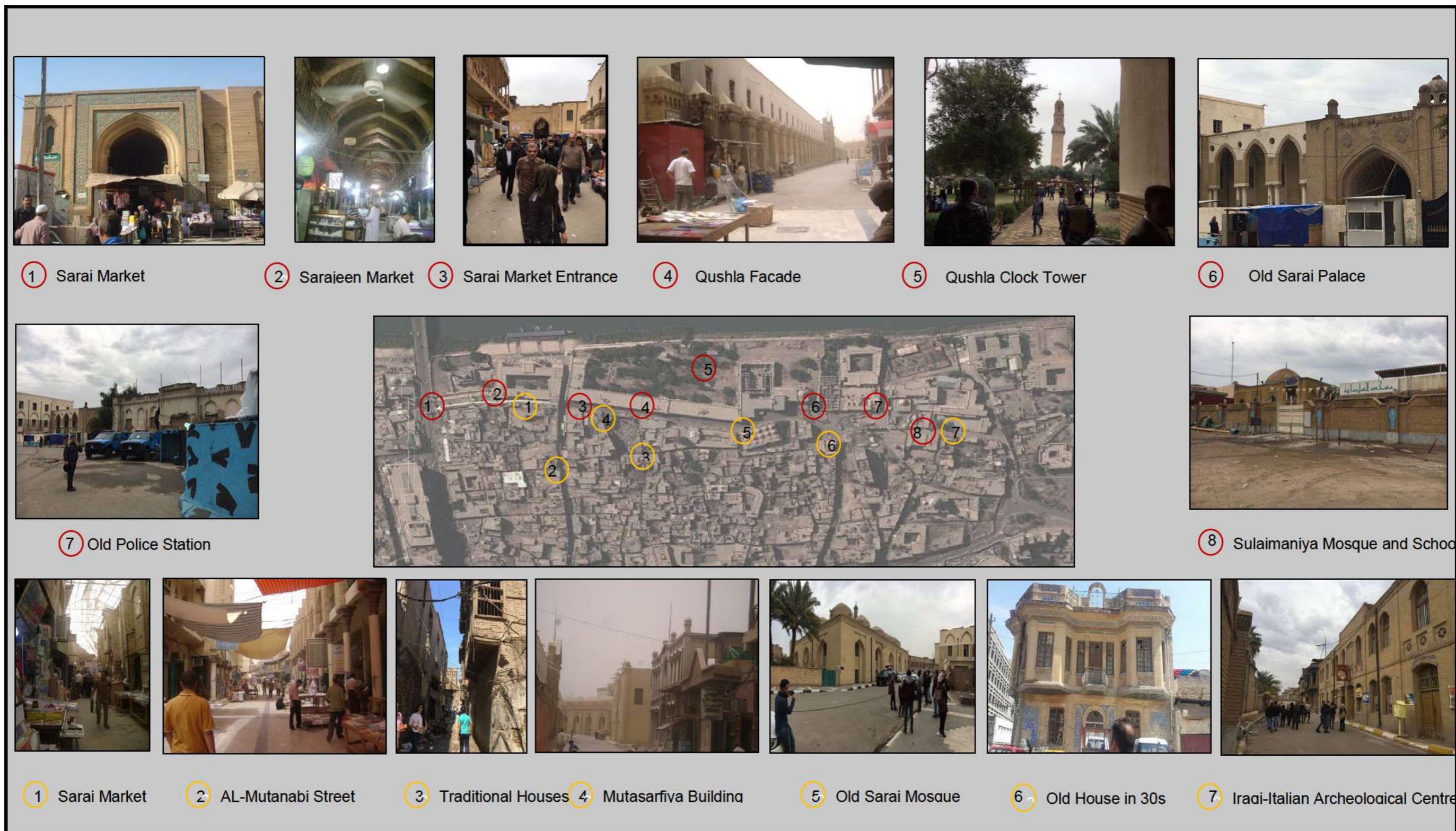


Fig. (5.16 a): - Segment A (Right side with red circles) showing the building types along AL-Sarai street,Source: Photographed by the Author.

Fig. (5.16 b): - Segment A (Left side with yellow circles) in Yellow Color showing the building types along AL-Sarai street,Source: Photographed by the Author.

### 5.2.2.1.2 Parcels, Building Types and Land Use Pattern

This part showed a variant of building types on both sides belong to different historical periods that reflects different architectural styles as seen in Fig. (5.16 a&b). This segment starts at the beginning of this artery from Maidan plaza through Haraj market within pedestrian movement and also along the two car streets where both of them branched from AL-Rasheed street adjacent to Maidan. The parcels got smaller in size when the ownership became more private within the mixed land use pattern and increased in size within the public facilities. The parcels from the old castle till the Sarai market are considered the biggest ones along the whole street parts and they enjoy pure geometric shapes on both sides due to the concentration of the main Ottoman public buildings. The buildings along the river are exposed directly to the street and are considered larger than the other side as they were assumed to be the main administrative centre for long decades. The building types varied according to many historical periods. The inward-looking plan with open courtyard and solid external facades associated by few openings is the prevailing type of the buildings of the early Ottoman period. The advanced type of the late Ottoman period neglected the courtyard concept and followed the outward looking idea by having big facades associated with classical European details. The architectural style was transformed totally after the British mandate using Art-Deco style in many private houses and buildings especially along AL-Mutanabi street. The multi-story property bank building reflects the tendency to insert new modern types that designed by the British architect Hening & Chitty<sup>125</sup> in 1957 (AL-Chalabi 2018,71). It was planned among many historical monuments attached to the historical bath<sup>126</sup> (Hamam AL-Basha) and in front of Sarai and its front elevation exposed to the connector that directed to AL-Rasheed street. The artery continued along Sarai covered market that was developed parallel to the old Sarajen market (Leather market) that worked as complementary part for the old one providing continuity to the both pedestrian walkways along the vehicular street. The old market covered by brick arches and has a direct connection to AL-Wazir mosque along the river from one side and to Al-Sarai new market on the other side that was covered by corrugated sheets. The Sarai market has small retail shops at the ground level and a screen of solid brickwork wall at the upper level within some few traditional two floor buildings to match traditional Sarajen market which have retail shops in the ground floor and rooms that was used as residence for the merchants and now used as storages. The prevailing number of storeys is to have two storey buildings with only five storey building belong to the property bank as shown in the height survey in Fig. (5.14)

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<sup>125</sup> See Biography P.432

<sup>126</sup> Built by the Ottoman ruler Hasan Basha.

### 5.2.2.1.3 Urban Public space types

The street segment was considered the main public pedestrian street which converted to car base street after the British mandate. Due to security reasons after 2006 the car movement was restricted inside the old public centre and the attached AL-Mutanabi street. The meeting point for both Sarai market and Al-Mutanabi street was pulled to the riverfront area through a defined public space with a focal point statue belong to AL-Mutanabi poet that could be seen from the start point of AL-Mutanabi street Fig. (5.17). Another space is the Semi-rectangular space at the end of the Haraj market where both car streets and the pedestrian artery meet together. This space was created by destructing part of the Sari building to facilitate both the vehicle and pedestrian movement and ensures accessibility to the castle and the river front area Fig. (5.18).



Fig. (5.17)

Fig. (5.17): - The frontage public space along the river, Source: google map ,(accessed 12 Jan. 2018).



Fig. (5.18)

Fig. (5.18): - The Semi rectangular public space, Source: google map ,(accessed 12 Jan. 2018).

### 5.2.2.2 Segment B (AL-Mustansir Street)

#### 5.2.2.2.1 Street Structure

This segment starts from the vertical connector road that heads towards AL-Shuhada bridge and is connected within the previous one physically by a tunnel with ground retail shops. This is often irregularly used as users always prefer to cross the street due the direct visual access to the other part of the market across the street and also to the existing AL-Mustansirya school as a strong attraction point. It starts from AL-AL-Asifiya mosque and the adjacent AL-Mustansirya school up to a covered-market specialized in clothes and fabrics trading.

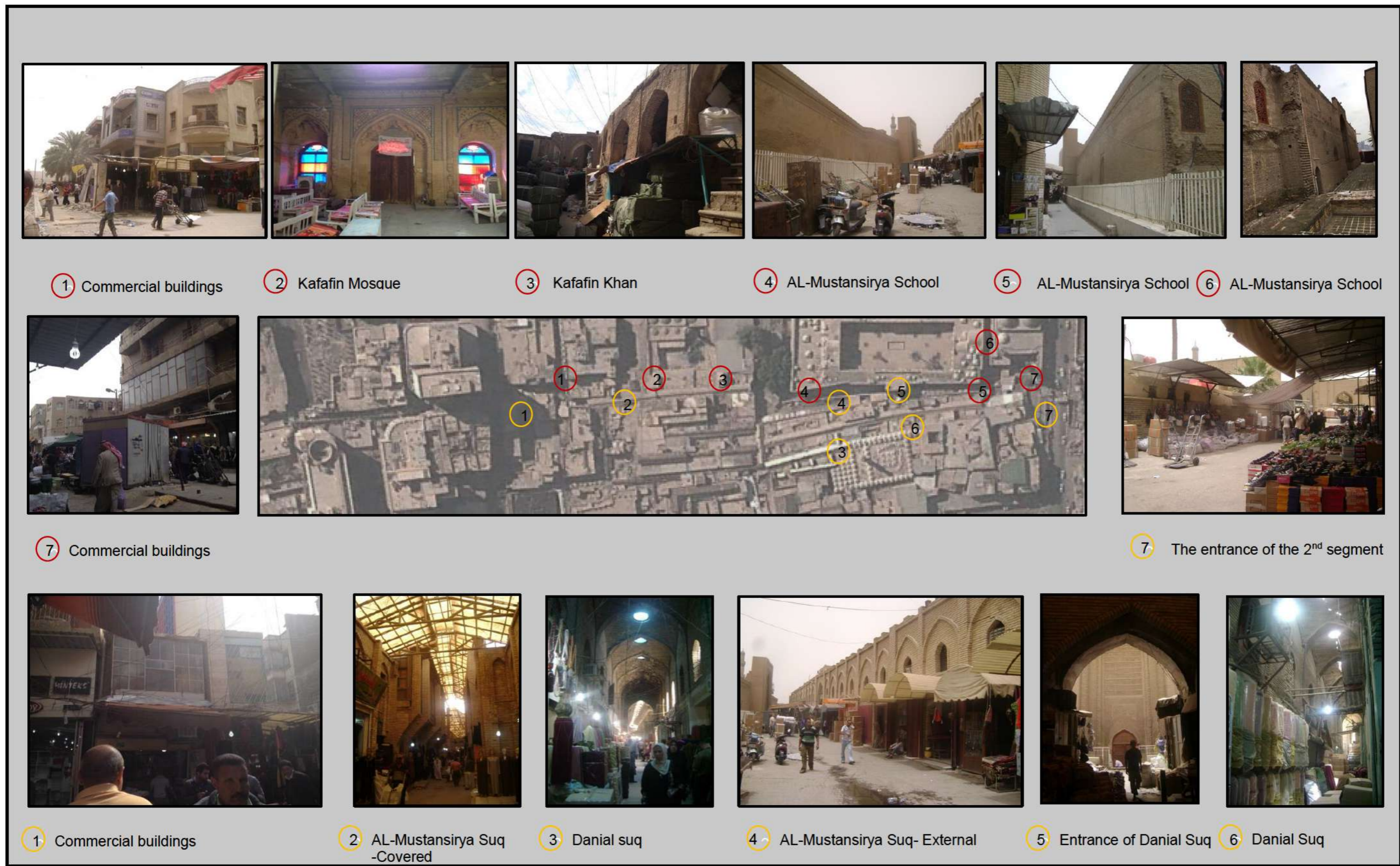


Fig. (5.19 a): - Segment B (Right side with red circles) showing the building types along AL-Mustansir street, Source: Photographed by the Author.  
 Fig. (5.19 b): - Segment B (Left side with yellow circles) showing the building types along AL-Mustansir street, Source: Photographed by the Author.

It is also possible to get inside a network of market branches through a big entrance located in front of AL-Mustansiriya school gate. This segment passes through shielded market type with 90m length then continues with a new short bay as an open-air market where the ground floor of the old khans and new commercial buildings are used as retail shops. The continuity of this segment is intersected by Samawal car street where new and modern types of multi-stoery buildings standing along within the traditional one starting from AL-Rasheed street up to the river<sup>127</sup>. The car movement was rather hindered as a result of security reasons after 2003 to provide more protection for the markets and to retain the continuity of the pedestrian movement in AL-Mustansir street up to the end. This segment has two pedestrian passages linked to the river frontage area from the right side at the beginning of the covered market near AL-Mustansiriya school and at its end. It has also been connected from the left side with three market passages as parts of the traditional commercial covered-markets network which was linked later to the main commercial historical artery (AL-Shorja) across AL-Rasheed street and also to Samawal car street.

#### 5.2.2.2.2 Parcels, Building Types and Land Use Pattern

This lane is part of the main market artery that was aligned parallel to the historical monuments that faced the river as shown on the aligned buildings from both sides (Fig.5.19 a, b). The parcels are relatively bigger in size along the river regarding the public buildings of AL-Asifiya mosque and AL-Mustansiriya school and then they shrink in size parcels which are of private ownership. These parcels have a longitudinal shape which is exposed to the river from one side and to the covered-market from the other side thus composing a series of retail shops as part of the market passage like the parcel of AL-Kafafin mosque. Some parcels have taken the opposite direction due to their location along the narrow passage that goes to the river at the end of this segment to generate more accessibility to commercial buildings. Having small and multi divisions in big parcels is attributed to the expensive land value in this area. The Market type here is varied between open commercial street to closed one with two storeys and covered by brick arches for the traditional ones or corrugated sheets for the new added ones. The land use is varied between commercial, religious and recreational within many historical monuments like AL-Mustansiriya school, old mosques and some traditional coffee shops. There are many old Khans at the end of this segment that spread along the whole market area up to AL-Rasheed street with relatively big plot size and geometrical shape. The buildings on both sides vary in height from 1-2 storeys as a prevailing height which is increased at the end of the segment reaching up to three floors as shown in (Fig.5.14).

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<sup>127</sup> It was considered in the research as the first segment of Shorja market.

### **5.2.2.2.3 Urban Public Space Types**

As mentioned above the traditional market with open air and covered types are considered the main open and closed public spaces in this area. Rectangular open space within the southern wall of AL-Mustansirya school is considered an important public space and meeting point directed to the river for both the traditional market arteries and AL-Mustansirya school. The enclosure of the public space provides a clear definition for the facades of AL-Mustansirya school by having an opportunity to move around and also to access the adjacent river frontage buildings. It is considered as a transitional area between the market and the riverfront area following the traditional human scale. The corridor between AL-Asifiya mosque and AL-Mustansirya school is not accessible now and was an additional passage for pedestrian to access the old bridge and the entire frontage area in the old time. After the construction of the new bridge in 1936, the access to river frontage area was interrupted and the river bank transformed to be car parking or lost spaces.

### **5.2.2.3 Segment C (AL-Mustansir Street)**

#### **5.2.2.3.1 Street Structure**

The street segment starts first from the intersection point between AL-Mustansir pedestrian street that is extended parallel to the river and Samawal car street which is lined vertical to the river. The (Deftardar) multi storey building is the start point of this segment located along the river and at same time at the end of the relatively wider Samawal car street. The segment continues as a main market artery but with another type based on having an open-air market with ground floor retail shops instead of covered market like in the last segment. This part is a hub for the new banking cul-de-sac car street where rows of multi storey buildings are lined on both sides as part of the modern urban structure inside the traditional compact one. The segment was not straight and it goes far in its middle from the river and then deviates again to get close again. The end of the street is clearly identified at the point where it becomes closer to the AL-Rasheed street. The lane width varies along this segment according to different building types that date back to different historical periods. Hafuth AL-Qathi square and AL-Ahrar bridge are considered the end point of this segment as a main public space and focal point within both AL-Rasheed car street, and the pedestrian AL-Mustansir street. Five secondary car streets ended within this segment from the left side are branched from AL-Rasheed street to provide parking service and better accessibility for the street users. There are also three pedestrian walkways connecting AL-Rasheed street to AL-Mustansir street from the left side through mixed land use area and another three walkways providing accessibility

to the riverfront area from the right side. There is a direct pedestrian artery in the middle of this segment that connects both AL-Rasheed street from Abed AL-Kareem Qasim plaza up to the river frontage area passing the Al-Mustansir street.

#### **5.2.2.3.2 Parcels, Building Types and Land Use Pattern**

This part is considered the longest one and have different building types belong to different historical periods on both sides and matched in many blocks the building types that was aligned along AL-Rasheed car street as shown in (Fig.5.20 a, b). The plot sizes differ in this segment, according to the function, historical value and the location within both the riverfront area and AL-Rasheed street. In the left eastern side within the area between the segment and AL-Rasheed street, the parcels start with bigger size, especially in the first two blocks. The first block has regular geometrical plots and was mainly used as old Khans some of which are now converted to modern commercial centres. The second block is occupied by a complex of large-scale buildings as part of the main financial centre for Iraq including the central bank of Iraq and other bank institutes. The complex was deducted from the old traditional neighborhood and attached directly to the old buildings as shown in the frontage facades where the high-rise building attached to the old AL-Adiliya mosque. The plot size of the frontage facades that followed AL-Adiliya mosque start to be smaller where the distance between both river and AL-Rasheed street gets bigger as a result of the existence of traditional residential area that follow the characteristics of the compact urban pattern. The parcel moves again to have bigger size and clear geometry up to the end of this segment where relatively modern buildings occupy this area and the distance gets so closed to AL-Rasheed street. On the right western part within the area between the segment and the river frontage area, the parcels start with a large-scale building of 15 storeys of Dafterdar building that occupies a big plot up to the riverfront area. A series of narrow portrait parcels has occupied the whole block adjacent to Defterdar building having facades on both sides. Some of these plots are divided into two buildings where the first one is facing AL-Mustansir street and the other facing the riverfront area. The parcels continue to have a variety of plot sizes where the distance to the river increases and continues to have big plots with large scale buildings that belong to private and public institutes. A layers of portrait parcels with small width have occupied the end of the segment where the distance gets closer to the river.

The commercial and administrative land use is the prevailing land use type in this area having governmental institutes and some light industries with wholesale and retail shops.

The traditional building types have transformed rapidly and are substituted by modern commercial malls and high-rise buildings though this part is considered the most historical path within the old city of Baghdad. The buildings types start and end with multi storey buildings that exceed 5 floors while the buildings in between ranged from 1-3 storey as shown in Fig. (5.14). Two multi storey buildings placed along both AL-Rasheed street and AL-Musatnsir showing the end of this part where they come together at AL-Ahrar bridge as shown in Fig. (5.21).

#### **5.2.2.3.3 Urban Public Space Types**

The street segment itself can be considered the only public pedestrian urban public open space that has the ability to guide users through a variety of old and new public functions inside the old city. It is also considered the main hub and the transitional space that collects pedestrians through three old corridors to connect them to the riverfront area and is also able to collect the mobility of the pedestrians from other car streets in the old city vertically towards the river. A small rectangular space in the middle of this segment is considered as fatigue point within the long passage and it is composed by difference in the street width. There is also an intersection point between AL-Mustansir street and the pedestrian walkway that links directly both AL-Rasheed street to the river where two parcels with tabor elevation along the AL-Mustansir street provides visual axis to the river. The riverfront area is neglected and is not well connected as one artery because most of the area is used mainly as a parking space.



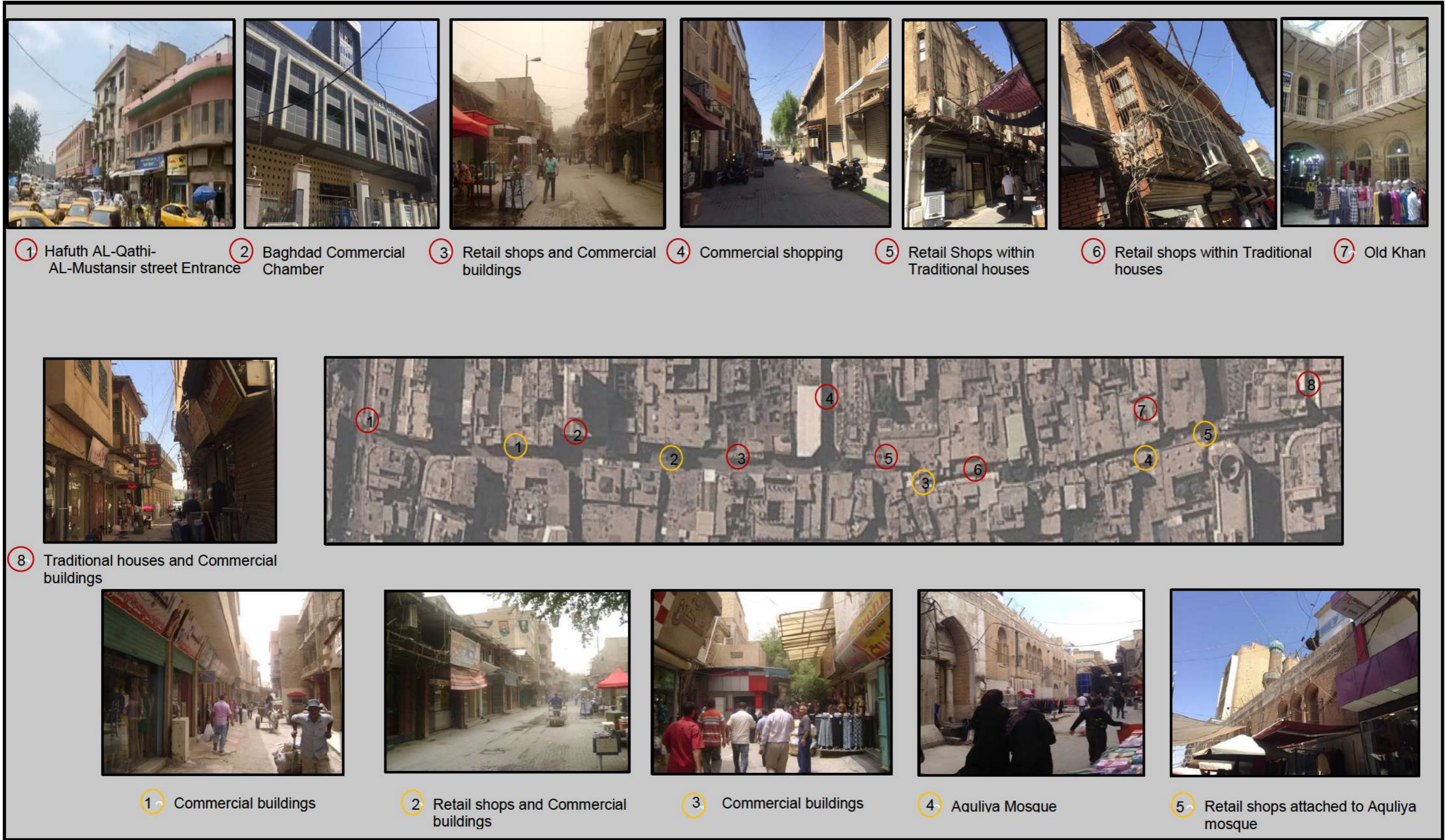


Fig. (5.20a): - Segment C (Right side with red circles) showing the building types along AL-Mustansir street, Source: Photographed by the Author.

Fig. (5.20b): - Segment C (Left side with yellow circles) showing the building types along AL-Mustansir street, Source: Photographed by the Author.



Fig. (5.21) :- The domination of two multi storey buildings at the end of AL-Mustansir street, Source: Photographed by the Author.

## 5.3 The Analysis of the modern Streetscapes in Old Baghdad AL-Rusafa

### 5.3.1 AL-Rasheed street

#### 5.3.1.1 Al-Rasheed street –The first car street

Al-Rasheed street represents the first alley that was penetrated in the historic traditional structure of the city of Baghdad. It was lined between 1915 up to 1918 (JCP1984:24). The Street was inaugurated officially for the public on 23 July 1916 and named Khalil Pasha Street up to the British colonization period when it was renamed as AL-Sharee AL-Jadid (the new street). The path of the current street was carefully curved to avoid any possible demolition of many religious buildings (Mosques, churches and synagogues). It followed the traces of some existing alleyways and deviated in many cases as a result of corruption and bad control system. Some house owners attempted to resort to bribe or manipulate effect to push the demolition process far off their houses. However, the first attempt to pave the street by stones was done by the British and later the street was paved with asphalt in the 1926, that is after the ratification of the constitution of the royal kingdom of Iraq. During the city development after the British occupation the first gate (Bab AL-Mudham) was removed to ensure better accessibility to the street path and the governmental area that occupied the Ottoman riverfront

administration buildings. Colonnaded buildings started to be the dominant feature of the street. The idea of colonnades was inspired by the old covered market (Suq) or perhaps by the Tarna in traditional Baghdad house. Colonnades also existed in many Ottoman buildings like AL-Rushdiya Imperial school, Qushla and others as an internal feature which surrounded the inner courtyard. They were also obviously seen in some British buildings like Lynch's house which was built in 1905 and the British Consulate as an external feature along the facade. It was argued that colonnades were a better traditional way to create shade in houses and they were useful to be used in large scale buildings. Colonnades were one of the common architectural features of Art Deco and the neo-classicism which was applied in AL-Rasheed street and was constructed between 1920s and 1930s. At the end of the 1930s the street was broadened from the southern direction as a result of the destruction of the southern old gate. In 1946 the street was renovated rather hard by removing parts from the historic Mirjaniya mosque and Haydar khana mosque.

### 5.3.1.2 AL-Rasheed Street Form Configuration

The street length is estimated to 3.120 m long from the old north gate (Bab AL-Mudham) to the south gate (Bab AL-Sharqi) with about 12 m width. It has occupied an area of about 3.8 hectare of the traditional urban fabric. The buildings with colonnades consist of about 70% from the total buildings along the street with about 4.5 m height and 3.5 m width between each one. Those colonnaded buildings type gave the street a special identity to provide a visual continuity along its path. The buildings at AL-Rasheed street have variant styles that belong to different construction ages. The multi storey buildings have a height between (9 to 14m) which estimated approximately a third of AL-Khulapha street height. The two storey buildings constitute about 40%, while the three storey buildings constitute about 25 % of the total buildings as shown in Fig. (5.22). (JCP11984:25).

The majority of buildings are lined with two dimensional facades distinguished by different architectural styles that belong to different periods. The traditional type with wooden cantilever windows and brick work details is considered the first type initiated at the time of street construction. The second type is the Art Nouveau that dates back to the late 1920s and beginning of the 1930s; it consists of brickwork details associated with steel joints and variant decorations. The third type is the Art deco type of the end of the 1930s and late 1940s, which has also brick work details in facades with steel joints but in a different decoration approach based on rectilinear lines. The other type of the facades belongs to modernism with concrete and brick work. Other building type based on having retail shops with only ground floor was found in the midst of the other styles.



Fig. (5.22): - The Height survey for the buildings along AL-Rasheed street in the old city of Baghdad, Source, drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017,14, See Fig. (48) in Appendix I in A3 Size.

After 2003 many buildings were deteriorated and many facades were covered with colored aluminum panels that distorted the visual quality of the traditional buildings. The monumental buildings with three dimensional facades are divided into two types: the first is the historical monumental buildings like AL-Mirjania mosque, AL-Muradiya mosque, AL-Ahmadiya mosque, AL-Azbakiya mosque, British residency and Lynch house. The second type is the modern large buildings like, AL-Arabi market, Abd AL-Kareem Qasim square and its surrounded shopping centre, several multi storey buildings that belong to private and governmental institutions and finally multi storey parking. The parcel division in the frontal area differs in size and shape based on the surrounded buildings types, the possibility of getting a defined geometrical shape from the traditional compact blocks and finally the transformation in ownership for both private to public. The street varied in height in each segment where multi storey buildings always interrupted the traditional 2-3 storey buildings Fig. (5.22). ***The street is divided into five segments as shown in Fig. (5.23).***

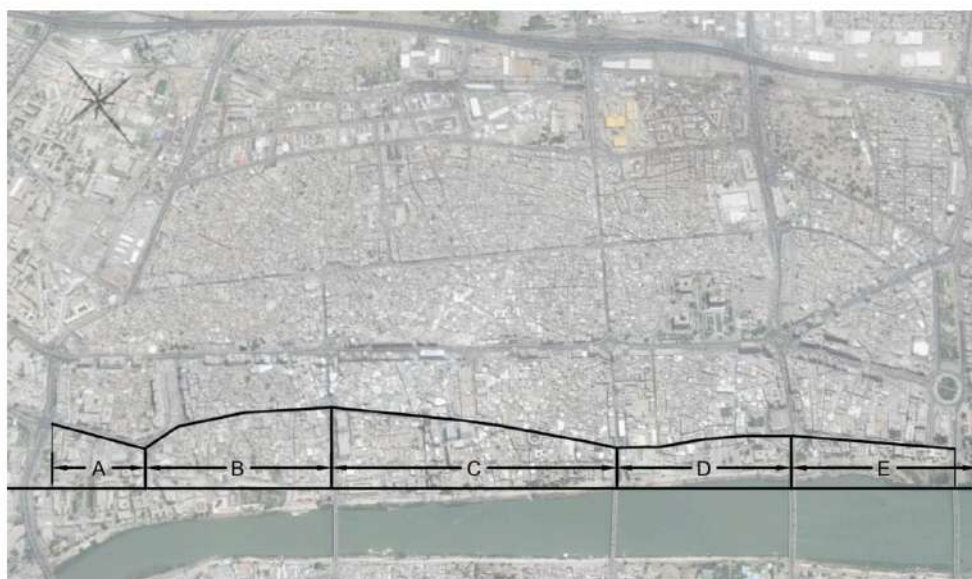


Fig. (5.23): - Segments A, B,C,D,E for AL-Rasheed street.

, Source: determined by the Author based on google map image for Baghdad ,(accessed 12 Jan. 2018).

**According to the survey for the buildings along the car street (AL-Rasheed street) regarding their height, types and relation to the surrounding as shown in (Fig. 5.22), Fig (5.25 a,b), (Fig.5.26 a,b,c) ,(Fig.5.27 a,b), (Fig.5.28 a,b) and ( Fig.5.29 a,b.c), the street could be analyzed according to the following criteria.**

### 5.3.1.3 Segment A

#### 5.3.1.3.1 Structure and Form

The length of the first segment is estimated of about 450m with a straight-line shape that has a little deviation in its path following the old castle wall. It starts from Bab AL-Mudham square (The old north gate) passing through the main gate of the Ministry of Defense up to the new Maidan parking lot and bus station. The car street segment consists of two lanes in opposed direction with about 14 m width. The pedestrian walkways on both sides were not colonnaded like the other street segments except for 3 scattered buildings on the left side that have colonnades but they are not connected to each other. The segment has on both sides many governmental buildings like the assembly of the ministry of defense, AL-Shaab theatre and the national library. It includes also many historical mosques like AL-Ahmadiya mosque, AL-Azbakiya mosque and AL-Muradiya mosque as shown in (Fig.25a, b). The segment ends with AL-Maidan bus station that surrounded by many multi storey buildings <sup>128</sup>(Fig.24). This segment has a historical background and experienced significant morphological changes, especially in the last century. It was gradually transformed from the main Maidan public urban space that faces the northern main gate (Bab AL-Mudham) to vehicle street.

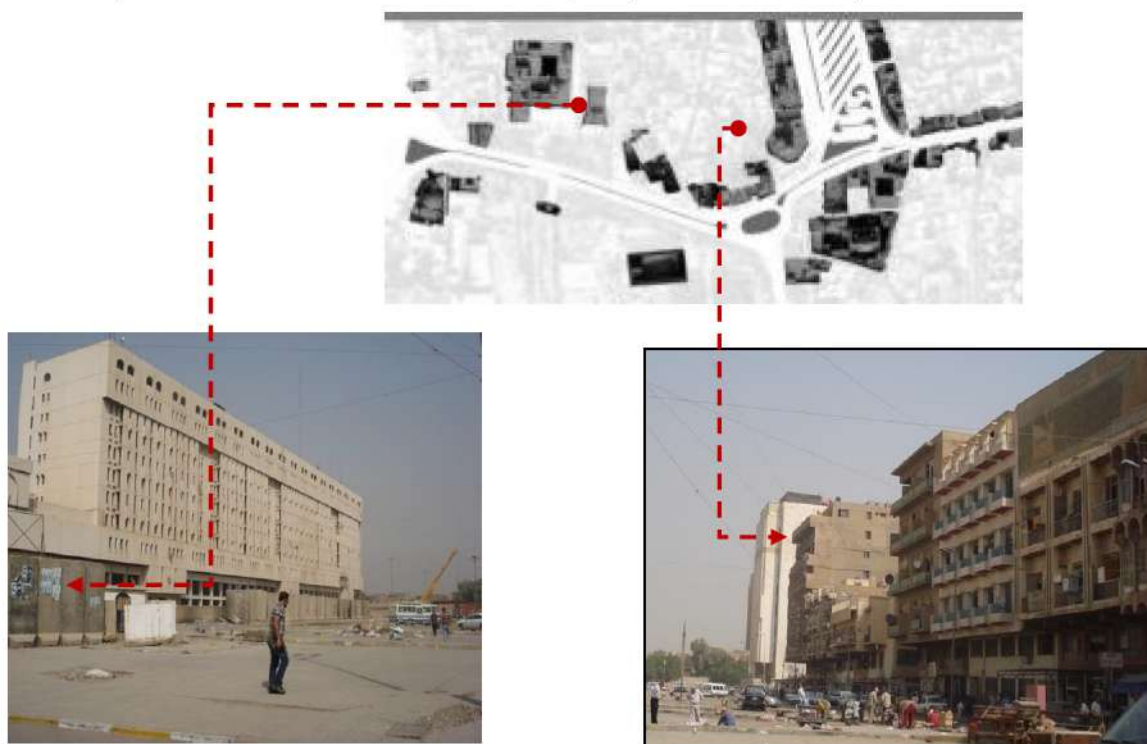


Fig. (5.24): - The new Maidan surrounded by multi storey buildings , Source: Photographed by the Author.

<sup>128</sup> Their Ownership belong to the private and public sectors.

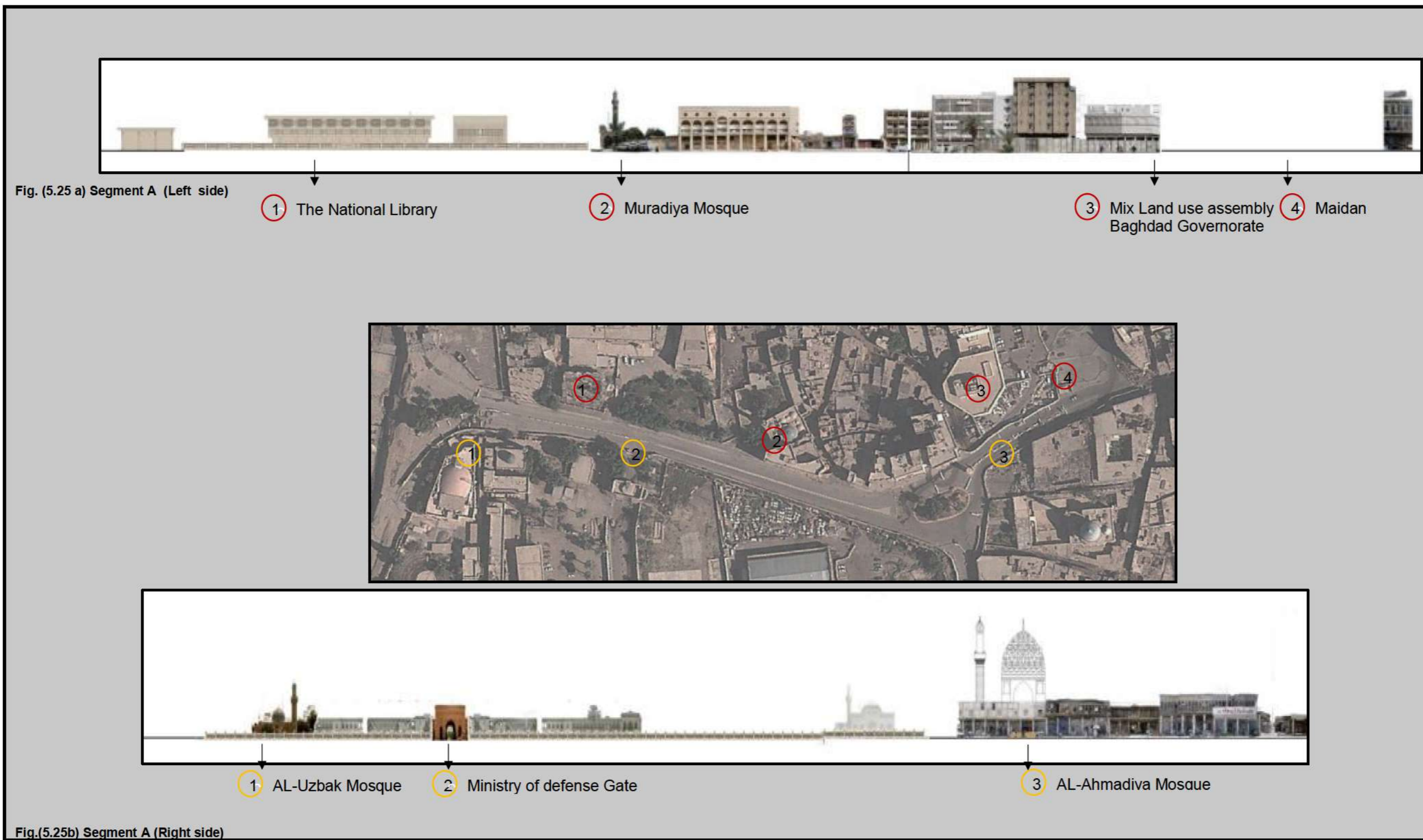


Fig. (5.25a): - Segment A (Left side with red circles) in red color showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.25b): - Segment A (Right side with yellow circles) in yellow color showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

The segment is a hub for three traditional pedestrian walkways from the adjacent neighborhood in the left side to the east. The first one separates the old structure from the frontage buildings along the main street in AL-Mudham area and lines around the National Library building. The second one provides accessibility to the Armenian Church from AL-Muradiya mosque as a main artery that connects AL-Rasheed street to AL-Khulapha street. The third one is connected to the previous artery from one side and moves behind the new residential and administrative campus that is exposed to Maidan from the other side up to AL-Khulapha street. The street in this segment continues within a deviation in its direction up to Maidan and then to start after the second segment. It ends visually with the main focal point (Al-Ahmadiya Mosque) within an oval node that is connected to the AL-Mustansir street parallel to the southern wall of the Ministry of Defense (The old castle) from the right side.

#### 5.3.1.3.2 Parcels, Building Types and Land Use Pattern

The street parcels in the first zone differ in size based on the variety of the land use along the segment as shown in (Fig.5.25 a,b). The right side starts with (AL-Shaab Theatre)<sup>129</sup> that is attached to the old historical AL-Azabikya mosque. Both buildings are located within the assembly of the Ministry of Defense that occupies the largest parcel in the whole of AL-Rasheed street basin. The fence within its main monumental gate extends up to the end of this segment. The monumental gate, built in the 1950s, could obviously be observed with its large-scale height that stands for the power of the Iraqi state. The buildings belong to the ministry of defense have a maximum 3 storeys in some buildings and located a bit far from the street adjacent to the riverfront area. On the other side the National Library has occupied a large Parcel which was deducted from large area of the historical urban fabric. The frontage plots along the street segment adjacent to National Library from both sides are considered small plots that have resulted from the destruction process during the lining of the street. It was occupied mostly by buildings that belong to modern architecture ranged in height between 1-5 storeys. AL-Muradiya mosque is located near the National Library with external courtyard facing the streets by a decorated fence. A strip of multi storey buildings configures a cordon around the whole neighborhood and is placed along Maidan plaza and AL-Khulapha Street designed by the TAC group in the 1980s of the last century. The building types have varied from traditional monuments represented by three old mosques that belong to different historical periods to modern buildings that were built after 1950s with different functions. The existence of two recreational land use represented by AL-Shaab Theatre and a cinema in the other direction mitigate the rigid military type of this segment. The majority of buildings have a

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<sup>129</sup> Built in the fourteens at the royal period and was the only hall used for cultural events.



state public ownership while only a small ratio between AL-Muraidiya mosque and the cinema adjacent to Maidan complex have a private ownership. The ownership of the three old mosques belongs to the endowments as public properties. After the war<sup>130</sup> most of the public buildings were maintained in their same old style after heavy bombings, especially the military buildings and the National Library while the private buildings are currently neglected and they are in bad physical conditions.

### 5.3.1.3.3 Urban public Space Types

The first roundabout square in AL-Mudham area, which is now substituted by a tunnel, is considered the main entrance to the AL-Rasheed street. The square is surrounded by many governmental buildings and is considered the junction point between the old core and AL-Adhmaiya part in the north of Baghdad, university campus, and the western part (AL-Karch) across the river. The entrance to the street was not well defined due to the existence of vacant parcels located at the beginning of segment opposite to AL-Shaab Theatre. The open spaces inside the National Library and the Ministry of Defense were restricted only for their users and they have no connectivity to the adjacent area. The military function in this area is restricted to the accessibility in many times for other buildings and facilities. The segment ends with oval roundabout that ensures a flexible connectivity to Maidan from east and to AL-Mustansir street from the west and to control the continuity to the next segment. The Maidan square is used as a main bus station and parking. It was located at the end of this segment adjacent to many institutes and public buildings where both substituted a large area of traditional urban fabric. The Maidan is surrounded by high-rise buildings from both north and south sides and linked to both AL-Rasheed Street and AL-Khulapha Street. The Maidan square has a rectangular geometrical shape with an area about (0.01 km<sup>2</sup>).

### 5.3.1.4 Segment B

#### 5.3.1.4.1 Street Structure

The second zone starts from Maidan plaza to AL-Rusafi plaza. The bay length is estimated about 500m with two lanes for cars. It starts with little curvature and then continues as one straight line. This area is considered the initial part in forming the path of AL-Rasheed street (J.C.P1 1984:26). The pedestrian walkways are covered by colonnaded cantilevers on both street sides, creating a continuous shaded area. Two car streets are cut through the traditional

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<sup>130</sup> First Gulf war in 1991.

urban fabric perpendicular to AL-Rasheed street from the right side (river side) at the start and the end of this segment. They create a traffic loop within Hasan Pasha neighborhood to ensure a better and flexible connection to Hasan Pasha Street (AL-Sarai street) and the governmental area along the river. The two branches follow the traces of the existed pedestrian ones and they are mostly formed by widening some parts and connecting them together. The street in this segment is considered a main hub for seven pedestrian collectors on the eastern side and five ones in the western sides. One of the pedestrian streets on the left side is configured as a transitional space between the high-rise buildings along Maidan square and the residential neighborhood behind.

#### **5.3.1.4.2 Parcels, Building Types and Land Use Pattern**

The Parcels on the street frontage area are attached to each other on both sides in longitudinal strip and are connected back to back directly to the neighborhood. The parcel shape varies in orientation between landscape and portrait. The buildings have completely covered the parcels without voids in between or inside the buildings. The majority of land use along this segment is a mix land use with many traditional coffee shops in between. Haidar Khana mosque is the main religious monument that is located in the heart of this segment and is considered a focal point for the adjacent neighborhood within its big blue dome. This area, it is worthwhile, has witnessed all through different periods numerous political demonstrations and cultural events. This has gradually added another function to the area which becomes a cultural centre. The whole buildings in this segment have a private ownership except Haidar Khana mosque which belongs to the religious endowments. In this area many buildings are considered important for reflecting many architectural styles in different historical periods. They are a mixture of the traditional Ottoman type, Art Deco and Art Nouveau from 1920-1940 and finally the modern architecture. Modern type could be seen scattered, but mainly concentrated on the frontage along the Maidan plaza as shown in (Fig.5.26 a, b, c). The one-floor buildings spread along the segment with retail shops function and can mostly be considered without any architectural interest. The Art Nouveau and Art Deco buildings normally have one to three floors. The buildings which belong to the modern architecture have more than two storeys. The skyline in this segment is not unified and differs within the variation of types and heights (Fig.5.22). Due to the continuous negligence for the maintenance in this part, the majority of these buildings are now in bad physical conditions.

#### 5.3.1.4.3 Urban Public Space Types

The street segment ends in AL-Rusafi semicircular roundabout which is named after one of the famous Iraqi poets (Marouf AL-Rusafi) with his statue. The roundabout connects four perpendicular streets together either by moving to the next segment or to link the street to both west direction across the river and to the far east direction. The roundabout is not well defined as the buildings around have different architectural styles and vary in both form and height. Al-Rusafi Park and commercial centre in the next segment dominates the roundabout in scale and height. The roundabout can be considered a transition space rather than an attractive public space. Many buses that stop near the plaza have affected the pedestrian connectivity within the adjacent area especially within the surrounded main historical buildings like the Baghdadi Museum. The roundabout also interrupts the continuity of the colonnades and the pedestrian movement along AL-Rasheed street in spite of the underground tunnels which cannot contain the high pedestrian volume.

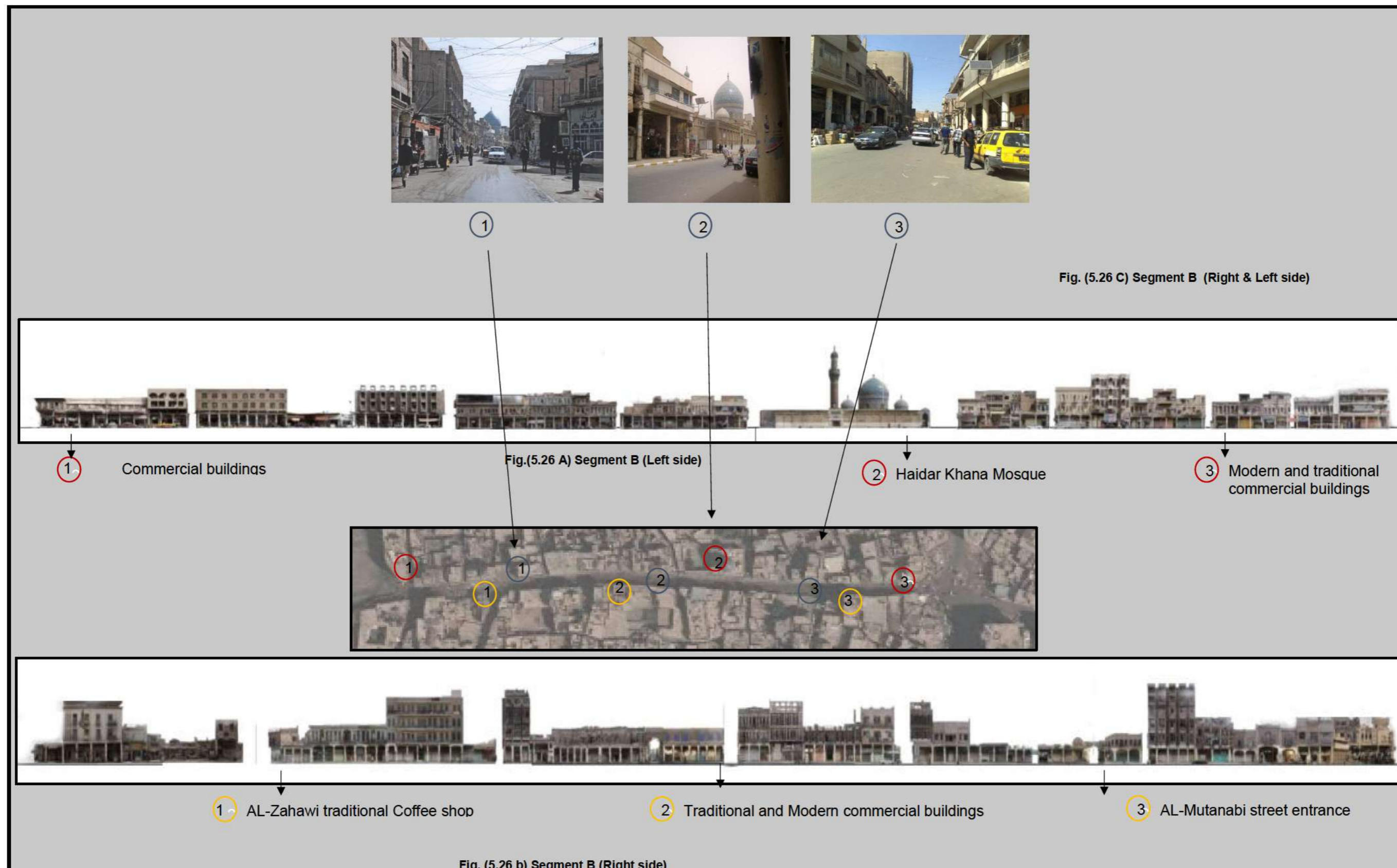


Fig. (5.26a): - Segment B (Left side with red circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.26b): - Segment B (Right side with yellow circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.26c): - Segment B (Right & Left side with blue circles) showing the building types along AL-Rasheed street , Source: Photographed by the Author.

### 5.3.1.5 Segment C

#### 5.3.1.5.1 Street Structure

The third zone extends from AL-Rusafi plaza to Hafuth AL-Qathi square with 1020 m length that is considered the longest segment within the whole path of AL-Rasheed Street. This part has continuous colonnaded pedestrian walkways within some interruptions which are done by modern buildings and the existed historical monuments. This part has seven secondary closed end car streets on the right side that penetrate the old fabric up to AL-Mustansir street. They were basically constructed as a transitional space between old and new fabric. The first secondary street extends behind AL-Rusafi multi storey parking and commercial centre to ensure a better accessibility for goods and also for cars. The second and third ones extend within the central bank campus and end in AL-Mustansir Pedestrian Street. They both are used to ensure the maximum security for the financial centre and also to guarantee a flexible accessibility for workers. The fourth one is Cul-de-sac street that ends with parking space behind Abed AL-Kareem Qasim plaza. The last three streets ensure accessibility for cars to the blocks that have modern structure with bigger parcels as compared with the adjacent neighborhood. They were also used to ensure the connection for pedestrians from AL-Rasheed street to Al-Mustansir street. There are two other secondary car streets from the left side. The first one is lined along the southern facade of AL-Arabi commercial mall centre. It connects both AL-Rasheed street with AL-Khulapha street to provide better accessibility for car movements and goods transport. The second one runs behind one of the twin buildings on the left side that shape Hafuth Al-Qathi square to be connected to the vertical connector to both west across the river and to the far east. This part interrupts the continuity of the main traditional market spines. It provides accessibility to 17 traditional pedestrian collector streets in the left eastern side and 8 pedestrian collector streets in the right western side used mostly as part of the commercial street network or as collector streets for the residential neighborhoods.

#### 5.3.1.5.2 Parcels, Building Types and Land Use Pattern

This segment is of a high economic concern where the main traditional markets (Suq) and the main banks<sup>131</sup> meet together to create the main commercial centre for the capital, Baghdad. It has also many buildings that belong to many private and public institutes with an architectural

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<sup>131</sup> Mainly the Rafidain bank and the Central Bank of Iraq.

interest. The eastern facades especially from Abed AL-Kareem Qasim plaza to Hafuth AL-Qathi square show more preserved part that dates back to 1930s. The most important focal points in this part are the traditional market arteries, Shorja plaza with old Mirjan mosque, the central bank campus, the old library and institute of Lynch Brothers company, AL-Aarabi commercial mall centre and Abd AL-Kareem Qasim plaza. The segment includes variant buildings mixed between classic and modern architecture on both sides as shown in Fig. (5.27 a, b). The parcels size and form followed the same arrangement as aforementioned. The frontage parcels were varied in form and size because they are regarded as left lots resulted from the destruction process during the street construction. The colonnades have covered the walkways on both sides and look like a continuous strip that is interrupted many times by large scale projects. Some of the plots were merged to adopt the increased demand in having bigger size buildings types. The reason behind that may be attributed to the extreme commercial uses that need more area for storage and the motivation to substitute large residential area by large scale commercial projects and high-rise buildings. The skyline has been interrupted several times in this segment with a variety of different heights (Fig.5.22). The big projects like the AL-Aarbi commercial mall centre and AL-Rusafi commercial centre normally take the shape of big rectangular geometry. The reason behind this geometry type is to substitute as much large traditional area as possible by new blocks as a part of wide modernization plan. The Arabi shopping centre was built as an additional market passage associated with lining a vehicular connection between AL-Rasheed street and AL-Khulapha street while AL-Rusafi complex is located within the traditional market network between AL-Rasheed Street and AL-Mustansir Street. The financial centre was initiated on the old Ottoman banking area with modern large-scale buildings reflecting the booming in economy and it was integrated within the traditional market centre. The large-scale project approach is intended to reflect the will to have renewal projects instead of the traditional decayed urban fabric, and to have modern and new city core. The majority of buildings have mixed land use with some governmental institutes and some historical buildings like Mirjan mosque which is part of the religious endowments. The ownership of the majority of buildings and their retail shops goes to the private sector, while the public ownership has occupied the large-scale commercial and governmental buildings. The ownership moved from private to public as a result of enforcing the private owners to sell their properties to the government. Many parts of the traditional urban fabric were substituted by new large-scale projects with much public benefits like governmental institutes, shopping centres and multi storey parking. Buildings that belong to the modern multi storey type spread along the start and the end of the street segment and have also concentrated in the middle point where the Central Bank complex is dominating the urban scene.

AL-Rasheed Street has experienced an excessive development between 1920 and 1930. The Art Deco and Art nouveau building types could be considered the prevailing pattern along this segment, and concentrated in the part that restricted between the AL-Arabi shopping mall centre and Hafuth AL-Qathi square. It is obvious that there are few buildings of the Ottoman period in this part, like Lynch brothers' company, occupy a large corner parcel connecting both AL-Rasheed street to AL-Mustansir Street. The building heights are varied along this segment within the concentration of the high-rise buildings along the right side of the street segment to ensure closed view to the Tigris river as shown in (Fig.5.22). Currently, the majority of buildings including the modern ones are in bad physical condition as a result of the heavy destruction in war, lack of the maintenance and use of inappropriate materials for the reconstruction in the light of the absence of conservation strategies.

#### **5.3.1.5.3 Urban Public Space Types**

Mirjan mosque square is considered the main public one in this segment. The mosque takes the shape of half circle and is surrounded by car street and high-rise buildings reflecting the tendency in the fifties of last century to pave streets around the historical monuments. The surrounded street works as a transitional space between the traditional urban fabric and the modern urban structure. It directs people toward both the traditional Shorja market and the modern financial area by breaking the continuity of the straight visual axis which is formed by colonnades. Another plaza was created as a fatigue point within the long distance of this segment that followed the same idea of the Mirjan square. The design has showed some due respect to the traditional fabric and ensured the continuity of the colonnades to provide more enclosure around the public open space. The statue of the former prime minister Abed AL-Kareem Qasim became a new focal point along the street. Both focal points have divided the long segment in three parts with approximately equal distance. The last space is Hafuth AL-Qathi plaza, which works as a welcome space to both AL-Rasheed street and AL-Mustansir street. The initial idea is to create a public space in front of twin buildings reflecting the modern approach in architecture and urban design in the 1940s of the last century. The twin buildings are considered a main focal point mediated by the vertical connector street that goes to AL-Ahrar bridge in the west and to the far east. Both buildings are also surrounded by colonnaded streets as part of AL-Rasheed street. The public space is split later by extending the main vertical street that separates the twin buildings to be connected directly to the AL-Ahrar bridge instead of moving around. The plaza also works as transitional area that connects the end of the AL-Mustansir street to AL-Rasheed street.

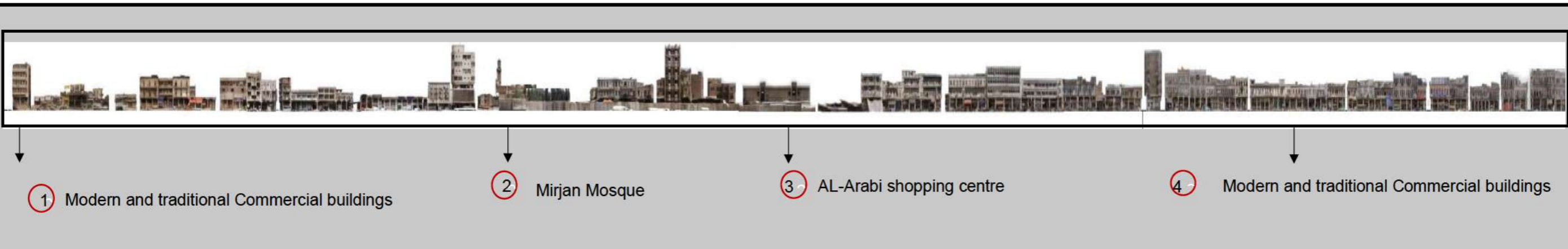


Fig.(5.27a) Segment C (Left side)



Fig.(5.27b) Segment C (Right side)



- 1 AL-Rusafi parking and commercial building
- 2 Rafidain Bank
- 3 Central Bank of Iraq
- 4 Commercial buildings
- 5 Administrative buildings

Fig. (5.27a): - Segment C (Left side with red circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.27b): - Segment C (Right side with yellow circles) in yellow color showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.



### 5.3.1.6 Segment D

#### 5.3.1.6.1 Street Structure

The other segment starts from Hafuth AL-Qathi square to AL-Sinak bridge in the area that is traditionally called AL-Murab'a quarter. The street segment is lined with little deviation to the east. It has two secondary car streets surrounding the traditional neighborhoods and connecting AL-Rasheed street to AL-Khulapha street, providing accessibility to the light industrial zone along them and to the residential neighborhoods in between. Two other car streets are located on both ends of this segment: The first one surrounds the multi storey parking lot near the AL-Sinak bridge which was designed to ensure flexible entry and exist for the parking while the second is located behind one of the twin buildings that shape Hafth –AL-Qathi square from the right side. This segment is the hub for five pedestrian streets from the east in the left side. The riverfront area is accessible by two pedestrian streets and also through the historical Said Sultan Ali Mosque, which occupies the whole block between AL-Rasheed street and the river frontage.

#### 5.3.1.6.2 Parcels, Building Types and Land Use Pattern

The plot sizes range along this segment from small size to the large one. Three plot types can be explored in this segment. The first one is the attached plots from three sides with full coverage ratio. The second type is the attached plots from both sides, but detached from the back side. The third plot type is the completely detached plots designated for large scale buildings like the multi storey parking, communication centre and the old British consulate. The area that is penetrated by this segment up to the end of the street is considered a hybrid area that mixes old and new urban structures. It is considered a relatively new built-up area compared to the previous segments. This reason explains the disparities in plot size and building types as shown in the variety of building types on both sides in Fig. (5.28 a, b). This could be explored clearly by many building types built in 1920s and 1930s with Art Deco and Art Nouveau with maximum three storeys.

The segment includes also three old cinemas which reflect the tendency after 1940s in having such new building types to serve entertainment purposes within AL-Rasheed street which are now unfortunately neglected and in bad physical condition. The new central market was introduced for the first time in this area as a new type invented in urban scene of Baghdad. Modern types were implemented after 1960s with more than three storeys like the communication tower, which reflects the national vision of modernism by interpreting the traditional architectural elements and materials in modern function. The mix land use is the prevailing land use type in this segment with private ownership accompanied by few governmental buildings owned by the state. The Said Sultan Ali mosque is considered the main historical monument that belong to religious endowments and extends up to the river. It forms together with the British consulate two historical focal points along both the riverfront area and AL-Rasheed street.

#### **5.3.1.6.3 Urban Public Space Types**

There are no public spaces along this segment. The space under the bridge is the leftover area facing the river and resulted from curving the path of the AL-Rasheed street to provide enough space in front of the multi storey parking. This space is a neglected one in spite of its being a potential link between both the British consulate and the riverfront area in the following street segment to provide a continuous path parallel to the river. The space within the British consulate, which now is used as Music school, is restricted only to its students. The collector car street that is linked to AL-Kulpha street at the end of the segment is restricted only to pedestrians and to provide more space for retail shops assigned for automobile spare parts trade and to engulf the increasing demand for more pedestrian specified markets.

#### **5.3.1.7 Segment E**

##### **5.3.1.7.1 Street Structure**

The segment started from AL-Sinak bridge and turned beneath the bridge, causing an interruption in the physical and visual continuity of the street. It is considered the closest part of the street to the river frontage. This segment continues till Al-Jumhuriya bridge which signs visually the end of the street close to the river and continues to Abu Nouas street forming a recreation area and green buffer zone outside the border of the old core. The street segment turns to the left toward AL-Tahreer square where a multi storey building of the Turkish restaurant standing at the end of the street. The segment is connected to AL-Khulapha street

by seven secondary streets from the eastern side. The urban fabric in this area is rather regarded more modern based on the vehicular street network rather than on pedestrian historical one. On the other side, the distance up to the river reaches the closest point and is connected together by two secondary streets. The river area can be also accessed through the green urban space at the beginning of the segment near AL-Sinak bridge. It can also be accessed in an indirect way through each individual building that has two facades along the street from one side and along the river on the opposite side.

#### 5.3.1.7.2 Parcels, Building Types and Land Use Pattern

The last zone is considered the most modern one, and developed after 1950. It was formed by modern buildings that were added to the existed traditional ones like Jamal Pasha and Khalil Pasha houses<sup>132</sup>. The parcels in this segment vary from small parcel sizes to big ones. Apparently, the area during the Ottoman times was an agricultural land then divided, after being allocated, into big size plots to meet the increasing demand for more modern public buildings and houses of wealthy people. The close distance between AL-Rasheed Street and the river frontage has encouraged to have longitudinal big parcels with two-side facade houses and buildings. The colonnades in western and eastern facades have been interrupted many times by modern building types and free-standing ones. The majority of the buildings are of modernist style with few scattered traditional houses built in the Ottoman era far from the old governmental centre (Fig. 5.29 a, b, c). The variety in building types explains the disparities in building height within this segment, especially at the endpoint where AL-Rasheed Street meets AL-Khulapha Street (Fig. 5.22). The governmental land use and the commercial one is the prevailing land use type along this segment which has many governmental buildings and traditional houses of public ownership that spread along the private ones.

#### 5.3.1.7.3 Urban Public Space Types

AL-Sinak Square under the bridge can be considered a free public space along the river. It is used as a transition space between the two segments. The other rectangular space is the parking area in the street that connects both Al-Rasheed and AL-Khulapha streets adjacent to the Turkish restaurant building. The riverfront area, specially where AL-Rasheed Street comes closer to the river is mostly neglected and used as car parking. Vacant plots and undefined spaces between the buildings spread along the segment and mostly used as car parking lot.

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<sup>132</sup> Ottoman rulers and officers who started the tendency to privatize the river frontage area.

Fig.(5.28a) Segment D (Left side)



1 Traditional and modern commercial buildings

2 AL-Sinak communication centre

3 AL-Sinak Multi storey Parking



Fig. (5.28 b) Segment D (Right side)

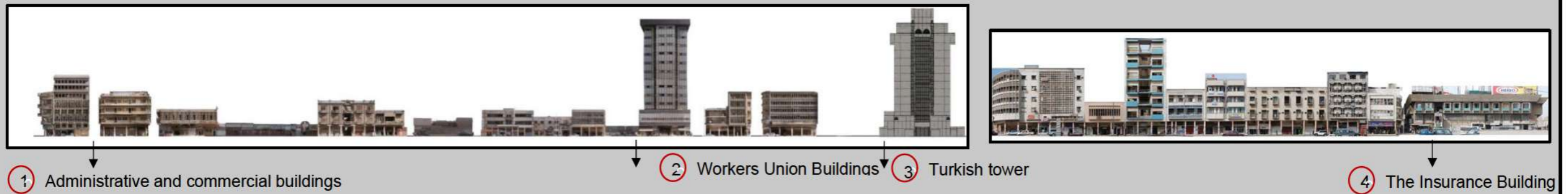


1 Said Sultan Ali Mosque

2 British Consulate (Music Institute)

Fig. (5.28a): - Segment D (Left side with red circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.28b): - Segment D (Right side with yellow circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.



① Administrative and commercial buildings

② Workers Union Buildings ③ Turkish tower

④ The Insurance Building

Fig. (5.29a) Segment E (Left side)



①



②

Fig. (5.29 c) Segment E (Right left side)



① Traditional and Modern Commercial buildings

② Traditional House- The national leader Abd-AL-Kareem Qasim Museum

③ Commercial buildings

Fig. (5.29 b) Segment E (Right side)

Fig. (5.29a): - Segment E (Left side with red circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.29b): - Segment E (Right side with yellow circles) showing the building types along AL-Rasheed street , Source: Abdul.Hadi T 2017.

Fig. (5.29.c): - Segment E (with blue Circles) showing the building types along AL-Rasheed street , Source: Photographed and surveyed by the Author.

### 5.3.2 AL-Kifah Street

The street is extended for more than 4 km starting from the AL-Mudham area passing some local monuments like AL-Fathil mosque up to AL-Gailani. The street then turns down to meet AL-Khulapha street up to the main bus station adjacent to AL-Tahreer square. The majority of the area occupied by the street originally belongs to the old historical residential neighborhoods with few parts which were relatively developed at the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century. These are located at the far end of the street which was inaugurated in 1930s and then filled with new modern architecture in the 1940s and 1950s. According to historical plans found in old archives, it is believed that the planner drew a straight line to connect the following points, AL-Mudham area (which was placed at the position where AL-Mudham street deviates in its path following the trace of old wall), the big Fathal mosque, the intersection nodes of old main traditional arteries, the end of Shorja market and AL-Gailani shrine as final destination and a main point that had motivated the decision to choose the current location of the street. The line curves to create a direct connection within AL-Rasheed street which was the only street at that time. AL-Kifah Street is the hub for the old central Shorja market artery and it contains many multi storey buildings of 1-4 floors with a ground floor used as retail shops; these buildings substituted the frontage parcels that survived the construction with a main concern to have the majority of the residential and mixed land use area on both sides. *The street is divided into Three segments as shown in Fig. (5.30).*

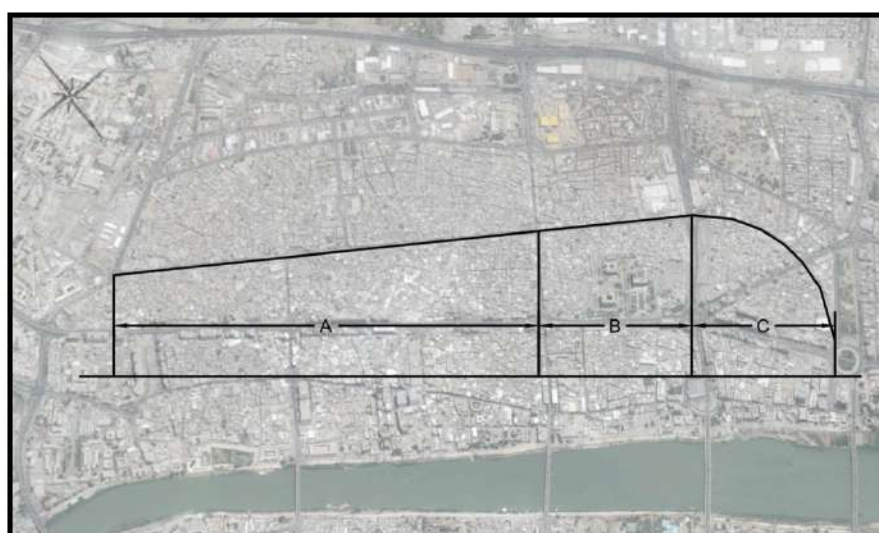


Fig. (5.30): - Segments A, B,C, for AL-Kifah street , Source: determined by the Author based on google map image for Baghdad ,(accessed 12 Jan. 2018).

According to the part survey for the buildings along the car street (AL-Kifah street) regarding their types and relation to the surrounding as shown in (Fig. 5.31), Fig (5.32 a,b) and ( Fig.5.33), the street could be analyzed according to the following criteria<sup>133</sup>.

### 5.3.2.1 Segment A

#### 5.3.2.1.1 Street Structure

The segment starts from AL-Mudham area up to the intersection node within the vertical connector street that penetrates the old city and links the eastern part with the west across AL-Ahrar bridge passing through both Al-Rasheed and AL-Khulapha streets. The length is estimated about 2.4 km and starts with diagonal path for a short distance and then continues in a straight direction. The street interrupts 15 traditional main and secondary old pedestrian streets and many cul-de-sac arteries. Some of these pedestrian streets were transformed to car streets due to its large width. The segment is also connected to Sheik Omar street from the left side through a secondary street, passing AL-Sibaa square. In the middle of this segment a new vertical street starts from Zebadiah square and moves to both AL-Khulapha and AL-Rasheed streets and then to AL-Karch across AL-Shuhada bridge.

#### 5.3.2.1.2 Parcels and Building Types

The parcels are varied in shape and size along this segment and depend mainly on the size of the leftover plots that face the street and get shaped during the destruction process. The building heights range from ground floor retail shops to maximum 4 storeys while their types mostly belong to the modern architecture of the 1940s and 1950s of the past centuries or belong to some local style that was not designed by architects and was built in a spontaneous way by the owner's ideas. The commercial function is the prevailing land use along this segment that more meet the local need for the neighborhoods more than the public one (as shown in ( Fig.5.31).

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<sup>133</sup> Due to the security situation it was very hard to access this part of the old city to explore the height and the complete building typologies and according to that few pictures were taken for segment c and analyzed without having height survey for the whole building along the street.

### 5.3.2.1.3 Urban Public Space Types

Part of the street passes through Zebadiah square which is rather composed by an oval space that has been divided by the street into two halves. The first half on the left side is mostly used as parking space while the second half is also divided by a vertical connector street into two quarters used also as parking spaces. This node is thought to be the start point for the connector street that penetrates the old fabric in a vertical way reaching AL-Shuhada bridge and passing through both AL-Khulapha and AL-Rasheed streets.





Fig. (5.31): - Segment A (Left side with red circles) showing the mixed land use building types (residential and commercial) along AL-Kifah street ,Source: Photographed by the Mayoralty of Baghdad.

### 5.3.2.2 Segment B

#### 5.3.2.2.1 Urban Structure

This segment starts from the last intersection node within the oval space up to the AL-Gailani shrine. The segment length is estimated about 0.6 km and interrupts five main and neighborhood traditional streets. This segment is considered the most important part for AL-Kifah street because of the existence of the AL-Gailani shrine. The street segment ends in the main vertical artery that moves to AL-Sinak bridge connecting both AL-Khulani mosque and AL-Gailani shrine together as main attraction focal points in this area. In addition, there is also a local pedestrian connection between AL-Gailani shrine and Saraj AL-Din Shrine in Bab AL-Sheik quarter as part of the traditional market. There is only one vehicular local street on the left side from this segment which is penetrated inside the old urban fabric and used as local street to connect AL-Kifah street and AL-Gailani shrine to AL-Khulani mosque and AL-Khulapha street providing accessibility for the governmental campus and residence to reach both streets with more flexibility.

#### 5.3.2.2.2 Parcels and Building Types

The parcels follow the same variety in shapes and sizes like in the last segment as shown in (Fig.5.32 a,b). The buildings take the shapes of the leftover parcels that have resulted from the destruction process during the street construction. The building heights range also from one to maximum 4 storeys. AL-Gailani shrine has occupied large plots located at the end of this segment and is considered the largest building within the whole street as a religious focal point in the old city. At the end corner of this segment there is an empty large plot located in front of the shrine on the right side from AL-Kifah street and it is used as a parking space to cope with the large number of visitors to the holy shrine.

#### 5.3.2.2.3 Urban Public Space Types

The segment starts from the oval space with the intersection point between AL-Kifah street and the perpendicular street toward the river. In front of the AL-Gailani dome there is a small cemetery within the shrine. It has a polygonal shape with an ornamented brick fence along the street. The shrine gate is located at its southern wall and can be accessed from the street corner through a long corridor to the large inward-looking space that belongs to the shrine.

### 5.3.2.3 Segment C

#### 5.3.2.3.1 Street Structure

The last segment starts from the intersection point between AL-Kifah street and the perpendicular street toward AL-Sinak bridge. The segment curves down and intersects with AL-Khulapha street near AL-Tayaran square and then continues till a rectangular space used as a bus station near AL-Tahreer square. The bus station is considered the end of this segment that curbs the path to continue further and meet the main street along both the Umma Park and AL-Tahreer square<sup>134</sup>. It intersects three traditional old pedestrian streets and then forms the hub of many car streets that is lined along the new blocks which row perpendicular to the curvature line of AL-Kifah street.

#### 5.3.2.3.2 Parcels and Building Types

The street starts from both sides with empty large plots surrounded by fence. These two plots are part of the removed residential area which was planned to be substituted by large scale buildings. They are left blank due to lack of financial support and currently used as car parking or garages. The segment continues with small plots that have different sizes and shapes which are leftover spaces resulted from the destruction of the old fabric. The plots start to be larger, especially in the area that is located out of the traditional fabric border. New geometrical blocks are inserted along the curvature path of the street and attached to the old fabric where each block has two rows of parcels attached to each other from back to back and face the car streets. The large plots in the frontage area are occupied by commercial buildings and cultural buildings like the Art Museum, theatres and cinemas. The heights vary from one-storey for retail shops up to five storeys, especially for the commercial and cultural buildings. The street has colonnaded walkways like in AL-Rasheed street and the buildings follow the modern architecture style in 40s, 50s, and 60s of the last century with many buildings that are without architectural interest and designed by the owners themselves as shown in (Fig.5.33).

#### 5.3.2.3.3 Urban Public Space Types

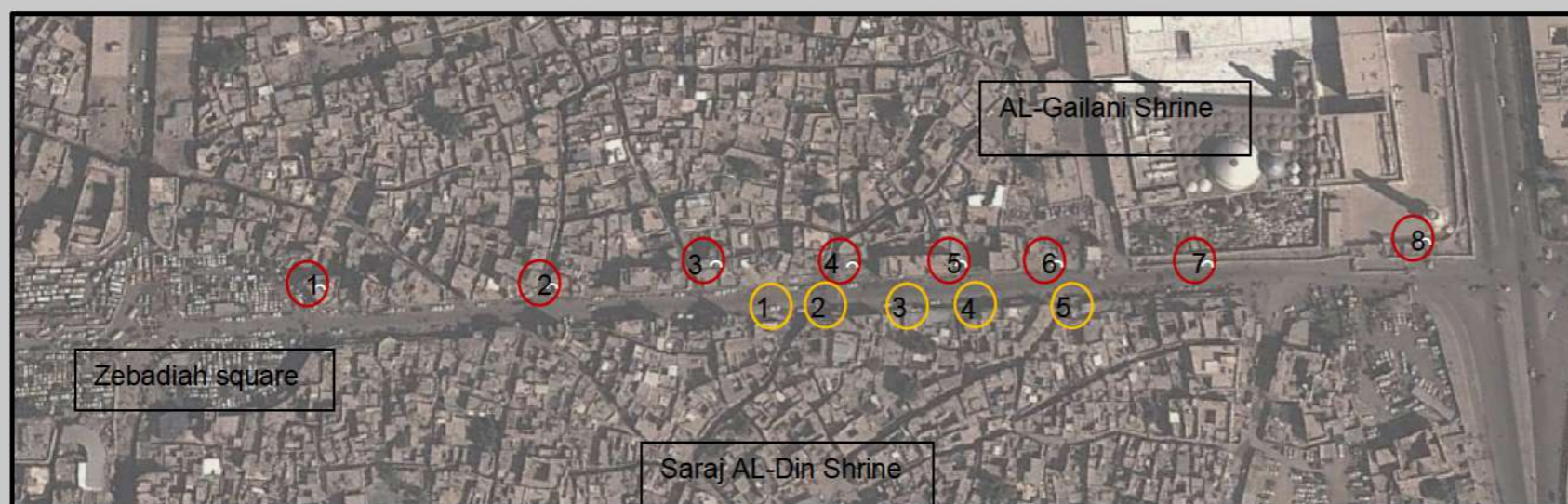
The segment passes through Granada intersection node that is located at the intersection point between AL-Kifah street and AL-Khulapha street. The intersection point is surrounded by corner buildings with tabor elevation. The large space at the end of the street is used as a bus station for the whole area and is surrounded by commercial and cultural buildings.

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<sup>134</sup> Bus station moved the traffic to Tayran Square to be connected to both AL-Khulapha street and AL-Rasheed street.



Fig. (5.32 a) Segment B (Left side)



1



2



3



4



5

8

Fig. (5.32b) Segment b (Right side)

Fig. (5.32a): - Segment B (Left side with red circles) showing the building types along AL-Kifah street , Source: Photographed by the Mayoralty of Baghdad.

Fig. (5.32b): - Segment B (Right side with yellow circles) showing the building types along AL-Kifah street , Source: Photographed by the Mayoralty of Baghdad.



Fig. (5.33): - Segment C (Left& Right sides with yellow circles) showing the building types along AL-Kifah street, Source: Photographed by the Author.

It has an entry and exist along the main street in front of the Umma Park. Recently, many peddlers have occupied AL-Kifah street from Granada intersection within AL-Khulapha street and the bus station where the car movement is rather hindered and restricted only for pedestrian.

### 5.3.3 AL-Khulapha Street

It is considered the main modern part inside the old city core showing a variation of architectural trends in the buildings along its path that belong to different periods. The street was planned to be constructed in 1954 and was inaugurated officially in 1957 based on removing large parts from residential neighborhoods and interrupting the continuity of the old traditional commercial artery. The street was initiated in multi phases where the first one starts from AL-Tahreer square with 500 m length up to AL-Khulani mosque within AL-Khulani square and then moves straight to the north. The second phase creates a link with in AL-Trayran square with 650 m length. The main boulevard is lined up from AL-Khulani square with straight line having a length about 3.4km up to Bab Al-Mudham area within AL-Khulapha square. The street was paved with 40 m width and some parts near AL-Tahreer square reached up to 50 m.

The street is aligned with high rise buildings whose architectural style is rather mixed between the modern interpretation of the traditional Iraqi architecture and the international style which reflects the tendency to globalize the city within the rapid economic development. A fence with approximately two meters works as a buffer zone between the street and the residential area in the parts that have no frontage buildings which are in pending to be built. The effect of this street on the traditional fabric could be considered more destructive because it removes a large area of the traditional urban fabric and interrupts many traditional arteries including the main Shorja market which all was blocked by high rise buildings that separate the skyline of the city in two parts. It causes a clear separation among the old city neighborhoods altering the order of the traditional physical urban elements and the social life. The street could be divided into four segments according to its linkage and accessibility. ***The street is divided into Three segments as shown in Fig. (5.34)***

**According to the survey for the buildings along the car street (AL-Khulapha street) regarding their height, types and relation to the surrounding as shown in (Fig. 5.35), Fig (5.36 a,b), (Fig.5.37 a,b,) ,(Fig.5.38 b), (Fig.5.39 a,b,c,d) , (Fig.5.40 a,b,) and ( Fig.5.41 a,b), the street could be analyzed according to the following criteria.**

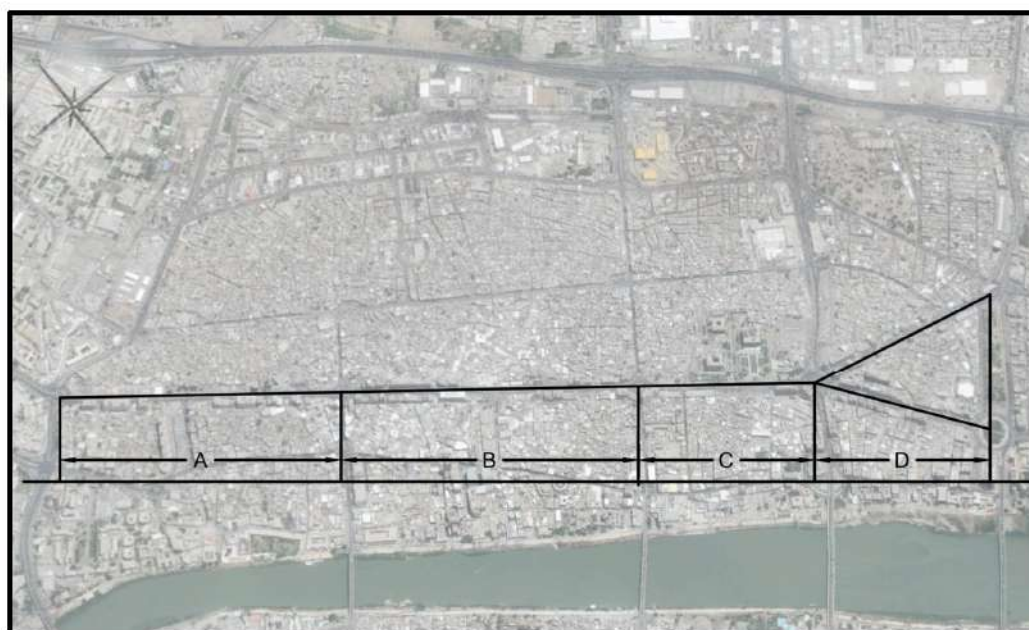


Fig. (5.34): - Segments A,B,C,D(Upper & Lower ) for AL-Khulapha street, Source: determined by the Author based on google map image for Baghdad ,(accessed 12 Jan. 2018).

### 5.3.3.1 Segment A

#### 5.3.3.1.1 Street Structure

This segment starts from AL-Khulapha square which has been recently substituted by overpass bridge to AL-Amin square. The length of this segment is estimated of about 1 km. The street segment passes through the traditional urban fabric penetrating the residential neighborhoods and interrupts thirteen main and local traditional pedestrian streets and many cul de sac passages. This part is well connected to AL-Rasheed street through the big (Maidan square) which is used as parking and bus station.

#### 5.3.3.1.2 Parcels and Building Types

Variant parcels of different sizes are provided in this segment to develop a new residential and governmental complex up to 11 floors with rectangular bigger parcels in Bab AL-Mudham done by TAC group in the 80s of the past centuries. The buildings assembly in the right western side were not achieved completely in a continuous series and some parcels in between were filled by buildings that belong to private owners

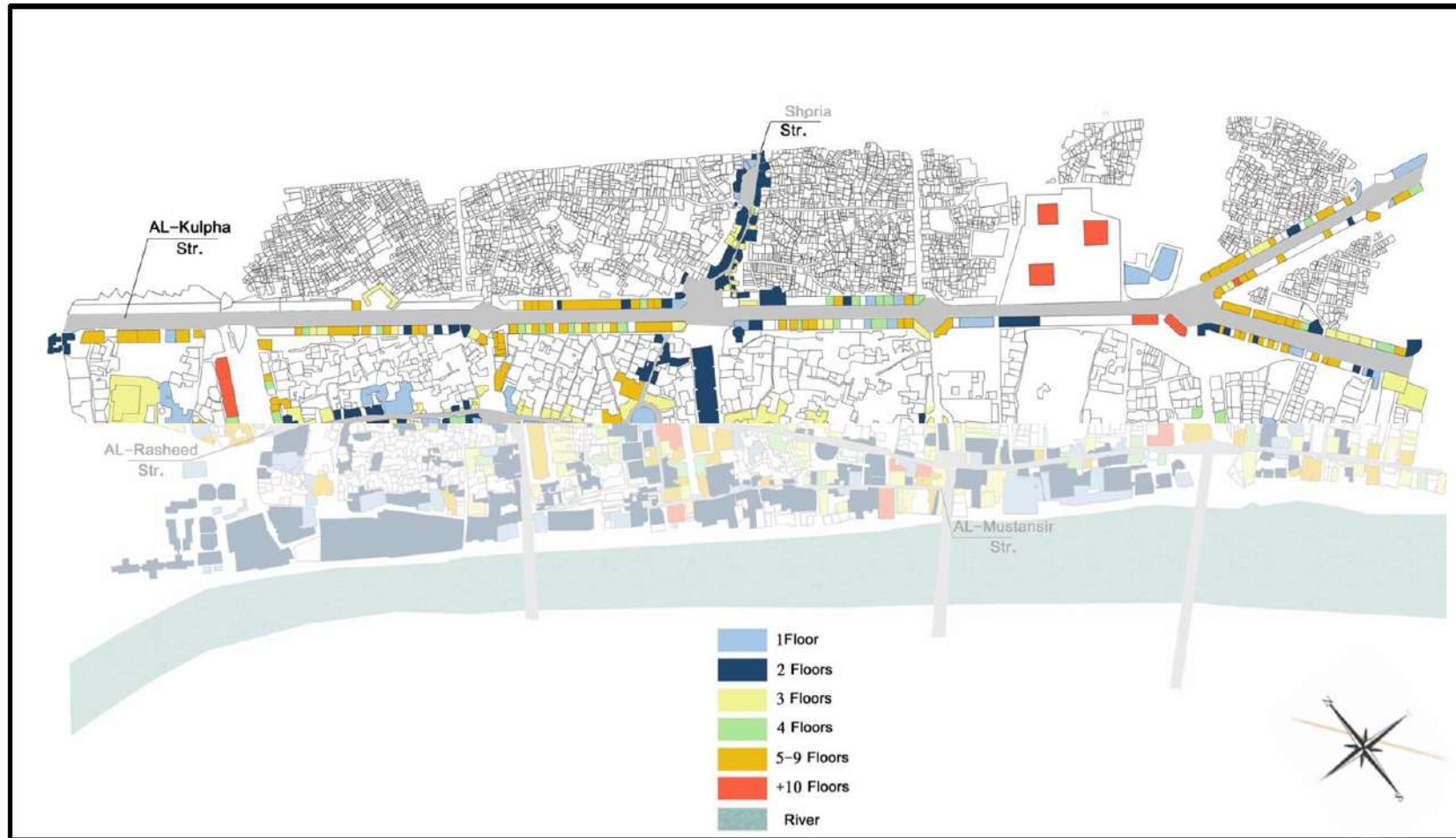


Fig. (5.35):- The Height survey for the buildings along the main AL-Khulapha street in the old city of Baghdaq , Source: Drawn and surveyed by the Author, See Fig.(49) in Appendix I in A3 size.



The privately owned building parcels are smaller in size and have a quadrate or rectangular shape with varying number of 1-9 storeys as shown in Fig. (5.35). Some parcels were not constructed and remained empty which affects the visual continuity of the street. On the other side of the segment, only two buildings with different types were found along the street: the first is a secondary school with inward looking planning and the second is a multi storey building with 7 floors adjacent to it. The remained parcels were left empty without any construction and the residential area is exposed directly to the street. These parcels are bordered by a long fence and converted to car parking to serve the traditional residential area. The building types are characterized by a typical office building attached to each other showing only the front façade with retail shops in the ground floor of about 4.5 m high according to the mayoralty construction law. The variety of building types area so clear in this part as shown in (Fig.5.36 a, b).

#### 5.3.3.1.3 Urban Public Space Types

The segment starts from AL-Khulapha square which is an intersection traffic point among four cross streets that is surrounded by three corner buildings which have public and private ownership; and the fourth corner is used as left-over space which is now converted into a peddler's place. The other big space in the street segment is the Maidan square which is used as a bus terminal and works to connect both AL-Khulapha street and AL-Rasheed street. Maidan is surrounded by high rise residential and administrative buildings as part of the TAC group project from one side. On the other side, there is variation of multi storey buildings with small plots compared to the first one. AL-Amin intersection point is the end of this part and is located between the main AL-Khulapha street and the vertical street that moves up to AL-Shuhada bridge. It is bordered from the right side of the intersection by two corner buildings. The first one is designed with tabor elevation as an office building with ground retail shops while the second one is designed with cylinder part at the corner as a Bank building and is considered one of the first attempts of Iraqi architects to build along AL-Khulapha street. Both corner buildings are presented different architectural design approach to provide an enclosure to the intersection traffic square. The buildings on both corners at the left side were not constructed and left only as empty parcels used as parking. The intersection was furnished by two islands to separate between the opposed lanes along AL-Khulapha street and facilitate the pedestrian's movement across the street.

### 5.3.3.2 Segment B

#### 5.3.3.2.1 Street Structure

This Segment starts from AL-Amin square to AL-Wathba square. The length is estimated about 1 km. The segment interrupts 10 old pedestrian main and neighborhood arteries with many cul –de-sac streets and small intersections as old gathering spaces. There is only one vehicle collector parallel to AL-Aarbi shopping centre that is linked to AL-Rasheed street providing a flexible access to transport goods between both main commercial car streets where both are part of the main wholesale trade market in Baghdad. The aligned buildings along the street segment are bordered by secondary street from the backside that separates them from the residential neighborhood behind as it is shown in (Fig.5.35). Two main focal points are opposed to each other (AL-Khulapha mosque & Latin church) within the place of the interrupted Shorja artery to compose the main historical part along the whole street.

#### 5.3.3.2.2 Parcels and Building Types

This segment is part of the main commercial and whole trade centre in Baghdad. The parcels in the left side from AL-Amin square up to the AL-Arabi shopping mall have a small quadrate shape with only large rectangular one. The aligned buildings have a variation in height with some few unbuilt plots located in between and used as car parking as shown in (Fig.5.35). The open public space in front of AL-Arabi shopping mall breaks the continuity of this segment to provide accessibility to enter Shorja market from the right western side and its complementary part across the street on the other side. AL-Arabi shopping mall signifies a new kind of building type that substitutes the large old traditional fabric. It occupies a large rectangular parcel with maximum two floors connecting both AL-Khulapha street and AL-Rasheed street together. A series of four quadrate buildings are connected to each other to compose rectangular big building with internal long vertical passage that is intersected by three horizontal ones. The segment continues from Latin Church up to AL-Wathba square to be lined with buildings that vary in height ranging up to 11 floors with some totally unbuilt plots. The shape of parcels also quadrates with a variation in building height up to the last building along this side that have tabor elevation to provide accessibility to the perpendicular street that heads towards Hafth AL- Qathi square. Starting from AL-Amin square on the other right side up to the second half of Shorja place, the plots are small and mostly have a quadrate shape with only large rectangular one that is occupied by governmental institutes.



Fig. (5.36a) Segment A (Left side)

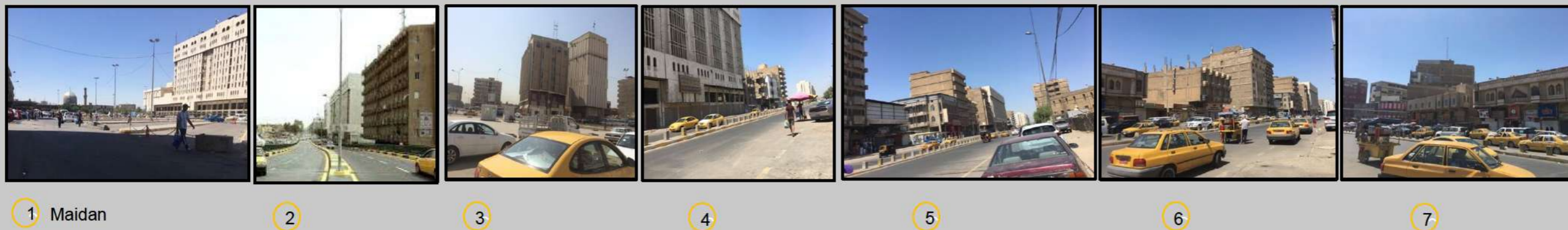


Fig. (5.36b) Segment A (Right side)

Fig. (5.36a): - Segment A (Left side with red circles) showing the building types along AL-Khulapha street , Source: Photographed by the Author.

Fig. (5.36b): - Segment A (Right side with yellow circles) showing the building types along AL-Khulapha street , Source: Photographed by the Author.

The buildings along this part varies in height and ranges from ground floor retail shops up to 7 floors and lines up to the open public space that forms the other half of Shorja square. The segment continues with some retail shops that are attached to the historical AL-Khulapha mosque. Other public space was formed adjacent to AL-Khulapha mosque along the street providing accessibility to the old Suq-Gazil market specified for pets. It directly faces the old neighborhoods which experience highly transformation process in building types where many houses are substituted by commercial multi storey buildings. The line continues with relatively small and quadrate plots with varied buildings height and rectangular big one used as governmental institute up to the chamfered corner plots and its building that shapes AL-Wathba square. The above mentioned building types could be seen obviously in Fig. (5.37 a,b).

#### 5.3.3.2.3 Urban Public Space Types

AL-Wathba intersection point square takes the form of rhomboid that is split into two halves by AL-Khulapha street. The chamfered corner plot shape and its occupied buildings surround the intersection point from three sides except one unbuilt parcel located adjacent to the governmental complex which is bordered by fence to protect the residential neighborhood behind. One of the important public spaces is the square that is located in front of the shopping mall (AL-Aarabi market). It is considered the main gathering point as it collects pedestrians from the first part of the old Shorja market artery, the old churches that are located along the linkage street between both AL-Khulapha street and Al-Rasheed street and AL-Arabi market. This square is connected by a pedestrian bridge to the other part of it across the street in order to convey people to the complementary part of Shorja traditional market on the other side. The pedestrian bridge is thought not to be a practical solution in providing continuity to the traditional Shorja market and in many times was neglected due to the massive pedestrian movement in this part. The physical and the visual connection between the two parts of square is considered critical and inoperative. The large traffic volume and high street width are more potential to achieve the physical separation. The absence of urban management system explains the reason behind the gradual transformation of the space to paddlers markets. The first part of Shorja square has a rectangular shape while the second part is polygonal. Another polygonal square is located in front of Al Gazil market, which is specialized in selling pets. The area is destructed and left over to be used as public space to provide access to the old markets.



1



2 AL-Khulapha Mosque



3



4

Fig. (5.37a) Segment B (Left side)



Fig. (5.37b) Segment B (Right side)



1



2



3 Latin Church



4

Fig. (5.37a): - Segment B (Left side with red circles) showing the building types along AL-Khulapha street , Source: Photographed by the Mayoralty of Baghdad.  
 Fig. (5.37b): - Segment B (Right side with yellow circles) showing the building types along AL-Khulapha street , Source: Nr.1 Photographed by the Author and Nr2-4 Photographed by the Mayoralty of Baghdad.

### 5.3.3.3 Segment C

#### 5.3.3.3.1 Street Structure

The segment passes through the governmental centre which was planned to be the main civic centre for the city of Baghdad. It starts from AL-Wathba square to AL-Khulani square. The length is estimated to be 0.6 km. The segment interrupts three main traditional pedestrian arteries, neighborhood streets and cul-de sac. There are two collector streets connected to AL-Rasheed street while other one is connected to AL-Kifah street in parallel to the governmental campus toward AL-Gailani shrine.

#### 5.3.3.3.2 Parcels and Building Types

The building types could be seen obviously in Fig. (5.38). The segment has large rectangular parcels that row along the main street from AL-Wathba square to AL-Khulani square and is planned to be part of the civic centre. A two-storey building was built with retail shops in the ground floor after the chamfered building in the right side along AL-Wathba square. They are followed by vacant plots up to two main governmental buildings (The Directorate nationality and the Ministry of Trade) which both occupy a large area facing AL-Khulani square. On the other side and in front of the ministry of trade and beside AL-Khulani mosque, a large area was removed and mediated by three free standing governmental buildings. There are no other buildings near the governmental campus and the parcels were left empty up to AL-Wathba square (Fig.5.38). The buildings in this area were reflected the tendency to find a new approach in Iraqi architecture by having large scale monumental buildings that exceed 10 floors with traditional details designed by Iraqi architects as shown in the Fig.(.5.35).

#### 5.3.3.3.3 Urban Public Space Types

One of the important roundabout squares is AL-Khulani square or round-about that has a circular shape with diameter of about 50m. It works as a meeting point of five main streets and link the main city market, (Shorja,) that was intersected by AL-Khulafa street to AL-Tahreer square and then to AL-Sadoun street from one side and to AL-Nidahl street through AL-Tayran square from the other side .It also connects AL-Gailani Shrine to AL-Rasheed street in AL-Sinak area and then to AL-Karch part across the bridge. It is surrounded by multi storey buildings that reflect different architecture styles mixed between local and international architecture. Al-Khulani old mosque was enlarged to stand as the main focal point within the modern multi storey buildings.



1

Upper (Left side)



1



2



3



4

Ministry of Trade

Fig. (5.38b) Segment D Lower (Right Side)

Fig. (5.438a): - Segment C Upper (Left side with red circle) along AL-Khulapha street , Source: Photographed by the Mayoralty of Baghdad.

Fig. (5.438b): - Segment C building types (Right side with yellow circle) along AL-Khulapha street , Source: Source Nr 1-2 Photographed by the Author, Nr.3-4 photographed by the Mayoralty of Baghdad.



Fig. (5.39 b)

1 AL-Tahreer Square



Fig. (5.39 d)

2 AL-Tayran Square



Fig. (5.39 a )



Fig. (5.39 c)

3 AL-Kulani Square

Fig. (5.39a): - Aerial view of Segment D (Upper & Lower ) showing the main three squares, Source: Photographed by the Mayoralty of Baghdad.  
 Fig. (5.39b): - Aerial view of AL-Tahreer square , Source: Photographed by the Mayoralty of Baghdad.  
 Fig. (5.39c): - Aerial view of AL-Khulani square , Source: Photographed by the Mayoralty of Baghdad.  
 Fig. (5.39d) :- Aerial view of AL-Tayran square , Source: Photographed by the Mayoralty of Baghdad.



### 5.3.3.4 Segment D

#### 5.3.3.4.1 Street Structure

This part comprises two main streets where both meet together in AL-Khulani roundabout composing a zone in between with a triangle form bordered from the south by the main street along the big city garden (Umma Garden) to move up to AL-Jumhuriya bridge as shown in Fig. (5.39 a,b,c,d ). The first street is extended from AL-Khulani square up to AL-Tahreer square and connected to AL-Rasheed street through two vertical streets at both segment ends. It was extended outside the old city border to AL-Sadun street configuring a continuous commercial artery up to AL-Karrada zone. There are also four local streets connecting this part to the mixed-land use area that is between this part and Al-Rasheed street. From the other side there lies only one secondary street linked to the area between the first street and the second street. The second street was extended from AL-Tayran square to meet the first one in AL-Khulani square and intersected within the curvature part of AL-Kifah street. One local street is connected to the triangle area from one side in addition to the part of AL-Kifah street while the other side is bordered only by blocks specified for multi storey buildings and is also only connected to the Al-Kifah street. The area is considered part of the main governmental centre especially where it moves near AL-Khulani square in addition to its commercial and cultural use especially at the intersection point within AL-Kifah street. The buildings along both streets are separated from the area behind by local streets parallel to the main one and connected to the curvature part of AL-Kifah street. One of the potential nodes in this segment is the green park which is unfortunately inaccessible because of the existence of the main streets that are heading to AL-Jumhuriya bridge and work as buffer area between the users and park. The reason behind finding many local and collector roads in this area is attributed to the absence of the compact traditional residential area around.

#### 5.3.3.4.2 Parcels and Building Types

In this part the parcels along the first street from AL-Khulani square to AL-Tahreer square are getting smaller in size depending on the building functions. The governmental buildings normally have larger rectangular parcels than other privately owned buildings which have quadrate shapes. The buildings were mostly built in the 60s up to 80s of the last century and reflect the modern international style as seen in Fig. (5.40 a,b). The parcels in the second street from AL-Khulani square to AL-Tayran square are shaped also in small size and follow the same division in having big rectangular parcels for the public buildings and quadrate

parcels for the privately owned ones. The right side from the second street starts with small plots then followed by many empty parcels with sporadic buildings in between until the end where the building of the Arts Museum occupies a big rectangular parcel facing AL-Tayran square at the intersection point within AL-Kifah street. On the other side, the parcels start with bigger ones that occupy governmental institutes and then become smaller up to AL-Tayran square with some empty parcels in between as seen Fig. (5.41 a, b). Two monumental buildings (Iraqi Industry Union building and the Insurance building) are located opposite to each other and facing AL-Khulani square show the tendency between architects to fill the street with representative ideas and design. The majority of buildings were designed to have more than 5 storeys as part of the proposed civic centre in this area as shown in (Fig.5.35).

#### 5.3.3.4.3 Urban Public Space Types

AL-Tahreer square is considered the joint that links the old city to the modern extension outside. The roundabout has a spherical shape with a vertical diameter of about 110 m crossed by a horizontal one with 100 m. The roundabout is split by vehicle tunnel and consists of underground level that includes retail shops. The roundabout is occupied by the National Freedom monument done by Iraqi artist Jawad Salem. The monument represents the history of Iraqi civilization and it connects AL-Khulapha street to AL-Sadoon street from one side and AL-Jumhuriya bridge to AL-Tayran square from the other side. The big garden which extends along the border of the old core is considered a buffer zone that separates it from the new urban structure. It has a semi rectangular shape with 21287m<sup>2</sup> and includes some art galleries within the green area. The area is totally isolated by a brick fence and has limited accessibility due to the high-speed roads around. The garden is not eligible to be a place for social interaction as it has turned into an accommodation area for poor, homeless and deported people due to the large urban decay in the surrounded area accompanied by the gentrification problem and the rapid transformation in the residential land use to commercial one. The other square is AL-Tayran square with a half circle shape that is considered the third pillar in providing flexible connections within the surrounded area. It connects both AL-Khulapha street and Sheik Omar street to AL-Nidhal street organizing the traffic volume in the light industrial zone. AL-Tayran Tunnel passes under the square to provide direct access from AL-Tahreer square toward the far eastern part of the city



1

2

3

4

5

Fig.(5.40a) Segment D Upper (Left side)



1



2



3



4

Fig.(5.40b) Segment D Lower (Right side)

Fig. (5.40a): - Segment D Lower (Left side with red circles) showing the building types along AL-Khulapha street , Source: Photographed by the Author.

Fig. (5.40b): - Segment D Lower (Right side with yellow circles) in yellow color showing the building types along AL-Khulapha street , Source: Photographed by the Author.



Fig. (5.41 a) Segment D Upper (Left side)

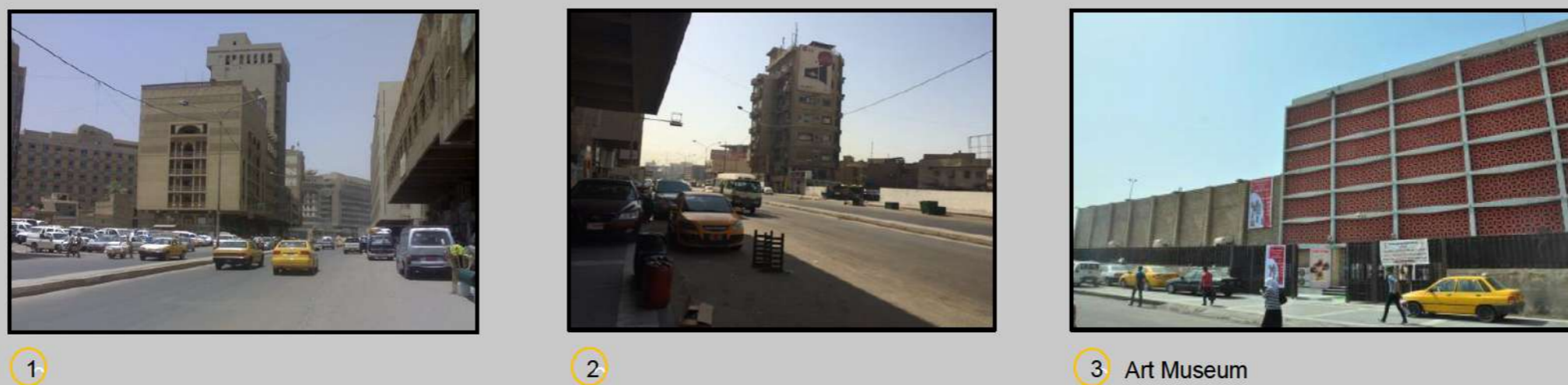


Fig.(5.41b) Segment D Lower (Right side)

Fig. (5.41a): - Segment D Upper (Left side with red circles) showing the building types along AL-Khulapha street , Source: Photographed by the Author.

Fig. (5.41b): - Segment D Upper (Right side with yellow circles) showing the building types along AL-Khulapha street , Source: Photographed by the Author.

## 5.4 Transect analysis in old city core of Baghdad

Several sections were taken in three zones across the traditional old city fabric. The vertical transects in each zone were chosen to pass through different spatial types with variant land use to provide a rigorous and comprehensive framework for the investigation process. These sections in different periods show the effects of variant intervention through history on the surrounded urban elements. The detailed sections have started from the traces of the old historical wall in the far east up to the river Tigris in different areas. They worked together to introduce a better scene about the transformation process and their impacts on each specific zone and on the entire area in general within time intervals. The sections explain the role of the new constructed streets in changing the order, hierarchy and type of urban space in old core and their impacts on the built-up area. They explain the role of the existing buffer zone as a transitional area between the old core and the entire city showing its connectivity, continuity and impacts on the adjacent area. The sections then pass through the residential area showing the transformation in neighborhood unit and the impacts of the wide destruction area and the implanted large-scale projects on the, connectivity, coherence, building types and the relatedness to the main streets. The selected sections pass the courses of four main streets showing the position and the physical character of each street course in each zone and their role on changing the area around. This comparative way of analysis is very significant to find out the role of street hierarchy in changing the urban structure of the old city. The selected sections passed through the large-scale urban structure that was implanted in the historic core to examine their integrity within the other part of the city. They also explained the role of the historical monuments after the modernization process within the historical residential area from one side and within the new urban pattern from the other side. Transect analysis is an effective tool to explain the development of the skyline for the old city and its building height. It demonstrates the way that the city operates within different functions and types and explore the order of the main poles of development in the old core. The volume of the modernized area to the traditional one within the city could be monitored according to the extension of new urban structure inside the old fabric. The city was investigated by defining action zones that were determined between the streets that have penetrated the city vertically toward the main bridges across the river. The spatial development in 2009 was investigated as it was partly surveyed during the preparation of the national Census <sup>135</sup>Fig. (5.42) within the association of Satellite images that could provide a clear three-dimensional information within the associated of aerial photos Fig. (5.43). It was compared to the air survey that was done in 1962 by Dutch KLM AEROCARTO firm for the benefit of the former Iraqi Ministry of

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<sup>135</sup> It was not done due to political issues.

Agrarian Reform Fig. (5.44) and to another air survey that was done 1917 by the British expeditionary force and found in the British Archive Fig. (5.45).

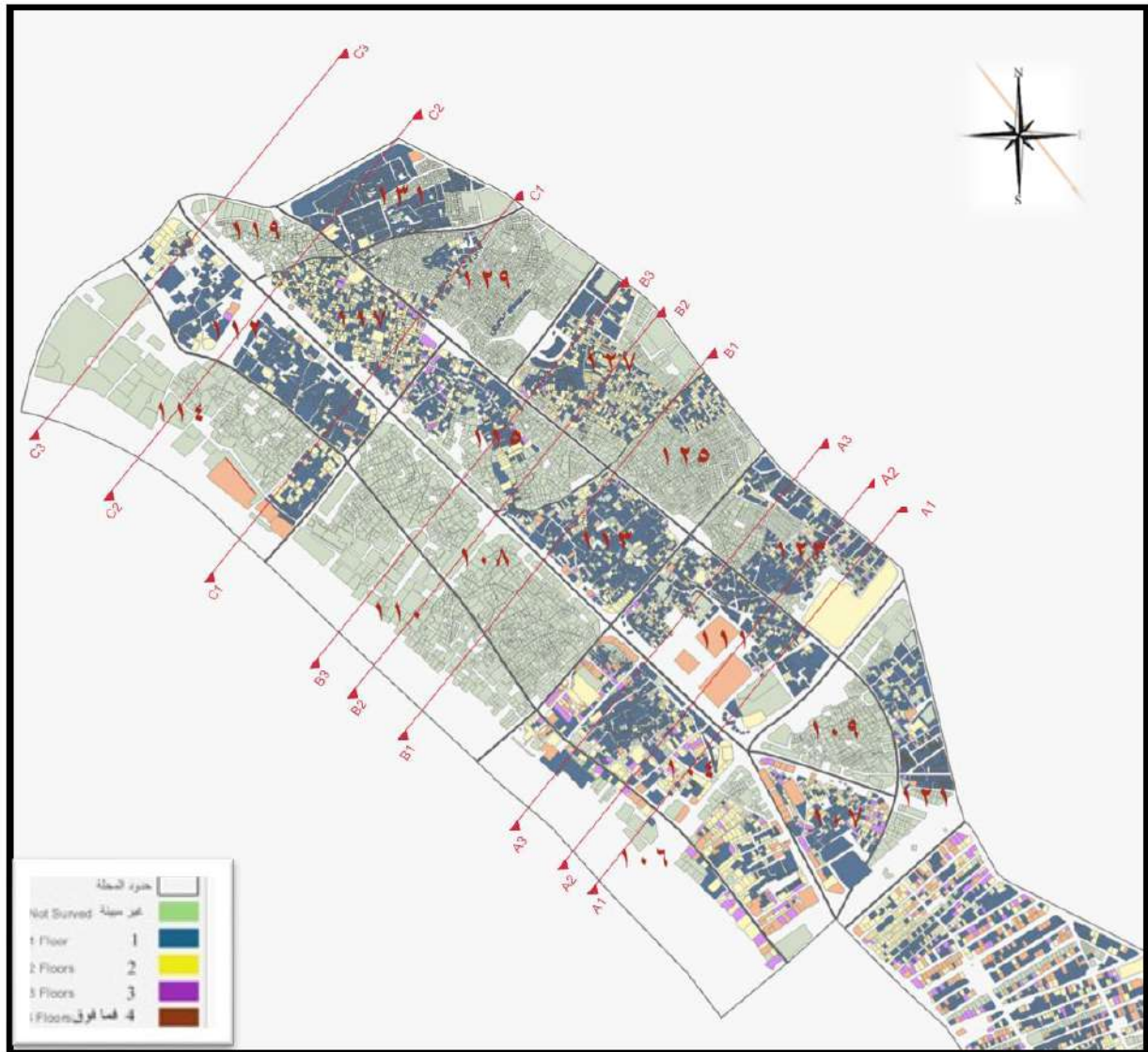


Fig. (5.42): - Floors Number survey in some parts of the old city core showing the selected urban sections, Source: Ministry of Planning, GIS Department, edited by the Author, See Fig. (50) in Appendix I in A3 size.

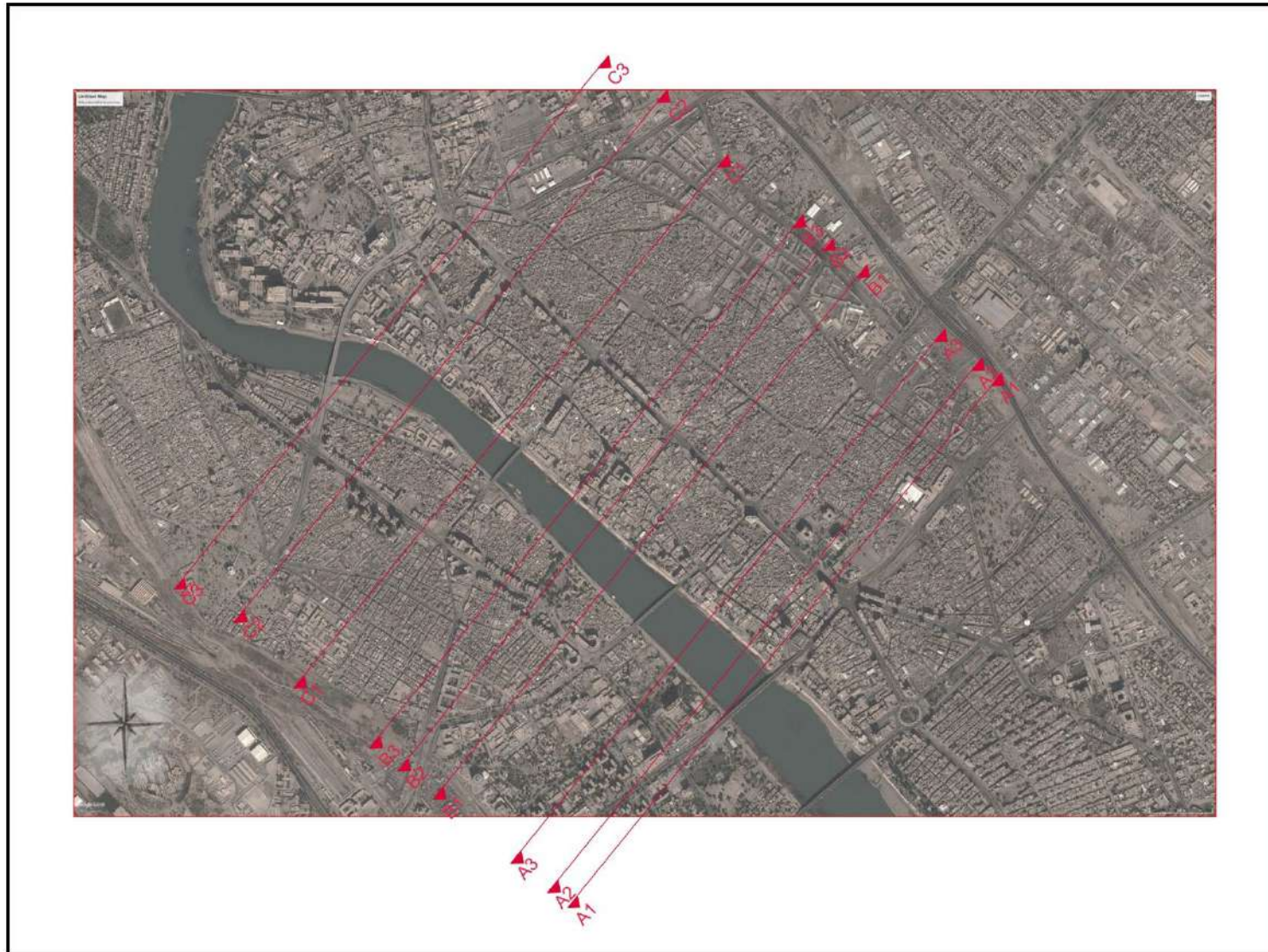


Fig. (5.43): - Aerial Image in 2009 in the old city core of Baghdad showing the selected urban sections, Source: Google Pro, (accessed 12 Jan. 2018), See Fig. (51) in Appendix I in A3 size.

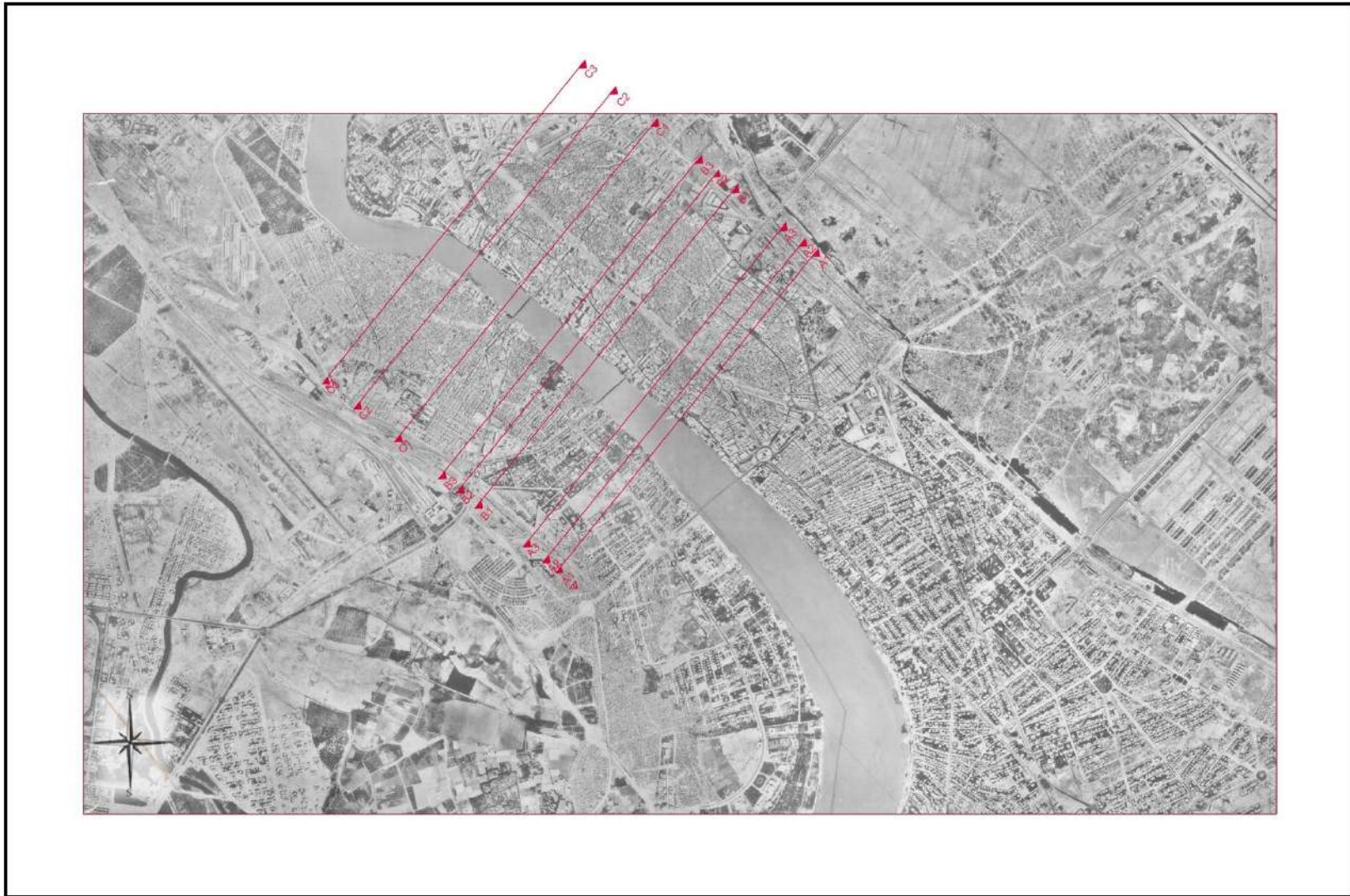


Fig. (5.44): - Aerial Image in 1962 in the old city core of Baghdad showing the selected urban sections, Source: Dutch KLM AEROCARTO, former Iraqi Ministry of Agrarian Reform, edited by the Author, See Fig. (52) in Appendix I in A3 size.



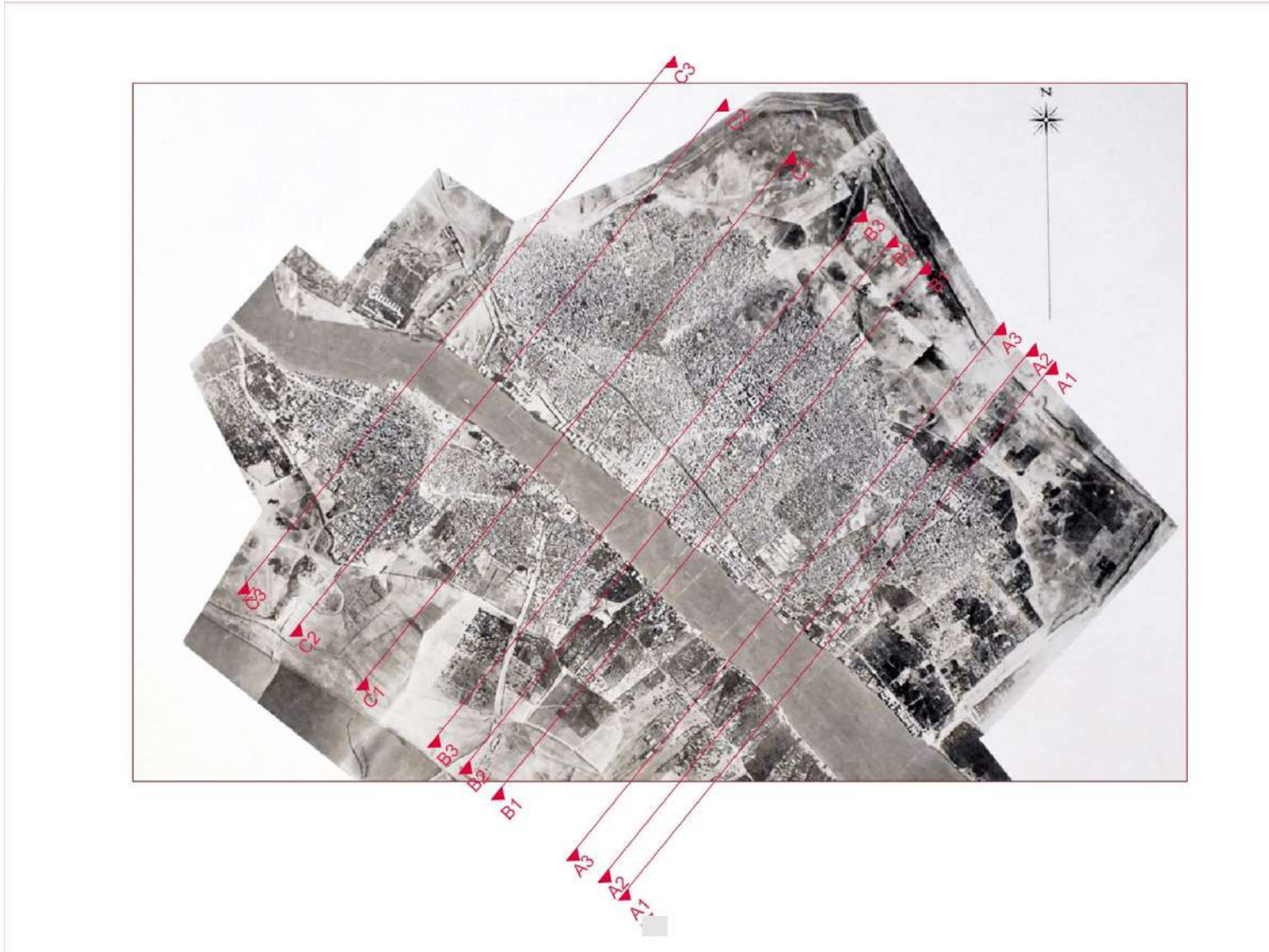


Fig. (5.45): - Aerial Image in 1917 in the old city core of Baghdad showing the selected urban sections, Source: British Archive, ref. WO 302/55, edited by the Author, See Fig. (53) in Appendix I in A3 size.

## 5.5 The Selection of Urban Sections

The Urban sections were selected in three zones in the area restricted between AL-Sinak Bridge and Bab AL-Mudham Bridge within the old border of the city of Baghdad as shown in Fig. (5.46). Nine sections were lined through different parts showing the reaction of the historical urban structure within each intervention in different historical periods.



Fig. (5.46): - The Selected Action zones, Source: Google Pro modified by the Author, (accessed 12 Jan. 2018), See Fig. (54) in Appendix I in A3 size.

### 5.5.1 Zone -A- Transects through the area restricted between AL-Sinak Bridge and AL-Ahrar Bridge

This area is extended from the riverfront area as shown in Fig. (5.47) up to Sheik Omar street and restricted between the two streets that both headed to the AL-Ahrar bridge from one side and AL-Sinak bridge from the other side as shown in Fig. (5.48 a,b,c,d,e,f). The selected zone is relatively considered the southern fringe of the historical built up area that started to be developed in the late of Ottoman period especially along and adjacent to the river by having some public buildings and private houses that belong to the wealthy people. The zone has

many religious monuments including both the most significant AL-Gailani AL-Khulani shrines and mosques. Both of them attract people to live around hence composing residential neighborhoods as part of the residential communities in the city. A good number of Muslim believers access the religious places for visitation and showing homage to religious dignitaries. This zone has experienced a severe modernization process and was selected to be replaced by totally modern structure as part of the proposed new civic centre for the whole modern city of Baghdad since the fifties of the last century. Large areas were destroyed and substituted by a large mass of new urban structure represented by multi storey public buildings extended along wide streets. The historical monuments have also experienced significant modifications, especially the main two shrines. They were enlarged and connected directly to the main arteries by destroying many neighborhoods around. This zone is considered as transitional one between the old and new fabric which was extended after the British mandate with totally modern structure more to the south out of the traces of the old wall. Three vertical sections were taken through this part to compare the development of the urban landscape within previous eras and to illustrate the impacts of the modernization. The first one passes through both AL-Gailani and AL-Khulani shrines. The second one passes through the modern civic centre and through the neighborhoods around. The third one passes through the partly destroyed old residential area and the highly transformed mixed land use area up to Said Sultan Ali Shrine.



Fig. (5.47): - The river frontage area in Action area A, Source: Photographed by Ziad Mati.

### 5.5.1.1 The Impacts on the Street Hierarchy and Urban Space Structure

#### 5.5.1.1.1 Section A1-A1

The accumulative impacts of the modern urban streets in the old fabric is quite significant as it produces a variation of different urban patterns that resulted from the inserted types of urban spaces and buildings. This was shown through the comparison between the selected urban sections in 2009 to the situation in the sections that belong to 1962 and 1917 cited in the same position as shown in Fig.(5.49). The relationship among urban elements and their reaction after each intervention will be investigated and analyzed in the mentioned time intervals. The first section in 1917 shows the stability in hierarchy passing several neighbourhood streets that were successive in width size up to the main pedestrian public arteries that linked AL-Gailani shrine to adjacent neighbourhoods. The section shows that main vertical pedestrian walkways toward the river have kept their position as main conveyors in spite of paving the new AL-Rasheed street. The section of 1917 shows the tendency to have more wider streets in the new developed areas following the border of the arable land that existed in the past especially in the area adjacent to AL-Rasheed street to conform the new urban space type and its aligned buildings. In 1962 the situation altered totally and the section started from the peripheral Shaik Omar street where light industry buildings and retail shops were constructed along its both sides with maximum 1-2 storey buildings. The transect has then passed through a residential area with geometrical gridiron pattern above AL-Gailani shrine and attached to the old compact quarters. The area consists of three blocks and each one has rectangular shape divided in two rows with back to back houses of maximum 1-2 floors. The maximum street width in this part is about 7 m which is estimated doubled of the width of the traditional compact pattern. Keeping the human scale and the linkage within the old pedestrian streets have explained the reason behind the successful integration between the old compact and geometrical patterns around the shrine.



Fig.(5.48a)



Fig. (5.48b)



Fig. (5.48c)



Fig. (5.48d)



Fig. (5.48e)

Fig. (5.48a): - Aerial Photos for Zone (A) From al-Khulapha Street up to the river, Source: Photographed by the Mayoralty of Baghdad.

Fig. 5.48b): - Aerial Photos for Zone (A) belong to the Governmental assembly along AL-Khulapha street, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.48c): - Aerial Photos for Zone (A) Sinak Area from AL-Rasheed street up to the river, Source: Photographed by the Mayoralty of Baghdad.

Fig. (5.48d): - Satellite Image for Zone A, Source: Apple MAP, (accessed 12 Jan. 2018).

Fig. (5.48e): - Aerial Photos for Zone (A) Bab AL-Shaik area up to AL-Gailani shrine, Source Photographed by Architect Muhanad Hussein.

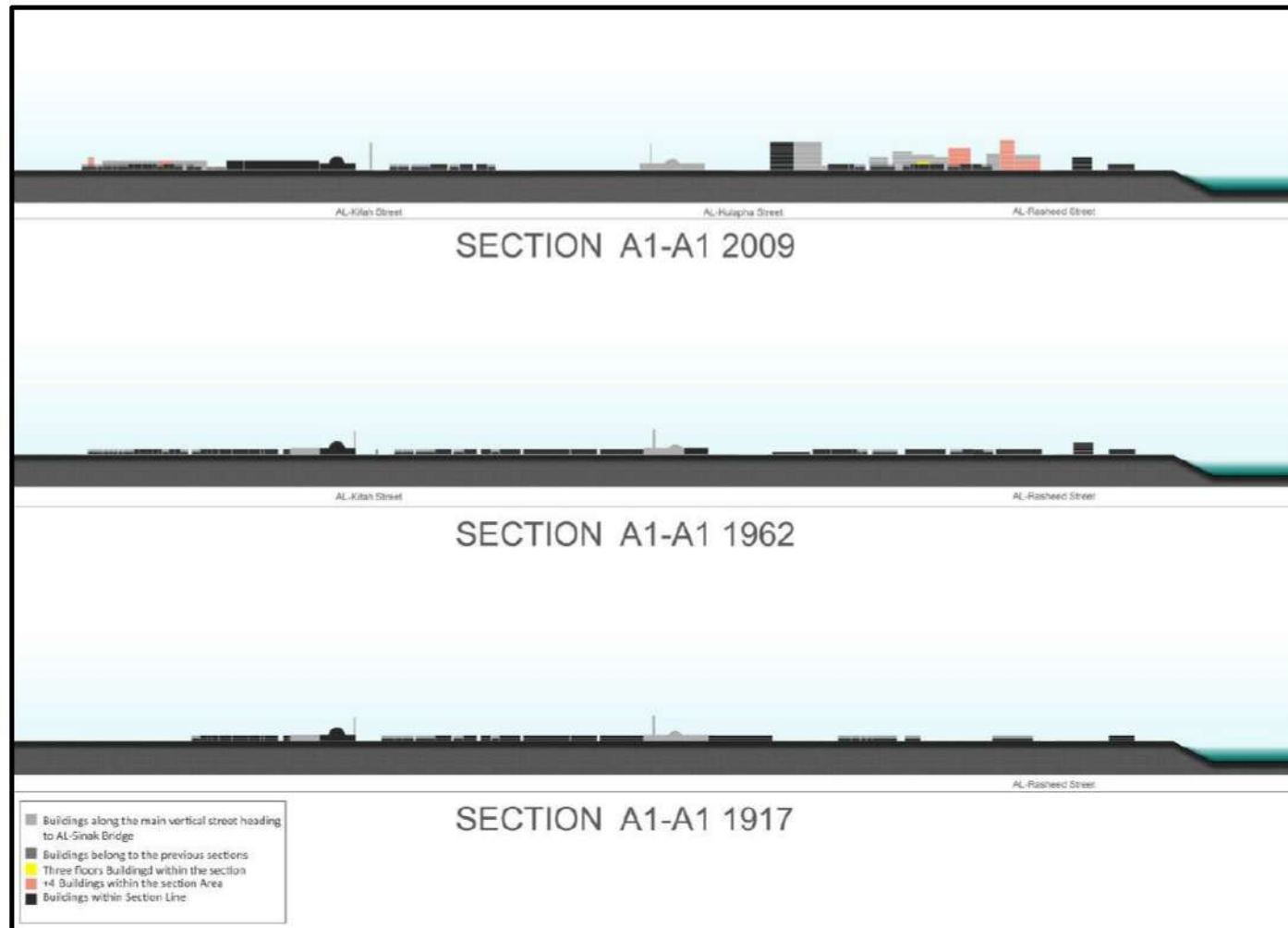


Fig. (5.49): - The transformation in urban structure shown by -Section A1-A1- (in Zone A ) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (55) in Appendix I in A3 size.

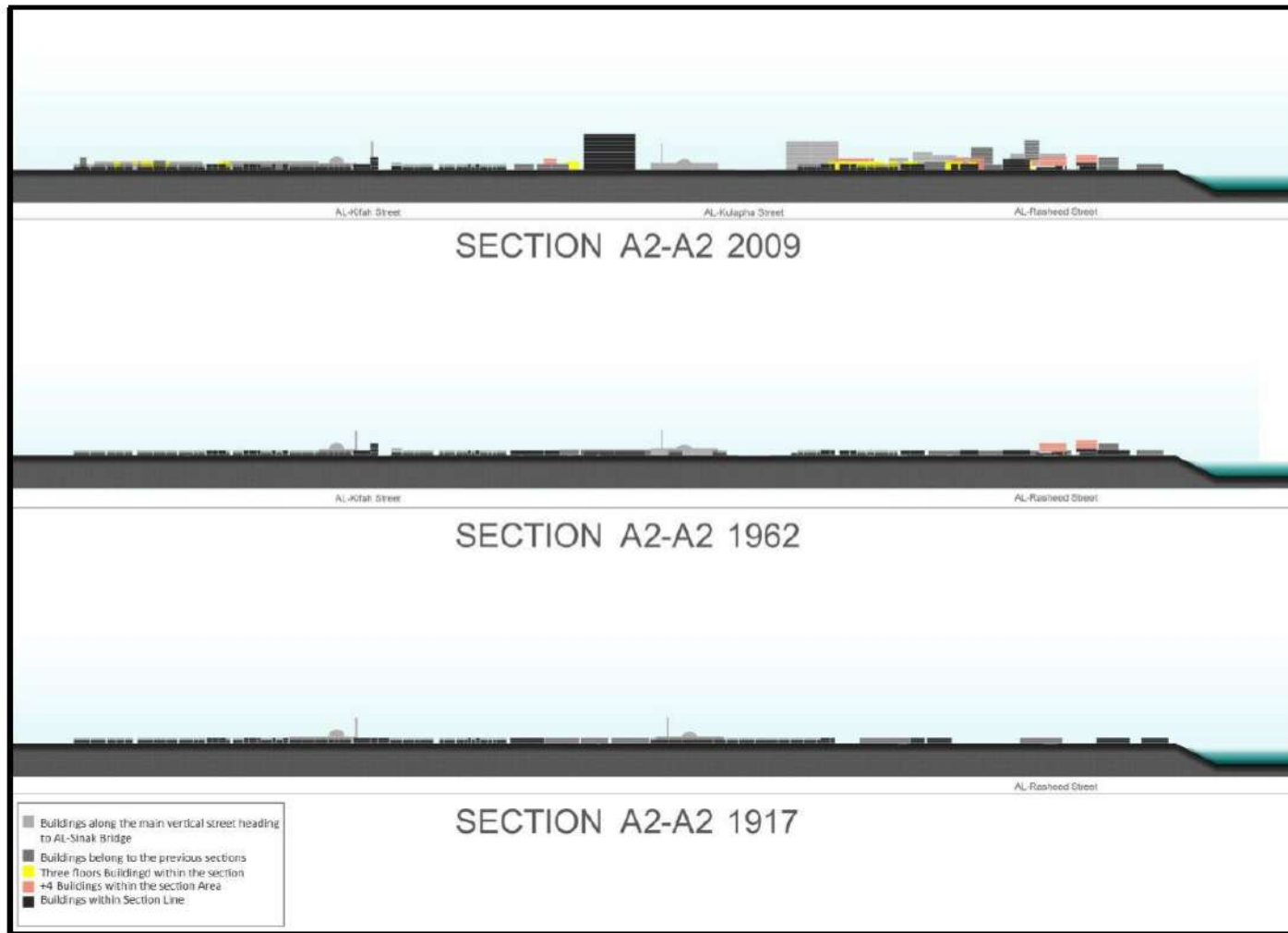


Fig. (5.50): - The transformation in urban structure shown by -Section A2-A2- (in Zone A) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (56) in Appendix I in A3 size.

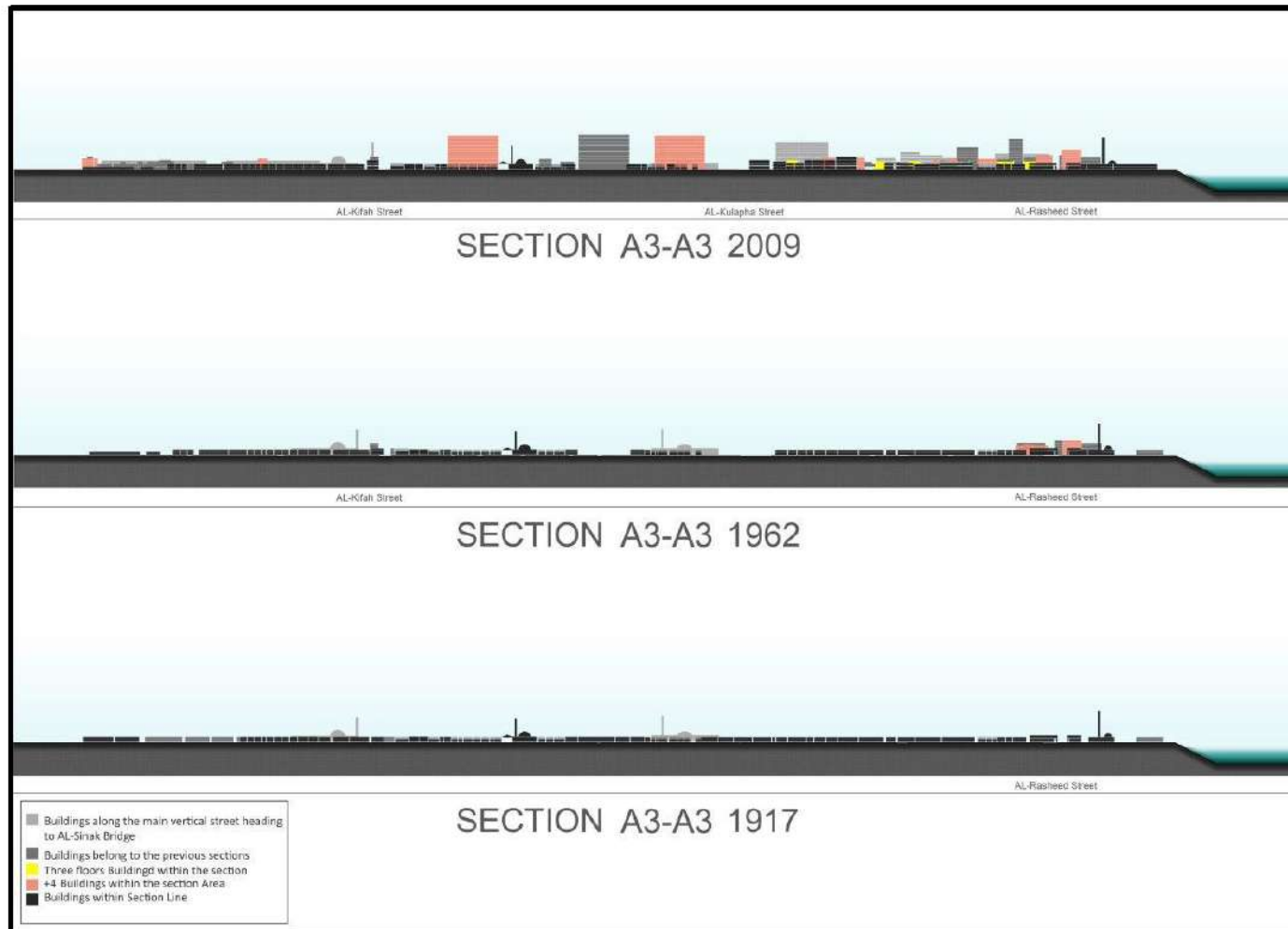


Fig. (5.51): - The transformation in urban structure shown by- Section A2-A2 -(in Zone A) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (57) in Appendix I in A3 size.



The first section in 1962 showed a sever interruption in the pedestrian hierarchy as a result of adding new public car streets which were paved through the city adjacent to the main historical monuments and the developed area. The hierarchy of pedestrian walkways have totally changed after the linkage within the neighborhood car streets. AL-Kifah street has contributed much to the change of the travel direction and behavior of the local pedestrians and visitors from using the traditional artery as main transporter to reach AL-Gailani shrine. Although AL-Kifah street was constructed through the residential neighborhoods and substituted a large area in this section, the main interrupted traditional arteries could be visually reconnected together due to the human scale of the building along the streets and their small plots that were not completely isolated from the residential area behind. The new AL-Kifah car street has substituted the existed old collector street along the shrine wall and was the first barrier that interrupted the vertical pedestrian movement towards AL-Gailani shrine and intersected the vertical neighborhood street towards AL-Khulani mosque. AL-Khulani shrine was considered the threshold and the joint between the residential area and the arable land in the fringe of the built-up area as seen in 1917. The new roundabout was carefully selected to be placed near AL-Khulani mosque for that reason, having a start-point for the new AL-Khulapha street that was constructed to substitute a large portion of land. The connection between AL-Khulani roundabout and AL-Rasheed street has contributed much to developing the area up to the river. The first vertical sections in the area between AL-Khulapha street and AL-Rasheed street showed a sudden change in street structure from the traditional arteries with an average of 3 m to bigger width that could amount to 7 m up to AL-Rasheed street.

However, the section in 2009 shows massive destruction in the traditional area which was converted later to large scale projects most of which were not achieved completely. The main old vertical traditional conveyer was widened and modified to be converted to straight car street instead of its original function as a main pedestrian street connecting AL-Gailani shrine to the river. The sections have passed through AL-Khulapha street where multi storey buildings face AL-Khulani mosque and shrine and were detached from the neighborhood behind by a buffer street used by cars as secondary street and parking. The area that was transected by the first and second sections is considered more semipublic and includes a mix of private and public buildings with relatively bigger plot size especially along the semipublic car street that connects AL-Rasheed street to AL-Khulapha street. AL-Gailani shrine with a series of multi storey buildings was overshadowing the skyline in the background of the section along the vertical street that headed to AL-Sinak bridge with a variant height of buildings. The section shows the free-standing buildings that were lined along the main AL-Khulapha street and their secondary vertical branches as new types in having individual multi storey buildings

surrounded by urban space. It crosses AL-Rasheed street up to the river frontage area where the old British residency kept its position with new extensions attached to the original one that is occupied by the Higher Institute of Music. The river frontage area is inaccessible except for some narrow corridors that were not used by the public.

#### **5.5.1.1.2 Section A2-A2**

The second section showed the next step of development in this area in different periods as shown in Fig.(5.50). The section in 1917 showed a bulky area of residential neighborhoods that were mediated by vacant land accompanied by some public buildings as shown in the archival aerial photo which was removed in the next periods to be substituted by the large civic centre in the 60s of the last century. The residential neighborhoods have maintained the one or two-storey houses which penetrate some orchards up to AL-Rasheed street where some public buildings and private big houses for notable people occupied the most imperative lands reaching the British Embassy along the river frontage area. The section in 1962 witnessed a mixture of new residential neighborhoods that follow the gridiron pattern within the traditional residential neighborhoods. It shows the impacts of the destruction process in the area where the residential area was split by AL-Kifah street. The new AL-Khulapha street has accelerated the transformation process along the street on both sides up to AL-Rasheed street and the river where some public buildings have substituted a part of the residential area. In 2009 the modern urban structure occupied the majority of the area that was cut through the section. The governmental assembly has substituted the vacant land that previously existed with some residential quarters and separated from the adjacent neighborhoods by a fence aligned with semipublic street that matches more or less in their width the main streets of AL-Kifah street (12m) and AL-Rasheed street (10m). These streets are considered artificial barriers or can also be called “connectors”, and they work as a buffer zone to isolate the remaining historical fabric from the new implanted structure. This could be shown in the streets around both AL-Gailani shrine and the governmental assembly and also was founded behind the frontage buildings of AL-Khulapha street. They act as semipublic space to create an acceptable entrance to move gradually inside the traditional fabric of the residential or mixed land use from one side and to reach the main streets and their aligned public buildings from the other side. Their width is based on the function, size and shape of the implanted projects and their building types that substituted the destructed neighborhoods. The large governmental assembly continued with about 130 m length up to AL-Khulapha street. The second section passes then through an empty plot which was specified to be built by high rise building along AL-Khulapha street behind the mixed land use area that became more public up to AL-Rasheed street. That caused an interruption in hierarchy between public and private

areas where the frontage building behind the buffer street faces directly AL-Khulapha street and was adapted to be more public. The section shows a variety of building types up to AL-Rasheed street where ground floor retail shops oppose a 3-storey building showing the interruption in height along AL-Rasheed street in this action area.

#### 5.5.1.1.3 Section A3-A3

The third section shows the further next step of development in this area as shown in Fig.(5.51). The third section as shown in the archival aerial photo belongs to 1917 is lined through a wide area of compact residential quarters mediated by Saraj AL-Din mosque and then aligned parallel to the old Ottoman industrial fabrics where some houses and leftover spaces spread along up to AL-Rasheed street and ends with Said Sultan Ali mosque. In 1962 the section started from Sheik Omar street that was used for light industry where two storey-buildings have occupied large plots along its lane. Those plots are segregated from the traditional area by semipublic car street serving both parts. The residential area shows an integration between new residential blocks and the old traditional structure in the area between the buffer street behind the industrial along Sheik Omar street and AL-Kifah street . The section passes through Saraj AL-Din mosque that is located along the main horizontal market artery up to AL-Khulapha street. The section shows the mixed land use area along the vertical pedestrian connector which links AL-Khulapha street to AL-Rahseed street and includes light industry buildings, commercial buildings and some scattered houses ending with Said Sultan Ali mosque that extended from AL-Rasheed street up to the river. In 2009 more destruction occurred in the tradition compact urban structure . The residential compact area is interrupted by AL-Kifah street to end with Saraj Al-Din mosque which is adjacent to the governmental assembly where it kept its coherence structure in spite of the wide destruction around. Both the second and the third vertical sections showed a hierarchy in width starting from AL-Kifah street to grade in size up to the main traditional artery that penetrates the neighborhoods with relatively bigger width that reaches up to 7 m in some parts especially in front of Saraj AL-Din tomb. The third section shows the interruption in the traditional neighborhoods by 60 m vacant long area which separates them into two parts. This area was demolished gradually especially in the frontage area that faces the governmental assembly. The demolished area was transformed into parking to serve the increasing demand for car parking lots for the users of the existing public institutions and market in the neighboring area. The frontage houses around the demolished part forms U shape and their types have changed to have two storeys with small horizontal opened windows to counterpart the traditional closed one. These houses were not transferred into commercial buildings like the behavior of most frontage houses in the demolished area. That may be attributed to the relatively far distance

from the main Shorja market artery and to the existence of governmental buildings that do not attract commercial facilities in the residential area. The demolished space works as a semipublic space linked between the new structures that is represented by the governmental assembly and the traditional existed one. The third section passes through a group of mix land use frontage buildings along semipublic car street that has replaced the old pedestrian one by having relatively bigger plot size along its lane with a mixture of traditional and modern buildings ending up to AL-Rasheed street. The section crosses AL-Rasheed street with 1-3 storey buildings and with relatively bigger plots that are visually connected to the old mosque of Said Sultan Ali on the other side which occupies the entire river frontage area. The frontage buildings of AL-Rasheed street are also separated by semipublic buffer street and are not attached directly to the plots behind, like in the other segments, due to the existense of some light industry buildings. As shown in the second and third sections, the residential area is bordered by AL-Khulapha street, AL-Rasheed street and the two semipublic streets that connect them vertically, and is surrounded by a mixed land use area from all sides creating a buffer zone for them

#### **5.5.1.1.4 Conclusion**

In this zone there is a kind of specifications for each car street according to its impacts on the surrounded area. AL-Kifah street serves the religious big monument AL-Gailani shrine inside the city and has fewer negative impacts on the surrounded urban fabric around. The aligned buildings followed the prevailed human scale in this area and were not separated from the area behind having small plots with colonnaded sidewalks. The visual connectivity of the interrupted traditional arteries on both street sides kept the integration within the neighborhoods as main pure living area in the old core. AL-Khulapha street have higher traffic priority due to its direct connection with the fringe area and serves the large civic centre on both sides. It has severe negative impacts on the traditional fabric through large destruction that was done for the adjacent area, accelerating the change in building types and motivate the land use to be more commercial. Its impacts are shown obviously on the next AL-Rasheed street by extending the high rise building vertically toward the river and also its impacts on the residential area some of which was converted to storage and small factories to serve the main market area in the following parts of the city. Finally, AL-Rasheed street is considered a complementary part of the commercial and administrative area that was extended from AL-Khulapha street up to the river and has a variation of traditional and modern buildings with different types. The situation shows a significant change in skyline where the buildings along AL-Khulapha street divide the skyline into three parts. The first is the residential area that expands along both sides of AL-Kifah street up to the governmental assembly that opposes

multi storey buildings across AL-Khulpha street to create a zone where the vertical movement for pedestrian is hindered by a protected and fenced zone along the main car street. The area then is lined up with a variation in height up to AL-Rasheed street. This reflects the modernization impacts in accelerating the transformation process inside the internal urban structure between the main streets; this is done by having more multi storey buildings with mixed and commercial land use area in between.

### **5.5.1.2 The Impacts on the Land Use**

#### **5.5.1.2.1 Section A1-A1**

The first section in 1917 shows the dominance of AL-Gailni shrine as a main urban element and religious centre that is surrounded by large residential communities with maximum one or two floors. The area from AL-Khulani mosque up to the river are more or less orchards and under development especially along the river where the new building of the British Embassy is located there and along AL-Rasheed street from the other side. In 1962 the section showed a significant change where AL-Kifah street separates the shrine and the adjacent neighbourhoods from their complementary part providing a new market artery associated within the traditional pedestrian market where both enhanced the mixed land use in this zone. The area keeps the residential use between AL-Kifah street and AL-Khulani shrine as shown in the section. AL-Khulani mosque signifies the end of the residential area where new AL-Khulapha street was constructed along. The new boulevard interrupted the old vertical pedestrian artery that connects AL-Rasheed street to AL-Gailani shrine. The Part of this artery between AL-Khulapha street and AL-Rasheed street was widened and straightened later to be converted to secondary car street that contributed to develop a mixed land use area along used for light industries and commercial facilities within the existed old residential neighbourhoods. The situation in 2009 looks more different in the first section where the size of the residential area has diminished and the local artery that conveys people to move between the two religious monuments was removed through the destruction process that occurred in the period from 1962-2009. The section shows a separation between residential and religious monuments where both main mosques and shrines face each other within a gap of vacant destroyed land. They then move to the mixed area land use which prevails the administration functions between AL-Khulapha street and the river where many governmental buildings were placed within the commercial land uses, This comparison among the different periods could be seen obviously in Fig.(5.49).

### 5.5.1.2.2 Section A2-A2

The second and third sections in 1917 show the dominance of the residential land use up to AL-Rasheed street. The second section partly passes through a developed area in the middle; this has interrupted the continuity of residential neighborhoods behind the main horizontal market artery that is heading towards AL-Gailani shrine. This area as shown in the aerial image has been occupied by some houses and also some industrial buildings. This, in fact, is an extension part to the industrial area that is placed along AL-Rasheed street and it dates back to the Ottoman era. Again, it moves across AL-Rasheed street up to the river where mixed land use has started to grow along the street Fig.(6.8.A). The situation has changed after the construction of the two car streets in 1962. AL-Kifah street has split the residential area and enhanced the mixed land use along the constructed artery like in the first section. The section continues with residential land use between AL-Kifah street and the external fence of the governmental assembly passing through the end of AL-Sadriya horizontal and commercial old artery. The industrial area was removed during the construction of AL-Khulapha street as part of the destruction process to insert new streets and new building types to establish a new governmental and commercial centre. The mixed land use was enhanced like in the last section in the area that is restricted between AL-Khulapha street up to AL-Rasheed street where both became later the main commercial artery in the city, Fig.(6.8.B). In 2009 there was a clear distinction between the residential area, mix land use and the public area that included the commercial and administrative land use. The civic centre together within the buildings along AL-Khulapha street are considered the main public zone that is located in the middle of this zone and split between both the residential neighborhoods and the associated mixed land use along both AL-Kifah street and Sadriya commercial artery in the upper part of the zone and the mixed land use part in the next lower part between AL-Khulapha street and AL-Rasheed street up to the river. This comparison of the section development in different periods could be seen obviously in Fig.(5.50).

### 6.2.1.2.3 Section A3-A3

The third section in 1917 passed through a large area of residential compact urban fabric up to the mixed land use area. This area was adjacent to the old industrial Ottoman zone along the main public artery of AL-Rasheed street. The area comprises many diplomatic consulates and residencies of the notable people, Fig.(6.9.A). In 1962 the residential compact area was interrupted by AL-Kifah street which composes a mixed land use area along car street associated within the existed Commercial Sadriya artery along Saraj AL-Din mosque. The section has a bulky residential compact structure that ends up to AL-Khulapha new added

street. Here the mixed land use was developed on the other side along a sub connector which links AL-Khulapha street to AL-Rasheed street and replaced the old pedestrian one and ends in the Said Sultan Ali mosque across the main commercial AL-Rasheed street Fig.(6.9.B). In 2009 the third section passes the residential area like in the situation in 1962 up to the AL-Kifah street and then continues with the residential area that was interrupted several times by the nonstop destruction process. This has created a gap between the old compact residential blocks. The traditional houses were split by a large space of destructed area that became more public and used as parking lot for the governmental assembly. The section passes through AL-Khulapha street and then to the extremely mixed land use part that is used for commercial, light industry and services up to the main historical Said Sultan Ali mosque; the mosque has indeed closed the river frontage area as part of the public space of AL-Rasheed street. This comparison of the section development in different periods could be seen obviously in Fig.(5.51).

#### **5.5.1.2.4 Conclusion**

The coherence in residential structure was based on the connection between the two religious monuments AL-Gailani and AL-Khulani shrines. The integration between both residential and religious land uses significantly stood on the vitality of the horizontal traditional market as a main public artery and backbone that bound the urban structure around. The historical market artery has connected both Saraj AL-Din mosque and AL-Gailani large shrine within the surrounded highly dense residential neighborhoods to the main Shorja market and then to the public area along the river. The sections also show that the remain traditional fabric could be recovered and it keeps its characteristic and original land use even if large scale projects are enforced inside. The remained residential neighborhoods around the implanted public spaces and the removed area have adapted their coherence by keeping their connectivity to the market and religious monuments and have protected their existence by using the destructed area as buffer zone in spite of the continuous urban transformation. AL-Kifah street has left less impacts than the other streets as a result of several factors connected to its integration within the AL-Gailani shrine area as a main integrated element. The frontage buildings along the street attached to the neighborhoods behind without having independent blocks like in AL-Khulapha street. The parcels varied in size as most of them are considered a leftover space that was shaped as a result of the destruction process to line the street. The commercial function of AL-Kifah street was integrated within the existed traditional market arteries. The extension of commercial and administrative land use along AL-Khulapha street has motivated more connectivity to AL-Rasheed street that caused severe damages on the adjacent area and accelerated the transformation process. The commercial land use has

prevailed in the area between AL-Khulapha street up to the river and has threatened the rest of the residential areas which area restricted in the middle of this part and are exposed to the surrounded mix land use blocks along the public and semipublic streets.

### 5.5.1.3 The Impacts on Proportion

#### 5.5.1.3.1 Section A1-A1

In the first section in 1917, AL-Gailani shrine dominated the urban scene as the biggest monument in the area where the residential neighborhood agglomerated around up to AL-Khulani mosque which comes in second priority as a main religious centre. The section showed the British residency as the third important public free standing two-storey building along AL-Rasheed street up to the river. In 1962 AL-Gailani shrine kept its dominance and higher proportion on the urban scene followed by AL-Khulani mosque while the area from AL-Khulani shrine up to the British residency became denser and occupied by maximum two storey buildings up to four storeys along AL-Rasheed street with relatively larger plots than the British residency along the river. AL-Kifah street has followed the scale and proportion of the residential area on the side that faced AL-Gilani shrine. The destruction process to line AL-Khulapha street has revealed AL-Khulani shrine as focal point that mediates both AL-Gailani shrine and AL-Rasheed street. The river frontage area along AL-Rasheed street is lined with multi storey buildings as shown in the section that ends the dominance of AL-Gailani shrine on the skyline of the zone and manifested further development along the new constructed streets; this is obvious in the city skyline in 2009. The first transect shows the majority of two-storey buildings from Sheik Omar street up to AL-Kifah street. This transect is rather dominated by the new extension of the original AL-Gailani shrine and the new addition in the background. Large scale buildings that were planted inside the urban fabric have motivated the propensity to enlarge the existed historical monuments. The position of the shrine was rather moved from main focal point where traditional arteries meet within its gate to an outward looking plan type that stands along the main streets with ornamented external facades. The shrine area has increased five times from 7,800 sq.m in the old fabric structure to 39,5 sq. m up to now. On the other hand, AL-Kifah street has a moderate scale with not too large sidewalks that reach about 3 m. The residential buildings adjacent to Shaik Omar street started to show an increase in height and type as illustrated in the section to match the increased demand to have more retail shops used for light industries on the ground level and more multi storeys on the upper levels to satisfy the housing purposes. The area between AL-Khulapha street and AL-Rasheed street has become dominant in height instead of AL-



Gailani shrine where many high-rise buildings were lined along both main streets and along the vertical streets that headed to AL-Sinak bridge as shown in the buildings located in the background of the section. Many two-storey buildings started to have multiple floors inside the mixed land use blocks between AL-Khulapha street and AL-Rasheed street where rapid transformation in building types occurred after 2003 when deficiencies in applying urban management rules have accompanied the increasing demand for commercial facilities in the area. This comparison of the section development in different periods could be seen obviously in Fig.(5.49).

#### **5.5.1.3.2 Section A2-A2**

The second section in 1917 showed a bulky large area of compact residential neighborhoods mediated by a vacant land and ended with scattered buildings with big size plots along AL-Rasheed street. Both AL-Gailani shrine and AL-Khulani shrine in the section background dominated the urban scene. In 1962 the size of the destructed area increased and covered a wide part up to the new AL-Khulapha street. AL-Kifah street experienced new building types up to four storey that overwhelmed the height of AL-Gailani shrine. AL-Rasheed street attracted more new building types that in many times occupied a relatively big plots with new building types which in many cases have two storeys or more. In 2009 the proportion was altered where AL-Gailani shrine lost its priority as a higher monument in this zone although it occupied large plots in the city where the length was extended up to 310 m while the new inserted governmental assembly was extended to about 174m and occupies around 56.5 000 sqm. In other words, the shrine was doubled its length to compensate the big difference in the plot size and proportion between the two areas. The three free standing buildings where the section passed through one of them are the highest point of more than 40 m and overlook a big internal garden of about 130 m up to the main external fence along the street. The section passes about 40 m distance of AL-Khulapha street and the sidewalks that ranging from 5-7 m in different street courses. On the other side, across the AL-Khulapha street, the section passes an empty plot of 15 m width that was specified to be occupied by multi storey buildings to create a balance within the other side of the street but this was not achieved and the plot was bordered by a long fence to isolate it from the street. There is a variation in building height on both sides that affected the spatial connection. The visual communication between the two parts is very hard because of the large distance between the fence from one side and the opposed free-standing buildings from the other side. The buildings located behind the empty plots along AL-Khulapha street were exposed directly to the street and got adapted to have more public use with multi storey type. This is what could be called the self-protective method noticed in all traditional areas that were surrounded by modern types of public spaces or main

streets. In the area between AL-Khulapha street and AL-Rasheed street, the section passes through a variation of different building types attached to the old residential area and their heights have ranged from 1-4 storeys for the mixed land use area. AL-Rasheed street in this bay is a mixture of traditional two-storey buildings and modern multi storey ones. In AL-Rasheed street, the section shows a group of multi storey buildings that form a physical barrier to prevent any access to the historical buildings along the river frontage area. This comparison of the section development in different period could be seen obviously in Fig.(5.50).

### 5.5.1.3.3 Section A3-A3

In 1917 the residential area occupied large space mediated by Saraj AL-Din mosque up to the large assembly which seems to be an industrial zone which is part of the old Ottoman industrial zone along AL-Rasheed street. AL-Gailani shrine in the background seems to dominate the sky line of this area with higher proportion in height and size Fig.(6.9.A). The section in 1962 passed through two-storey residential area up to AL-Kifah street. The human scale of AL-Kifah street provides a comfortable spatial connectivity between the buildings on both sides within acceptable width of about 12 m. The transect continues to pass through the residential neighborhoods and the main traditional Sadriya market showing the human scale of the compact urban structure with more or less maximum two-storeys that resists of the huge destruction in many parts around. The area along the industrial zone has kept the same proportion in height but with having relatively big plots as public buildings up to AL-Rasheed street where new multi storey buildings in the section background have dominated the urban scene along the river Fig.(6.9.B). In 2009 the destruction produced a kind of disorder in the scale inside the residential area by creating a large space inside the residential neighborhood. The distance between the opposite residential units is estimated to about 60 m which affects the type to have small windows with less openness toward the space. The spatial connectivity is disorganized and has affected the coherence of the fabric. The residential area was bordered by a fence from the side of AL-Khulapha street to keep as much privacy as possible. The transect goes through a wide street but with two-storey buildings on both sides with different functions. The section continues to have disparities in height along the semipublic car street that has substituted the old pedestrian one and has been linked to AL-Rasheed street having a mix land use area with residential and commercial functions. The section showed the increase of size in Said Sultan Ali mosque along AL-Rasheed street in order to keep the balance within the framework of large development and the higher proportion along AL-Rasheed street. This comparison of the section development in different period could be seen obviously in Fig.(5.51).

#### **5.5.1.3.4 Conclusion**

The three sections show the impacts of the new street width and hierarchy that effected the rapidity of the transformation process. The residential area adjacent to AL-Khulapha street on both sides experienced higher change in buildings type and especially the increasing number of floors compared to the area adjacent to AL-Kifah street where the residential area has reacted to be more conservative and keep its coherence around the main big religious monuments, in an attempt to respect the shrine as main holy place in the city. AL-Rasheed street matches the proportion of AL-Khulapha street as part of the main governmental assembly in this area. The continuous destruction has urged to have multi storey buildings that have dominated the urban scene instead of the traditional monuments that are enlarged to keep its importance as main historical centres. The three sections also show a disparity in the proportion regarding the physical structure on both sides of AL-Khulapha street. The area from AL-Khulapha street up to Shaik Omar street has dominated the urban scene by having a high proportion in some parts of the built-up area which extends in a vertical way through the governmental assembly and in a horizontal way through AL-Gailani shrine. The area from AL-Khulapha street up to the riverside maintain some multi storey buildings along AL-Rasheed street and in the background along the vertical main street that moves up to the river as a complementary part of the civic centre complex hence to match the building types that were extended along AL-Khulapha street.

#### **5.5.1.4 The Impacts on the Historical Monuments**

##### **5.5.1.4.1 Section A1-A1**

The first section in 1917 showed the coherence of the residential urban fabric within AL-Gailani shrine passing through the main vertical artery that connects the shrine to AL-Khulani shrine up to the riverfront area. AL-Khulani shrine was highly integrated to AL-Gailani shrine through another local street that connects both of them where relatively big houses have aligned along its lane. In 1962 the new streets significantly affected the role of the historical monuments in the city. The main big monument of AL-Gailani shrine faces the street and becomes accessible through the car street as a main alternative rather than the old pedestrian one. The coherence between AL-Gailani shrine and AL-Khulani mosque through the residential area has continued inspite of the destruction that occurred in the adjacent area near the AL-Kifah street as shown in the first section. A clear separation in movement was done by the construction of AL-Khulapha street between both AL-Gailani shrine and the riverfront area where many old historical monuments are cited there. In 2009 the size of AL-Gailani shrine doubled and extended to be aligned along the residential area as shown in the background behind the

residential area in the section where it has occupied the whole area between AL-Kifah street and Shaik Omar street along the main vertical street that heads towards AL-Sinak bridge. The free standing buildings of the governmental assembly stop the dominance of the shrine on the city skyline that has prevailed since decades and blocked the pedestrian movement where the shrine becomes mainly accessible through the main car streets. The destruction in the area between AL-Gailani and AL-Khulani mosques has increased the physical and visual separation between the two monuments as people tend to use the main car streets around instead of the direct pedestrian connection. The implanted projects have motivated more destruction as in the area behind AL-Khulani mosque which is estimated to be about three and half times from AL-Khulani mosque area. The destruction combined within the rapid transformation process along AL-Rasheed street have affected the accessibility to the available monuments on the river frontage area. This comparison of the section development in different periods could be seen obviously in Fig.(5.49).

#### **5.5.1.4.2 Section A2-A2**

In the archival aerial photo of 1917, the religious shrines dominated the urban scene in this area with a priority of AL-Gailani shrine to be the main destination for many pedestrian arteries. AL-Gailani mosque has still been dominating the urban skyline of this zone in 1962 as a main focal point although the accessibility was hindered by the destruction that was done to pave the new streets. AL-Rasheed street started to attract new types of modern buildings that exceed two floors and participated to overcome many historical monuments that were cited along the river affecting their accessibility and connectivity to the other part of the city. In 2009 the proportion varied along the section due to the rapid transformation process. The size of AL-Gailani shrine was increased until it covers the whole section background between Sheik Omar street and AL-Kifah street to create a physical balance with the implanted modern urban structure. The civic centre has affected the type of the historic monuments by converting the space idea to have both inward looking with large internal space and also outward looking by developing the space and the external façade that faces the main streets. The second section between AL-Khulapha street and AL-Kifah street shows how the location of the governmental multi storey buildings along AL-Khulapha street isolates physically and visually both AL-Gailani shrine and AL-Khulani mosque from the other city parts and substituted their domination on the city skyline. The main car streets become the preferable ways to reach them instead of the old main traditional arteries. The British residency and other historical monuments along the river hid behind the multi storey buildings that spread along the section and were attached also to buildings with variant height from both sides along AL-Rasheed street thus affecting its physical and visual connectivity within the entire urban fabric. This

comparison of the section development in different periods could be seen obviously in Fig.(5.50).

#### **5.5.1.4.3 Section A3-A3**

In 1917 the section lined through a large area of residential neighborhood crossing the main Sadriya commercial artery and the main Saraj AL-Din shrine that is located along its path. The section stands parallel to the industrial zone that is located along AL-Rasheed street and attached directly to the residential neighborhoods from the other three sides. The industrial zone has competed AL-Gailani shrine in the size of area that it occupies and in the height within the skyline of the city as a new public function is inserted into the city at the late Ottoman period. The section passes through the partly developed area between the industrial zone and the residential area up to Said Sultan Ali mosque along AL-Rasheed street that is considered the main focal point in this area that is connected to Saraj AL-Din Shrine. In 1962, the destruction in the historical fabric and the new streets affected the connectivity among the main historical monuments. The section lines through a large industrial area along Shaik Omar street attached to the old residential neighborhoods that is interrupted by AL-Kifah street where three-storey buildings were lined along its path. The section passes through the old neighborhood adjacent to the destructed neighborhoods that were extended from the periphery of Saraj AL-Din up to AL-Khulapha street. The destruction motivated to remove more parts around the main monuments as shown in the next period exposing Saraj AL-Din monument to be an independent element separated from the surrounded neighborhoods. In 2009 the situation was more different within the continuous destruction in the historical fabric. The third section shows an easy and direct connection between Saraj AL-Din shrine and Said Sultan Ali mosque along the river through the highly transformed area following the new secondary car street that is aligned along the governmental assembly up to AL-Khulapha street and then following the main secondary car streets up to AL-Rasheed street. Saraj AL-Din and Said Sultan Ali mosques were enlarged to cope with the large structure that was spread along the whole area. The third section shows the separation among the historical monuments in a horizontal layer where three free standing multi storey buildings of the governmental assembly have occupied a large area in the background cited between AL-Gailani shrine and both Saraj AL-Din shrine and Said Sultan Ali mosques. This comparison of the section development in different periods could be seen obviously in Fig. (5.51).

#### 5.5.1.4.4 Conclusion

In 2009 the three sections show a dramatic change in the physical characteristics of the historical monuments especially in their form, proportion, and accessibility. The impacts of modernization could be classified according to their accessibility for both external visitors and residence nearby. The visitors have used the public implanted horizontal main streets (both AL-Kifah street and AL-Khulapha street) to reach AL-Gailani and AL-Khulani mosque or the main and secondary vertical streets that linked the horizontal streets together, especially the main vertical street that heads towards AL-Sinak bridge where both mosques aligned along its lane. It is also possible to move parallel to the governmental assembly where the old pedestrian street was widened to be a secondary car street extended from AL-Gailani shrine up to AL-Khulani mosque and then cross AL-Khulapha street to reach both AL-Rasheed street and the river where many historical monuments are cited there. Saraj AL-Din shrine is accessible through the Sadriya traditional market that was part of the traditional horizontal artery which connects Shorja market to AL-Gailani shrine. The entry to the market was mainly through the vertical main car street that heads towards AL-Ahrar bridge across both AL-Khulapha and AL-Rasheed street. Saraj AL-Din mosque is also accessible from AL-Khulapha street through the secondary road that separates the old remained neighborhoods from the governmental assembly. Said Sultan Ali mosque is only accessible through AL-Rasheed street and the secondary car street that connects AL-Rasheed street to AL-Khulapha street. That explains the priority for visitors to use the main car streets to reach the main historical monuments instead of the traditional fabric. The existence of the new streets has given a new hierarchy for the historical monuments and participated in cancelling the old pedestrian arteries and substituted them by new ones or changing the common traditional routes. Inhabitants who live far from the monuments follow car streets as a first priority to reach them instead of the main old pedestrian one where it is interrupted by the new car streets or widened and straightened to be used as secondary car streets instead of pedestrian one. The old pedestrian walkways (Sadriya market artery) that directs to AL-Gailani shrine across AL-Kifah street is used only by the local inhabitants who live around passing Saraj AL-Din tomb and the adjacent traditional market. Saraj Al-Din mosque and its location within the main horizontal traditional artery could be considered the central monument that has the potential to connect AL-Gailani shrine, AL-Khulani mosque and Said Sultan Ali mosque together. The row of buildings along AL-Khulapha street and AL-Rasheed street has formed an artificial obstacle for the movement through the traditional residential fabric to reach the main four monuments. The new urban structure represented by many multi storey buildings that were placed along the new urban space type have participated significantly to enlarge the area of the existed historical monuments like AL-Gailani shrine and Said Sultan Ali shrine by adding new facilities

and building extensions to the original one in order to create large and representative constructions with ornamented facades associated with their original inward looking plan.

### **5.5.1.5 The Impacts on the Building Types**

#### **5.5.1.5.1 Section A1-A1**

According to the archival aerial image in 1917, the section lined along a compact residential area within one or two storey inward looking houses. The new scattered buildings in the fringe area from AL-Khulani mosque up to the river were relatively bigger in size with a variation of having inward and outward looking plan that impresses them with the image of public buildings showing the tendency to extend the city to the south. The building types were altered and modified after the construction of the new streets as shown in 1962 plan. The gradual moving from traditional courtyard houses with inward looking plan to outward looking plan buildings especially after the construction of Al-Kifah street was seen obviously in the area around AL-Kifah street. The commercial buildings along the street were attached directly to the old residential area following the shape of the plots that survived the destruction process after straighten their front elevation. The buildings that faced AL-Gailani shrine have two or three storeys with shaded sidewalk by having a continuous colonnaded cantilever. The section in this area varied in land use distribution as shown in 2009 plan where the old residential and religious areas attached to the new multi storey commercial and public buildings that were initiated along the new streets which penetrated and bordered the majority of neighborhoods. Governmental multi storey buildings were lined along AL-Khulapha street opposed to AL-Khulani shrine as part of the proposed civic centre reflecting the tendency to create new centre with totally modern architecture. The new buildings between AL-Khulapha street and AL-Rasheed street follow the outward looking plan and occupy relatively big plots used for mixed land use area and light industries and services. AL-Rasheed street has varied in building types by having multi storey buildings that reflect the modern style of architecture associated within the classical Art Neavau and Art deco styles of the 20s and 30s of the last century. Some inward-looking buildings date back to the Ottoman era like the British residency and some fancy houses of notable people attached to the new modern buildings. This comparison of the section development in different periods could be seen obviously in Fig. (5.49).

### 5.5.1.5.2 Section A2-A2

In the aerial image of 1917, the section lined through a wide area of the compact courtyard houses that prevailed in the late Ottoman period. New houses types were inserted especially along the river and they follow a new approach in having outward looking within the internal courtyard. In 1962, rapid transformation occurred in the residential quarters after the destruction of a large area of the traditional fabric to be substituted by the new civic centre later in next period. The houses started to neglect the courtyard system after the destruction process as a whole environmental system became invalid because it lost the compactness among the residential neighborhoods. Most of the area located between AL-Khulapha and AL-Rasheed streets have developed after the Ottoman period except for some scattered houses that had existed before. The rapid development of the mixed land use around the residential area took place after 1920 and increased significantly after the construction of AL-Khulapha street where the area is still being exposed to a continuous transformation process till now. The initiated buildings were mostly used for light industry and retail shops with maximum two floors covering large plots. The plan in 2009 shows that the development along the main and secondary streets accelerate the transformation on the periphery of the residential area which became a main storages and commercial area rather than its original use for living. The inward-looking plan system gradually tend to be converted to an outward one by closing most of the internal courtyards. The traditional houses have changed the external material and the size of external openings after neglecting the courtyard. AL-Rasheed street has increased its tendency to accommodate the modern architecture with multi storey buildings that cover the whole plot area as shown in the section background where a variant building located behind the two storey building that was passed by the section. This section shows variant buildings height up to the river frontage area and across AL-Rasheed street in spite, having many parcels that were altered in size through merging several parcels to be bigger or splitting the bigger ones to be divided into small parts based on the ownership of those properties. The disparities in height creating a distortion in the proportion inside the neighborhoods especially in the area located between AL-Khulapha and AL-Rasheed streets and also along the sub car connectors that linked both of them. This comparison of the section development in different periods could be seen obviously in Fig. (5.50).

### 5.5.1.5.3 Section A3-A3

In 1917, the compact residential urban fabric kept its coherence in spite of having new types of industrial buildings which mediate and being attached to the neighborhoods which occupy large parcels. The type of houses kept the courtyard system while some public buildings along



both the river and AL-Rasheed street started to adapt the external outward looking on both sides as the river is so close to AL-Rasheed street in this zone. The situation in 1962 started to be different by having new housing types rowed along car streets and integrated into the old compact fabric in the area between Shaik Omar street and AL-Kifah street. AL-Kifah street started to be filled by modern building types of 1-3 storeys with a retail shop usually in the ground floor while AL-Rasheed street varied in building types as shown in the section where the intersected building has three storeys while the buildings behind were higher. In 2009, the 1-2 storey houses with traditional balconies gradually changed in size by dividing the plots in two or three parts for the big ones. Some of them got destroyed totally and substituted by new units using different materials with totally new design. Some traditional closed balconies were canceled in the new housing type and substituted by straight elevation with external windows or by having open balconies instead of the closed ones. Because of the lack of urban management many houses, especially near the new market centre, added more than two storeys which sometimes reach up to 5 in spite of their small plots in order to use them as small apartments or storages. Most of the buildings used cheaper material (steel structure and sandwich panel) to have additional floors. This phenomenon could be seen obviously in the current aerial view of the old city by having many white roofs. The free-standing buildings which have occupied a large area represented by the governmental assembly were buildings surrounded by large spaces. The attached multi storey buildings started to be erected along the main street as shown in the background of the section. This comparison of the section development in different periods could be seen obviously in Fig. (5.51).

#### **5.5.1.5.4 Conclusion**

According to the preliminary census of the Planning Ministry in 2009, the majority of the modified houses belonged to the period between 1920-1960 in the area around AL-Gailani shrine that is restricted between Shaik Omar street and AL-Kifah street. The area between AL-Kifah street and AL-Khulapha street has experienced several interventions through last decades which participate in modifying the building types continuously. Large scale multi storey buildings were constructed along the main streets affecting the privacy of the remained residential area behind. The residential area around AL-Gailani shrine up to AL-Khulapha street had slight change in height and type compared with the mix land use area between AL-Khulapha street and AL-Rasheed street that had the tendency to transform into commercial buildings matching the large scale development that was done along the main streets especially within the lack of urban management strategies. The main historical monuments were also enlarged in this area by increasing their proportion and scale along the main streets especially after introducing a new type of free-standing buildings. The houses after the

destruction process have experienced a rapid transformation in type from inward looking courtyard system to outward looking that have been exposed to the external streets. The houses that were adjacent to the commercial area started to accommodate the type of high-rise buildings matching the building types along the constructed main and secondary car streets with the absence of management and control system. The commercial buildings, on the other hand, started to compete each other in height especially along AL-Khulapha street and AL-Rasheed street. AL-Khulapha street was lined by successive blocks that detached it from the area behind to compose a cordon of multi storey buildings around the neighborhoods. The destruction has motivated to plant free standing buildings that were isolated from the adjacent area by fence creating like the gated building assembly used for governmental purposes.

### **5.5.2 Zone –B- Transects through Shorja Traditional Market and the Modern Economical Zone**

The area is extended from Sheik Omar street up to the river frontage area passing through the main traditional market (Shorja) and the modern assembly of banking area. The zone is restricted between AL-Shuhada bridge and AL-Ahrar bridge showing a variation in the way of modernization process through different historical periods according to the increased requirements to overcome and cope with the rapid development in economy as shown in Fig. (5.52 a,b,c,d,e). A sever destruction of large area was done and substituted by large scale projects that participated in accelerating the transformation in space and building types of the traditional fabric. The banking area was located to replace the large traditional area that was also specified for banking purposes during Ottoman era and integrated functionally to the main traditional markets. It worked as a central place that connects the start of the traditional market near the north gate to the traditional Shorja market from one side and to continue to old AL-Mustansir street from the other side. The river frontage area varies in function gathering both public and private buildings that belong to different historical periods. The area between AL-Mustansir street and AL-Rasheed street has a variation of mixed land use and connects and integrates both streets through secondary streets in addition to the old traditional one. The area between AL-Rasheed street and AL-Khulapha street is considered the complementary part of a forked series of the traditional markets in the zones below which motivate more transformation in many local arteries to be converted to new market branches. The modern shopping centre of the main AL-Aarabi market mediates this area and enhances the economical functions and the commercial activities of the traditional market arteries on both sides. Many multi storey public buildings have been implanted in this area as a result of the

booming economy that needs more commercial centres. AL-Khulapha street is considered the main big street that has an intensive row of many multi storey buildings on both sides. The high speed artery splits the area of the traditional residential area and markets into two parts and mediates the skyline of the city. The area between AL-Khulapha street and AL-Kifah street is considered more mixed land use that contains the rest part of traditional markets surrounded by a residential area. The area between AL-Kifah street and Shaik Omar street is assigned for residential purposes and light industries along Shaik Omar street as the border of the old city. This zone is thought to be the main part of the old city that experiences many planned and spontaneous transformation processes. Three transects are selected inside this zone to show the role of economy in the transformation process in the urban structure.



Fig. (5.52a).



Fig. (5.52b).

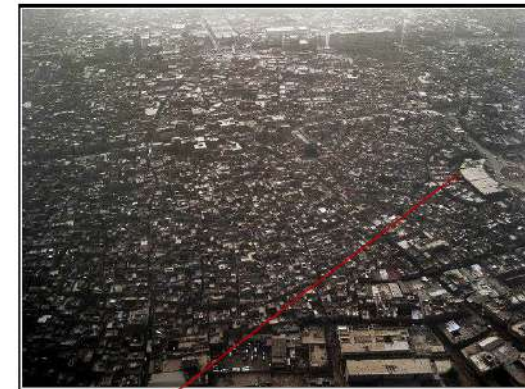


Fig. (5.52c).



Fig. (5.52d).



Fig. (5.52e).

Fig. (5.52a): - Aerial Photos for Zone (B) , Source: Photographed by the Mayoralty of Baghdad.

Fig. (5.52b): - Aerial Photos for Zone (B) showing AL--Rusafi centre, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.52c): - Aerial Photos for Zone (B) belong to the zone up to the river, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.52d): - Aerial Photos for Zone (B) from AL-Khulapha street up to the river, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.52e): - Satellite Image for Zone (B) , Source: Apple map, (accessed 12 Jan. 2018).

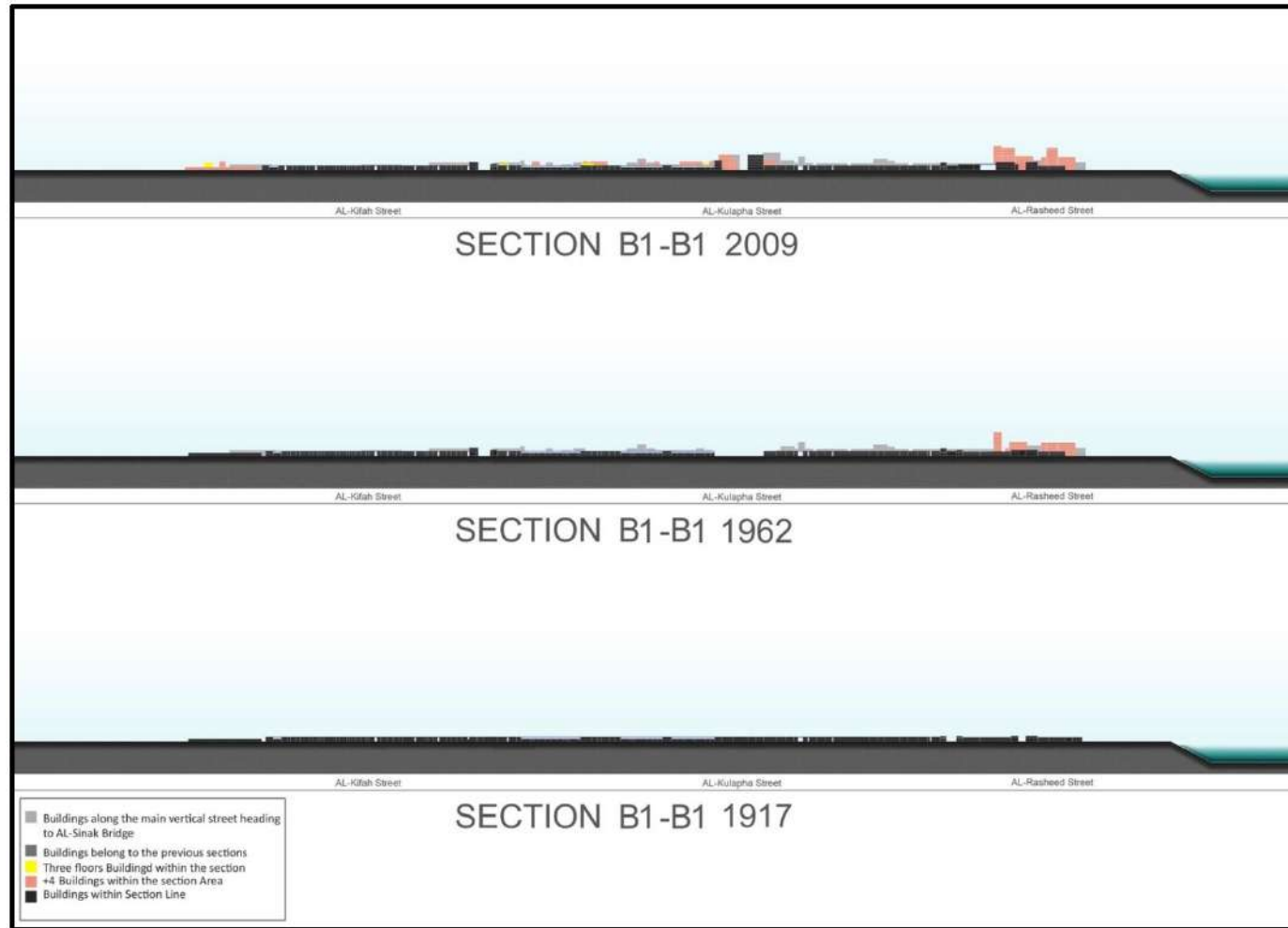


Fig. (5.53): - The transformation in urban structure shown by -Section B1-B1-( in Zone B) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (58) in Appendix I in A3 size.

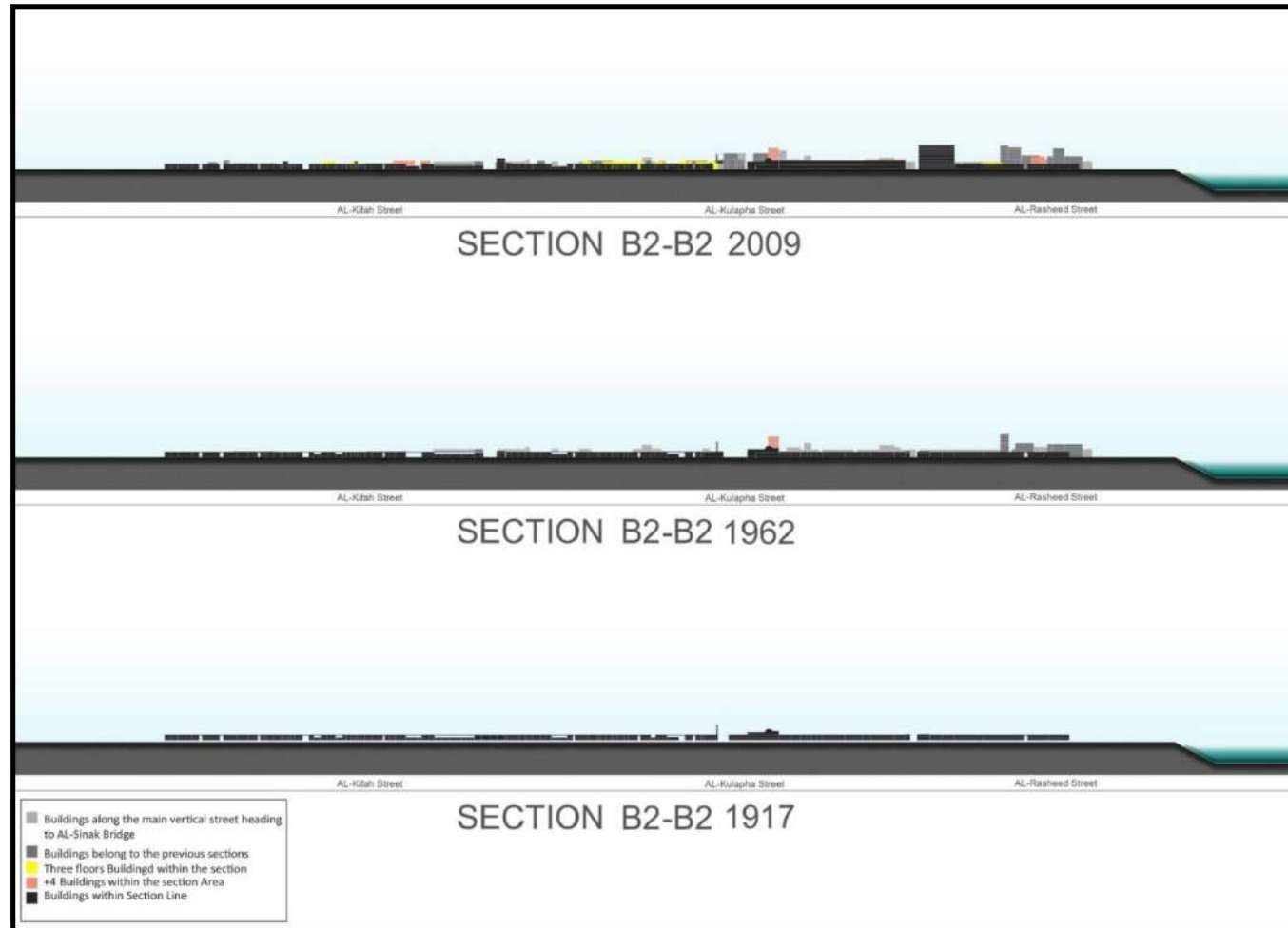


Fig. (5.54): - The transformation in urban structure shown by -Section B2-B2 -(in Zone B) from 1917 via 1962 up to 2009,Source: Surveyed and drawn by the Author, See Fig.(59) in Appendix I in A3 size.

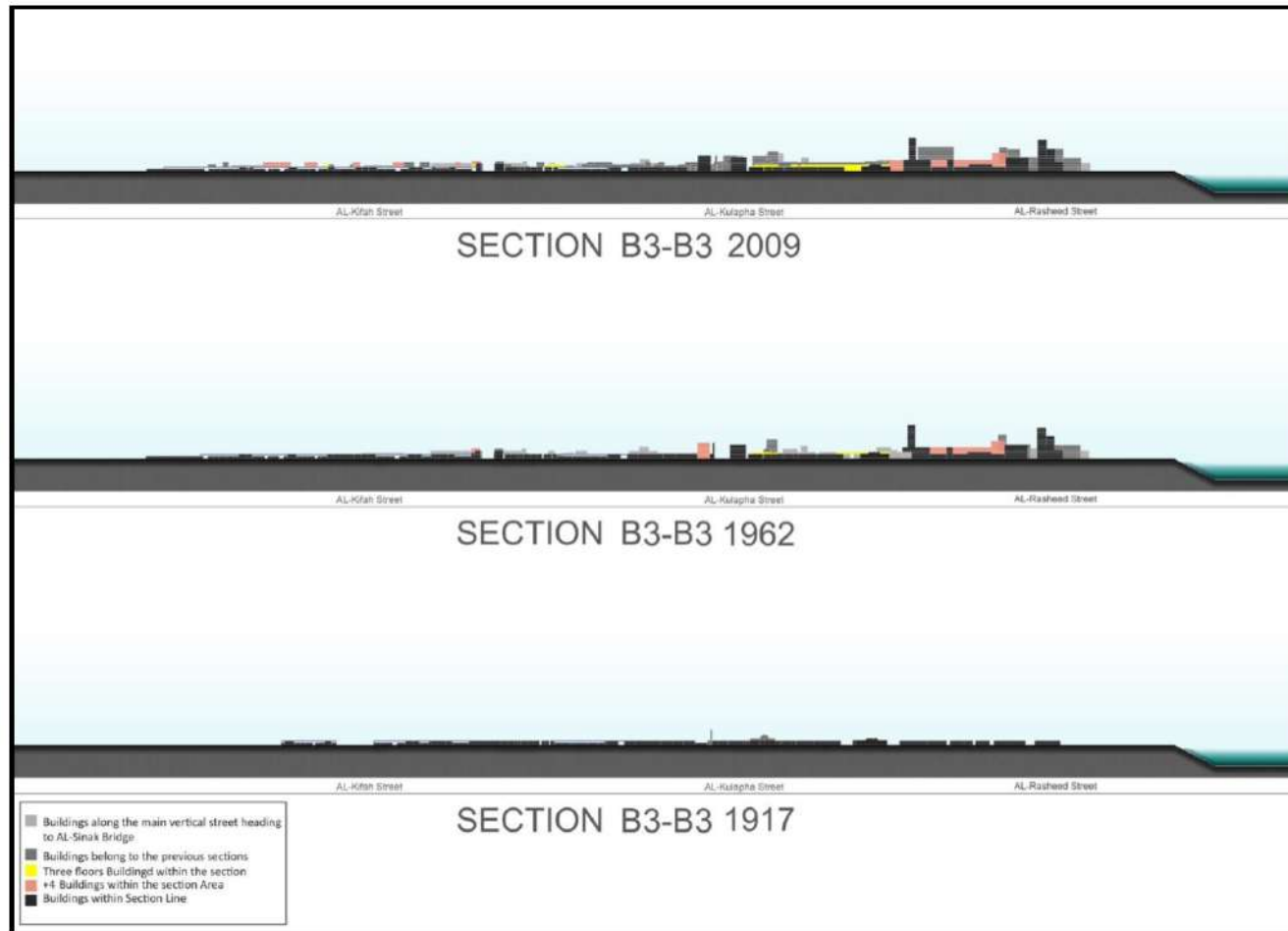


Fig. (5.55): - The transformation in urban structure shown by -Section B3-B3 - (In Zone B) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig.(60) in Appendix I in A3 size.

### 5.5.2.1 The impacts on the street hierarchy and urban space structure

#### 5.5.2.1.1 Section B1-B1

In 1917, a large mass of residential units was shown in compact form up to AL-Rasheed street, having relatively some large size buildings in the area that was adjacent to Shorja market artery which is considered the main market vertical artery in the city. In the area between AL-Rasheed street and the river bank, the section passes through a mixed land use area which has been occupied by buildings of big size plots with two external facades on both sides. In 1962 the situation looked totally different with the new streets that were lined through the bulky compact urban fabric. The section is lined through a new residential neighborhood along the peripheral Shaik Omar street that is integrated within the old urban fabric. Those blocks followed the geometrical shape by having a two row parcels attached to each other. The section continues through the old urban fabric that is penetrated by both AL-Kifah street and AL-Khulapha street. The destruction was so significant where a large area of the old urban fabric was removed exposing the remained part of residential units to the new AL-Khulapha street. The section was lined again through compact residential area which was affected by the rapid transformation process along the main Shorja market where small parcels have begun to be merged in order to have bigger size to accommodate more goods storages for the whole trade in this area.

The section crosses AL-Rasheed street up to the river front area that is occupied by buildings of big size which was extended to be exposed on both sides. In 2009 the section showed dominance of multi storey buildings along AL-Khulapha street as a main new commercial artery that is lined with large structure. The section shows the extension of commercial buildings inside the residential buildings which has experienced a rapid transformation process in the area from AL-Kifah street to AL-Khulapha; This process has apparently significant impacts resulted in the existence of Shorja market artery along with AL-Khulapha street , both of which meet adjacent to the then new commercial centre of AL-Arabi market which seems to have motivated the expansion of various commercial facilities on both sides of the streets. The section shows a half circular public square as a fatigue point along AL-Rasheed street with a direct access to AL-Mustansir street that has experienced a significant change in having big and multi storey commercial and administrative building types up to the river as shown in the transected buildings and in the section background. This comparison of the section development in different periods could be seen obviously in Fig. (5.53).



### 5.5.2.1.2 Section B2-B2

In the second section of 1917, the urban fabric shows a mixed compactness between residential and commercial areas. The section passes through the current Shorja area in the point where the curvature Shorja artery turns to be straight from AL-Rasheed street up to the river as shown in Archival satellite image of 1917. The section penetrates a relatively mixed land use area where mosques and churches are well connected to the main Shroja artery through sub connectors attached to many residential houses up to AL-Rasheed street. The section crosses AL-Rasheed street again with a mixed land use area up to the main commercial artery of AL-Mustansir street. In 1962 the situation was different where AL-Kifah street penetrates the old fabric with maximum buildings height up to 3 floors. The area between AL-Kifah street and the new AL-Khulapha reveals a rapid transformation process where cul de sac street feed Shorja artery from AL-Kifah street, has motivated the area around to accommodate the commercial functions. The node of Shorja market was, however, devastated after the construction of AL-Khulapha street and was transformed into a round-about that mediates AL-Khulapha street. The devastation was carried out along the main street artery in order to be developed later by multi storey buildings. The section relatively penetrates mixed land use area up to AL-Rasheed street and passes a devastated area that was removed during the construction of the main banking and financial centre up to AL-Mustansir street.

In 2009 the section has witnessed a rapid transformation in the housing area adjacent to the traditional Shorja artery up to Shorja square along AL-Khulapha street as a result of the increasing demand on more wholesale commercial centres. Some buildings even have increased their height to create more spaces for goods storages. Shorja square, as a result, was covered totally by peddlers on both sides and extended along the main and secondary streets composing new markets corridors that have competed the original pedestrian one. A new linear commercial shopping centre substituted a large area from the mixed land use that prevailed in the last archival photos in 1917 and 1962 to create a new commercial axis parallel to the Shorja artery where many buildings around have been motivated to turn into commerce instead of housing. The new AL-Aarabi shopping centre faces both AL-Khulapha street and AL-Rasheed street opposite to the new added central bank that increased the devastation in this area rather than it was before in 1962. The commercial artery along AL-Mustansir street has also experienced a transformation in building types to accommodate the increasing demand for commerce use. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.54).

### 5.5.2.1.3 Section B3-B3

In 1917, the section passes through a compact residential fabric with relatively bigger parcels adjacent to Shorja market up to Mirjan mosque along AL-Rasheed street that splits Shorja artery into two segments. The section passes through public buildings which are allocated for banking branches that date back to the old Ottoman era and has later become the main financial centre in the next few decades. The situation in 1962 was more fragmented in many parts. The section passes through new building types specified for light industry along both sides of Shaik Omar street and gets separated from the residential quarters by a secondary car street. The new urban structure is extended inside the residential neighborhoods by having an oval roundabout called AL- Sibaa square where retail shops of light industry are rowed along a vertical connector that links both AL-Kifah street and Shaik Omar street. The residential area is split into two parts by AL-Kifah street and ends within an empty space assigned to be covered by multi storey buildings along AL-Khulapha street. Variant commercial building types have substituted many houses and prevailed along the section from AL-Khulapha street adjacent to Shroja artery up to the Mirjan mosque along AL-Rasheed street. The historical Mirjan mosque is surrounded by secondary street to be separated from the commercial multi storey buildings behind in order to provide a definable entrance for Shorja market. A large urban structure is shown in the section up to the river where multi storey financial assembly has substituted the old Ottoman banking area. In 2009 the sections also revealed a rapid transformation in the residential neighborhoods that have been gradually chopped off to change into a part of the market area despite its far distance from Shorja artery; however, this artery is associated with the multi storey buildings along the AL-Khulapha street. The new street behind the new blocks has contributed to increasing the transformation process in the backward areas. Nevertheless, the section continues to adopt the new commercial building types along Shorja artery exceeding the height of two storey buildings, up to Mirjan mosque that was merged again within the surrounded buildings by converting the surrounded street into a pedestrian one. Like in 1962, the section passes through multi storey buildings of the business centre up to the river. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.55).

### 5.5.2.1.4 Conclusion

In this section the hierarchy of the main streets is changed according to the function, proportion, the inserted building types and their impacts on the adjacent area. Modern urban structure in the fifteens of the last century substituted a large area of traditional fabric to present the economic development of the state in one of the main traditional economical centres in Baghdad. The Central Bank of Iraq and the surrounded main banking area together

within the traditional market have all motivated the tendency to develop a modern market area that extends from AL-Mustansir street up to AL-Khulapha street within a totally new structure. In this part the general hierarchy of the main streets is altered according to the implanted urban pattern inside the traditional one that tends to be geometrical and monumental. AL-Rasheed street is of a higher priority and it represents the national and international economical centre. It was integrated into the traditional AL-Mustansir street that is considered the main pedestrian historical artery that moves up to the main Shorja artery. AL-Mustansir street becomes the second priority that meets both traditional and modern market requirement and provides an accessibility to the river area in some parts. Two secondary cul-de sac car streets are branched from AL-Rasheed street providing car accessibility to the banking area and the market along AL-Mustansir street as part of the new urban pattern that substitutes the traditional structure and the old market especially the main pedestrian artery that is considered the start of Shorja market. The most important one is the street that is part of the vertical Shorja market and is considered of a higher priority as it connects the traditional horizontal market branches which are parallel to the river up to AL-Rasheed street and to continue within the traditional Shorja market passing many historical Khans and monuments such as the main historical Mirjan Khan. The new modern structure is extended across both AL-Mustansir street from the river side and AL-Rasheed street from the other side creating new corridors in addition to the old traditional streets to increase the connectivity between both AL-Rasheed and AL-Khulapha streets. For example, new three corridors were composed within AL-Arabi shopping centre: one through the building itself for pedestrians and the other two are on both sides specified for car streets which have been later converted into pedestrian streets. AL-Khulapha street has become the hub of the new and old market arteries that start from AL-Rasheed street through the old fabric where they all meet in Shorja square. The new urban pattern works as horizontal and vertical barriers' that separate the traditional fabric into several parts. The traditional pedestrian network is blocked by the new AL-Khulapha street and this has increased the tendency to construct new direct channels in the additional market arteries to provide new access to the surrounded historical monuments that have survived from the destruction. The exchange between old and new markets has enhanced the transformation process to absorb the increasing demand for more commercial area for wholesale trade around the new structure. The new constructed car channels worked as a transitional zone and semipublic space attached to the residential neighborhoods which were converted gradually to cargo storages at the absence of urban management strategies. It is clear in the selected sections that the urban structure is graded in height and proportion from the river area up to the residential area around AL-Kifah street, which is considered of a lower hierarchy that attracts moderate commercial functions. It is also noticed that the main historical points

have been developed around the main public streets and squares to work as joints between new and old structures and to create the continuity in movement between two adjacent fabrics.

### **5.5.2.2 The Impacts on Land Use**

#### **5.5.2.2.1 Section B1-B1**

The section in 1917 shows the dominance of the compact residential neighborhoods with limited mixed land use area adjacent to Shorja main artery and along the river within AL-Mustansir street. In 1962, Shaik Omar street accommodated light industry services on both sides and was followed by modern residential blocks with gridiron patterns that were integrated within the old traditional one up to AL-Kifah street. The traditional neighborhoods were penetrated by AL-Kifah street enhancing the mixed land use within the nearby Shorja market. The section also shows the separation in the compact residential fabric which was split into two parts by AL-Khulapha street hence creating a big gap that reaches more than 40 m. It is worth noting that the development of commercial activities along AL-Rasheed has enhanced the mixed land use area up to AL-Mustansir street which was occupied by commercial buildings of big parcels and some scattered private houses along the river. The situation in 2009 was rather different and the residential area along both sides of AL-Kifah street had experienced an urban transformation in the land use which was prone to be more mix landuse in the parts that are close to the traditional market of Shorja and behind the blocks of AL-Khulapha street. The zone between AL-Khulapha street and AL-Rasheed street reflects the extension of commercial use inside the residential neighborhoods which participate in increasing the ratio of the mixed land use, thus leaving negative impacts on the nearby residential area where inhabitation neglects their houses which become difficult to access within the prevailing whole trade commercial use around. The area between AL-Rasheed street and the river has totally transformed into a commercial use area; this of course has reduced the mixed land use nature that was before. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.53).

#### **5.5.2.2.2 Section B2-B2**

In 1917, the section penetrates a large residential area up to mixed land use along Shorja artery that extends inside the compact urban structure to reach AL-Rasheed street where a mix of residential, commercial and religious buildings accumulate in a compact form. However, this form engulfs relatively big courtyard buildings mixed with small size ones as shown in the archival satellite image. The mixed land use area has extended from AL-Rasheed street up to AL-Mustansir street where commercial and administrative buildings have mushroomed

along the river. In 1962 large buildings that serve light industries were built side by side with the traditional residential fabric that was interrupted by AL-Kifah street as another mixed land use artery after AL-Rasheed street. The section passes a residential fabric which has witnessed a transformation in type and use to be more commercial as shown in the satellite image where some demolished houses occurred to be substituted by commercial buildings to accommodate the considerable demand for more storage, offices and retail shops to serve the whole trade centre. Shorja artery, on its part, is interrupted by the new AL-Khulapha street that has separated the main market into two parts by creating traffic roundabout in between. The section passes the mixed land use area like it was in 1917 showing the tendency to have new commercial building types up to AL-Rasheed street. A demolished area with remains of residential houses was shown by the section adjacent to the large-scale financial assembly that was built in the 50s and extended up to the river across the main commercial AL-Mustansir street.

The situation in 2009 was rather different by having totally commercial land use from AL-Kifah street up to AL-Rasheed street passing across AL-Khulapha street. The old commercial Shorja artery was integrated within the new Shopping centre that was initiated across AL-Khulapha street. This artery becomes parallel to the main historical churches as a new extension market part. It is intended to create a large zone of commercial land use that stretches inside the encased residential area on both sides due to the lack of urban management strategies. The new administrative and business centre has been pushed to be behind the section line across AL-Rasheed street. It was integrated into the vertical old and new commercial arteries that penetrated the urban fabric but at same time it is considered as a vertical barrier that separates the existed mixed land use area on the right side from the traditional markets on the left side. It also neglects the residential houses in the area between AL-Rasheed street and the river by means of motivating the commercial and administrative use to be extended along AL-Mustansir street. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.54).

#### **5.5.2.2.3 Section B3-B3**

In 1917, this section follows the previous one in having residential area attached to the mixed land use parallel to Shorja market up to the historical Mirjan mosque which states the start point of Shorja artery. Old ottoman banking and administrative buildings occupied the area from AL-Rasheed street up to the river adjacent to the main old Khans and traditional covered markets. In 1962 the section shows buildings that were assigned to light industry along Shaik Omar street and attached from behind to the residential area that was interrupted by the mixed

land use of AL-Kifah street and then continued within the compact houses up to AL-Khulapha street. The destruction caused the removal of a large area from the residential houses to be substituted by commercial buildings types creating a mixed land use zone along Shorja market up to Mirjan mosque in the area that was restricted between a series of multi storey buildings along both AL-Rasheed street and AL-Khulapha street. Mirjan mosque is considered the joint between the old and new urban structures that is surrounded by a secondary street to be isolated from the main Shorja market entrance. The multi storey buildings that belong to the banking assembly have dominated the urban scene as a main financial centre for the city of Baghdad up to the river. In 2009 the section showed the same reaction like in the last one by converting many residential neighborhoods to be used purely for commercial use. The impacts of the transformation were less and many residential units still exist but under threat in the area between AL-Kifah street and AL-Khulapha street. The extension of the commercial use has increased behind AL-Khulapha street rather than AL-Kifah street due to the separated blocks of multi storey buildings which row along AL-Khulapha street; this has encouraged the extension to take place in a horizontal way on both sides. The section passes the same situation like in the last section where the historical Mirjan mosque separated between the pure composed commercial land use along Shorja artery from the new business and financial centre that extends up to the river and works moving from the modern urban fabric up to the old transformed one. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.55).

#### **5.5.2.2.4 Conclusion**

The three sections show the domination of the banking area as there exists the main finance and administrative centre which controls the impetus of the economic activities from wholesale trade to retail shops. The traditional and modern market types are connected directly to the banking area and extend through the city in vertical and horizontal ways following both old Shorja market and old AL-Mustansir street. The area between the river and AL-Rasheed street is considered a pure commercial one followed by mix land use with the majority of commercial use between AL-Rasheed street and AL-Khulapha street. The area up to AL-Kifah street is considered a mix land use one with a majority of residential area that is more intensive and clearer up to the Sheik Omar street. The religious land use was spread along the river and also in the area that is restricted between AL-Rasheed street and AL-Khulapha street or along both of them and they act as a link among different urban patterns. The new implanted urban patterns with their urban space and building types have followed the land use that had previously existed in old city and that contributed to keeping the integration among all existed urban element.

The modern banking area, on the other hand, had substituted the old Ottoman banks whereas the new market had substituted or added to the old market arteries. The commercial land use has always motivated new developments to spread all over the old urban structure, especially at the absence of urban management strategies. One of the big risk factors of the city behavior following the huge transformation process in this area was having many commercial poles around. This, indeed, has resulted in a severe damage in the residential area which has mostly been transformed into warehouses and retail shops and has accordingly caused a removal of a good number of historical monuments including mosques and administrative buildings and replaced by multi storey buildings or commercial centres.

### **5.5.2.3 The Impacts on Proportion**

#### **5.5.2.3.1 Section B1-B1**

In 1917, the first section showed stability in proportion within the compactness of the residential neighborhoods by having up to maximum two storeys which occupied the majority of the area in this section. The river front area is considered the main public zone and has been occupied by big size parcels that kept the same height with maximum two floors. In 1962 the section showed mass destruction in a large area due to paving AL-Khulapha street which created a big gap in the compact urban fabric where houses were exposed directly to the street with large width that exceeds 10 times more than the old traditional ones. In the section background, multi storey buildings were erected in the area where both AL-Rasheed street and AL-Mustansir street come close together having the tendency to increase the proportion of AL-Rasheed street matching the financial centre that was not far. AL-Kifah street came with second priority by having frontage buildings with maximum three storeys that kept more or less the human scale within the surrounded area. In 2009 the area up to the AL-Kifah street kept the human scale with some scattered small buildings with relatively three to four storeys. AL-Khulapha street flanked with multi storey buildings in the middle of the section providing balance for the high rise buildings along AL-Rasheed street. The buildings in the background along the vertical street that is heading to AL-Ahrar bridge showed relatively lower height than the buildings along the main streets especially for both AL-Rasheed street and AL-Khulapha street having the majority of three storey buildings with some few others up to 5 storeys. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.53).

### 5.5.2.3.2 Section B2-B2

In 1917, the section kept the stability in height with maximum two floors in compact form. It shows relatively large parcels aligned to the covered Shorja market then crossing the current Shorja square up to AL-Rasheed street where the size of parcels increases up to the river as shown in the aerial image. In 1962, the section in the background showed the first multi storey building along AL-Khulapha street behind the big Latin Church that was detached from the remained urban structure. This had taken place after the destruction process which led to the disconnection of the historical monuments from the aligned main and secondary traditional arteries. The section also reveals the horizontal separation between the area from Shaik Omar street up to AL-Khulapha street from one side where the height was kept with a maximum of two floors and the other part on the right side of AL-Khulapha street up to the river where multi storey buildings spread as part of constructing the central financial centre.

In 2009, the second section started with relatively low height up to AL-Khulapha street which is extended to 30m. The transect passes an open area that is considered the complementary part of Shorja Market and connected visually to an open space in front of the new shopping centre. Both spaces are connected by pedestrian overpass but physically they are separated into two parts and both mediate a variety of multi storey buildings with different heights from both sides along AL-Khulapha street as shown in the background of the section. The section moves horizontally within the new shopping centre up to the vertical barrier represented by the multi storey central bank buildings and then moves within two storey buildings up to the river bank. The horizontal shopping centre, indeed, dominates the surrounded traditional market arteries with its geometrical mass that mediates a large destructed area. The area between AL-Khulapha and AL-Rasheed streets shows a rapid transformation process by having multi storey commercial buildings in the inner structure. The types have gradually changed to multi storey housing and commercial buildings which may adopt the rapid demand for commercial activities. In the transect the banking area that covers a wide area between the river bank and AL-Rasheed street manifests some development of the commercial activities to extend along the whole area in the next section. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.54).

### 5.5.2.3.3 Section B3-B3

In 1917, the section kept the height like in the last sections with a maximum two storey buildings with the domination of Mirjan mosque to be the main joint between AL-Rasheed street and Shorja artery. In 1962 the section revealed a series of multi storey buildings



extended from AL-Rasheed street up to the river which dominates the skyline of the city as the main business centre. It also discloses some work of construction of more multi storey buildings along AL-Khulapha street. The traditional urban structure is divided into isolated parts between the free standing buildings; this has ended the role of the religious building like Mirjan mosque which dominates the urban scene. In 2009, the development of the financial centre that occurred in one sector at the end of 50s has motivated the tendency to accelerate the transformation process in the adjacent area especially along the main streets. The vertical extension through having high rise buildings dominates the whole area between AL-Rasheed street and the river and controls the economic activities in the city core. It works horizontally as an intermediate zone between the traditional market from the direction of AL-Shuhada bridge and the mixed land use in the direction of AL-Ahrar bridge. A little change especially in the third transect has occurred through passing the traditional Shorja market between AL-Kifah street and AL-Khulapha street. The plot size and building types have changed to come up with the required commercial activities as a main area for wholesale trade and storages. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.55).

#### **5.5.2.3.4 Conclusion**

The concentration of the high rise buildings along AL-Khulapha street, and the financial centre along both AL-Rasheed street and AL-Mustansir street up to the river has created a new urban commercial centre that dominates the urban scene and divides the traditional urban structure into several parts. The historical monuments have already occupied a big plot size due to their location on the administrative and commercial public area between AL-Rasheed street and AL-Mustansir street and adjacent to the old Shorja market. The old monuments are unable to enlarge due to the high economic value of the adjacent land except for AL-Khulapha mosque which was rebuilt to create a joint between the two sides of the AL-Khulapha street and also to maintain the historical value of the old minaret. The clash in proportion is so obvious between the traditional compact housing system and the inserted multi storey buildings. The traditional neighborhoods restricted between the new modern commercial streets have recovered the massive segregation that had experienced a complementary part for the new and old commercial arteries to be used partly as warehouses or private residence for workers. The residential area far from the new commercial centre has kept its structure for residential purpose especially in the area between Shaik Omar street and AL-Kifah street and has integrated any interventions that follow the human scale and the old urban pattern. The three sections show instability in the proportion of this area. It starts with relatively traditional compact system following the human scale from Sheik Omar street up to AL-Khulapha

mosque and Shorja square along AL-Khulapha street. The other part from AL-Khulapha street shows several high rise buildings which mediate the skyline of the transect. The transect shows again a lower building height with maximum 3 storeys but with relatively bigger plot size up to AL-Rasheed street. The Market area shows a continuity inside the city in spite of the large scale interventions that hinder the soft movement several times. This is usually done by finding new corridors within the new structure to overcome the increasing requirement for economic activities and to provide access to the old arteries that are interrupted by the horizontal streets and their aligned blocks designated for multi storey buildings. The area between AL-Khulapha street and Al-Rasheed street is considered the transitional zone to move toward the modern urban structure that is implanted with high rise buildings dominating the whole skyline for the city.

#### **5.5.2.4 The Impacts on the Historical Monuments**

##### **5.5.2.4.1 Section B1-B1**

The first section in 1917 is lined through a large part of traditional residential area up to AL-Rasheed street where it started to be the main commercial and business centre together within the nearest old AL-Mustansir street . The zone between both streets used to have relatively large parcels that were occupied by main public buildings and houses of notable people at the time of the Ottoman era. In 1962, AL-Kifah car street and AL-Khulapha street had taken large parts from the old residential buildings and motivated to line more streets in both horizontal and vertical directions where many historical monuments had been lost or exposed directly to those streets. The public historical buildings that agglomerated along the river were hidden or lost their prevalence by multi storey buildings while others were removed and substituted by other buildings of different functions and activities, especially those assigned for whole trading one. In 2009, the transformation process increased by having many commercial building types instead of residential ones and this was seen adjacent to the vertical Shorja artery and the main AL-Mustansir street where destruction for historical monuments continued. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.53).

##### **5.5.2.4.2 Section B2-B2**

The second section in 1917 passed through the old Shorja traditional covered market area that mediated a large part of compact urban structure and accompanied by many Khans, historical churches and mosques along and adjacent to its vertical path. The main historical monuments were allocated along AL-Mustansir streets as a main horizontal commercial artery

parallel to the river which also includes some houses along the riverbank. In 1962 the massive destruction in order to line up new streets interrupted the connectivity between the historical mosques and churches and the adjacent neighborhoods as shown in the section background where AL-Khulapha street mediates both the Latin Church and AL-Khulapha mosque which are both exposed directly to the street. The destruction process to construct the banking assembly has affected the main Aquliya mosque by detaching it from the surrounded neighborhoods. In 2009 the situation looked different where the modern building types prevailed the urban scene. The historical churches faced the commercial shopping centre as a new building type that substituted a large mix land use area between AL-Khuapha street and AL-Rasheed street. They determined the border of the destruction and rowed along a secondary street to be accessible within new commercial buildings attached to them and opposed to the modern shopping centre. The secondary car street was later transferred into a pedestrian walkway that is used as an additional market artery for vendors. The second transect, along AL-Khulapha street, revealed the location of AL-Khulapha mosque which was rebuilt and enlarged as an individual monument. This location is separated from the old structure and located within a row of multi storey buildings providing a focal point to indicate the second segment of Shorja market. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.54).

#### 5.5.2.4.3 Section B3-B3

In the section of 1917, along AL-Rasheed street, Mirjan mosque is considered the joint between the old traditional Shorja artery and the main public area that includes market arteries, Khans and other Ottoman public land use area. AL-Rasheed street has detached Mirjan mosque from Mirjania Khans as first separation between the historical assemblies resulted from paving the car street. In 1962 new streets had resulted in the destruction of many areas around the main historical monuments. Mirjan mosque was surrounded by a secondary street with three storey buildings to be a part of the developed buildings along Shorja artery; yet these were later on replaced by new commercial building types with multi-stoery buildings and shopping centres. Mirjan mosque has operated as a focal monument surrounded by a large structure and worked as a start point to access the traditional market. The modern urban structure which belongs to the financial centre was extended from AL-Rasheed street up to the river. In this way it has stopped the visual and physical linkage among the existed traditional urban elements despite the continuity of AL-Mustansir street that was influenced by having a totally new structure along its path which hides and removes many monuments. In 2009 the third section showed the enormous mass of multi storey buildings that worked as a barrier extended from AL-Khulapha street up to the river frontage area with

variant height that hides many historical monuments behind. The new implanted structure of the banking assembly has overcome the historical monument of Mirjaniya Kahn and motivated the adjacent buildings to match the same type in having multi storey buildings that participated in destroying many historical Khans and public buildings that date back to the Ottoman era. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.55).

#### **5.5.2.4.4 Conclusion**

In this zone an agglomeration of historical monuments is concentrated along the river frontage area near AL-Shuhada bridge. It forms the traditional covered market zone that included many old schools, mosques, khans, and other facilities located along the market arteries and extended in a wide area across AL-Rasheed street up to the old Shorja artery and along AL-Mustansir street. This part is considered the continuity of the old market that extended from Bab AL-Mudham area near the old castle (ministry of defense assembly). The coherence and variation of the market branches kept the connections among the main existed historical monuments although many of them were lost through continuous transformation process. The market routes were integrated functionally to the new structure of the banking area due the dependency of both functions on each other but physically the financial assembly split the traditional structure horizontally in two parts and causes a severe damage to the visual connectivity and accessibility between the market area and the historical monuments along the main (Banking) street, AL-Rasheed street and also along AL-Mustansir street and the adjacent river frontage area.

The banking area is considered the start point to move towards a new type of economic functions by having new building types instead of the series of traditional covered ones that belong to the past historical periods. The change in type may be attributed to the relatively big plot size along the traditional market that has motivated the heavy structure to be planted inside. The three sections pass through the old residential urban fabric up to AL-Kifah street showing the coherence with the main traditional Shorja market and the remaining historical mosques. AL-Khulapha street has contributed to splitting historical monuments on the adjacent area on its both sides. In this way, the split has created a horizontal barrier that changes the direction of movement to follow the wide walking sides instead of the old arteries that connect historical monuments with each other providing higher accessibility to those monuments along the main streets rather than monuments inside the neighborhoods. The assembly of the financial zone has produced a massive development along AL-Mustansir street especially along the river frontage area that contributed significantly to closing the river

side. This could obviously be seen in the second and third sections where a new structure has competed with the old historical monuments along AL-Mustansir street. The area between AL-Rasheed street and AL-Mustansir street is a mixed land of many building types that came to surface as a result of massive transformation process that more or less participated to hinder the accessibility to reach the historical monuments. The first section passes adjacent to mixed land use area composed by the main old library, mosques and residential units which occupied the area between AL-Rasheed street and AL-Mustansir street and ended with totally a mix of old monuments and high rise buildings along the river. The second and third sections pass through new multi storey buildings along AL-Rasheed street up to relatively old buildings along the river. Recently the mosques are directed by the endowments institutions that participated in demolishing many parts to use the expensive land for commercial investment like the destruction of the old Ottoman court along the river.

### **5.5.2.5 The Impacts on the Building Types**

#### **5.5.2.5.1 Section B1-B1**

In 1917 the section passed through the compact inward looking residential houses up to AL-Rasheed street where new buildings types with outward looking plan and colonnaded sidewalks rowed along the street. The section showed relatively big parcels that belong to some old khans adjacent to the Shorja market artery. Big parcels along AL-Musatnsir street were occupied by large buildings following the inward and outward looking with external facades along the streets or sometimes having front and back facades. In 1962 multi storey buildings started to be erected along AL-Rasheed street. The buildings along AL-Kifah street followed the type of AL-Rasheed street in having colonnaded sidewalks and outward looking plan attached to the residential fabrics. The inward looking plan houses have been exposed to the destruction parts along AL-Khulapha street waiting to be replaced by multi storey buildings and separated from the houses behind by a secondary street. Public building types with inward looking started to be filled inside the old residential compact fabric. The first section ended in the main public area passed through the narrowest distance between AL-Rasheed car street and the pedestrian AL-Mustansir street where many commercial storages and retail shops extended along both of them. In 2009 the building types tend to have multi storey buildings as shown in the section background. New commercial centres and office buildings have substituted many areas along both AL-Rasheed street and AL-Mustansir street as shown in this section and also illustrated many decayed old historical courtyard buildings lined from AL-Mustansir street up to the river. The transect passed a new implanted type of urban space along AL-Rasheed street surrounded by a half circle of retails shops. This kind of monumental

space was planted inside the area and left a space used as parking between the retail shops and the traditional buildings behind along AL-Mustansir street. The building types which belong to the late Ottoman period were removed or partly destroyed and converted into commercial buildings as shown in old library adjacent to the old shipping company (Linj house) that occupies a large area with outward looking plan type. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.53).

#### **5.5.2.5.2 Section B2-B2**

In 1917 the second transect, like the first one, showed a compact urban structure with traditional inward looking houses and old Khans adjacent to the old Shorja artery where the section shows big parcels as compared to those which were far from the market. The relatively big parcels size continues across AL-Rasheed street up to the river where many commercial and religious buildings occupied the main public zone parallel to the river. In 1962 the section revealed a set of commercial buildings that rise up to 5 floors; such kind of buildings were rather exposed to AL-Kifah street and their type is quite matching the modern architectural style of the time. New space was found as cul de sac at the end of Shorja market to provide an access for the trucks to get inside. The section passes through the new roundabout square that mediates AL-Khulapha street splits the residential neighborhoods which were cited from AL-Kifah street up to AL-Rasheed street and also the main Shorja market artery. It was obvious from the aerial image that the height along AL-Rasheed street does not exceed two floors in this part and faces directly the new modern urban structure that belongs to the financial assembly which occupies the area up to AL-Mustansir street where relatively big parcels with its outward looking building are cited with more destruction in historical urban fabric up to the river. The adjacent inward looking houses directly face the new multi storey buildings in the area between AL-Rasheed street and AL-Khulapha street; these houses have disparities in urban pattern as a result of inserting different building types. In 2009, the second transect shows leftover spaces along AL-Khulapha street on both sides and that was defined as a collecting and transit space to move toward the interrupted two parts of Shorja artery. The scattered vendors fill the space from both sides thus creating some new shaded market corridors. The surrounded frontage buildings on the left side are transformed to commercial multi storey buildings without following any management system. The multi storey buildings and retail shops have indeed extended deeper to occupy a large part along the market up to AL-Kifah street. The section passes through AL-Arabi shopping centre that occupies the whole area between AL-Khulapha street and AL-Rasheed street with a series of buildings connected to each other. The aligned streets on both sides along the shopping mall are transformed into a covered market later as a result of Shorja market extension on both sides. The buildings

around have occupied large plots and been transformed into multi storey buildings which are used as retail shops and big warehouses attached to the adjacent residential neighborhoods which was modified to adopt the commercial use. The section crosses AL-Rasheed street to show the difference in height between the new multi storey buildings and the adjacent traditional area around and moved across AL-Mustansir street where different types of commercial and office buildings lined along the street. The longitudinal parcels are transformed to commercial buildings with internal passage directed to the river to provide more retail shops and warehouses in this part. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.54).

#### **5.5.2.5.3 Section B3-B3**

In 1917, the section passed through the compact urban pattern which area composed from courtyard houses and crossed Shorja artery where Khans with big parcels aligned along its path up to Mirjan mosque along AL-Rasheed street. The section continued with variant building types represented by mix of residential, religious and commercial buildings across Al-Mustansir street up to the riverbank. In 1962 the section showed new types of commercial and office buildings along AL-Kifah street. The section passed through vacant land along the new AL-Khulapha street that was under development to be built by multi storey building as shown in the first trials in the background of the section line. The section lined across Shorja market where the surrounded area witnessed a highly transformation process by converting many old Khans into big commercial buildings that have occupied large parcels and used as warehouses and retail shops which follow in their design the modern architectural style of 60s. New multi storey buildings were initiated along the main street that surrounded Mirjan mosque whose façade was modified to be lined in a straight way along AL-Rasheed street. The section passes through the most modern part with multi storey buildings that compose the main financial centre for the city of Baghdad. Large plots have been occupied by modern style buildings distributed around cul de sac street up to AL-Mustansir street where the 14 storey building of Defterdar is cited along the river. This approach developed in the 50s and continues in transferring many traditional buildings into modern style. Despite the fact that this area is separated from the traditional market area by a buffer car street, it has a negative impact in motivating a rapid transformation in old market area and the buildings along AL-Mustansir street. In 2009, the section showed more destruction to pave more secondary and vertical streets and construct large scale projects. The urban structure experienced a rapid transformation especially in the last decade after the war when urban management and control diminished or not applied. AL-Khulapha street has so far revealed many multi storey buildings. However, these were not completely implemented and they also disclosed many disparities in

height and unbuilt parcels. Indeed, the international style of having multi storey buildings which has covered big rectangular plots is the prevailing type along AL-Khulapha street where there appear many retail shops in the ground floor and offices in the other storeys. Many leftover and unidentified spaces were found between the mass of the modern urban structure and the traditional one. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.55).

#### **5.5.2.5.4 Conclusion**

The three sections in the central business and commercial zone in this part of the old city illustrate the impact of economic development in changing and modifying the building types. The plot size is relatively smaller and get bigger wherever they become close to the commercial part especially in the area between AL-Kifah street up to the river along and adjacent to the main traditional Shorja market and other specialized market arteries. The housing types vary in forms like other parts of the old city that experienced a continuous process of change. The main types are the traditional courtyard houses with one or two floors, the renovated traditional houses using concrete slabs, covered courtyard houses, new constructed modern houses with big windows and sometimes with open balconies, three or more storey apartment with external entrance, and finally multi storey houses with retail shops in the ground floor near the main market. The three transects pass pure residential area street that kept its coherence between the light industry zone of Shaik Omar street and the commercial one of AL-Kifah street. This stability in residential structure is due to the existence of a buffer street between the retail shops along Shaik Omar street and the residential part to protect it from the harms caused by industry. Besides, AL-Kifah street serves as a local residence and is integrated within the area in the back by keeping the traces of traditional arteries on both sides. The first and third transects pass through the residential area that is located on both sides of the main artery of traditional Shorja Market which dominates the second transect. The plot size gets bigger along the main artery and motivates higher transformation in type to adopt the rapid need of warehouses for the whole trade zone in this area. The impacts of the clash between private and public traditional structure within the modern one could be noticed in the frontage buildings around the modern structure. This could be seen in the area behind AL-Khulapha street where buildings were attached to each other in row with front elevation along the street and back elevation facing the remained urban fabric. The impact varies according to building height and its closeness to the traditional market where building types nearby were adopted to have commercial buildings with internal passage to get benefit from the economic nature of this part of old city. At the end of the three sections there is a direct impact of having new mass urban structure inside the old core that affects the



city skyline and the relation among different types. The new urban structure has interrupted the traditional arteries several times and created new ones to cope with the rapid economic activities. The left-over spaces are considered less than other parts because of the higher value of the land in this zone. The transects revealed different types in the area between AL-Rasheed street and AL-Mustansir street. They are varied in architectural style and approaches, height, size and orientation. Some of these were designed by Iraqi architects and some followed the international style done by foreign architects. The three sections showed variant approaches of intervention between traditional and modern style like the narrow rectangular plots along both the river and AL-Musatnsir street that were occupied by different architectural style ranging from old courtyard building to modern one.

### **5.5.3 Zone -C- Transects through Modernized Urban Fabric in the Restricted Area between AL-Shuhada Bridge and Maidan**

This area is extended from Sheik Omar street up to the riverfront area and restricted between AL-Shuhada bridge from one side and Bab AL-Mudham bridge from the other side, See Fig. (5.56 a,b,c,d). The selected zone is considered relatively the highly dense built up area and the oldest part that belongs to the late Abbasid period. This zone, moreover, was subject to a severe modernization process during different historical periods as a result of destructing large area from the traditional fabric. It is considered a more hybrid zone that includes both the old and new urban structure. Then this structure was modified after the British mandate with totally modern structure that was planned to be integrated within the late Ottoman one creating the new governmental area for the city of Baghdad. This area is thought to be the start point of the old city that has been subject to many trials to substitute the old structure by a new one. The action zone is believed to be the main historical part in the old core of Baghdad as it includes the most important historical monuments and was for long decades the main governance centre among many public buildings of the Ottoman and pre Ottoman period. The area between AL-Mustansir street and AL-Rasheed street includes many public buildings and private residential quarters followed by more mix land use up to AL-Khulapha street. No doubt, ALKhulapha street is always seen as the main element that split the skyline of the city into two parts. The area between AL-Khulapha street and Sheik Omar street passing through AL-Kifah street enjoys a more conservative touch and is specified for residential purposes though the buffer zone is filled by light industries and handicraft activities. The main and secondary arteries in the action area is vertically oriented to the main public AL-Mustansir street and has limited accessibility to the river due to the concentration of administrative and military buildings. In the late period of the Ottomans and the start of British mandate there were many

private houses that belong to wealthy and notable people and officials who lived near their working place. However, the zone engulfs many religious monuments including many public shrines and mosques and is considered the most variable part. It is in this part residential neighborhood is found along with the mixed land use area between AL-Khulapha street and AL-Mustansir street. Whereas the public historical area, on the other hand, continued to exist despite the sever destruction and rapid transformation process. A large number of local and foreign visitors approach this zone as the most touristic area in the old city of Baghdad especially on Fridays where a large market for antiques and books held frequently. This zone has experienced a severe modernization process where many parts had been removed to be substituted by Maidan urban space and totally a large mass of modern structure along the main wide car streets. The historical monuments also experienced significant modifications where many parts were removed and substituted by new ones like Sarai which was the main administration centre. The mosques experienced high modifications by removing many parts to be rebuilt far from the original old form. Some of them were enlarged and connected directly to the main arteries by destroying many neighborhoods around. A cordon of public buildings with a variation in height in both streets were implanted in this area with a big square used as bus terminal called Maidan that connect both streets together. The area of the Ministry of Defense has substituted the old Ottoman castle located on the city corner near the main Bab AL-Mudham gate and was separated functionally from the other part due to the military function that needs more security. Three vertical sections were taken through the city to compare the development of the urban landscape within previous eras and to illustrate the impacts of modernization. The first one passes through both residential area and then adjacent to the main booklet market AL-Mutanabi street up to the old Rushdiya Ottoman school along the river. The second one passes through the residential neighborhoods through Maidan up to the river while the third one passes through the ministry of defense assembly.

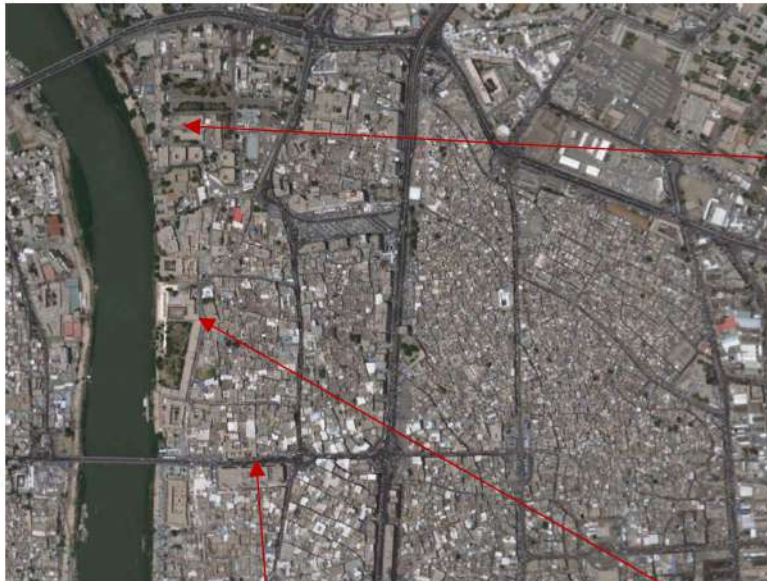


Fig.(5.65a)



Fig.(5.65c)



Fig.(5.65b)



Fig.(5.65d)

Fig. (5.56a): - Satellite Image for Zone B,Source: Apple Map, (accessed 12 Jan. 2018).

Fig. (5.56b): - Aerial Photos for Zone (C) AL-Sarai Street up to the river, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.56c): - Aerial Photos for Zone (C) from Qushla tower, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

Fig. (5.56d): - Aerial Photos for Zone (C) for the Ottoman industrial school, Source: Photographed by the Iraqi photographer Mohammed Alaa Din.

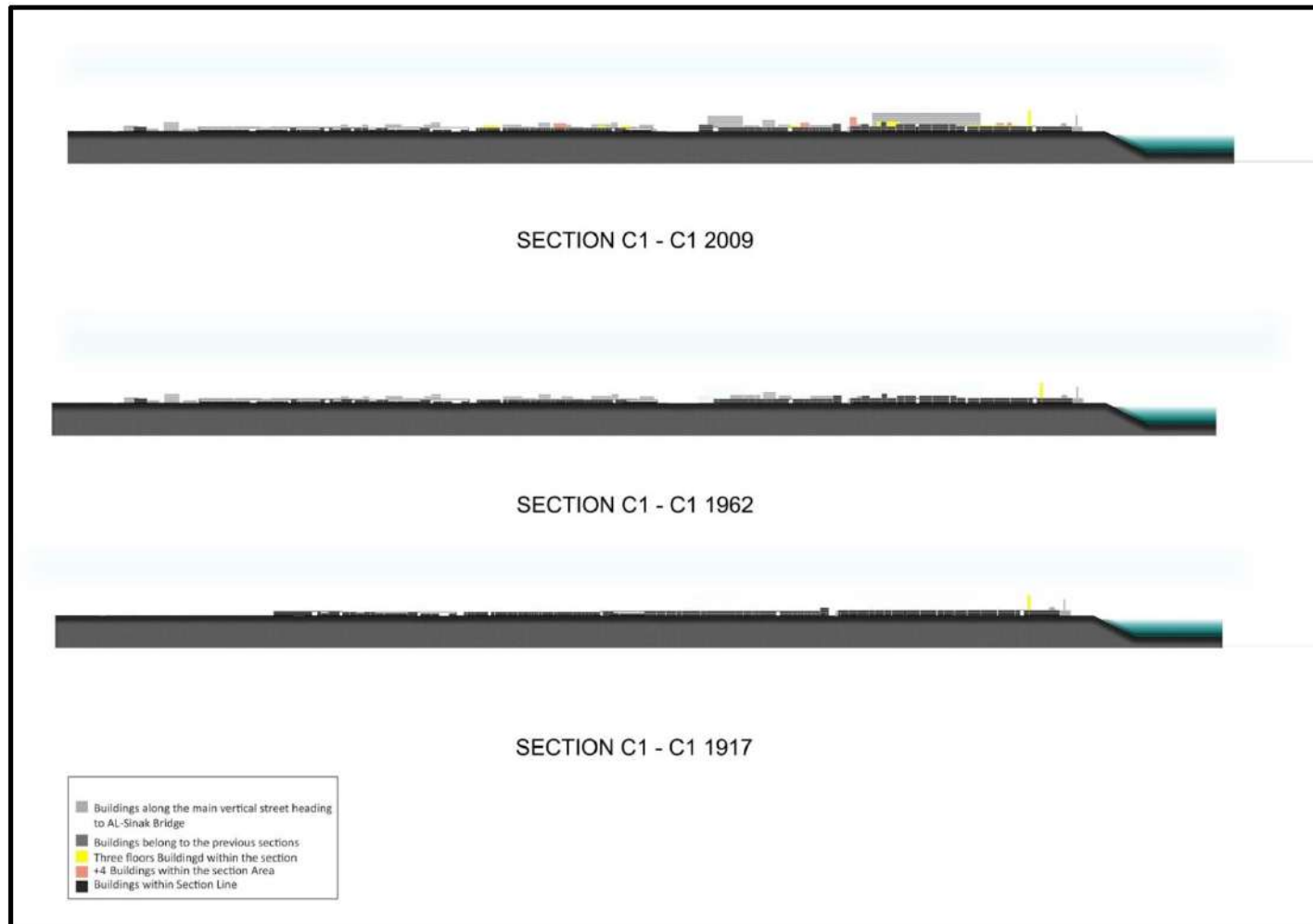


Fig. (5.57): - The transformation in urban structure shown by -Section C1-C1- ( in Zone C) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (61) in Appendix I in A3 size.

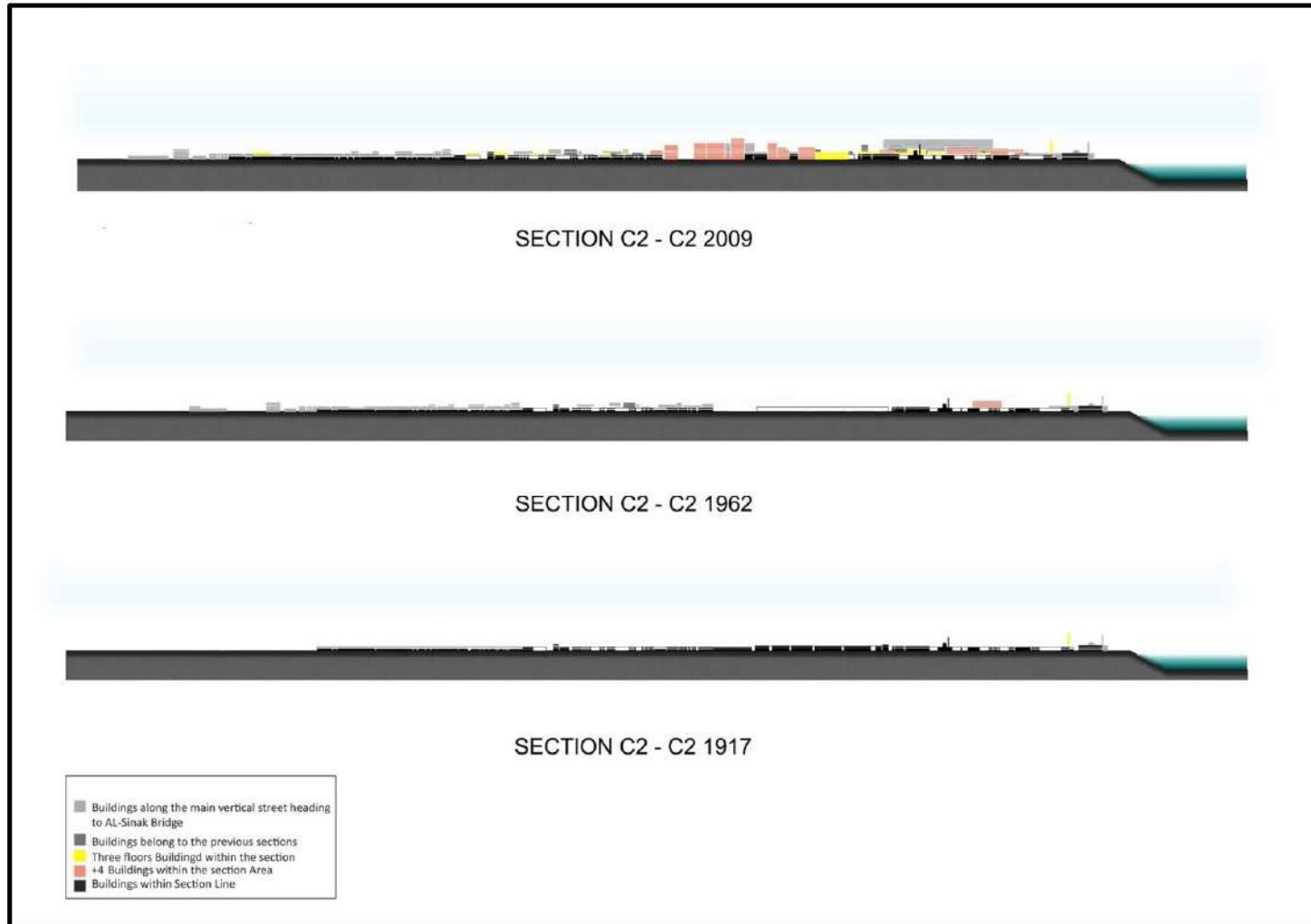


Fig. (5.58): - The transformation in urban structure shown by -Section C2-C2 -(in Zone C) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig. (62) in Appendix I in A3 size.

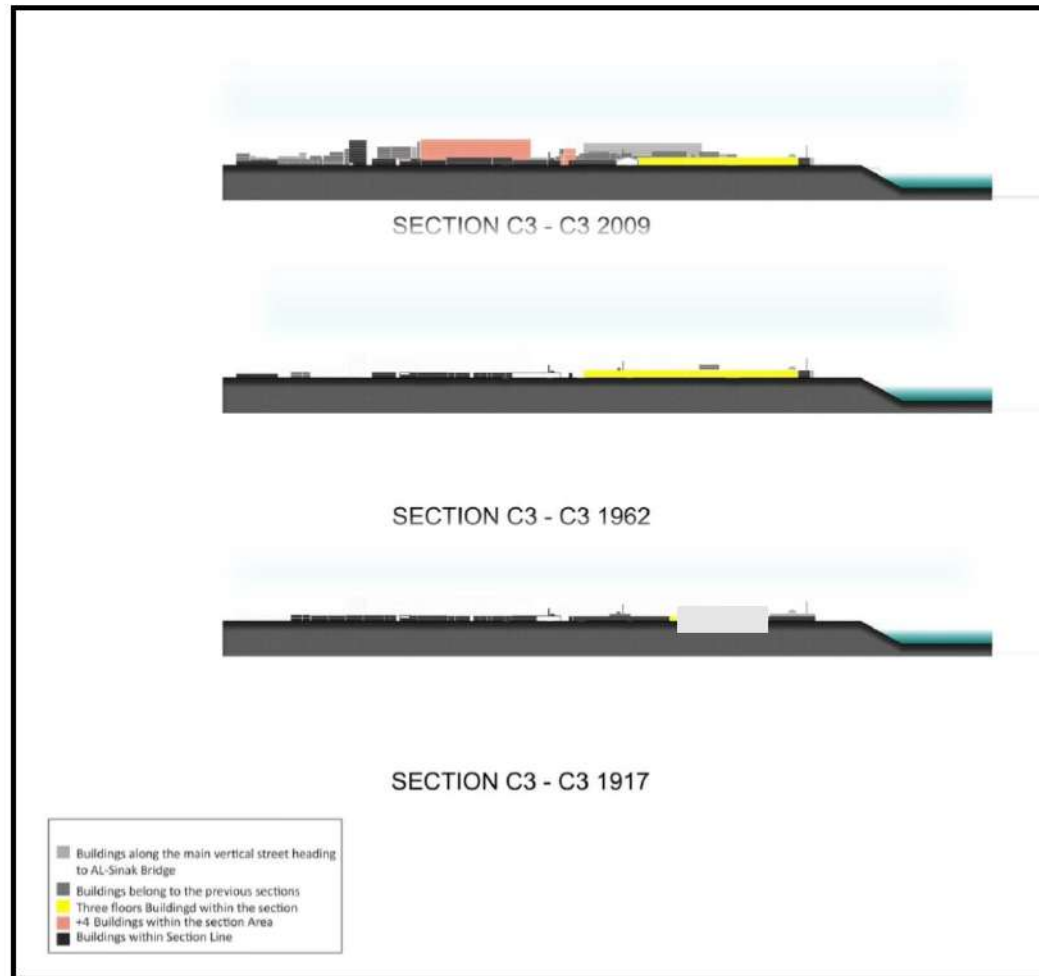


Fig. (5.59): - The transformation in urban structure shown by -Section C3-C3- ( in Zone C) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author, See Fig.(63) in Appendix I in A3 size

### 5.5.3.1 The Impact on the Street Hierarchy and Urban Space Structure

#### 5.5.3.1.1 Section C1-C1

As shown in the aerial image of 1917, the first section passes through large and compact residential neighborhoods up to AL-Rasheed street. The plot size accompanied with the internal courtyard is bigger as compared to the previous one. This is shown in the area that starts from Al Rushed street up to Sarai Market. This indicates the prevailing mix land use that reaches the market passage which was attached to the Ottoman military school along the river. AL-Rasheed street is considered the main element that separates the compact urban fabric into two parts but more or less it replaces an old semipublic artery as was explained in chapter four. In 1962 the situation looks different and the first section passes through an industrial zone along Shaik Omar street before moving through the compact neighborhoods that are interrupted by AL-Kifah street. As shown in the satellite image within the section line, large parts were deducted during the construction of AL-Khulapha street creating a big gap between the interrupted neighborhoods. AL-Rasheed street has also created a vertical car street connected to AL-Mustansir street which is called AL-Mutanabi street where the section line passes through the urban elements along its path up to the river and parallel to the second vertical street that leads to the western part of the city (AL-Karch) across AL-Shuhada bridge. In 2009 the section witnessed many changes as compared to 1917 and 1962 where many building types were added along the main constructed streets and extended later within the compact residential neighborhoods. It passes Sheikh Omar street that is specified for light industry and considered more harmful for the old structure because it motivates the residential area to be transformed into industrial places for car maintenance. The residential area continues up to AL-Kifah street where less impacts on the surrounded area was observed as compared to AL-Khulapha street. This is due to many vacant blocks along the street that was designated to be filled by multi storey buildings and motivated the frontage residential units to be transformed into multi storey buildings. On the other part of AL-Khulapha street, the transect passes through a two storey building that is located within a row of multiple height buildings along the street segment. The transect moves through residential neighborhoods up to AL-Rasheed street having frontage buildings with 2-3 storeys aligned with arcaded sidewalks on both sides. The transect passes parallel to AL-Mutanbai street with a variation of heights which was constructed as a secondary car street and transformed later to be only for pedestrians. The transect ends with the old Sarai market area that is considered a complementary part of AL-Mustansir street up to the old Ottoman military school along the

river which is attached directly to the market. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.57).

#### 5.5.3.1.2 Section C2-C2

The second section of 1917 showed AL-Rasheed street as a main artery that separates the large compact residential neighborhoods and the mixed land use area up to the river while in 1962 it showed a big difference where the residential area was interrupted firstly by AL-Kifah street to end up to a large destruction area between AL-Khulapha street and AL-Rasheed street that was designated to be the main bus terminal of the old Maidan that was not far from it . AL-Rasheed street, in this part, directly faces AL-Khulapha street and both are linked by Maidan thus exposing the far residential neighborhood. This exposure is along AL-Khulapha street which is linked to AL-Rasheed street, then to be moved through the mixed land use area that includes the main market artery and many historical monuments. This, in turn, moves up to the riverfront area adjacent to old military buildings and the old Ottoman industrial school to cross the start segment of AL-Mustansir street. In 2009 the situation became more segregated. The second section passes through the majority of the residential area with a compact pattern surrounded by grid pattern area. Both patterns are interfered and have a negative impact on the main pedestrian traditional artery that was used as car street later because of its wider section. The residential area was intersected by AL-Kifah street and revealed fewer negative impacts as compared to those adjacent to AL-Khulapha street and AL-Rasheed street because of the acceptable street width with its surrounding buildings that apply the human scale and are attached directly to the compact fabric. The residential buildings stop up to AL-Khulapha street that ends again with empty plot that is specified to be part of AL-Khulapha street and blocked by higher fence to isolate the whole area from the main street. On the other side, the section passes Maidan that is considered the biggest public space in the old city that is used as the main bus terminal that links both AL-Khulapha street to AL-Rasheed street. Maidan is surrounded by multi storey buildings as a part of AL-Khulapha street development; this has created long distance between the residential area up to AL-Rasheed street. The movement is shifted from the main traditional arteries that already were blocked by high rise buildings to the Maidan open area. Its position as a main bus terminal has enabled it to be the main transitional area from the old city toward the modern part of Baghdad.



The transect passes through a group of old public buildings with relatively bigger plot size that belongs to different historical periods up to the river frontage area that faces a new constructed library with three storeys. In this section, AL-Rasheed street is still with high functional variation and considered of higher priority as a meeting point between the traditional mixed land use that is directed to AL-Mustansir street and the modern AL-Khulapha street within Maidan public space. In spite of its human scale, AL-Rasheed street is considered more systematic and identified as a main artery that has more impacts that motivated substitution of wide area by large scale projects and secondary streets to create connectivity with both AL-Mustansir street and AL-Khulapha street. This has been looked at as a higher hierarchy to ensure connectivity instead of AL-Khulapha street that has long width but not well identified due to the irregular height of its buildings on both sides. The irregularity especially in having multi height on one side and empty plots on the other has interrupted the role of the street and its impact as a commercial artery in this part. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.58).

#### 5.5.3.1.3 Section C3-C3

In the archival map of 1917, the section passes the Castle along the river which occupies the current ministry of defense and then moves through a large residential compact area across AL-Rasheed street up to the traces of the old wall where the residential houses are attached to it. In 1962 the assembly of ministry of defense took new order and design but still within the old fence. The residential area shows the start of removal process in front of the ministry of defense Monumental Gate. This may secure the Ministry of Defense which was the main administrative centre at that time. The residential area experiences a severe interruption by the construction of AL-Khulapha street and then ends in a large area of storages and retail shops at the border of the old city. In 2009, the section passes through the north border of the old town which is substituted by public buildings that are varied in size and height between 1-3 storeys facing the main bordered street of Bab AL-Mudham area which is located to the far east of the city. The strip of public buildings was isolated from the adjacent residential area by semipublic artery as a transitional area between the new structure and the residential area. The section then goes through an empty plot that is planned to be constructed in multi storey buildings as part of the AL-Khulapha street and was bordered by 2-3 m height of a concrete fence to provide as much privacy for the neighborhoods behind as possible. The other part of AL-Khulapha street starts with multi storey buildings that form a cordon around the entire neighborhood reaching AL-Rasheed street from the opposite side. The row of the new multi storey buildings was separated from the residential quarter in the backside by a secondary car street with 5 m width as transitional semipublic space between the implanted buildings and

the neighborhoods. The remains of residential neighborhoods are restricted from all sides by the new structure which allow more destruction and decay in many parts especially on both sides of the cul de sac back entrance of the National Library along AL-Khulapha street. The section passes the assembly of the national library with maximum 3 storeys leaving a wide destruction on the neighborhood attached to it. The gate of the National Library assembly with high fence along AL-Rasheed street faces the monumental gate of the ministry of defense assembly and followed by relatively two storey buildings of the ministry of defense assembly up to the river. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in fig. (5.59).

#### **5.5.3.1.4 Conclusion**

AL-Rasheed street is considered here with the higher priority than AL-Khulapha street due to its cultural and administrative importance and its connection to Maidan as a main urban public space that connects both streets together. There are two types of interventions inside this part as shown in these sections. The first is to have a cordon of public buildings around the residential quarters and along the main car streets. In this case the continuity of the old traditional public arteries is blocked and the existed traditional public artery are transformed into semipublic space to have accessibility to the buildings along the main streets and works as transition space between public car streets and the privately owned area. The second kind of intervention is the infilling process by large scale projects. The national library assembly faces AL-Rasheed street and occupies a large area that allows the construction of the cul de sac street from the other side as a secondary entrance from AL-Khulapha street to the parking area. This street splits the remained residential blocks into two parts. The assembly of national library buildings are not surrounded by a semipublic street and attached directly to the private area of the residential quarters unlike the governmental assembly in the first zone. The fence causes a severe destruction in the attached buildings due to the loss of privacy factor within the limitations of accessibility inside neighborhoods.

#### **5.5.3.2 The impacts on Land use**

##### **5.5.3.2.1 Section C1-C1**

In 1917 AL-Rasheed street provides a clear separation between the residential area which extends up to the external wall to the east from one side and the mixed land use which extends up to AL-Mustansir street from the other side where most of the public buildings and facilities are built along the river. In 1962 The section passes through the residential land use that is

restricted between sheik Omar street and AL-Khulapha street where both are aligned by private and public buildings used for light industry and commercial use. The land use distribution was altered after the construction of AL-Kifah street inside the old residential area by having a mixed land use with relatively more than two storey buildings. The destruction in the residential area has deduced many parts from the existing neighborhoods regardless to the coherence among the composed urban elements especially during the construction of both AL-Khulapha street and Maidan. This has exposed many houses from the remained area to face the destructed land along the street. The mixed land use was enhanced along AL-Rasheed street and in the area up to AL-Mustansir street where commercial use extended up to the river.

In 2009, commercial and administrative multi storey buildings were erected only in the right side along AL-Khulapha street while the other part was left without development and their parcels were bordered by fence to isolate the residential units from the street. The residential area restricted between AL-Khulapha street and AL-Rasheed street was surrounded by a row of multi storey buildings from all sides, which extended inside the neighborhoods and transformed many building types to adapt the commercial facilities. The transformation process was increased in the area between AL-Rasheed street and AL-Mustansir street where many traditional houses were used as commercial centres, printing houses and bookshops. AL-Mutanabi street was converted into a pedestrian walkway and connected to old Sari market that participated in readapting the use of many public historical buildings. However, this has encouraged the destruction of many existing historical buildings within the old residential neighborhoods and were transformed into a commercial use instead of a mixed land use. This comparison of the section development in different periods (1917, 1962, 2009) could be seen obviously in Fig. (5.57).

#### 5.5.3.2.2 Section C2-C2

In 1917 the section showed the prevailing of residential use up to AL-Khulapha street. The section then passed relatively a mixed land use where many private and public buildings lined along the start segment of the market moving toward educational and religious area up to the river. In 1962, the new AL-Kifah street provided a new mixed land use artery within the residential area which continued within a compact form up to AL-Khulapha street. The new Maidan bus station is considered part of the continuous destruction in the residential urban fabric. Large parts were removed to be substituted by urban public space used as bus station and parking lots between the residential area and the mixed land use one that extended to the

river where the main religious and educational public buildings have occupied the river frontage area.

In 2009, the section continued with residential use between AL-Kifah street and AL-Khulapha street and stopped with vacant plots along AL-Khulapha street where the edge of residential parts tends to be more public by having more than two storeys used for commercial and residential uses. AL-Kifah street had less impacts on the area around because of its form and configuration that kept the traces of the traditional corridors which could be accessed and connected visually in spite of the street path that crosses them. The buildings on both sides have maximum three storeys with arcades along the two lanes from both sides. The construction of the wide AL-Khulapha street has affected the nature of the area. The buildings on one side were not constructed and many vacant areas were left attached to the residential area that was bordered by high fence to isolate it from the street. The other part was developed partly like the way that was planned for the street to be the main large-scale avenue in the old core but still many buildings were not constructed or were built with different height.

Maidan, on the other hand, was surrounded by high rise buildings as part of developing AL-Khulapha street to provide a vertical separation from the adjacent area from both sides and to connect both AL-Rasheed and AL-Khulapha streets together. The multi storey buildings cordon with different height was composed by both AL-Khulapha and AL-Rasheed streets and it has increased the transformation process inside the mixed land use area in between. The devastation of the most historical buildings from AL-Rasheed street up to AL-Mustansir street motivated the owners to substitute old Khans by modern commercial buildings especially for those along Harj old market. Most of the residents left their houses as result of bad conditions of the building structure. The main religious and educational buildings have also experienced a real change in their size, type and connectivity within the surroundings. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.58).

#### **5.5.3.2.3 Section C3-C3**

In 1917 the section shows the city wall attached to compact residential neighborhoods that were extended up to the old Maidan in front of the city castle which is considered the start point of the AL-Rasheed street that separates the old mixed land use area from the military functions. In 1962 the first section showed a new block within the old city border that was specified for commercial and light industry uses. It was rowed along the main street that is heading towards Bab AL-Mudham bridge to substitute the trace of the old wall. The public

buildings that occupied the block varied in size and height between 1-3 storeys and were separated from the traditional residential neighborhoods by secondary semipublic street. The compact residential neighborhoods stopped up to AL-Khulapha street and then continued up to AL-Rasheed street. The frontage houses were exposed directly to the street from both sides and some started to be exposed to AL-Rasheed street where the removal process started to take place in front of the Ministry of Defense assembly that substituted the old castle.

In 2009, the section then passed through an empty plot that was planned to be occupied by a multi storey building as part of filling the aligned blocks of AL-Khulapha street. It was bordered by 2-3 m height of a concrete fence form the left side of AL-Khulapha street to provide as much privacy for the neighborhoods behind. As shown in the section a large renovation project was partly achieved along AL-Khulapha street from the other side by introducing a new type of mixed land use inside the old core. A cordon of highrise buildings surrounded the traditional area from three sides while the fourth side along AL-Rasheed street was occupied by administrative and cultural buildings. This cordon within Maidan as shown in the second section has accelerated the destruction in the residential area inside. The multi storey buildings with large plots along AL-Khulapha street and Maidan motivated more destruction behind the buffer semipublic street than AL-Rasheed street did which has less impacts due to the direct attachment of the frontage plots to the surrounded fabric. The row of the multi storey buildings along both Maidan and AL-Khulapha street was separated from the residential quarter in the backside by a secondary car street with 5 m width as transitional semipublic space between the implanted buildings and the neighborhoods. The remains of residential neighborhoods are restricted from all parts by the new structure which allowed more destruction and decay in many parts like lining cul de sac back entrance to the National Library from AL-Khulapha street. The section passes the assembly of the national library with maximum 3 floors leaving wide destruction on the neighborhood attached to it. The gate of the national library assembly with high fence along AL-Rasheed street faces the monumental gate of the ministry of defense assembly. The section relatively passes two storey buildings of the ministry of defense assembly up to the river. The military function of this area has restricted the accessibility towards the river and affected the integration within the whole new developed part. The section shows that providing new types of housing system has participated potentially in increasing the destruction of the traditional one due to the disparities in form and societies that live in. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.59).

#### 5.5.3.2.4 Conclusion

The selected sections show that residential area attempts to survive each time through any destruction process by resetting the relationship between privacy and publicity through creating a proper buffer zone around the inserted modern part to ensure a safe accessibility to the more private units. Creating new car streets and adding more building types with different land uses patterns near the traditional ones have accelerated the transformation process by increasing the area assigned to public facilities. This area, however, has been extended gradually to the private one. The interruption occurred by cutting several streets associated with barriers of tall buildings which has affected the accessibility of residents to the main mosques for Friday or daily prayers. Besides, it has also affected the reach to the main old historical monuments which were restrictedly visited during certain days; yet such movement was rather hindered towards the river.

The sections have also demonstrated that having multi large avenue car streets with a variety in their functions inside the old core could encourage a wide scale deterioration in creating many connections to the main places and monuments that spread overall the urban structure or increasing the tendency to destruct the area behind the frontage area. According to the urban scene provided by the sections inside this zone, the area between AL-Khulapha and AL-Rasheed streets has undertaken different reactions. The first section passes through highly transformed area parallel to the main vertical connector that is directed to AL-Shuhada bridge while the second one passes through the main public space that is used as garage and bus station. The area between AL-Khulapha and AL-Rasheed streets is considered more residential with having mixed land use on the periphery area as a result of the extension of the modern urban structure behind the aligned public building along both streets. It is clear that there is a graduation from residential area to mixed land use reaching the main governmental and cultural zone along the river between AL-Rasheed and AL-Mustansir streets. This belongs to the location of this zone, far from the main traditional Shorja market where all public facilities concentrate along the river frontage area and reach vertically through the car streets that connect AL-Rasheed street to AL-Mustansir street and also to the existing pedestrian ones. The two car streets between AL-Mustansir and AL-Rasheed have motivated transference of many traditional ones to maintain more mix land use. AL-Rasheed street is considered of a higher priority than AL-Khulapha street due to its cultural and administrative importance and its connection to Maidan. Indeed, Maidan is a main open space that connects both streets together. The main public land uses were allocated along the river which is partly accessible due to the military and administrative function that enhances the mixed land use

along the vertical artery AL-Mutanabi street then to be connected to the old Sarai market hence affecting the continuity of the first market segment Sug AL-Haraj.

### **5.5.3.3 The Impacts on Proportion**

#### **5.5.3.3.1 Section C1-C1**

In 1917 the maximum height of buildings reached up to two storeys and only the minarets of the existing mosques have prevailed the city skyline within the clock tower in Qushla. The residential neighborhoods have small plot sizes as shown in the aerial image and those plots are getting bigger near AL-Aquliya mosque up to AL-Rasheed street, precisely in the area that was substituted later by the vertical street which connects both AL-Khulapha and AL-Rasheed streets heading to AL-Shuhada bridge. The section shows the majority of bigger plots in the mixed land use area that is restricted between AL-Rasheed street and the river frontage area. In 1962 the situation was getting more fragmented in comparison to the last period. The residential neighborhoods have continued to maintain the compact form by having maximum two storeys in spite of the penetration of AL-Kifah street most of those aligned buildings have kept the same proportion on both sides. It was obvious in the section background that many buildings started to reach three floors especially in the vertical streets that intersected the horizontal streets and directed to the river. The initial buildings along AL-Khulapha street began to be displayed in the background where multi storey buildings started to be planted along the new wide boulevard. The first section kept the same proportion and height up to the river far away from the previous action area where high rise buildings were dominating the urban scene along both AL-Khulapha and AL-Rasheed streets near the market area.

In 2009, the proportion of the traditional residential area kept the maximum of two floors between Sheik Omar street and AL-Khulapha street. The residential neighborhoods experienced a wide destruction process and the frontage houses were exposed directly to the public main AL-Khulapha street. The types gradually changed to multi storey housing and commercial buildings that could adopt the change in privacy in spite of having long fence that bordered this area. Multi storey buildings on the other side of the street have dominated the city skyline and imposed lack of privacy as they have exposed the residential area behind. The transect goes through AL-Kifah street up to AL-Khulapha street with relatively small plot size and two-storey buildings that sometimes turn to maximum three storeys in the background along the main vertical streets. The plot size varied due to the impacts of AL-Khulapha Street that is considered the higher point in this section. The buildings then kept the height more or less with a maximum limit of 3 storeys up to AL-Rasheed street. AL-Mutanabi street followed

suit with relatively 1-3 storey buildings with big parcel size that dates back to different historical periods up to the river frontage area. The first section showed a horizontal skyline somehow with few high scale buildings along AL-Khulapha street that are distinguished from the action area behind where large mass of multi storey buildings erect in the midst of the economic core of the city that belongs to AL-Rusafi multi storey parking and the financial assembly. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.57).

#### **5.5.3.3.2 Section C2-C2**

In 1917, the section passed the compact residential neighborhoods with maximum two storeys up to the AL-Rasheed street where Haidar Khana mosque dominates the urban scene in this zone as shown in the section background. AL-Ahmadiya mosque occupies big parcels along the main old market artery where commercial buildings, khans and coffee shops are aligned along its path up to AL-Mustansir street. The riverfront area was occupied by religious, educational and administrative buildings with two storey buildings and large parcels. The section revealed different reaction in 1962 where large destruction removed many residential units to be substituted by Maidan that was used as a bus terminal, dominating the urban scene with its long distance between AL-Khulapha street and AL-Rasheed street. The residential units with maximum two storey buildings are exposed directly to AL-Rasheed street through Maidan. No high rise buildings along AL-Khulapha street were built yet and all blocks were waiting to be occupied. The area between AL-Rasheed street up to the river witnessed the first multi storey building (AL-Aqari bank) belong to grants loans adjacent to Sulaimanya mosque and school at the end of the market artery. This 5 floor building dominates the urban scene in this area and still does in the highest point in the area adjacent to the river.

In 2009 the second section passed Maidan as a main open area that occupies the whole section between AL-Khulapha and AL-Rasheed streets with about 240 m length. It works as an intermediate zone between the residential area that is located between AL-Khulapha street and Sheik Omar street and the public area between AL-Rasheed and the Tigris river. The section horizontally showed a maximum two storey buildings with no high barriers but with voids represented by Maidan. The background behind Maidan showed a variation of multi storey buildings on both sides as part of AL-Khulapha street and then moved to the two storey traditional public buildings that cover large plots up to the river. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.58).



### 5.5.3.3.3 Section C3-C3

In 1917, the section revealed compact residential units up to the castle across AL-Rasheed street which has been occupied by a large courtyard building that mediates a big parcel of the castle. Only the existed mosques dominate the urban scene at that time with their long minaret. In 1962 the destruction started by eliminating many houses during the construction of AL-Khulapha street. The section started with relatively maximum two-storey buildings at the old city border where AL-Khulapha street extends to 30 m width up to the second part of the destructed neighborhoods that also started partly to experience destruction from the other side along AL-Rasheed street. The section ended with new building types that belong to the Ministry of Defense that reached to a maximum of three floors up to the river. In 2009, the high rise buildings in this section increased the segregation between the start point and the end point near the river. The concentration of the high-rise building between AL-Khulapha street and AL-Rasheed street and also along Maidan created a kind of isolated zone that dominates the urban scene rather than the military assembly which was isolated totally from the whole city. The scale of urban historical monuments was lost within the increase in the surrounded building proportion in spite of enlarging their parcels. The surrounded buildings combined both public institutes and large scale housing projects within the assembly of the national library that has occupied approximately 40000 sq.m while the historical area has occupied the rest within 3500 sq.m. The clash in proportion is so obvious between the traditional housing system and the multi storey housing project that surrounded the whole area. The traditional area started to diminish and deteriorate in some parts following the rule of the gated communities. The location of residential units inside a cordon of mixed uses has created a highly decayed area within the whole city. The third section shows military use in the large assembly that is formed in a symmetrical way. The main entrance leads to the U shape assembly of buildings with close façade to the river. The large area of both military assembly, national library and the mix land use buildings has affected the accessibility and the visual connectivity among all available historical monuments. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.59).

### 5.5.3.3.4 Conclusion

The selected sections uncovered an obvious conflict in proportion between the old and new urban space concept. Maidan revealed the impacts of having large plaza inside the city that interrupted the soft movement from smaller inward courtyards houses with traditional corridors toward the public inward looking courtyards buildings between the residential area and the

river. The new inserted out looking buildings in this part have created many barriers that isolated the neighborhoods in addition to the restricted area which is assigned to the military and administrative functions. More specifications were given to the riverfront area because of the variant functions that were integrated to each other and well connected to the private residential use. The skyline was dominated by Qushla clock tower along the river and was competed by another 5 storey building of the property bank along AL-Mustansir street and also the multi storey buildings that were set in order along AL-Khulapha street and surrounded Maidan. Inserting large scale project has dominated the urban scene and isolated Maidan and many traditional residential neighborhoods from the entire city. This part was connected and more integrated to the Bab AL-Mudham area out of the city wall where many governmental multi storey buildings are located there.

### **5.5.3.4 The Impacts on the Historical Monuments**

#### **5.5.3.4.1 Section C1-C1**

The first section of 1917 as shown in the historical aerial image, indicated the compactness in urban fabric where local mosques are aligned along the neighborhood streets to create a kind of focal points that should be followed to reach the main arteries that pass through the historical monuments like big mosques and shrines, market and the main public area. The section shows big parcels that were occupied by public buildings along the river which represent the main administrative, military and educational part along the river.

In 1962, the coherence among historical monuments disappeared and the main mosques and shrines became more local for a specific neighborhood and not easily accessible by other neighborhoods. The section lines through Sarai market which is attached to the old Ottoman school and both are considered the main monuments that kept their position adjacent to the river frontage area and are accessible by pedestrians and vehicles as an integrated part within the main administrative centre of the city. In 2009 the situation looks worse concerning the functional usage and the accessibility of the historical monuments. The section penetrated the area between Sheik Omar street and AL-Khulapha street showing the coherence of the agglomeration of the historical houses in compact way that keeps its unity in spite of the penetration of AL-Kifah. The cordon of multi storey buildings along both AL-Khulpha street, AL-Rasheed street and their vertical connectors, has affected the accessibility to the main historical mosques in the neighborhoods that are located in between like AL-Aquliya mosque that was isolated from the other parts of the city. The new streets and their aligned building types are extended to the neighborhoods with bigger plots behind and affected the dominance

of the mosques as it was in the old fabric by introducing new building types. The transect through AL-Rasheed street and along the frontage buildings of AL-Mutanabi street showed attached masterpieces of architecture that date back to different periods up to the river. The point where AL-Mutanabi and AL-Mustansir streets meet together are considered the start for pedestrians to access a series of covered traditional markets. Both streets were restricted recently to pedestrian after the severe attack in 2006. The car restriction creates more connectivity and increase the accessibility to many artifacts along AL-Mustansir street. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.57).

#### **5.5.3.4.2 Section C2-C2**

The second section in 1917 shows the separation created between the compact residential neighborhoods and the mixed land use area that includes many main mosques and commercial buildings along the main market artery. The public historical institutes were agglomerated along the river as a complementary part of the old castle. AL-Mustansir street provides the connectivity among the whole monuments along both river public area and the opposed mixed land use. In 1962, the main public monuments were not more integrated to residential neighborhoods and act as focal points along the main car streets. The connectivity between the existed monuments diminished especially after detaching the main mosques from the surrounded area. The historical monuments along the river have deteriorated and some were replaced by some military offices and administrative that hindered the accessibility to other adjacent monuments along the river. The neighborhoods faced several interruptions done by AL-Kifah street and AL-Khulapha street which both have triggered removal of wide parts to construct Maidan bus terminal. The neighborhood mosque became more local and lost its accessibility via the other parts of the city.

The section continues to pass through Maidan and moves to the historical mixed land use and public zone. Maidan is considered the start point to move toward a series of traditional buildings that date back to many historical periods. The change in plot size of those historical buildings were difficult due to the property value and the mutual integration between multi functional buildings that were constructed through different historical periods. The only change may have occurred to the type by having buildings with more external facades. In 2009 the historical monuments became more isolated and hardly accessible. Maidan has motivated pedestrians to use the car street parallel to the ministry of defense assembly instead of the traditional entry that is heading towards AL-Mustansir street. The high rise building located on both sides of Maidan has restricted the horizontal connection between the historical

monuments and enhanced the role of AL- Rasheed to be the start point for many car and pedestrian street toward the river. The assembly of the main historical buildings along both the river frontage area and AL-Mustansir street has limited the negative impacts of any intervention with new types. This is attributed to the relationship between the inward and outward looking plan types and the soft gradation in urban space hierarchy from public space to private one. The multi storey building of the industrial bank was surrounded by historical buildings with public use that worked to limit the tendency to have more extension for any new urban pattern. Added to that are the building types that have relatively bad impacts that cause visual isolation and disparities in scale. Recently the mosques are directed by the endowments institutions which try to change or add many parts that affect their accessibility as a result of changing the traditional arteries directions or cause destruction in the adjacent monuments. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.58).

#### **5.5.3.4.3 Section C3-C3**

In 1917 the section shows the isolation of the castle from the entire city since it stands as an independent part in the city. The street along the castle which was historically called Maidan, later became the start segment of AL-Rasheed street that separates the administrative zone from the residential neighborhoods. This resulted in having a kind of mixed land use facilities along the street frontage area opposed to the castle and other entertainment facilities aligned to the castle wall. The old castle is only accessible from the north gate and linked to the historical monuments along the river by having a pedestrian walkway parallel to the Castle southern wall. In 1962, the aerial photo showed the devastation of the old castle which was substituted by the ministry of defense assembly and was isolated from the entire city due to its peculiar function which requires more security. The new Maidan public space participated in destroying many historical monuments and led the area in front of the defense Ministry to be substituted by other public and private functions. In 2009 the first section shows the huge mass of the new implanted structure that belongs to the national library assembly and the multi storey buildings along the main car streets which overcome the existed two historical monuments (Mary church and Muradiya mosque) that were located along the interrupted traditional artery. Maidan as main urban public space restricted the movement through this artery and directed the people to access both monuments from the main surrounded streets. The church was accessed from AL-Khulapha street and the mosque from AL-Rasheed street instead of having a direct link through the residential area. Both monuments were enlarged to be distinguished from the large mass of buildings around. All monuments attached to the fence of the defense ministry assembly were hardly accessed by users and were kept as scattered

monuments. The remaining historical mosques within the ministry of defense assembly were restricted inside the protected zone. The assembly isolated the area from the riverfront and directed all users to consider Maidan as the main start point to be moved toward the main three streets (AL-Khulapha street, AL-Rasheed street and AL-Mustansir street). This comparison of the section development in different periods (1917, 1962, 2009) could be seen obviously in Fig. (5.59).

#### **5.5.3.4.4 Conclusion**

The three sections showed how the implanted streets changed the movement direction in each morphological period. AL-Rasheed street altered the direction of movement to be horizontal toward the Shorja market in the next action area instead of directing people toward the river. The zone between both AL-Rasheed street and AL-Mustansir street has relatively large parcels that were occupied by main public buildings and houses that belong to notable people at the Ottoman period. The historical monuments along AL-Mustansir street became more accessible by vehicles rather than pedestrians because of the vertical streets that were heading toward the river direction. Some of the old mosques and governmental buildings were enlarged and their type was altered far from the original one throughout time. The main mosques and monuments were aligned along AL-Rasheed street that participated in isolating them from the adjacent area in addition to the part destruction that occurred around. The monuments located in the neighborhoods between AL-Rasheed street and AL-Musansir street lost their role as a result of changing the movement direction toward the car streets instead of the traditional pedestrian one. Many monuments were isolated because of the existence of the ministry of defense assembly that restricted the accessibility and hindered the connectivity within the rest of public area, especially the main market. In the area that was restricted between AL-Rasheed street and AL-Khulpha street, many monuments became more local instead of their original location as main focal points along main arteries. The area between AL-Khulapha street and Shaik Omar street had many local mosques which still play their role in the most conservative residential part while the main mosques and shrines also became more local and they belong to the neighborhoods around.

### 5.5.3.5 The Impacts on the Building Types

#### 5.5.3.5.1 Section C1-C1

In 1917 the compact system of the traditional fabric kept the integration between urban space and the building types that always overlooked on an internal courtyard. At the late Ottoman period, an outward looking public building were exposed directly to the wide street along both AL-Rasheed street and AL-Mustanasir. Both types kept their mutual coherence due to their location in public area and also to the harmony of their proportion that kept the maximum of two floors within the city skyline that increased the tendency to pave more streets. In 1962 the situation went in a different direction when the new streets of AL-Kifah and AL-Khulapha initiated inside the old fabric. Free standing buildings occupied the blocks along the streets and altered the traditional relationship between space and buildings where they were exposed to the surroundings from two directions and sometimes from four directions. In 2009 the modern multi storey building types spread along the main car streets especially after filling up the blocks along AL-Khulapha street. Public buildings neglected the courtyard system and houses started to leave the wooden or brick balconies and to be more outward looking to the streets. The section shows a variation in building types and their interaction within other urban elements to form the urban structure. It lined through buildings with variant architectural style especially the Art Deco and Art Neveau one in AL-Mutanabi street that have a continuity within the main arcaded street type of AL-Rasheed street. The transect ended with an arcaded market that is attached to the Ottoman military school which has both inward and outward looking pattern composing together with Qushla a public urban space and connecting the river frontage area to AL-Mutanabi street. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.57).

#### 5.5.3.5.2 Section C2-C2

In 1917, the section shows the compact inward looking planning system for both the residential area and the public buildings up to the river passing through traditional covered market passage that is always located in between public courtyard buildings with big parcels. In 1962 the destruction occurred by lining both AL-Kifah street and AL-Khulapha street. A sudden interruption occurred when new high rise building type that belongs to the Industrial Bank were inserted inside and along both AL-Mustansir street and the collector street that connects AL-Rasheed street to AL-Mustansir street. Introducing the new building type in this area caused a confusion in the relation between the built up area and its surrounded space. The buildings did not cover the whole plot like the other traditional buildings and left many lost spaces around which has affected the accessibility to the surrounded monuments. The

residential area that passes through the transects kept the systematic way of interaction without too much alteration in their compactness that may belong to their location far away from the public area and the main market but with an alteration in the housing types that started to neglect the courtyard. In 2009 the situation was different especially for the building types in the area between AL-Khulapha street and AL-Rasheed street thus having an international architectural style of modernism that varies in height, plot size and orientation. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.58).

#### **5.5.3.5.3 Section C3-C3**

In 1917 the section shows compact courtyard houses attached to the old wall that extended up to AL-Rasheed street where some retail shops and recreation buildings spread on both sides before passing the old castle where two courtyard buildings mediate large parcel inside the wall. In 1962 the situation looked different where the courtyard houses started to be removed gradually through the destruction process. The section penetrates an assembly of the defense ministry which substitutes the old castle and was designed to be gated and isolated from the adjacent area. The assembly consists of several buildings that covers the whole area in a symmetrical way. It is obvious, in 2009, that the availability of large vacant parcels belongs to a group of decayed traditional buildings that pass by the transect. The houses were restricted inside a cordon of free standing housing and administrative complex that was built by TAC group as mentioned in chapter three. The house types were altered to be more outward looking neglecting the courtyard system and sometimes moved to have multi floors especially for the houses that are exposed AL-Khulapha street. This comparison of the section development in different periods (1917,1962,2009) could be seen obviously in Fig. (5.59).

#### **5.5.3.5.4 Conclusion**

A variation of housing types that belong to several morphological periods could be found through the pure residential area between Shaik Omar street and AL-Khulapha street. The housing types could be found in many forms after a long period of transformation process and could be characterized as follows: Frist floor and second floor traditional courtyard houses , Covered courtyard houses, renovated traditional houses with totally new materials, new constructed modern houses with big windows and sometimes with open balconies and finally more than three storey houses used as apartment with an external entrance. The large scale buildings affect the relationship between public land use and the private residential

neighborhoods. The backside buildings match the international style by transferring many pure residential areas to mix land use pattern. Those new building types crashed both the private traditional houses and the traditional public buildings which have maximum two storeys. Some of those building types were designed by Iraqi architects using the traditional material and the old courtyard system but they have still affected the coherence of the urban fabric because they were planted as free standing buildings that segregated the continuity of the traditional arteries and dominated the urban scene creating new urban poles in the old core. The neighborhoods behind the frontage buildings along AL-Khulapha that were rowed with front and back elevation, had sever impacts that varied according to their height but in general they affected the street hierarchy and motivated the opposite residential buildings to change their types and adapt their privacy to be more public as the blocks were not built yet. They used to get the benefit from the economical type of the frontage buildings along the main streets to provide more facilities for the local residence at the same time.

## **5.6 The change in urban space Structure and Hierarchy- Traditional Pedestrian Network Vs. New Car Streets**

### **5.6.1 Hierarchy in the Vehicle Streets as Traffic Conveyors**

The four car streets that penetrates the old fabric from north to south differs in geometry, width, connection to the pedestrian network and the linkage to the entire city of Baghdad. AL-Khulapha street is considered the highest priority in carrying the higher traffic volume through two wide lanes. It brings three main streets together from outside the city core and has the potential to link different focal points that are located along its segments. The car movement through the streets is thought to be faster in spite of the existence of the traffic intersections within the vertical street toward the river along its segment. That belongs to the less pedestrian traditional arteries which can access and cross the street to reach their complementary parts because they are hindered by a row of attached buildings along its frontages from both sides. AL-Rasheed street could be ranged as second priority in carrying the traffic volume because of its narrow lanes. The traffic segment is not straight and interrupted several times by the intersection nodes within the streets that move up to the bridges across the river. The variety in functions along its segment has delayed the traffic flow along the streets where pedestrians move through old arteries and cross the street to reach the complementary parts of the interrupted main and secondary traditional pedestrian arteries. The street brings two streets together from the north and south outside the city with seven arteries linked to AL-Khulapha



street but the main emphasis is to provide connectivity within the internal focal points along its segments like the market network, governmental buildings and historical monuments. Although the street was built for vehicles as main movement pattern but the colonnaded walkways on both sides keep the largest number of pedestrians to move along its segment and to be connected to the old interrupted traditional arteries on both sides. AL-Kifah street takes the third priority in attracting car traffic volume because it starts from the main vertical artery that connects Bab AL-Mudham bridge toward east and ends in AL-Khulapha street yet it does not achieve direct horizontal connections to the main streets outside the old core.

The street is located within a highly condensed residential area and was firstly constructed to be integrated within AL-Rasheed street by creating a ring within the old city that was mediated later by the construction of AL-Khulapha street. The traffic volume is moderate in this artery in spite of its narrow width. Pedestrians mostly use the colonnade walkways to move along the street on both sides to get connected with the wide network of traditional pedestrian alleyways on both sides in spite of their interruption by the street. The fourth street within the car traffic hierarchy belongs to Sheik Omar street which is located at the periphery of the old city and specialized to accommodate light industries and car maintenance retail shops. The traffic volume is limited to the users regarding the street function; its connectivity is only to AL-Nidhal street through AL-Tayran square in the south. AL-Mustansir street has special hierarchy as a combined pedestrian and car street in some parts. It is considered the end destination for the secondary car street that is branched from AL-Rasheed street to reach market and old traditional buildings along both sides providing accessibility to the riverfront area. The car movement inside has been hindered later and is allowed only for limited conditions encouraging more pedestrians to access this area.

### **5.6.2 The Public Space Hierarchy in The Old City – Urban Hybrid Space After the Transformation Process**

The new streets have imposed a new urban structure and new hierarchy regarding the configuration of each street structure, the building types that shaped the streets and the inserted public spaces types. The traditional streets have experienced a huge change in their hierarchy and type by converting many pedestrian streets into car streets or by destructing many parts to be converted into other public space types. Shorja pedestrian artery is considered of higher priority as it provides the coherence for the fragmented parts of the city as main historical spine. It still works as a main whole trade commercial centre for the entire city of Baghdad connecting AL-Kifah street to AL-Mustansir street. The surrounded area along its path is still attracting many commercial activities that accelerate the transformation process

within the absence of urban management. This can be noticed in adjacent residential neighborhoods that experience a significant change in building types with relatively big parcels moving from traditional two storeys up to multi storey buildings. The historical monuments along the interrupted car street work as joint and focal points to reconnect the segments of the Shorja artery in spite of detaching them from the surrounded area. AL-Mustansir street is considered the main connector that feeds both Shorja artery and AL-Rasheed car street where most of the historical part is assigned to motivate many financial institutes which are located along its path adjacent to the river within the market network area. AL-Mustansir street provides a pedestrian walkway from the northern part of the city to the south end; its existence enhances the vertical orientation towards the river as a transit space with relatively big parcels and monumental building with variant functions. The combined movement between pedestrians and cars in the administrative part reduces the accessibility and social interaction along the street which has increased later after restricting car movement for security purposes and this shows an indication that pedestrian walkways are the most social and safe places to provide vitality and to create more activities other than being car streets. AL-Rasheed street is of a higher hierarchy as a hybrid urban space and is considered increasingly representative to reflect the development in architecture through decades. The street has direct connection to many historical main arteries like Shorja, AL-Mustansir and other public and semipublic spines that were variously interrupted. The interrupted traditional arteries can be followed visually from both street sides as frontage buildings are attached to the historical fabric and not isolated like in AL-Khulapha street. AL-Rasheed street is considered more public as it owns some cultural, historical and recreational characteristics and engulfs many governmental institutes; yet it is, at the same time, considered a harmful factor that has induced more destruction and accelerated the transformation process in the surrounded area. The parcels are relatively smaller than AL-Khulapha street with a limited number of floors but in some parts AL-Rasheed exceeds AL-Khulapha street in the proportion of the buildings and the dominance of the skyline as in the financial and banking assembly and some high rise governmental buildings. AL-Khulapha street is considered the main boulevard and modern economic centre with high rise buildings and wide street section that splits the main Shorja market in two parts. It was constructed to mediate both AL-Rasheed street and AL-Kifah street and divides the city into two parts. It hinders the continuity of many historical arteries by having a series of blocks with high-rise buildings on both sides that detached from the neighborhoods behind.

The construction was done along the street through two planning methods: the first was done by having a row of multi storey buildings attached to each other from both sides with many parts that were left empty, while the second method was done by constructing free stranding

multi storey buildings that were surrounded by a public space as in the governmental assembly to make a part of the civic centre. These different styles show the importance of the street as a main economical and governmental centre. The concentration of high rise buildings that were achieved on both sides could be found in three main parts as many parts in between were not completely filled. These points are in Bab AL-Mudham project as residential and governmental part, the part near Shorja market in the middle of the street and at the end where the civil centre has occupied a large area inside the old city within AL-Khulani square. The significance of the street has diminished within the process of growth of the city of Baghdad that has led to the sprouting up of many commercial and governmental centres. AL-Kifah street, on the other hand, has kept its moderate level to serve both local and external users with various commercial activities within the old core. The surrounded buildings have more or less followed the human scale by having colonnaded sidewalks on both sides connected to the interrupted local residential neighborhoods that could be followed visually from one side to the other. The street has a direct linkage within AL-Khulapha street and Shorja artery and both have influenced AL-Kifah street to accommodate the whole trade commerce together within the local retail shops. The car movement is limited as it has no direct connection to the main street outside the old city. Sheik Omar street has kept its position as an industrial zone located on the periphery of old city with many retail shops specified for car maintenance and light industry with no attractiveness for other functions to take place along its path.

### **5.6.3 Urban Public and Private Space Conflict**

The clash between old and new structure is significant in the old core that affects the series of hierarchy in moving from public space to the private residential unit. New car streets had replaced the existing urban structure and increased the segregation by exposing the survived parts of the residential neighborhoods to be attached directly to the deducted parts that were removed and transformed to urban public space. It was concluded that the impacts of any intervention inside the old city (through removing parts of the traditional urban fabric or widening streets) depend on its exact position within the entire space hierarchy of the old city. The intervention within the traditional semipublic and public space and their adjacent area has less impact on the residential neighborhoods than on where it was placed with geometrical defined border directly regardless of the traditional streets' hierarchy and their relation to the surrounded built-up area. For example, widening a traditional public or semipublic street will have less impact than on widening or removing neighborhood streets or removing an entire part bordered by the traces of old arteries. The neighborhoods have changed into separated clusters that were isolated by wide car streets thus creating undefined area between the new

structure and old one. The new streets and other urban space types have different physical and visual characteristics in their connectivity and proportion like having boulevard, avenue, or local streets; accordingly, they have imposed new hierarchy for the area behind along with new building types and functions. Sometimes, inserting new building types may accelerate the transformation within the adjacent traditional buildings by inserting new relations between building and space, which extends consecutively, setting a new hierarchy of urban space inside the neighborhood. The result was a rapid transformation process in the neighborhoods producing urban hybrids space resulted from the interactions among different urban patterns accompanied by a high sense of blurring between publicity and privacy. The new urban space pattern has altered the old urban space hierarchy and founded a new setting based on the original land use pattern before the intervention and the new proposed one. The traditional urban public space arteries that were interrupted by the new street react as complementary part while the old private one in the residential area has more negative impacts and in many cases has been transformed into a public or semipublic space process to accommodate the new land use pattern in the new street. Having more public streets around the residential neighborhoods with new building types has reduced the level of the privacy by transforming many interrupted semiprivate arteries into semipublic ones. The original land use of the interrupted traditional urban fabric has varied in reaction where new commercial public space penetrates the entire city structure. The new streets that penetrate the commercial land use in the old fabric always accelerate the transformation process; then they are expanded in a wide area along the commercial arteries to reach inside the neighborhoods by means of altering the building types like in Shorja market artery and its wide expansion. The impacts on the residential area that is located far from the old commercial artery are considered less as they work to reset their internal space hierarchy to keep as much privacy as possible. The area for non residential people may reveal a drastic transformation process taking into account that the public facilities have already expanded and impacted the residential area. Such kind of people can move easily inside the transformed area while it is hard to do this in the more private residential area. In the clashed area where private and public get suddenly together, it is necessary to reset the urban space hierarchy in the hybrid urban structure by defining the area between different patterns. Creating a neighborhood space is regarded with high priority in any conservation strategies to reconnect both public and private spaces together through reestablishing a movement chain from a highly accessible level to the lower one. It works as a buffer zone and a common space to keep the connection between private and public spaces.

The traditional cities were exposed to many changes in their form and structure in addition to hierarchy as mentioned before. New streets are imposed to shape the internal lanes after reducing their privacy and neglecting the non straight angles by widening and striating process trying in many times to allow private cars to enter to the narrow street. The neighborhoods have started to have geometrical shapes after the potential change in the structure of the surrounded area along the main car streets. The methodologies to produce new urban concept in the city of Baghdad were based on destructing wide area to be replaced by car streets, modern buildings or big plazas. Sometimes, new buildings types were inserted as free standing type and surrounded by secondary streets as an interval part to separate them from the old structure. The destruction in old fabric has less impacts on the adjacent neighborhoods when it was restricted in the area between the main public and semipublic traditional streets while it has more impacts when it was done within a defined geometrical block, having the cut through old passages and buildings. The main public traditional street in Shorja played a big role to stabilize the coherence in urban structure in spite of it is being considered the main element that motivates more transformation due to its economic importance. AL-Musatansir street, however, is considered the first and the oldest one that stands for the historical development of the city as it goes through variant building types that belong to different eras and pass through a network of specified markets. Its large plots and economical importance have motivated the initiative of the main financial centre along its course within its connectivity with the main Shorja market across AL-Rasheed street. It also has a connectivity with both the river frontage area and the surrounded residential and commercial areas. It is considered the main hub that is always reached through a vertical street toward the river in spite of its limited accessibility to the river bank. Its integration within the Shorja market makes the street a main element that provides coherence for the city. New street characteristics always alter the hierarchy of space in proportion, scale, connectivity and building types.

As for vehicle streets, AL-Rasheed is always given a higher priority as it has direct link with AL-Mustansir pedestrian street and Shorja market artery through its colonnaded walkways. The old traces of the interrupted streets could be followed visually across the street. It is considered the main economical and recreational part within the city in addition to its accessibility to mixed land use area on both sides. In parallel, the study concludes that it was considered the harmful intervention as it motivates many destructions later within its path. It passed many public important military areas and then moved through mixed land use with many important historical monuments to be connected later to the main market area. The street included many governmental and institutional offices that provide the potentiality to attract development in the surrounded area. All those potentials provide the street with the

higher priority for being the main economical, administrative and recreational centre. However, throughout history it is regarded the main element that had impacts on the surrounding area through accelerating the transformation process. AL-Khulapha street was already initiated to have a new business centre that interrupted the vertical main Shorja market artery. The existence of both AL-Rasheed street and AL-Kifah street has motivated a new artery in the middle to enhance the car connectivity through the old core. The streets have hindered totally the old pedestrian connectivity by creating a series of multi storey buildings along its path yet most of which are not achieved. The row of multi storey buildings was more or less concentrated and completed near Shroja market due to its economic importance. The governmental buildings from AL-Tahreer square up to AL-Khullani square were also of high concern and participated in splitting the old structure into segregated parts. AL-Kifah street kept the human scale and the connectivity within the residential area around. It is of less priority within the city of Baghdad but of higher priority for the residence in the old core. The present study sets the priority of the streets with both the old core and the entire city of Baghdad and finds that Shorja and AL-Mustansir arteries are still of higher priorities as main pedestrian walkways. AL-Rasheed street is of a higher priority as a main car street followed by AL-Khulapha street in spite of its wide and long course. AL-Khulapha street does not integrate with the city structure because of the visual and physical interruption made by its high attached buildings in some parts. The expansion of the city of Baghdad has reduced the role of the street as many new commercial and business centres were distributed on all districts. On its part, AL-Kifah street seems to enjoy less priority to the city of Baghdad yet it maintains a higher priority on the local level for the residence who still live in the old houses. All other parts between AL-Khulapha street up to the river miss the daily social life after the end of the working hours (3-5 pm) where less people live only in some few parts.

## **5.7 The Evaluation of old Baghdad sectors after modernization by Transect analysis**

The first zone (A) is the mostly representative one by having free standing buildings along AL-Khulapha street which provides the higher hierarchy in movement where it meets with many other streets from different directions in AL-Khullani square. However, AL-Kifah street with AL-Gailni shrine are looked at within the second priority. This is also considered the hub of Sadria traditional market. AL-Rasheed street comes after in priority and was connected to AL-Khulapha street creating new market specifications attached to the governmental buildings as part of the civic centre along AL-Khulapha street. The residential land in this zone was

always engulfed by new developed commercial and governmental area. The religious impacts of AL-Gailani shrine kept the cohesion of the residential area around the destructed parts keeping AL-Sardiya market artery as a main integrated element. The historical monuments are mostly not integrated within the pedestrian spines and they are reachable by the main car streets due to the large destruction in the traditional area. The proportion of buildings for the governmental assembly dominates the urban scene in addition to the buildings around AL-Khulani square where free standing buildings were initiated to mediate the inward-looking planning residential neighborhoods. The area that was built in the colonial period was converted to big storages because of its big plots and was remodeled to create new market specifications connecting both AL-Khulapha street and AL-Rasheed street and surrounding a traditional residential area which is now under a highly transformation process to be converted into small storages. The study comes up with a result that the governmental buildings have less impacts on the traditional urban fabric than the commercial one as the latter increased the transformation process and motivated other areas to be part of the market area. The second zone (B) is considered the main complicated one as the vertical pedestrian Shorja artery has dominated the whole urban scene and modified the hierarchy in the main four car streets by splitting the area into two parts on both sides where each part has a different reaction. Shorja starts from AL-Mustansir street to pass through the street along the banking institutes and then continues through the old covered market across AL-Rasheed street that was supported by AL-Arabi shopping centre where both meet and cross AL-Khulapha street up to AL-Kifah street. On the right side along this pedestrian artery, AL-Rasheed street enjoys a high priority as it provides an integration between AL-Mustansir street and the markets network up to AL-Khulapha street which is considered the start and end point to reach this area. AL-Mustansir street provides the accessibility to the Shorja market artery and its surrounded area and is considered as a secondary priority. AL-Khulapha Street stands as third priority to accommodate the increase of business within Shorja market. In the left area from Shorja market area the situation is getting different and AL-Rasheed street keeps its priority by being connected with the mixed-land use around and the governmental multi storey buildings while AL-Khulapha street has the second priority to serve the area of Shorja in spite of having vacant plots and buildings with different heights. AL-Kifah street occupies a third priority as a back entry to Shorja area while AL-Mustansir street loses its role as a main commercial part by adding many governmental buildings along its path facing the river within the commercial buildings and also due to the concentration of commercial activities along Shroja market artery. The hierarchy of streets is changeable and based on their connectivity and accessibility which is determined by Shorja market vertical artery. The area reflects some majority of buildings that have commercial use after the people had rented or sold their houses

which were transformed into storages. Shorja and AL-Arabi Market are obvious examples for this alteration within showing large parcels size. This situation continued across AL-Khulapha street within the extension of Shorja artery up to AL-Kifah street with residential quarters are seen on both sides. The banking area represented the main centre with higher proportion in scale and height that dominate the city and enhance the shorja artery and AL-Arabi centre. The historical monuments were scattered and their connectivity was lost by the prevailing of the commercial wholesale trade activities where the vehicles and carriages fill the walkways and car streets and hinder access to the historical monuments. The transformation process was higher because of the wholesale trade activities that have concentrated in this area and affected in losing many historical buildings. The third zone (C) shows the dominance of AL-Mustansir street as the main public artery that passed through many historical monuments and considered the start of the old market from the north gate. It was connected within AL-Rasheed street through the market and other two car streets associated with other pedestrian walkways and connected also to AL-Khulapha street through Maidan that faces the market entry. Maidan has the second priority as urban public space and has the role to combine all streets together as a main start point that is surrounded by multi storey public buildings and mixed land use area and is considered a complementary part for both AL-Rasheed street and AL-Khulapha street. AL-Rasheed Street followed both AL-Mustansir street and Maidan in priority as a main historical, commercial and recreational path. AL-Khulapha street reveals only one side with higher buildings along the boulevard from the right direction while the other side was not completed and left with fenced vacant plots where the residential area is exposed directly to AL-Rasheed street through both AL-Khulapha street and Maiden. This could be used later to reconnect the old pedestrian arteries with the riverfront area by managing or hiding the traffic in both AL-Khulapha street and Maidan. AL-Kifah street is the most local one in this section and was integrated more or less within the surrounded area by keeping the visual connectivity between the interrupted arteries. The proportion of the frontage buildings follow the human scale with maximum three storeys buildings that were integrated within the surrounded residential area. The sections move from the public area along the river through the mixed land use zone between AL-Mustansir street and AL-Khulapha street where AL-Rasheed street mediates this part up to the residential street between AL-Khulapha street and old city periphery that is mediated by AL-Kifah street. Multi storey buildings along Maidan are dominating the skyline of this zone as the highest point but the skyline of all three sections were too much affected by the multi storey buildings that are located far in the background within the followed zone. The historical monuments show a high connectivity within the arteries in spite of the large destruction that occurred in paving the main streets and Maidan area. Building types of the traditional public buildings were varied in having inward or outward



looking plan but they were integrated within the fabric in a compact way. The buildings along AL-Rasheed street, AL-Mustansir street and AL-Kifah street showed a high connectivity to the surrounded area while AL-Khulapha street and Maidan showed a modern commercial and residential multi storey type that was separated from the area behind by secondary streets. The type of having gated public buildings or secured one occupied a large area and created a kind of segregation within the old city represented by the Ministry of Defense assembly. The area reflected a possibility to be integrated together by reconnecting the old spines and using Maidan as a main space media to get benefit from the interruption that occurred in lining more multi storey buildings along AL-Khulapha street. The area has still more or less kept the human scale in the majority of its parts and the hierarchy was still dominated by the pedestrian old arteries that kept the coherence of mixed land use within the public historical part along the river.

# Chapter -6-

**Conclusion**

## Chapter Six- Conclusion

### 6.1 Final Conclusion: The Modernization Impacts in Baghdad Oriental City

The urban landscape of the old city of Baghdad experienced an accumulative destruction that strongly affected the spatial coherence like in adjacent oriental cities: Aleppo, Fez, Cairo, and holy cities like Macca. More contradictions were appeared with physical, social and cultural impacts through gathering different planning approaches. The structural conflicts increased by having different concept of developments, planning, urban form, architecture and circulation accompanying with a dramatic change in socio-economic conditions (Bianca, 2000). The transformation process in the old core was clearly linked to the general planning policies that were altered several times, providing variant urban patterns (vernacular, gridiron, radial or mixed) and following different strategies as shown in the subsequent planning approaches and master plans through expanding the city several times, set a limitation in density, combining the old core within the central business district and the alteration in land use patterns. The current city plan is a collection of different approaches and it is more or less planned under an individual political decisions and economical needs.

This could explain the reasons behind the variety of interventions in urban landscape of the old core that is considered the main financial and economical centre of the city of Baghdad. The interventions in the old city of Baghdad were done in different periods by adding new functions with new building types far from the original land use distribution along with the continuous absence of urban management strategies. The absence of management strategies for the entire city manifest interventions to be distributed in the area limited between the main vertical and horizontal car streets in the old core that were disintegrated from the other city parts. Mapping the transformation in urban landscape according to the available maps provides knowledge about the direction of development and the potential factors that permitted the new urban structure to overcome the old one. The factors belong to the continuous concentration of the main economical and whole trade centre inside the city accompanied with separating the urban land use by having wide streets connecting the surroundings through the old core. The transformation in the end of the 50s up to the 80s is considered more harmful inside the city that mediated more spontaneous transformation before and after this period. The transformation process moved from an accumulative and slow process to the time of AL-Rasheed street construction that motivated a

rapid transformation process in urban structure through various interventions by creating different commercial poles and destructing many parts on both sides to build new roads and get more accessibility to the other part of the old city. The transformation process continued in accumulative one that is always done to cope with the recent needs of the inhabitants and users.

### **6.1.1 The Impacts on The Urban Space Hierarchy**

The willing to develop the main economical centre in each period has motivated an alteration of urban space by adding new public spaces and streets each of which has different impacts on the historical urban structure. Multi urban patterns create a spatial conflict where new and old urban structures meet together. Like in Baghdad this spatial conflict is also found in Aleppo especially in Bab AL-Farj area where new streets aligned by free standing buildings penetrates the old urban fabric creating a zone estimated by 200 m width and 200 m length with many traffic nodes inside the old city. The perception and the idea of urban space and the aligned building types has changed according to the inserted urban projects, creating a continuous change in the relations among urban elements (Bianca, 2000, p. 288). In Cairo, the combination between traditional and modern types of streets altered the street hierarchy and connections causing a sever destruction. Five wide streets In Ottoman period were planned in Cairo to have the European urban pattern within the old oriental one. Radical transformations were done also in Beirut during the colonial period having severe impacts for the traditional fabrics, imposing Hasumann planning approach by establishing wide boulevards intersected through a monumental square (Jaber, 2013, p. 34). In Baghdad the failure in the interaction between the inserted urban patterns and the existing physical elements created a spatial conflict between old and new urban structures that affect the hierarchy for the entire urban space network and their associated land use pattern. The new inserted urban patterns will create more destruction inside the old fabric with the intention to have more accessibility; meanwhile it will stop the continuity of the traditional arteries since more destruction and rapid transformation will continue in the surrounded areas. The urban space hierarchy tends to be more unbalanced and produced what could be called urban hybrid space that combines the spatial concept for the new and old pattern. The hybrid urban space imposed the built up areas around to lower its privacy level where many parts became more public along the new streets within many public building types. Every new added street has changed the hierarchy of the entire space network based on functions, proportions and the aligned building types. It is emphasized that the change in space hierarchy concerning the new streets and

squares have affected the configuration and the structure of the urban elements around and altered the reaction of the traditional urban spaces. The new vehicle streets that were inserted inside the old fabric set a new hierarchy of the urban space based on their characteristics as local streets, boulevards or squares according to the type of intervention inside the city and the objectives behind. The new wide streets interrupted the consequent of the old pedestrian network inside the old fabric created different layers of connectivity within the traditional pedestrian lanes and participated in altering both direction and behavior. The city experienced an alteration in the hierarchy of pedestrian arteries and an interruption in the traditional movement pattern by inserting new traffic nodes along the main vertical and horizontal car and pedestrian streets which have altered the connectivity and the travel behavior by having three levels of movement: The first by using the new modern streets to connect the main urban monuments which belong to the inserted new modern structure, The second by using part of the old traditional arteries in connecting the main old monuments within the neighborhoods that were already limited between the new streets and finally the third by using both traditional and modern streets to move within the entire city connecting the old and new monuments. The main old public pedestrian arteries were supported the new streets that surrounded the old neighborhoods. The other interrupted semipublic and private arteries that exposed directly to the main public streets were converted to be public spaces as part of the market. This caused several interruptions in the privacy of the neighborhoods who started to use different modes of transportation and several shortcut directions to reach the required destination. The old pedestrian hierarchy has continued to change automatically in the neighborhoods until it reaches the housing units that have lost their privacy in many cases by being directly connected to the new public and semipublic spaces depending on their location within the public area and the size of the neighborhood. The new car streets that replaced old public and semipublic traditional arteries could be integrated better within the whole urban elements when they follow the same proportion for the surrounded area. The competition between traditional and car streets areas is quite clear especially where main traditional arteries with more than 3m width were gradually converted into car streets which were used by residents. The main traditional commercial arteries experienced a modification that allowed cars and trucks to reach the nearest possible points. It was emphasized that traditional pedestrian arteries still dominate the urban space hierarchy in spite of the fact that they were interrupted several times by the new streets. The intersection between both the old pedestrian AL-Mustansir street and Shorja market has created the core of the financial and business centre and provided the main inspiration to match its economic power to all car streets that intersected their path. This fact was proved later during war time when pedestrian corridors secured the old core and activated many

other ones. The short distance between the inserted streets caused a sever destruction by motivating to establish more linkages between them up to the river causing more destruction to be substituted by totally other building types exposed to the streets and increased the area of public zone within the old city. Having also more car streets in the commercial area will motivate to create more passages within the old and new building types having the possibility to transform those car streets to peddler's market corridors. It was found that the vertical streets always accelerated the transformation process. They separated the city to Four main zones as they work as bypass streets to cross the river to the other side AL-Krach. The type of the inserted urban spaces especially that of the main streets and their aligned buildings were examined. It was emphasized through the morphological process that having more car streets will create more urban space types along them and within the traditional urban fabric. The new streets that were implanted inside the old fabric have motivated different types of public urban spaces used to organize movement of pedestrians and traffic and to create various urban patterns. New streets that tended to be lined near the old commercial arteries have motivated many traffic nodes to facilitate the movement of the trucks and other storage facilities. The impacts of the main traditional commercial public spines on the adjacent residential neighborhoods is higher in the old city of Baghdad. The residential areas have started to change their type to have more than two storeys to accommodate the large demand on offices and storages in the absence of urban land management. The impacts of modernization could be indicated through the visitors' accessibility to the residential areas adjacent to the market. These residential areas are highly considered as a more transforming and more public zone within the city. The residential area that were far from the main traditional public commercial spines had less impacts even if they were interrupted by the new car streets for example, the area along AL-Kifah street has kept its coherence as old residential housing area in spite of the existence of the street as a public space; moreover, many residences are agglomerated in this area and prevent market to spread more. That also explains the priority for visitors to move within the main streets instead of using old pedestrian arteries in the residential blocks that experienced less impacts and kept the coherence of the compact urban structure.

The new hierarchy for both new and old urban public spaces have altered the building types. Sometimes new building types set a new hierarchy for the urban space when they inserted within the compact traditional urban structure. Both intervention methods accelerate the transformation process in the adjacent blocks. The building types were altered in the joints between old and new streets where the destruction was replaced by different types of traffic joints or sometimes were

left undefined; this has motivated more destruction inside the traditional neighborhoods and imposed more car streets like Shorja space and Maidan space along AL-Khulapha street that were surrounded by unbuilt area. Having more public streets with new building types will participate in converting many private corridors into more semipublic streets that could accommodate more mix land use. The research found that blocking the traditional arteries by allocating parcels to be occupied totally by buildings attached to each other along the new car streets has increased the transformation inside the old neighborhoods and altered the travel behavior by making the movement along the vertical car streets as a first priority rather than the traditional pedestrian streets. The frontage parcels along the main car streets that are attached directly to the neighborhoods at the back normally controls the privacy setting as much as possible and ensures the movement hierarchy within the traditional arteries while having a buffer street behind them has reduced the privacy setting in the neighborhoods behind. This is obvious in the traditional arteries that were interrupted by horizontal streets that were visually connected in both AL-Rasheed street and AL-Kifah street but totally blocked totally by AL-Khulapha street.

The buffer zone had two types after the modernization process: the first is the external one that is created between the traditional urban structure and the modern one at the fringe belt of the old city. The second one was the internal one that is created inside the old urban fabric and exactly in the area that witnessed a spatial conflict. This type may be converted into semipublic spaces mediating the movement from the new urban pattern to the old one or may be left as undefined and lost spaces that may be filled by functions incompatible within the surrounded land uses or motivated an extra destruction. Three Zones were under concern in this work which includes large area of the traditional fabric that had severe impacts caused by the western urban structure model. The first zone is considered the most fragmented one where the governmental assembly separated AL-Gailani shrine and the surrounded residential neighborhoods from the commercial mixed land use that extended from AL-Khulapha street up the AL-Rasheed street. The second zone is considered the most cohesive one in spite of the big destruction that occurred to constitute the main business and financial centre due to the activation of more than vertical artery within the main Shorja market which still works as a main connector between the commercial and public centre along the river and AL-Rasheed street and the residential area behind AL-Kifah street. The third zone comes in the second priority in keeping the compactness and vitality for the old structure after the second one where both AL-Rasheed street and AL-Mustansir street have been integrated within each other. Maidan lost its role as a main public space due to the function that was allocated to be used and the cordon of buildings from both sides that isolate it from the

adjacent neighborhoods where movement is directed to AL-Rasheed street or AL-Khulapha street before moving to Maidan. It was found that the urban landscape development resulted in making AL-Rasheed street the main urban element that accelerates the transformation process in the old core and motivates to line other horizontal streets to cross the main Shroja market at the middle of its path via AL-Khulapha street and at the end by AL-Kifah street. It has created new building and space types to be planted along.

### 6.1.2 The Impacts on the city Land use

By revising the change in the urban landscape from the Ottoman period in 1854 up to the 2009, It was emphasized on the characteristics of each inserted street within the aligned building types. Indeed, such urban space and building types have changed the hierarchy of the streets in every morphological period. The political and social instability increased the destruction by exposing the commercial area to be a competitive place for investors regardless to the historical value and the prevailed type of the inserted buildings. One other reason that accelerates the destruction is the combination between the governmental institutions and other public projects to be part of the land use of the old city. These were planted in north and south and extended to the deep urban structure in the middle. The result is a separation among land use components that increased within each morphological level. The coherence between the residential area, markets and religious buildings was affected physically and visually and created a gap between neighborhoods by having many non built up areas. These impacts enhanced the tendency to create many mixed land use areas in the vacant lands to get the benefit from the economic power of the old city. This also could be found in Beirut old city where many parts of the old structure were removed and substitutes by big large scale projects with different land use patterns.

The development tendency affected the integration in land uses within the conflict between the consequent authorities and their attempts to develop the city into main central business districts on the one hand and the private sector who want to convert the city into a main whole trade centre. Intervention in the old city as a result of governmental or private decisions have participated in diminishing the social participation especially where the old city was only specified for commercial use without inhabitation. The whole land use distribution was altered and reset several times due to more modifications inside the old city. Despite the change in movement direction from vertical to horizontal directions, it was proven that the vertical traditional movement through Shorja market artery is still considered the main backbone that controls all the latter inserted streets in the old



city. The negative impacts were concentrated adjacent to the commercial and public commercial zone where new developments took place there due to the highly land value accompanied by big size of the parcels that provide the possibility to be occupied by big commercial centres. The new structure normally extended over the residential neighborhoods to cope with the high demand of commercial use especially in case that the old city is also the main whole trade centre and the central business districts. It was found that the main commercial artery Shorja market remained the main urban element in the city that contributed to sustaining the connectivity that was broken among neighborhoods as a result of the new vertical and horizontal streets. It was found that commercial activities have extended to cover wide area after the construction of AL-Khulapha street which has created many focal commercial poles inside the old core. Lining more new commercial public streets will create more mixed land use area in between, especially in the public area and this will reduce the residential part gradually by motivating the will to create more linkages between neighborhoods and their existed historical monuments. Like in Cairo AL-Moez street still keep the coherence of the urban structure in spite of the interruption that occurred by the new car boulevards and the extension of the new urban structure and building types. Some secondary street was also adapted the commercial activities but not is severe way like in old Baghdad that still suffered from the concentration of the whole trade inside.

The old urban landscape was successful to adopt activities rather than new inserted projects that shows a failure of reintegration within the existed structure. Most of the projects that belong to the public sector failed to achieve revenue in terms of economy and to adopt the continuous change in space hierarchy like what the old urban structure did in spite of the nonstop abandoning of rehabilitation done by the community and the state. The total transformation moved to create more public space and building types over the private ones and that caused almost an alteration in use especially in the area between AL-Khulapha street up to the river where the commercial use extended almost on both sides of old Shorja artery and along AL-Rasheed street that worked to spread the mixed land use around. Curving out new streets and adding larger scale projects will accelerate the transformation of more residential area to be a pure commercial one. It was found that streets with lower hierarchy have less impact on the traditional arteries than the streets with higher hierarchy that separate the city structure to small islands. The implanted projects still accelerating the transformation process by inserting new urban pattern regardless of the existed connection and relationship among the existed urban elements and the hierarchy of the original space. It was proved that the interrupted public, common and private traditional urban spaces have set their hierarchy one step back to have self protection against modernization process in

the old city of Baghdad. Demolishing large parts especially around the main shrines has exposed the surrounded residential area to the extreme transformation process. This is done by creating a public area attached to the private residential one which tried to be more public to adopt the new change. Adding new streets inside the compact urban fabric will expose the residential neighborhoods to be split into multi parts and the residential units will face a vacant land that affects their privacy and connectivity within the adjacent neighborhoods. Their reaction will depend on the original land use before the cutting process and the closeness from the historical monuments. Vacant lands that resulted from the destruction was transformed into commercial buildings and storages with new market types in the area adjacent to the main market arteries. Meanwhile, destructed and decayed houses were left empty inside the neighborhoods that were surrounded by a cordon of multi storey buildings and public area. Dwellers avoid to live near the public area or market arteries due to the lack of privacy and also due to ownership problem as each plot was owned by many lessors of subsequent generations. The new pattern of residential area in having multi storey housing has created a gap within the traditional one and participated in demolishing many parts. Privacy, therefore, was neglected as a result of the separation between both housing patterns in social and physical levels. New streets, in general, tended to have a wide area with mixed land use and buildings always tend to get the benefit to have more multi storey buildings thus affecting the skyline of the city. The separation of the frontage blocks along the car streets from the neighborhoods behind by secondary street has created a second line of mixed land use area that triggered extension of different land use inside the neighborhoods. The industrial land use always tends to use the modern car streets or the wide traditional arteries.

It was confirmed that there is a gap in social and administrative actions that have participated in separating the city parts represented by the physical impacts on the urban structure. This fact was rather concluded from the land use pattern within each period of the transformation process. It was found that the variety in functions in the entire old core is the main factor that provides the ability to reconnect the whole urban components rather than focusing on developing one pattern or several ones in a single zone as old studies did and the proposed rehabilitation projects always tend to focus on. It is obvious that transformation process produced three types of zones according to the evaluated impacts on the land use patterns resulted from the modernization process. The zone that is between AL-Shuhadaa bridge and AL-Ahrar bridge (Zone C) is considered more affected as uncontrolled commercial activities accelerate the transformation process where many commercial arteries branched from the Shorja market or run parallel to it. The zone that is between AL-Ahrar bridge and AL-Sinak bridge (Zone B) comes second, where

administrational land use has hindered the extension of the commercial facilities but at the same time it has created a gap within the residential neighborhoods and AL-Gialani shrine. The zone that is between Bab AL-Mudham bridge and AL-Shuhada bridge (Zone A) is the least affected zone in altering the land use pattern due to the military functions that did not motivate commercial activities to spread overall the neighborhoods. The impacts of modernization process vary and depend on the traditional urban space types. The mosque is considered the most bounded element that contributed to reducing the impacts of urban transformation on the surrounded area. The market (Suq) is most active and generative and could stimulate massive development and transformation process, but at the same time it is considered a main bounded element to gather the segregated parts of the city. The Maidan is totally converted to become the segregated part that stimulates wide destruction and modern development. A traditional urban space is the best integration medium because of its validity and ability to interact and adapt variant planning approaches.

### **6.1.3 The Impacts on the Historical monuments and building types**

The city of Baghdad does not resemble the other Islamic cities in having one big mosque to control the city components. But it is necessary to understand that the variety in functions, in the historical monuments and the vertical gradation from public area to the private one should be reviewed in any prospective rehabilitation process. Showing the physical transformation process in subsequent periods has proved that inserting new space and building types regardless to the existed structure has increased the disparities and conflicts in the spatial structure of the old city of Baghdad in each morphological period. Yet at the same time it proves that there is good potentiality for the main historical elements to sustain the existence of the old core in spite of the wide destruction through decades, which provided flexibility of linkage to the new inserted projects. The historical monuments tend after lining the new streets to work as splitting elements where many neighborhoods behind disintegrated from the entire city. The historical monuments lost their role as a combining element between the variant types of land uses and in connecting the main arteries as focal points compared to the new commercial and administrative activities. The modernization process segregates the remained residential use in separated sectors surrounded by commercial cordons. The main streets have interrupted the connectivity between the existed monuments participated in creating disintegrated zones where each one includes its own variant historical buildings. The whole linkages between all main and secondary historical monuments were altered after lining new streets and destroying wide area where those

monuments referred to a specific local zone instead of integrating multi neighborhoods.

The modern urban interventions contributed significantly to transforming the residential land use to commercial one. The extension in public activities toward the residential one changed both the commercial and residential building types. However, the ratio of the extension started to increase gradually especially in the areas that are adjacent to the higher hierarchy streets where high rise building stands in the main administrative and commercial poles. The commercial activities have extended over the residential neighborhoods and the religious buildings exposing many historical local mosques and churches to be along the main streets or in between the transformed area separating them from the surrounded area and altering the travel behavior. These mosques or churches lost their role within the neighborhood and became of rare use due to the departure of most inhabitants inside the transformed area. Ignoring the context of traditional structure in general and the remained historical buildings in particular caused a change in building usage that was modified each time within any intervention in the city that occurred having an alteration in the building physical characteristics for several times. The main historical mosques were altered in size, height and type to compete the mass structure that was planted within the modernization process. Many historical buildings were threatened to be substituted by new building types where the new structure hid them and they became inaccessible. In many cases, inserting new building types helped to construct new streets in order to achieve multi accessible choices and also helped to change all buildings adjacent to historical monuments so as to match the same characteristics and change the hierarchy of the urban public space within the role of the historical monuments in the city by disconnecting them from each other. Wide streets that interrupted and blocked many local arteries that face many historical monuments have widened them to get more accessibility to those monuments from the main streets. Yet at the same time they participated in separating them from the residential neighborhood around. The destruction around the main historical monuments presented them as three dimension entities, quite different from the historical approaches which were to be integrated and attached to the neighborhoods around to show their outward looking facades. The main monuments, especially big shrines, after removing the surrounded area lost their urban role as meeting point for the main and local traditional arteries and by having new alternatives to be reached. It was found that having more destruction in the city will bring more building types different from the existing ones; and this has increased the difficulties to reintegrate them in a unified and compact form and alter the relation with the urban public spaces. New building types, especially the multi storey ones, compete with the existed religious and historical monuments in their proportion as they became the main focal points within

the entire city. The devastation in urban landscape by means of inserting new big scale building types has enlarged many important historical monuments and changed their original architectural characteristics, size, functions, form and their relations to the surrounded urban elements. This is done by having more facades with outward looking planning approach. Some historical monuments were hidden behind the multi storey buildings along the main streets thus losing their role as important elements in urban landscape. The hierarchy of the variant historical monuments was altered and their connectivity within each other was broken hence losing their domination on the urban scene. It was noticed that many combined historical monuments like schools which were attached to the mosques were split after lining the new streets hence they change their original type and function. The old market passages were also converted into modern passages that have devastated large plots around to be integrated into the old ones.

The new boulevards that were planted inside the compact urban pattern accommodate different architectural styles and building types along with public and private properties which all have created disparities in height according to the allocating financial resources that sometimes were not enough to reach the maximum height or were not enough to start the construction. The visual connectivity between both sides of the street was interrupted several times and in different directions with the possibility to change the buildings behind any empty plot to match the characteristics of the buildings along the street. Sometimes financial resources were insufficient to construct the whole frontage area along the main streets. This has resulted in many empty blocks which permitted public facilities to replace them like parking lots and expose the area behind to be transformed into commercial or mixed land use along semipublic spaces, and this space works as a joint between the public street and the residential neighborhoods. Large monuments have also worked to erase a wide area which may exceed the area of the monuments themselves. This has indeed converted the type to be more outward looking plan within the original courtyard system. The destruction may exceed the remaining parts of neighborhoods and may erase them gradually to have more lost spaces. More destruction along the river in the area between AL-Mustansir street and the river frontage area has motivated multi storey buildings to be erected connecting the existing poles of multi storey buildings and creating a horizontal barrier of buildings that isolate the river from the entire urban structure. Any intervention in lining new streets close to each other will automatically urge investors to use their both elevations and to create new large mass of multi storey buildings. However, it was found that public ownership including endowments were exposed to rapid transformation and motivated the private owned ones to alter the building and space type. Plots size and shape were modified during the

transformation process along the implanted streets and was subject to be merged or split in the transformed neighborhoods. The housing type was also altered to be more outward looking with new material and totally modern design. Multi storey housing was also added causing a conflict in physical, visual and social habits between both patterns which allowed many people to neglect their traditional houses which witnessed a massive destruction and decay. Some commercial building types were resulted from connecting two streets in longitudinal manner and having a passage in between.; for example, there was a tendency to create big commercial centres with internal passages inside the old city to match the old ones. Different building types were inserted like in the Bab-AL-Mudham area assemblies with new functions for cultural, governmental and administrative buildings that had negative impacts in isolating the surrounded area from these buildings.

The sections through the old core showed that skyline tends to grade from the riverfront area to the east far direction instead of directing to the river. The skyline indicated higher points in the first and second zones along the main pedestrian and car streets where they tend to reconnect by enhancing multi storey height in between. This indeed has threatened the traditional and old buildings and accelerated the transformation process in building types. The way of lining buildings along the main inserted streets played a big role in sustaining the integrity of the old structure. Specifying separated blocks from the neighborhoods behind increased the dependency in using car streets rather than old arteries that tend to be isolated as is the case in AL-Khulapha street. On the other hand, sustaining the visual connectivity by following the traces from one interrupting artery from both sides of car streets has increased the connectivity among neighborhoods like in AL-Rasheed street and AL-Kifah street. Changing proportion by the new multi storey buildings will participate definitely in altering the hierarchy of the space and then the privacy degree within the interrupted neighborhoods. More high proportion buildings will enhance the separation in horizontal and vertical ways with a variation in height that creates irregular visual and physical connections. It was found in old Baghdad city that the proportion of the building on the horizontal streets is higher than the vertical one and higher buildings were concentrated along the main public area especially between AL-Rasheed street and the river that works to isolate many parts in between. The disorder that was caused by the destruction in the residential area changed the proportion within the neighborhood where new multi storey building types could be inserted inside the vacant and devastated area. Sometimes the size of the street became larger than the remained neighborhoods that allowed to expose many residential houses along the street to be rowed within the multi storey buildings thus creating a gap in scale on both street sides. It was

found that public area especially with commercial use along more continuous and close end car streets always motivated high rise buildings to be erected. Increasing the proportion along the main streets will create multi poles of development inside the old city instead of the old ones. The clash in proportion between low and high structure has created spatial disparities and difficulties in reintegration especially where the high rise buildings form a cordon around the old compact structure. The financial assembly with multi storey building was considered the transit area and the main hub for the old market arteries that could be extended in a horizontal way in case of more hazardous intervention especially in the area where AL-Rasheed street and AL-Mustansir street came close together which will motivate more market corridors in between. Some historical monuments could be enlarged by occupying the adjacent buildings to compete within the high proportion buildings in the old core and some of them were not able to due to the limited area that they occupied. The cultural and social conditions especially in the post war period and the lack of management system have increased the tendency to import many styles that are far from the original ones causing an interruption of the total city image. The dominance of business districts and the increasing demand to have many stores have reduced the need to redesign the existing urban structure for the whole area except for big commercial centres which undergo high demand. The role of the architect in designing the inside of the buildings was rather diminishing due to the loss of the past physical, cultural and social entities. The bureaucracy and the large need to create business tended to decrease the role of rehabilitation projects within the gap in understanding how to create a modern physical structure in the devastated area along the need to understand the historical urban pattern. Adding larger scale projects and free standing buildings types along the main four streets will motivate to create more vertical connections between them through devastating large area of residential and mixed land use quarters. Enhancing the vertical pedestrian walkways toward the river could be considered the main approach that should be followed against the horizontal car streets in order to decrease the transportation pressure and reduce traffic that went through the old city in the main car streets. This situation was similar to many oriental cities especially in Beirut where new building types were filled in the devastated old core according to Solidere <sup>136</sup>plan that more or less focused on investing in real estate project that defaced the historical identity of the city. Large scale projects were inserted to cope within the economical need that affect the role of the historical buildings to sustain the existence of the old city.

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<sup>136</sup> Solidere is the Lebanese Company that worked in developing and rebuilding the old town of Beirut.

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## Biography

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Abdurrahman Abdi Pasha (1616–1686) was an Ottoman leader who ruled Baghdad 1873,

See, [https://en.wikipedia.org/wiki/Abdi\\_Pasha\\_the\\_Albanian](https://en.wikipedia.org/wiki/Abdi_Pasha_the_Albanian)

Aldo Rossi is an Italian architect and urban planner who did an international investigation about the : architectural theory and his book The architecture of the City considered one of the basic references in explain the city as artifact.

Antoine-Chrysostome Quatremère de Quincy (1755 – 1849) was a French archeologist and theorist in architecture, who wrote many texts also belong to art

See, [https://en.wikipedia.org/wiki/Quatremère\\_de\\_Quincy](https://en.wikipedia.org/wiki/Quatremère_de_Quincy).

Armando Montanari is an Italian researcher specialized in the Field of Tourism, Regional Development, and Mediterranean Studies,

See, [https://web.uniroma1.it/seai/sites/default/files/15\\_07\\_01\\_CV\\_DSEAI\\_Italian\\_English.pdf](https://web.uniroma1.it/seai/sites/default/files/15_07_01_CV_DSEAI_Italian_English.pdf)

Baumeister ( 1833-1917 was a German urban planner and the author of one of the earliest texts on this topic, See also [https://en.wikipedia.org/wiki/Reinhard\\_Baumeister](https://en.wikipedia.org/wiki/Reinhard_Baumeister).

Bill Hillier is Professor in The Bartlett School of Architecture/Faculty of the Built Environment who did many spatial analysis researches focused on the method of space syntax analysis,

See, <https://www.ucl.ac.uk/bartlett/architecture/prof-bill-hillier>

Branda Sheer is an architect and at the University of Utah specialized with urban design and the development of cities, See <https://utah.academia.edu/BrendaScheer> while David Sheer is an architect founded the firm of Scheer & Scheer in 1994 and published many books related the architectural theory, See, <https://utah.academia.edu/DavidScheer>

Broadbent British architect who had many researches on the urban space concept and design, See, [https://prabook.com/web/geoffrey\\_haigh.broadbent/644688](https://prabook.com/web/geoffrey_haigh.broadbent/644688)

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Carlo Aymonino (1926 – 2010) was an Italian architect and urban planner who consider the first who followed the typological approach in architecture and urbanism,

See, [https://en.wikipedia.org/wiki/Carlo\\_Aymonino](https://en.wikipedia.org/wiki/Carlo_Aymonino)

Carol Mc Harg is an architect and landscape designer who referring his work and researches to ecology, cartography and engineering,

See, <https://carolmcharg.com/Asset.asp?AssetID=5529&AKey=2B7T2E5R>

Carsten Niebuhr German geographer (1733 –1815) who visited Baghdad in 1766 as part of scientific expedition sponsored by King Fredrick V of Denmark

Charles C. Bohl is a researcher and associate Professor at the University of Miami's School of Architecture specialized in Community Buildings. He worked with Duany Plater-Zyberk on planning the Downtown of Fort Myers,

See, <http://www.worldwhoswho.com/public/views/entry.html?id=sl2174463>

Colin Rowe was a British architect who emphasized in the urban planning history and the theory of world architecture in the second half of the twentieth century,

See, [https://en.wikipedia.org/wiki/Colin\\_Rowe](https://en.wikipedia.org/wiki/Colin_Rowe).

Edwin Landseer Lutyens, (1869 – 1944) was an English who always use the local and traditional architectural styles to the requirements of his era,

See, [https://en.wikipedia.org/wiki/Edwin\\_Lutyens](https://en.wikipedia.org/wiki/Edwin_Lutyens)

Emad Raouf (1948) is an Iraqi historian and researcher and was a head of heritage conservation centre in Baghdad.

Eugen Wirth is a German geographer that focused in his scientific researches on the cultural, social and physical geography of the oriental cities,

See, <http://fgg-erlangen.de/fgg/ojs/index.php/mfgg/article/view/59/46about>



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Felix Jones (1878), captain in the Indian navy and surveyor who did his travel to Mesopotamia and draw the first detailed map for Baghdad,

See, [https://en.wikisource.org/wiki/Jones, John Felix \(DNB00\)](https://en.wikisource.org/wiki/Jones,_John_Felix_(DNB00)).

Frederick Stanley ( 1864 –1917) was a British Army officer who conquer Baghdad in 1917,

See, [https://en.wikipedia.org/wiki/Stanley Maude](https://en.wikipedia.org/wiki/Stanley_Maude)

Gerhard Curdes, in architect and urban planner who followed the mechanism of tracing the city structure from parcel up to the whole quarter following the typo morphological approach. He was a professor in RWTH Aachen University, Faculty of Architecture / Institute of Urban Design and regional Planning and edited many books like Stadtstrukturelles Entwerfen.

Gianfranco Caniggia's on is an architect who emphasized on following the typo-morphological approach in investigating the city as an organic result of a dynamic development of the typology.

Hans Bobek (1903-1990) was an Austrian geographer who was emphasized on social, cultural and urban geography especially in the middle east as he named (The orient),

See, [https://en.wikipedia.org/wiki/Hans Bobek](https://en.wikipedia.org/wiki/Hans_Bobek).

Harold C. Mason is a governmental architect and executive engineer who joined the public work department in Iraq.

Hening & Chitty are British architects who had a partnership to design many public buildings after 2<sup>nd</sup> world war.

Hugo Hassinger (1877-1952) is a German geographer who focused on the cultural geography in Germany, See, [https://de.wikipedia.org/wiki/Hugo Hassinger](https://de.wikipedia.org/wiki/Hugo_Hassinger)

James Molliston Wilson (1887–1965) was a British Architect who established a public work department after the mandate and build many public buildings.

Jermey Whitehand is Head of the Urban Morphology Research Group (UMRG) in the University of Birmingham and one who specializes in studying the role of historical geography in forming cities.

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Josef Stübben (1845-1936) was one of the most important city planners of the late 19th and early 20th centuries. He published completely revised versions of his book *Der Städtebau* in the 1907 which considered one of the important references that was translated in English by Julia Koschinsky and Emily Talen under the title (*City Building*),

See, [https://en.wikipedia.org/wiki/Josef\\_Stübben](https://en.wikipedia.org/wiki/Josef_Stübben).

Karl Kropf is an urban designer and a consultant in studying Built Form. He is Senior Lecturer at Oxford Brookes University and has many researches in urban morphology,

See, <https://www.buildingbeauty.org/faculty-profiles/2016/11/02/karl-kropf>

Karsten Niebuhr (1733 - 1815 ) is a German Cartographer and traveler who participated in the Royal Danish Arabia Expedition , See, [https://en.wikipedia.org/wiki/Carsten\\_Niebuhr](https://en.wikipedia.org/wiki/Carsten_Niebuhr).

Keyser (1893-1968) is a historian who studied in Freiburg, Halle and Berlin and published his doctoral thesis regarding the development of the settlements in Danzig,

See, [https://en.wikipedia.org/wiki/Erich\\_Keyser](https://en.wikipedia.org/wiki/Erich_Keyser).

Khalsi AL-Ashaab was a geographer in the institute of planning in Baghdad University and his unpublished Phd dissertation (*Urban Geography of Baghdad*) that was submitted in Newcastle university in 1974 investigated the Baghdad city morphology

Léon Krier (1946) is a Luxembourgish architect and urban planner who had many theoretical work concerning New Urbanism and New Classical architecture,

See, [https://en.wikipedia.org/wiki/Léon\\_Krier](https://en.wikipedia.org/wiki/Léon_Krier).

Marreto Italian architect and author established in his researches the systematic survey of the historic buildings in towns, See also <https://www.archinform.net/arch/13489.htm>

Marc-Antoine Laugier ( 1713 – 1769) was a priest and architect who wrote many essays in architectural theory to discuss the aspects of Renaissance and post-Renaissance architectural, See, [https://en.wikipedia.org/wiki/Marc-Antoine\\_Laugier](https://en.wikipedia.org/wiki/Marc-Antoine_Laugier).

Michael Robert Günter Conzen (1907 –2000) was a German geographer who established the English school in urban morphology, See, [https://en.wikipedia.org/wiki/M.\\_R.\\_G.\\_Conzen](https://en.wikipedia.org/wiki/M._R._G._Conzen)

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Midhat Pasha was an Ottoman democratic leader who governed Baghdad between 1868-1871 and built many public buildings, See, [https://en.wikipedia.org/wiki/Midhat\\_Pasha](https://en.wikipedia.org/wiki/Midhat_Pasha)

M.R.G. Conzen is a German geographer, at the University of Berlin (1926–1932) and worked more in analyzing the morphology of landscape). See [https://en.wikipedia.org/wiki/M.\\_R.\\_G.\\_Conzen](https://en.wikipedia.org/wiki/M._R._G._Conzen)

Muhammed Makiya (1914-2015) is an Iraqi architect who established the first architecture department in Iraq at the University of Baghdad and was committed to design many public and private buildings where he used the traditional architectural elements within modern concepts.

Nurgül Yardım is a Turkish architect and researcher who works to investigate the relation between architecture and culture, See, <https://bilgi.academia.edu/nurgulyardim>

Oscar August Reuther 1880-1954 is an architect who interested in oriental architecture and wrote about the traditional houses in Baghdad, See, [https://de.wikipedia.org/wiki/Oscar\\_Reuther](https://de.wikipedia.org/wiki/Oscar_Reuther)

Pier Vittorio Aureli is an architect who focused on architecture and urban history and their relation to the political, See, <http://phd.aaschool.ac.uk/faculty/pier-vittorio-aureli/>

Rifaat Chadrji (1926) is a famous Iraqi architect who was committed to design many public and private buildings in Iraq following the modernism approach using the Iraqi traditional elements

Rob Krier is the brother of Leon Krier and is one of the Luxembourgian architect and urban designer theorist who emphasized on the typology of Urban space,

See, [https://en.wikipedia.org/wiki/Rob\\_Krier](https://en.wikipedia.org/wiki/Rob_Krier)

Robert Mantho is an architect, who worked in N.Y.C., London, Portland, and Vermont. His research emphasized on spatial configuration and his book (urban section an analytical tool for cities and streets) is one of the trials to explain the city by analyzing the transects

Salim Ferwati is an architect and a member in Architecture department in Qatar University who focused on the Islamic architecture and the middle eastern cities,

See, <https://qu.academia.edu/MSalimFerwati>

## Biography

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Saverio Muratori is an Italian architect and one of the pioneers of establishing the typomorphological approach in following the morphology of the urban form.

Schlüter was a German geographer and professor at the University of Halle . He emphasized on the cultural landscape, which is one of basic discipline in geography.

Stanford Anderson (1934-2016) was an American architects who focused on the history of architecture and the concept of urban form, See, [https://en.wikipedia.org/wiki/Stanford\\_Anderson](https://en.wikipedia.org/wiki/Stanford_Anderson)

Stefano Bianca is a Swiss architect and urban designer who published many books on Islamic cities and architecture.

Terry Slater is a historical geographer at the University of Birmingham, UK. Who did many studies on town planning, See, [https://en.wikipedia.org/wiki/Terry\\_Slater\\_\(geographer\)](https://en.wikipedia.org/wiki/Terry_Slater_(geographer)).

Thomas L Schumacher (1941–2009) was an American architect who focused on developing the Contextualism ,See, [https://en.wikipedia.org/wiki/Thomas\\_L.\\_Schumacher](https://en.wikipedia.org/wiki/Thomas_L._Schumacher)

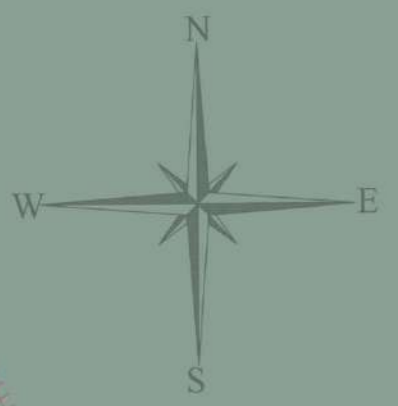
Tristram Ellis (1844 – 1922) was an English artist who did many paintings for Middle East and eastern Mediterranean, See, [https://en.wikipedia.org/wiki/Tristram\\_Ellis](https://en.wikipedia.org/wiki/Tristram_Ellis)

Walter Geisler is a German geographer who wrote many references regarding the history of geography and city planning, See, [https://de.wikipedia.org/wiki/Walter\\_Geisler\\_\(Geograph\)](https://de.wikipedia.org/wiki/Walter_Geisler_(Geograph))

Wayne Kenneth Davies is a Canadian geographer who did many researches concerning the Conceptual Revolution in Geography and Urban Social Structure,  
See, <https://albertaonrecord.ca/wayne-k-d-davies-collection>.

The Transformation of The Urban Landscape In  
The Old City of Baghdad between 1854 -2009

Appendix I



AL-Hasani Mohammed K



Figure -1-: Baghdad urban structure under the Ottoman in 1916 drawn by Ernst Herzfeld, Source: (Sarre, Herzfeld, & Berchem, 1911-1920.)

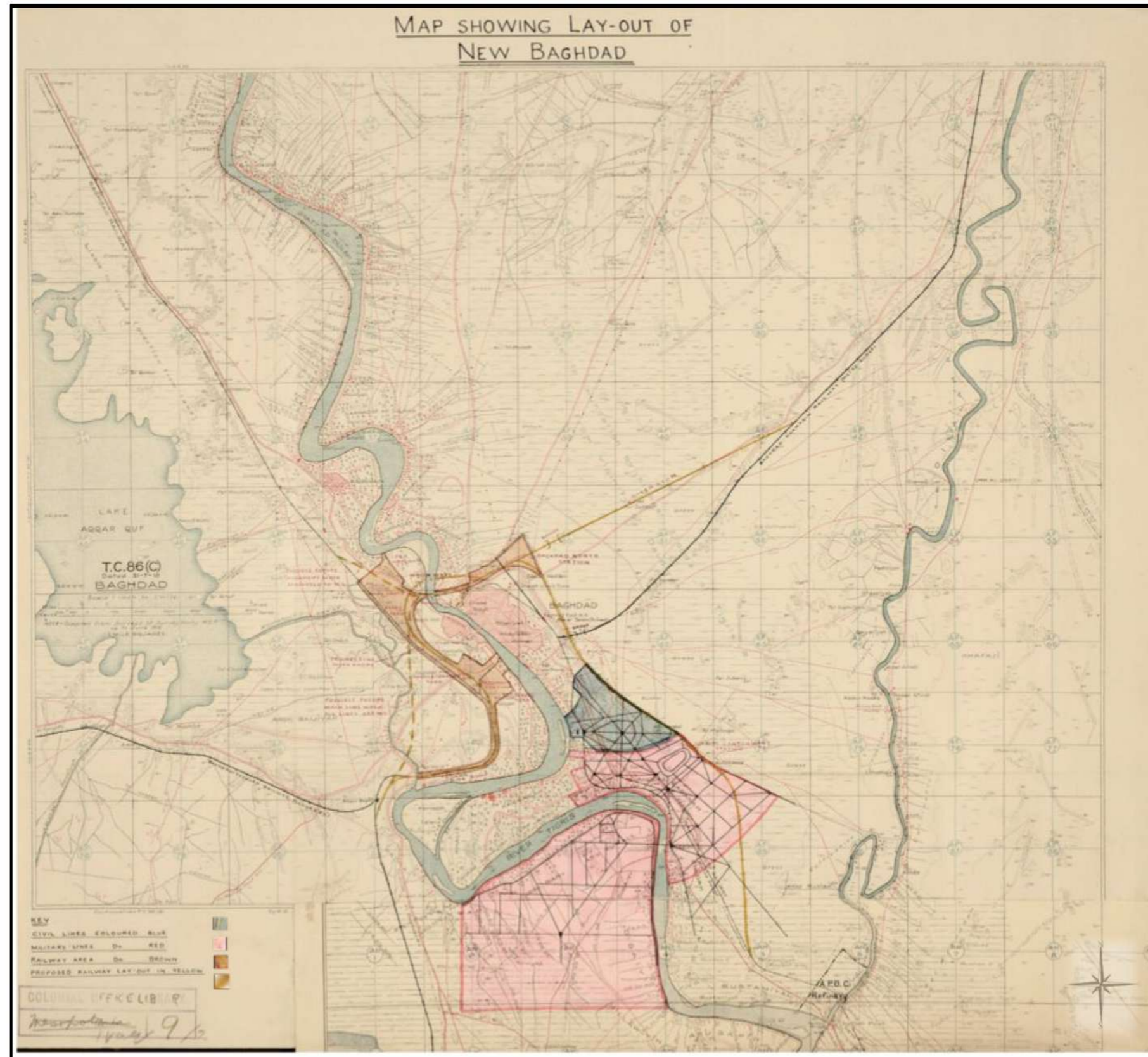


Figure -2-: The Proposed New Baghdad Master plan in 1918 by Sir, Wilson , Source: British Archive, CO1047/466.

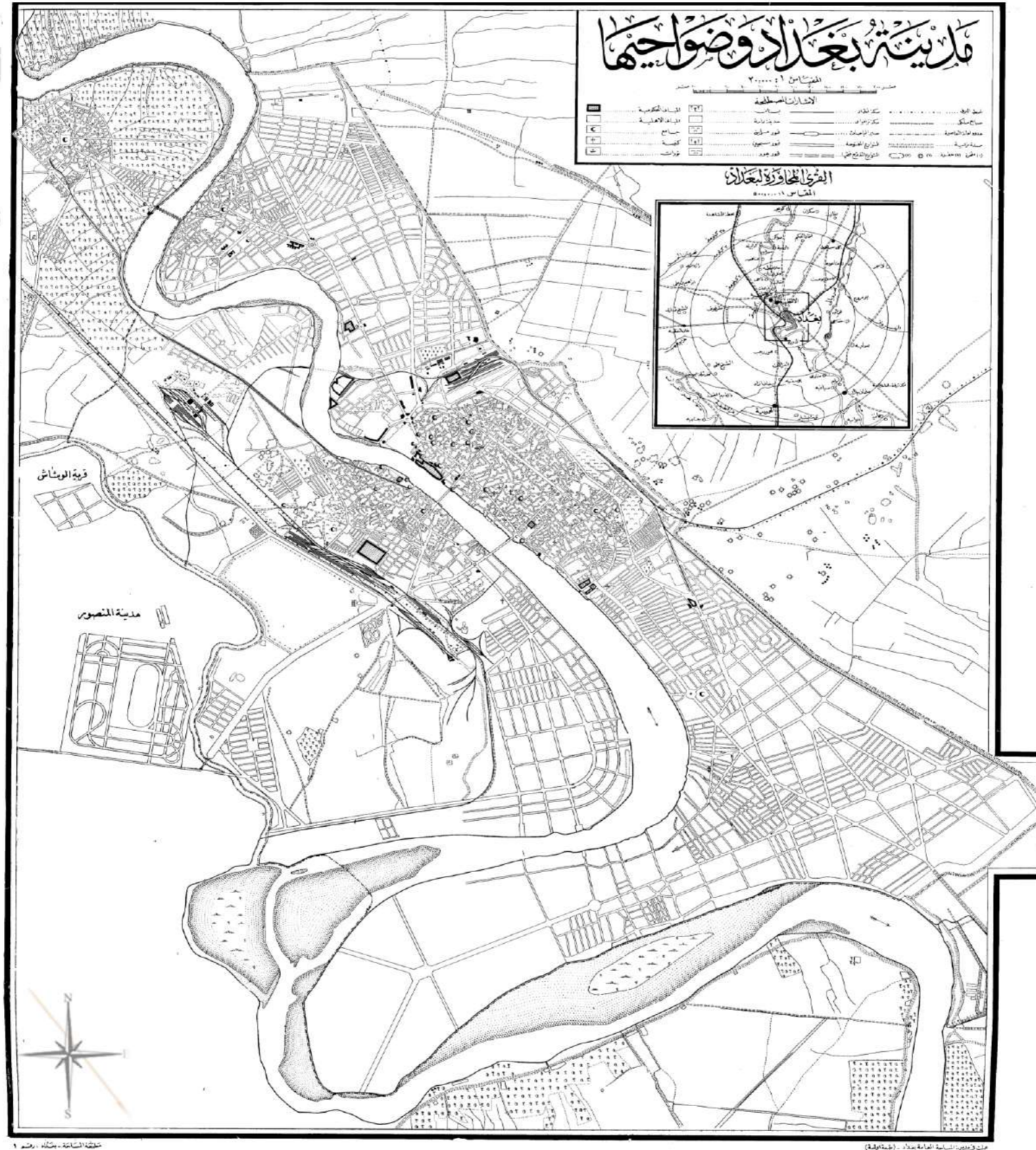


Figure -3-: Baghdad map estimated at the beginning of fifteenth, Source: Iraqi ministry of irrigation, Survey directory.



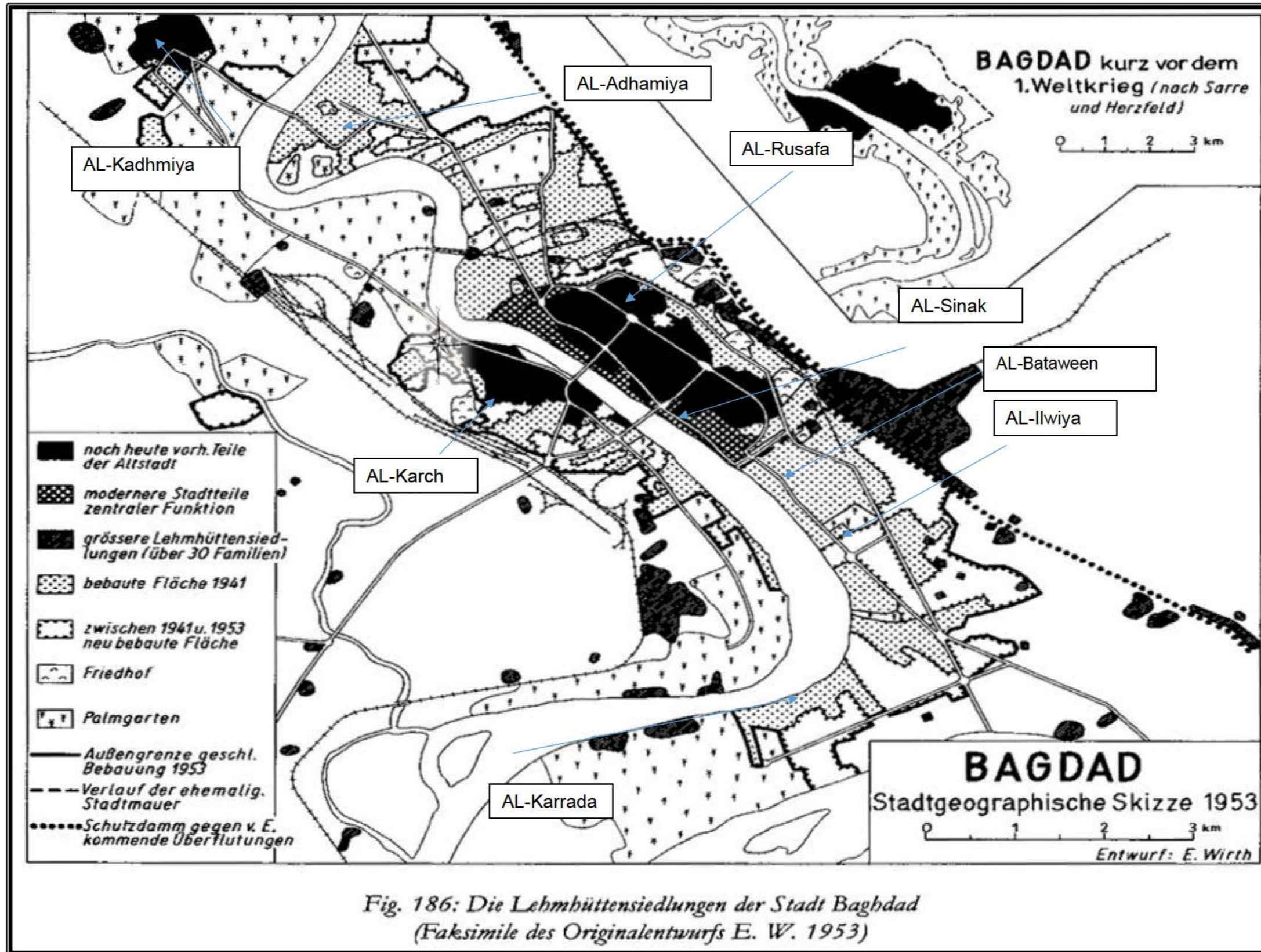


Figure -4-: The city of Baghdad development up to 1953, Source: Eugen. W,1953:311.

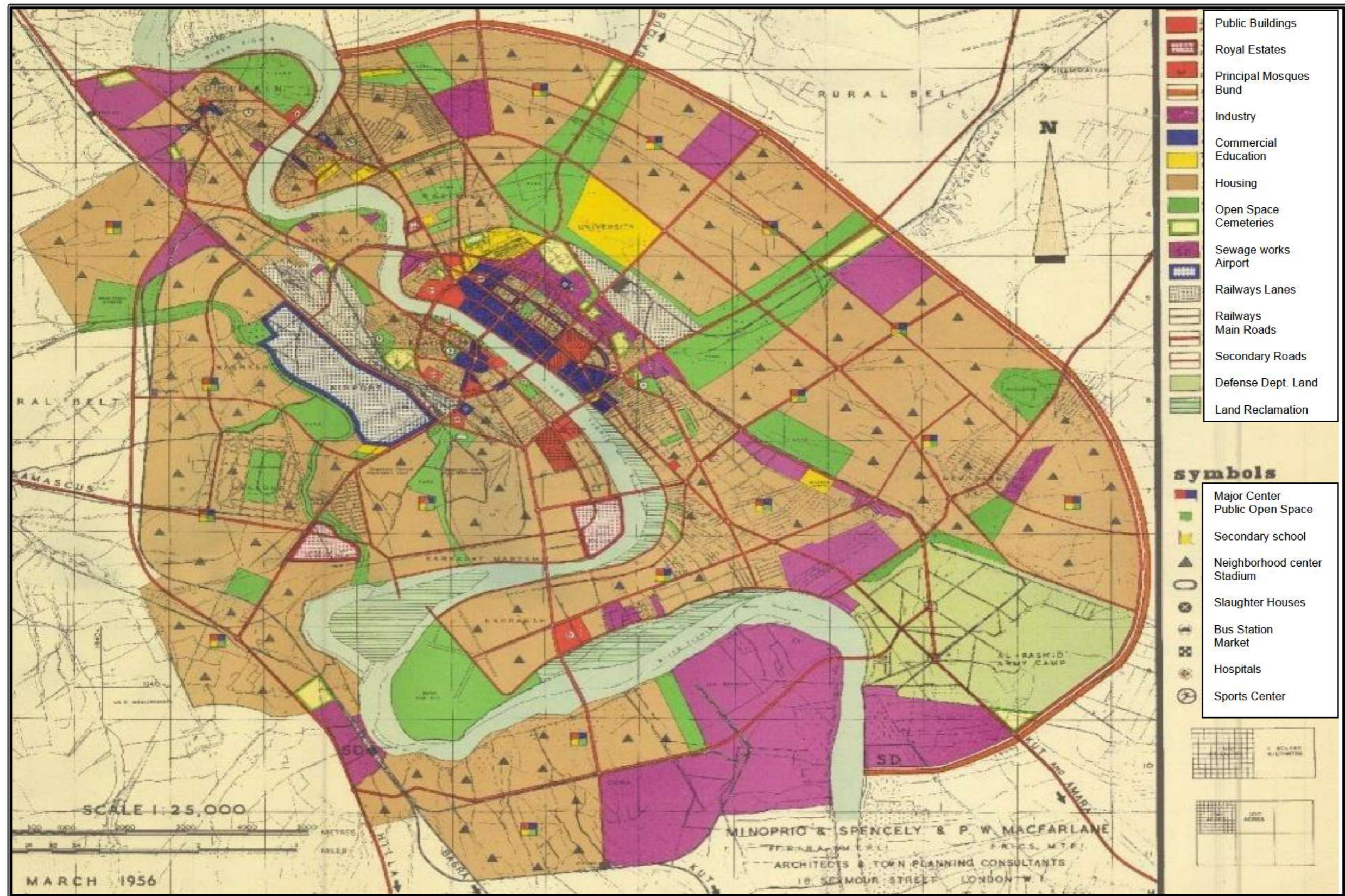


Figure -5-: Baghdad master plan 1956,Source: Minoprio & Spencely in 1956-Baghdad Mayoralty Archive (without Reference Nr.).



Figure -6-: Doxiadis Baghdad master plan in 1959, Source: Nikos Hadjikyriakos-Ghika Gallery, <https://gamblersfallacy.tumblr.com/post/117782922074/baghdad-master-plan-1955-1960-constantinos> (accessed 10 Aug. 2017).

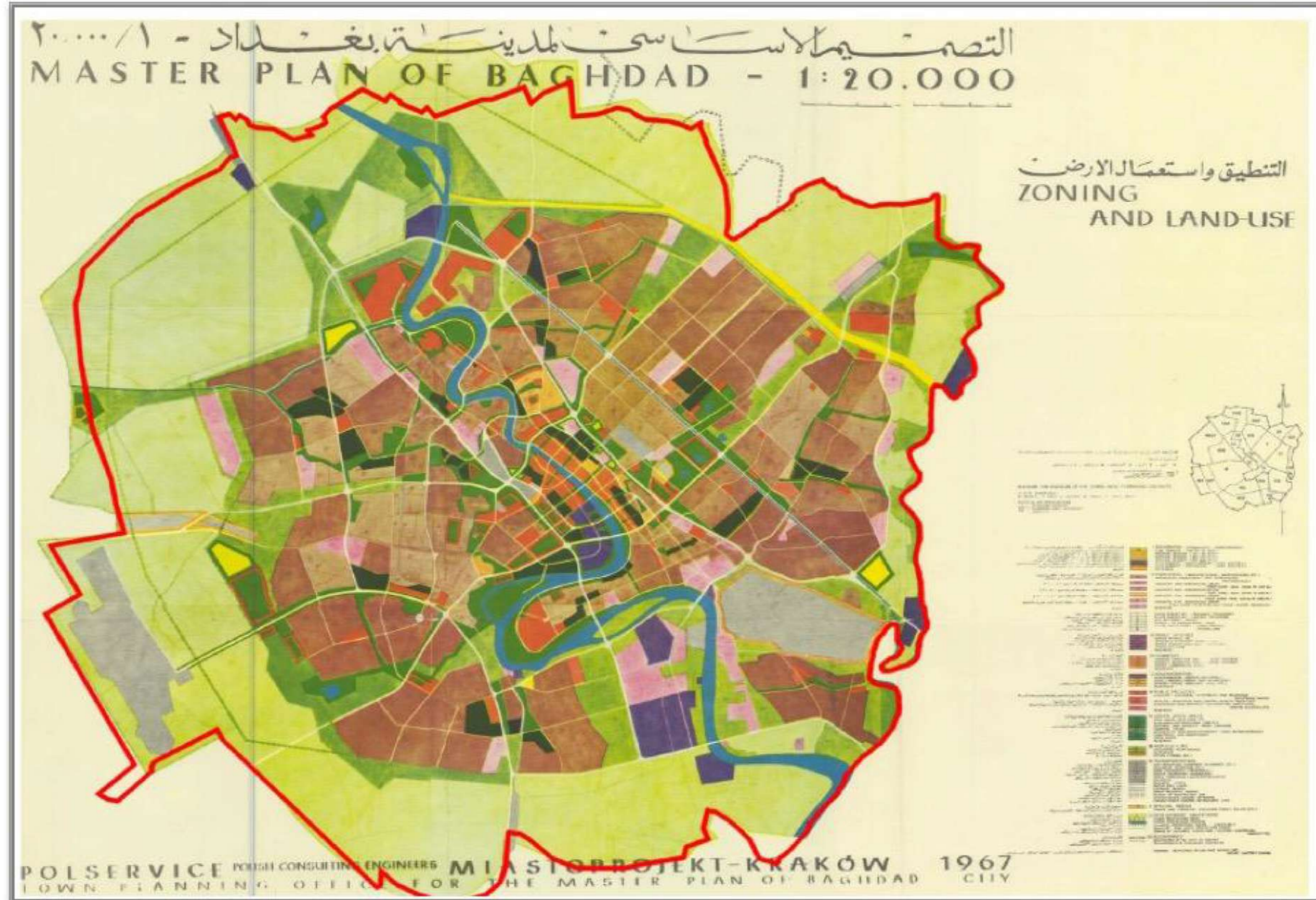


Figure -7-: Baghdad Master Plan in 1967, Source: Polservice, (Miasto Projekt-Krakow-Master Plan for Baghdad) 1967, See Also Stanek 2017:794.

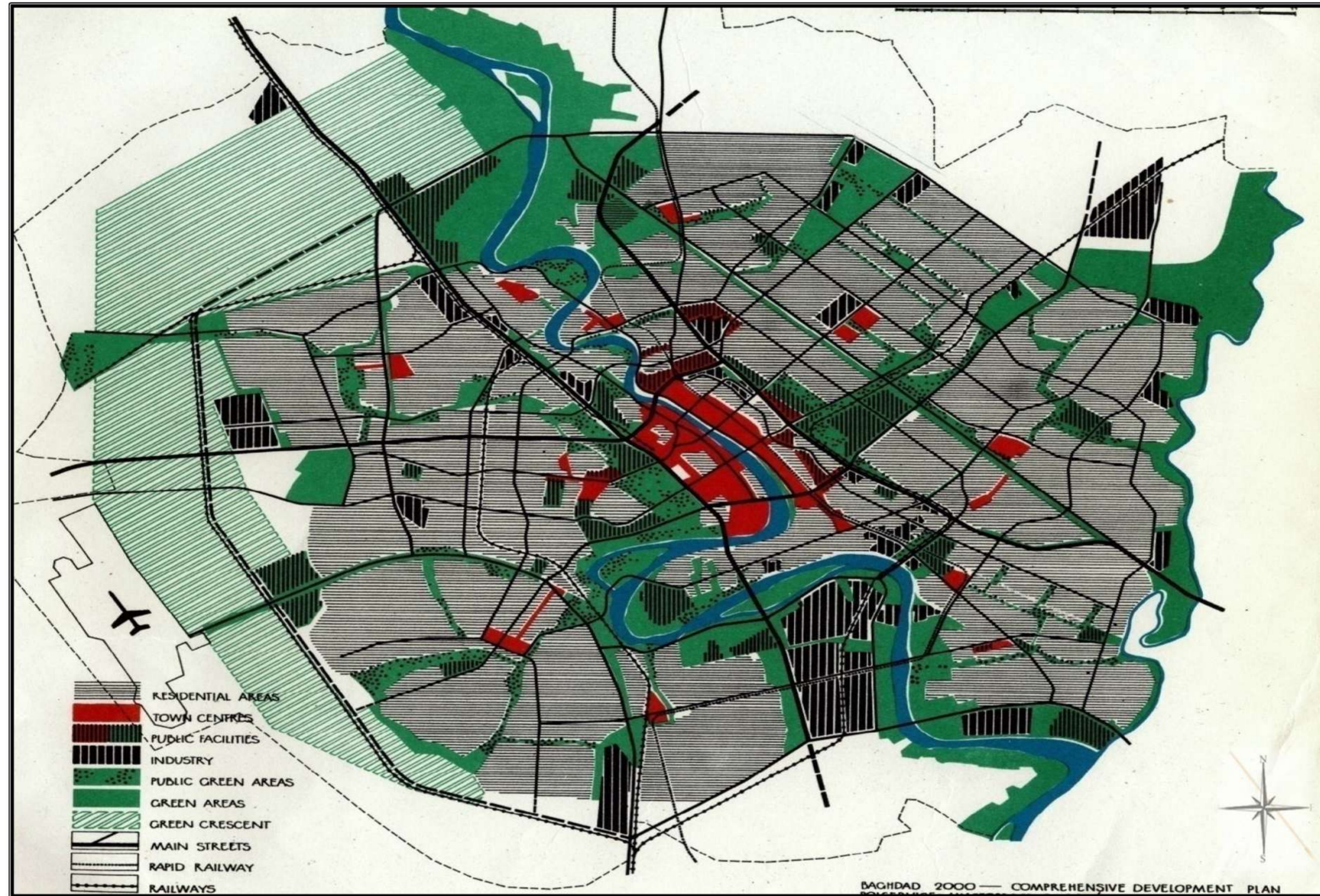


Figure -8-: Baghdad city structure in 1973,Source: Polservice 1973, (Miasto Projekt-Krakow-Comprehensive Development Plan for Baghdad), See Also Stanek 2017:796.



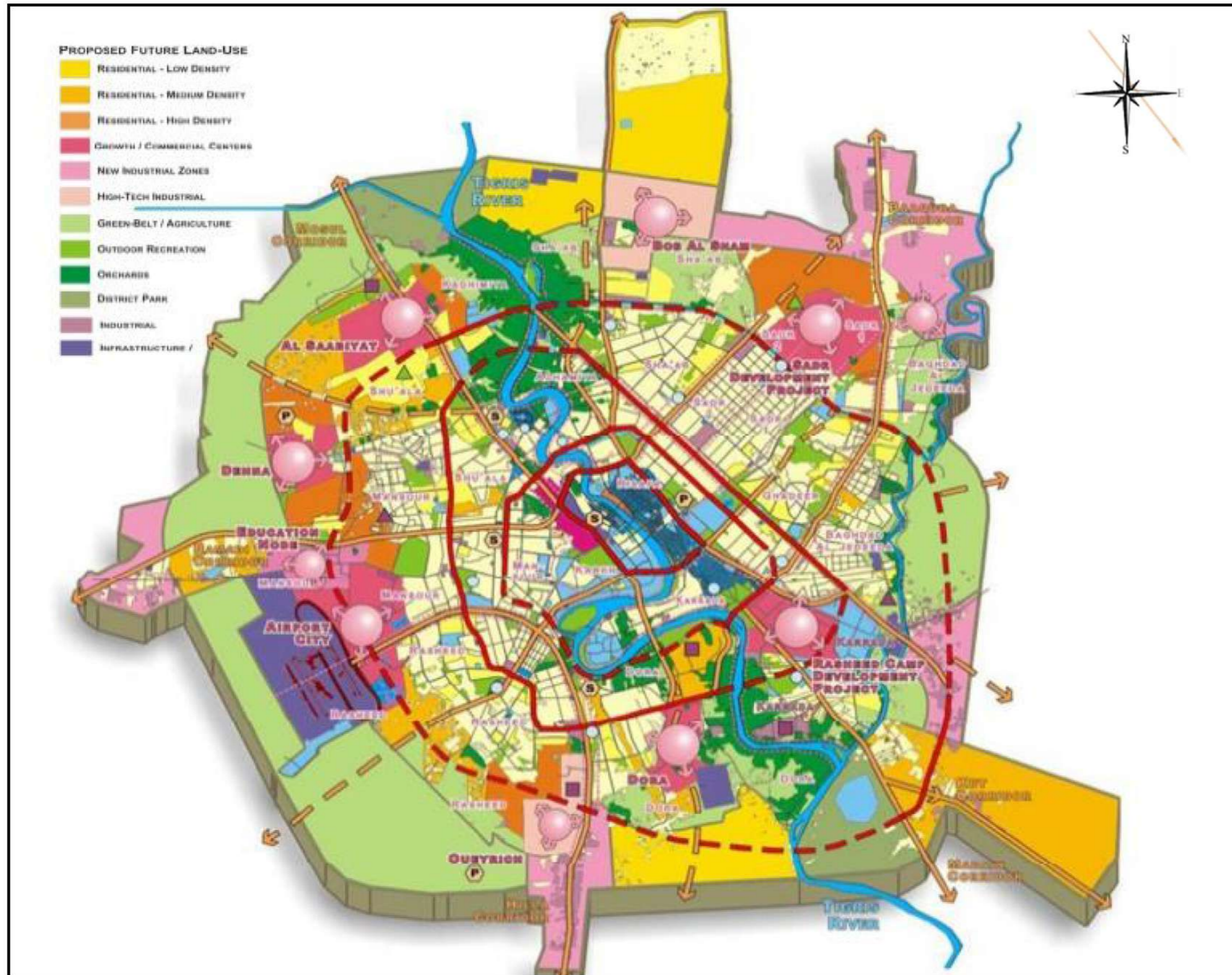


Figure -10-: The proposed Baghdad city land use 2030 created in 2013, Source: CCDP (Part 1 –Phase 3), Mayoralty of Baghdad, Khatib &Alami:26.

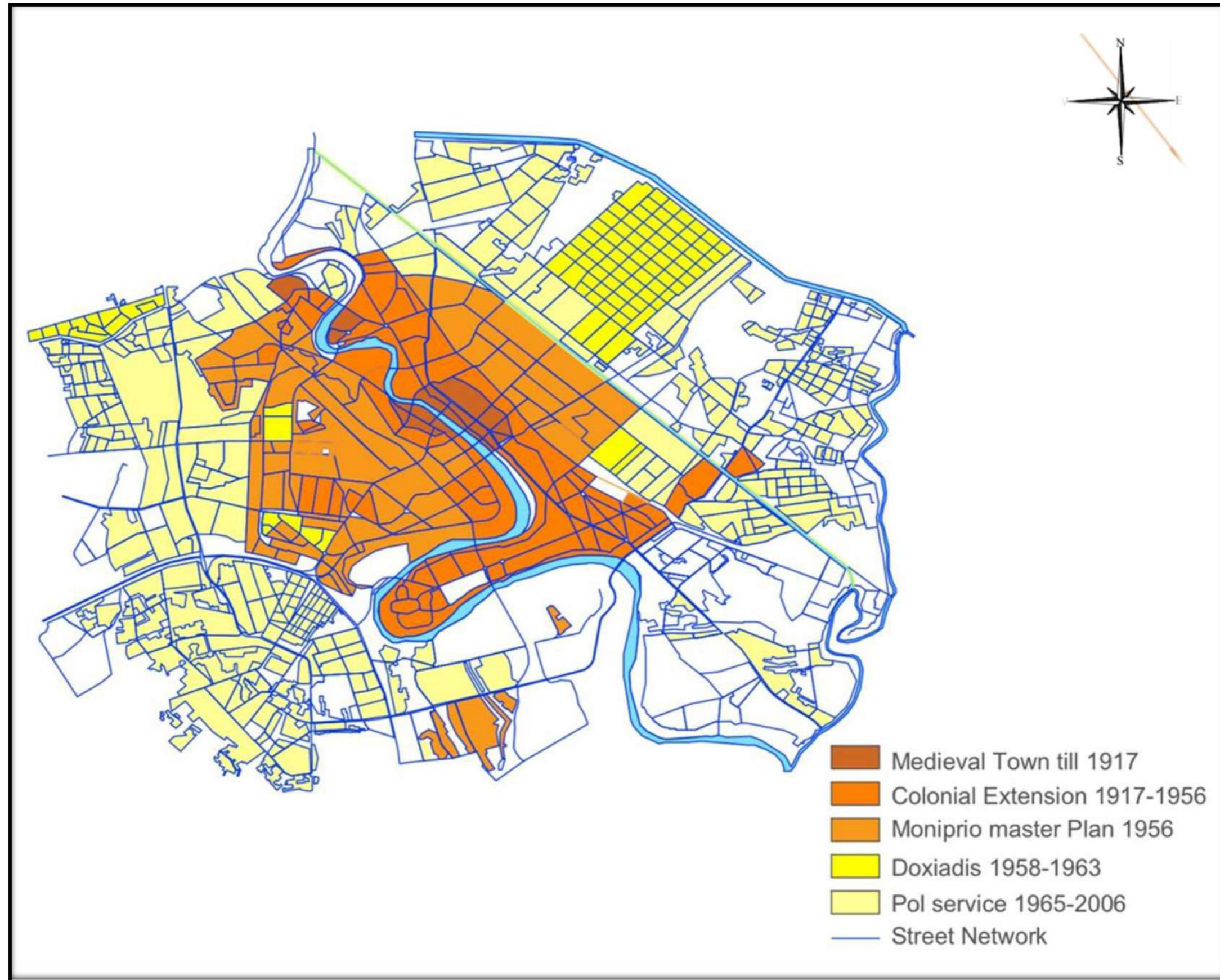


Figure -11-: The role of planning approaches in shaping the city of Baghdad,Source: Digitized and explored by the Author.







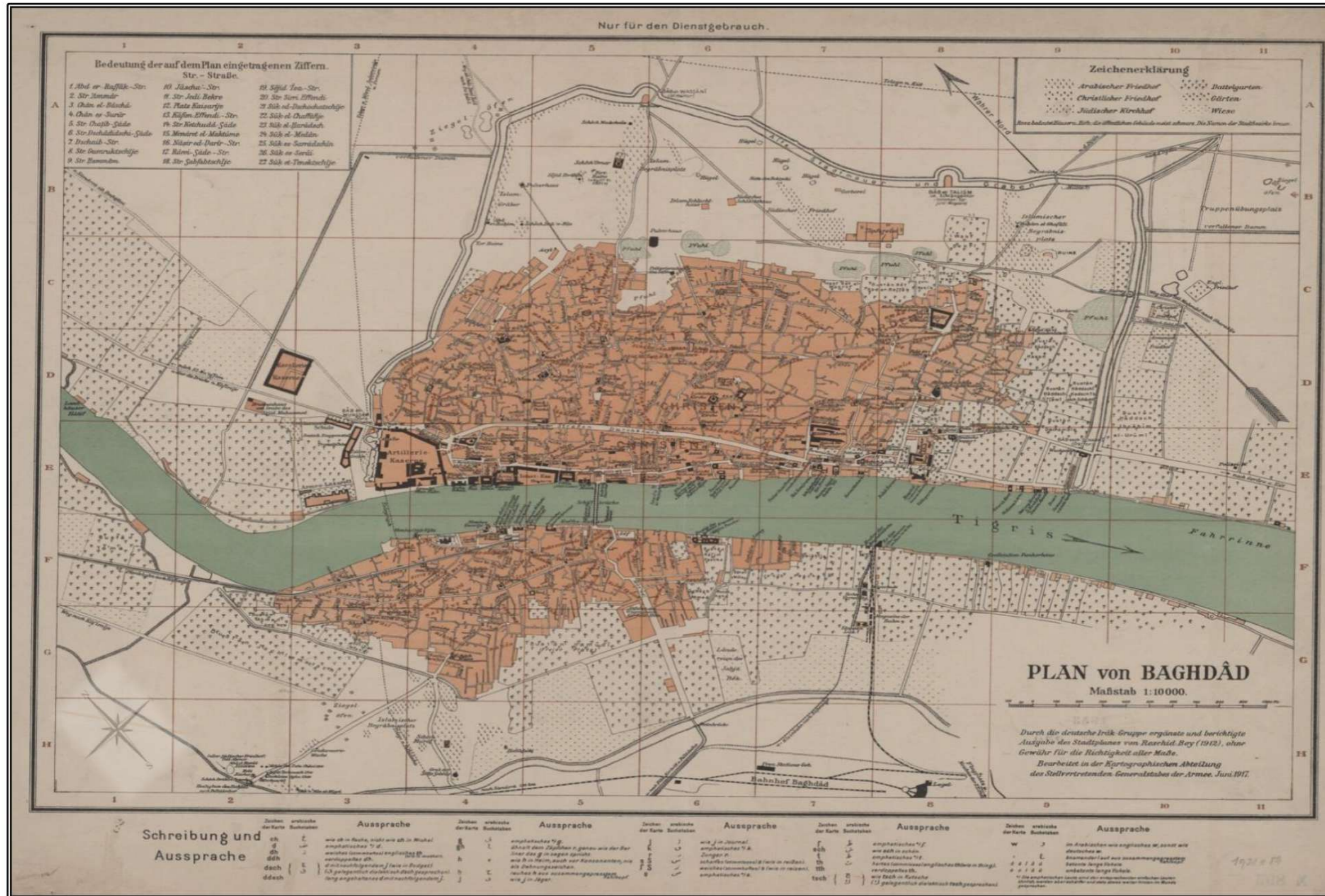


Figure -14-: Baghdad map in 1912, Source: Berlin City Library SBB\_IIC\_Plan. 892.

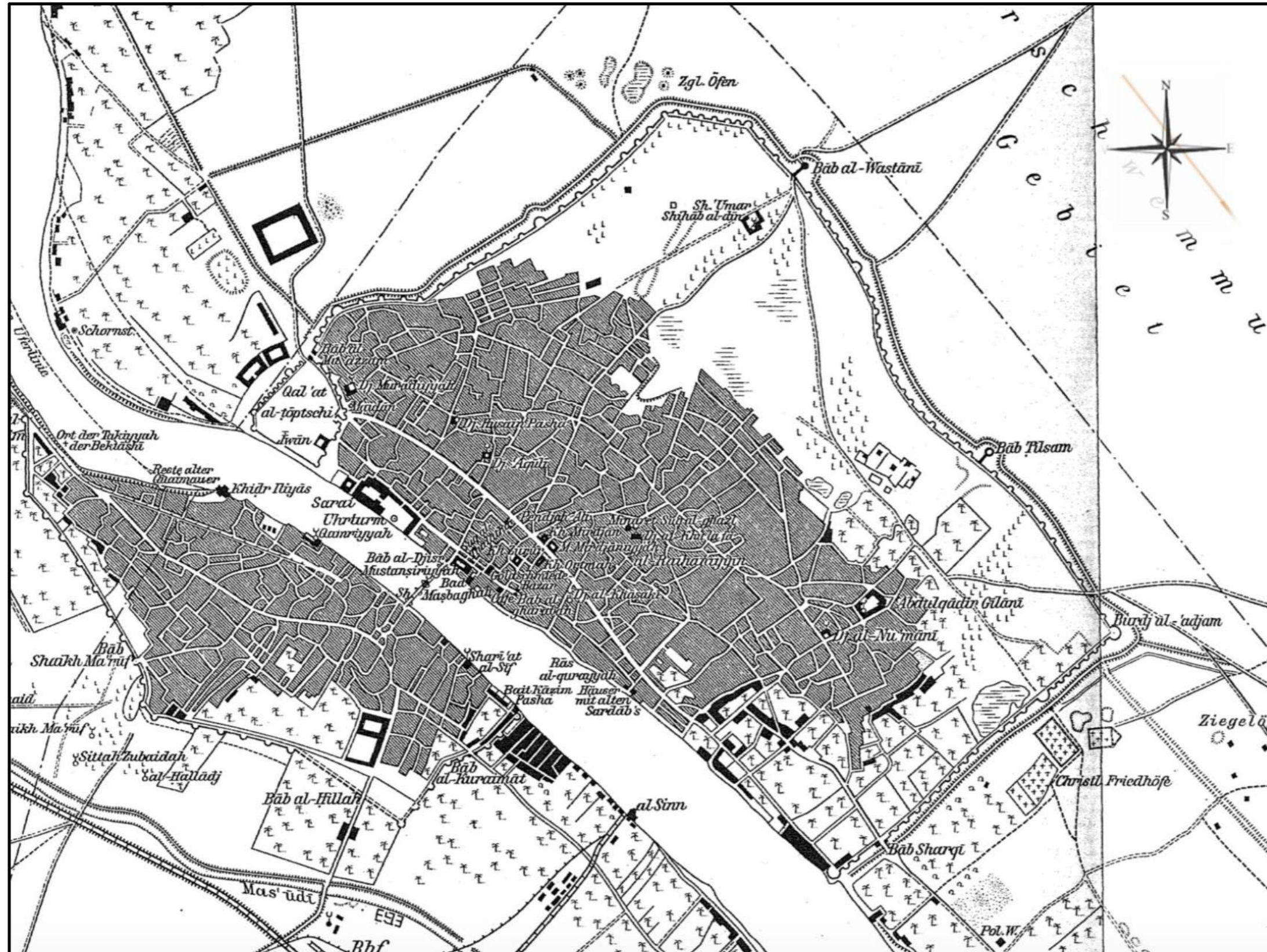


Figure -15-: Medieval Baghdad City plan at the end of Ottoman era, Source: (Sarre, Herzfeld, & Berchem, 1911-1920.)

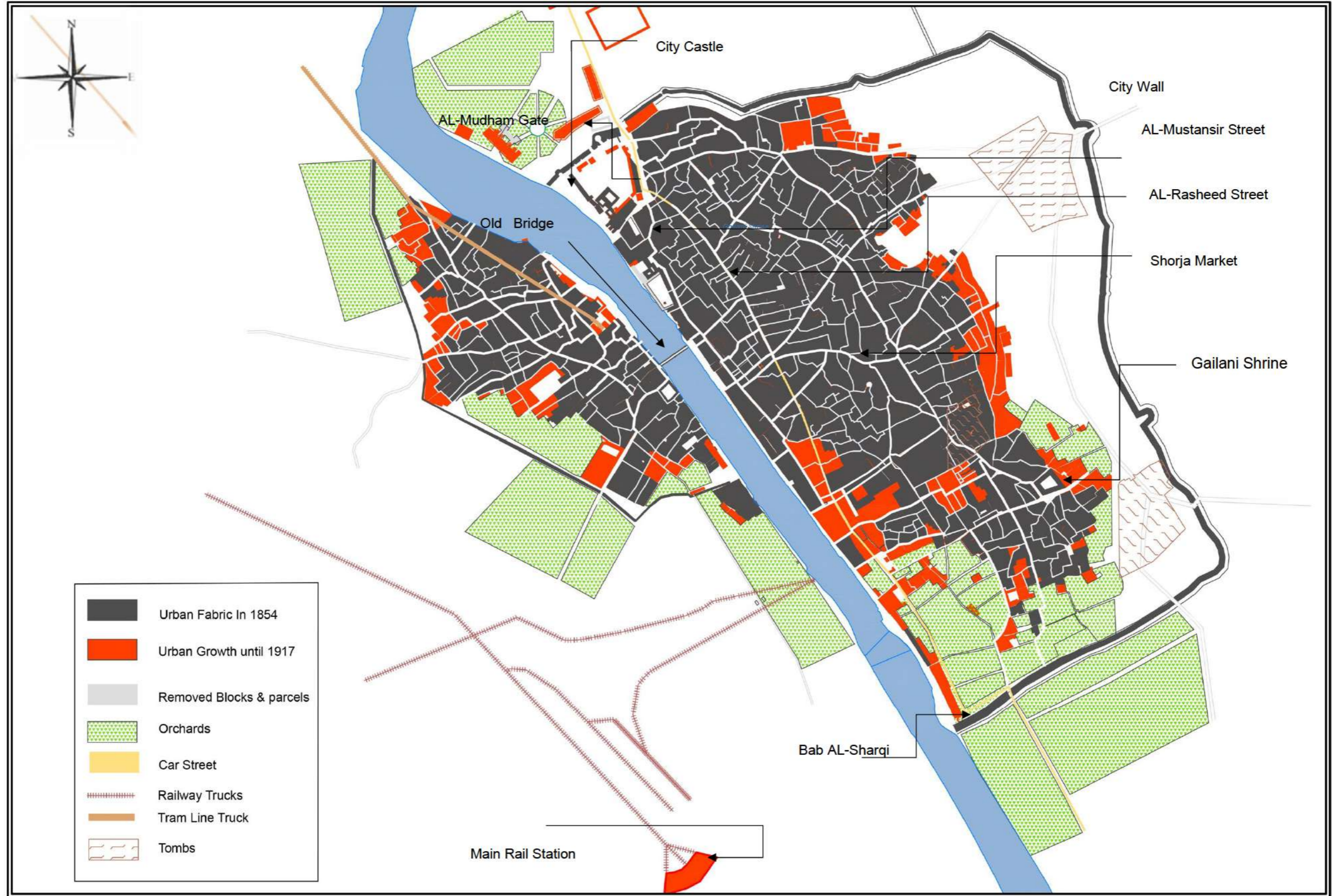


Figure -16-: Urban morphological change from 1854 up to 1917, Source: Digitized and investigated by the Author.



Figure -17-: Baghdad map in 1921, Source: British National Archive, WO 302/551.

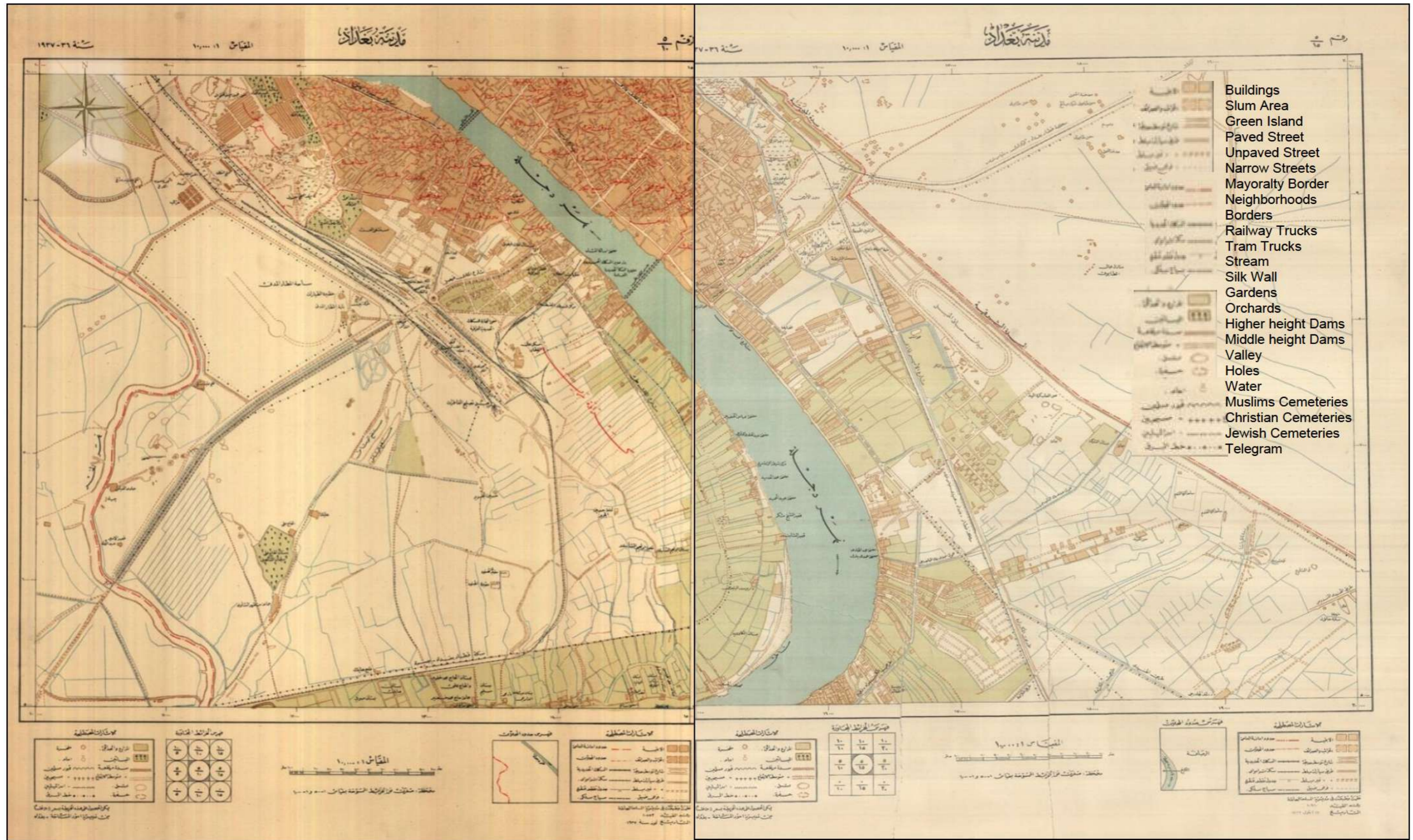


Figure -18-: Baghdad map in 1936 ,Source: Iraqi National Archive.

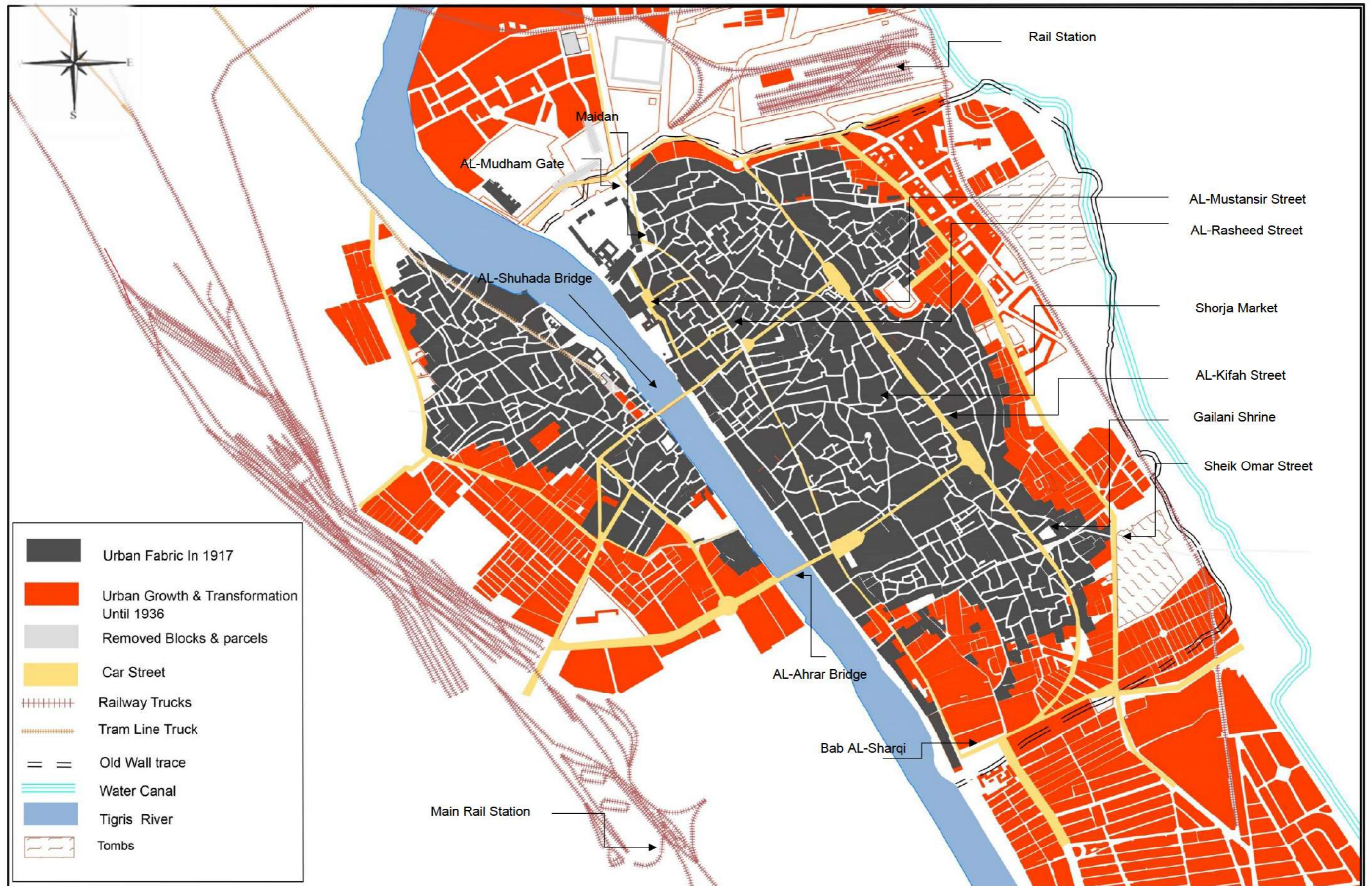


Figure 19: - Urban morphological change from 1917 to 1936, Source: Digitized and investigated by the Author.





Figure 20: - Lining AL-Kifah street estimated between 1934 -1936, Source: Mayoralty of Baghdad Archive.

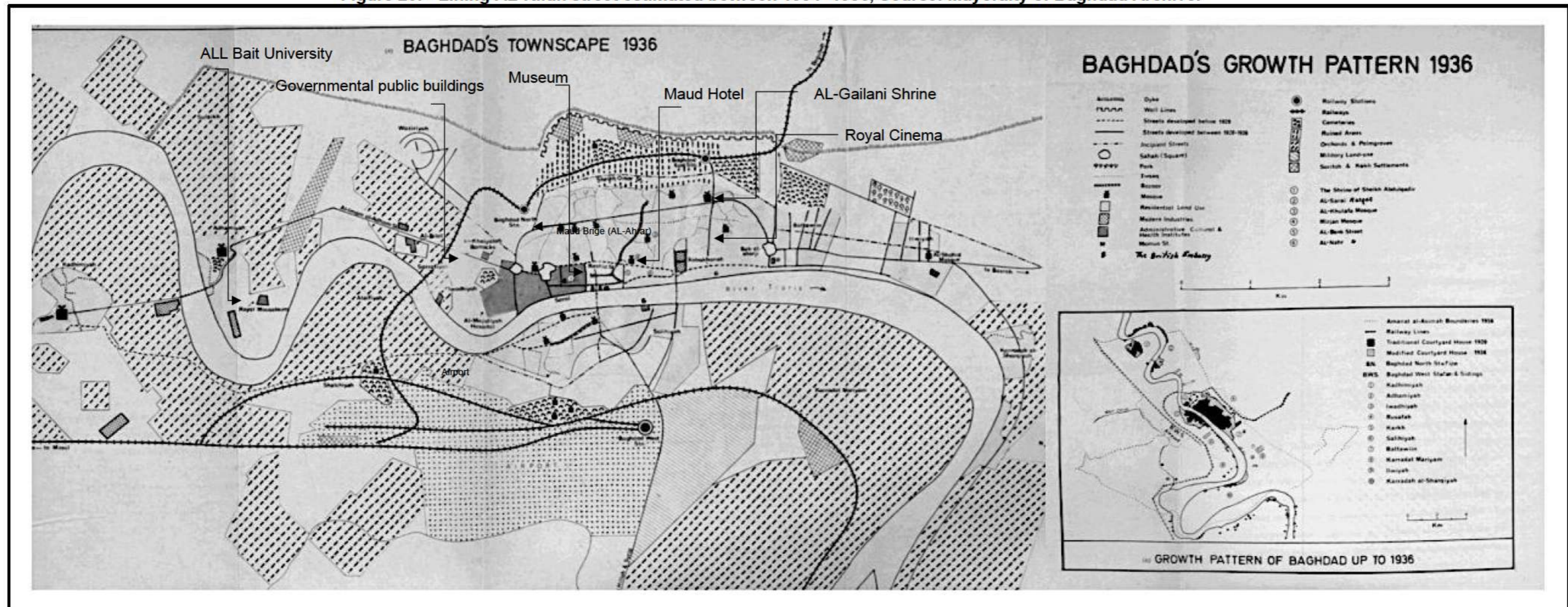


Figure -21-: Baghdad main streets in 1936, Source: AL-Ashaab 1974:256.

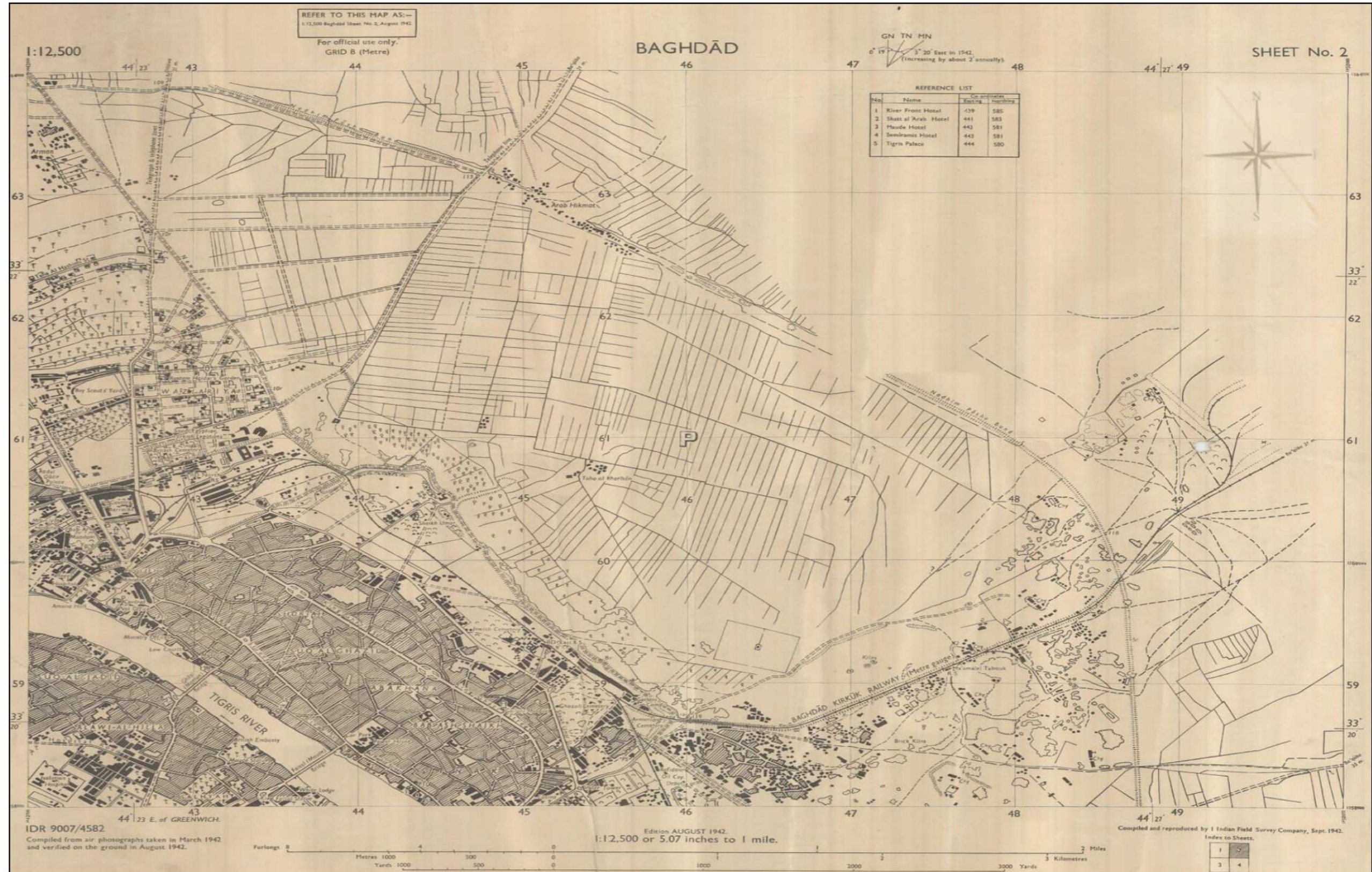


Figure -22:- Baghdad map in 1942, Source: Indian survey company 1942.



Figure -23-: Baghdad map in 1958, Source: Texas Library <https://legacy.lib.utexas.edu/maps/iraq.html>, (accessed 14 Nov.2012).

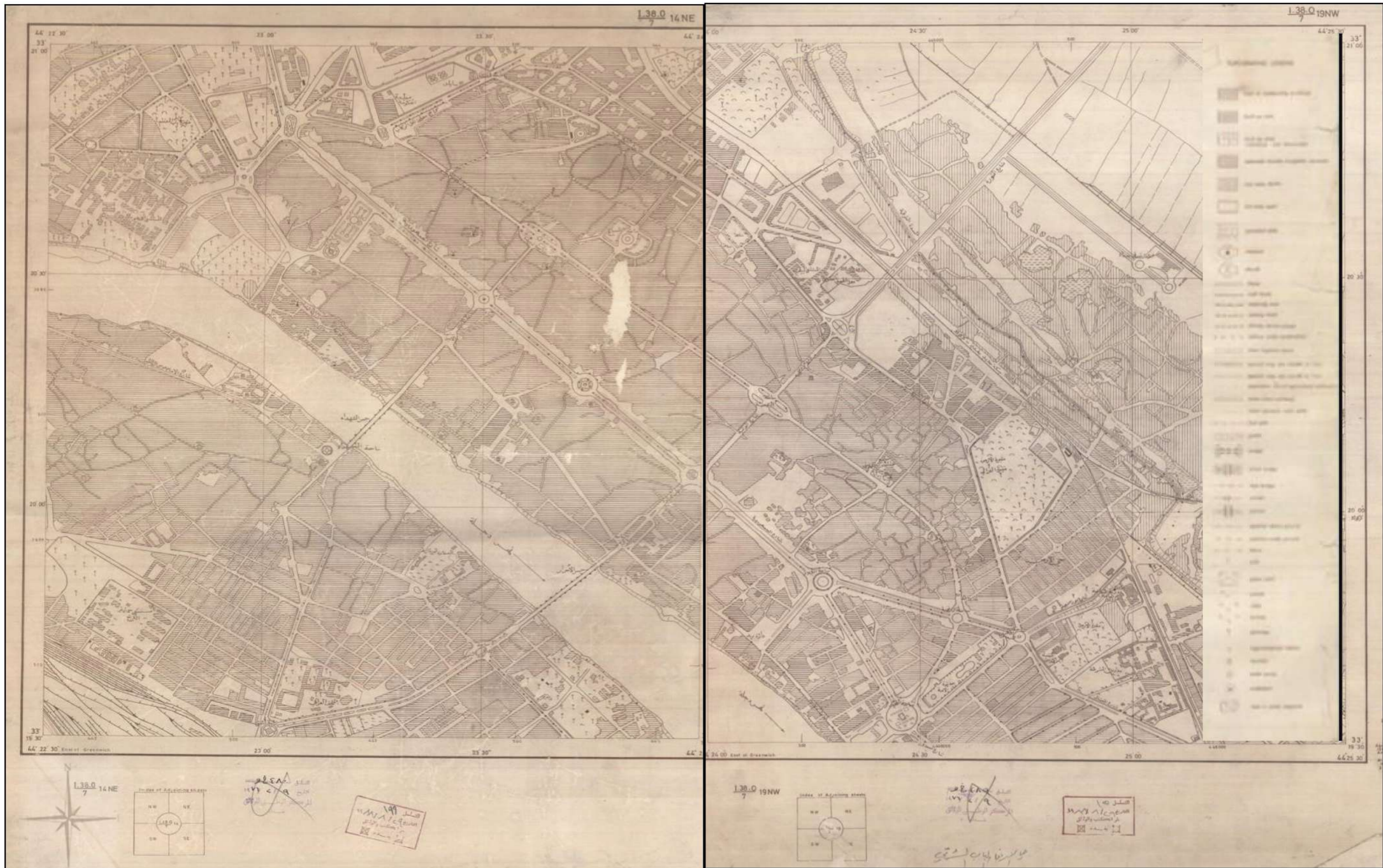


Figure -24-: Baghdad map in 1959 (Two Parts), Source: AERO Exploration (Frankfurt), Iraqi National Archive.

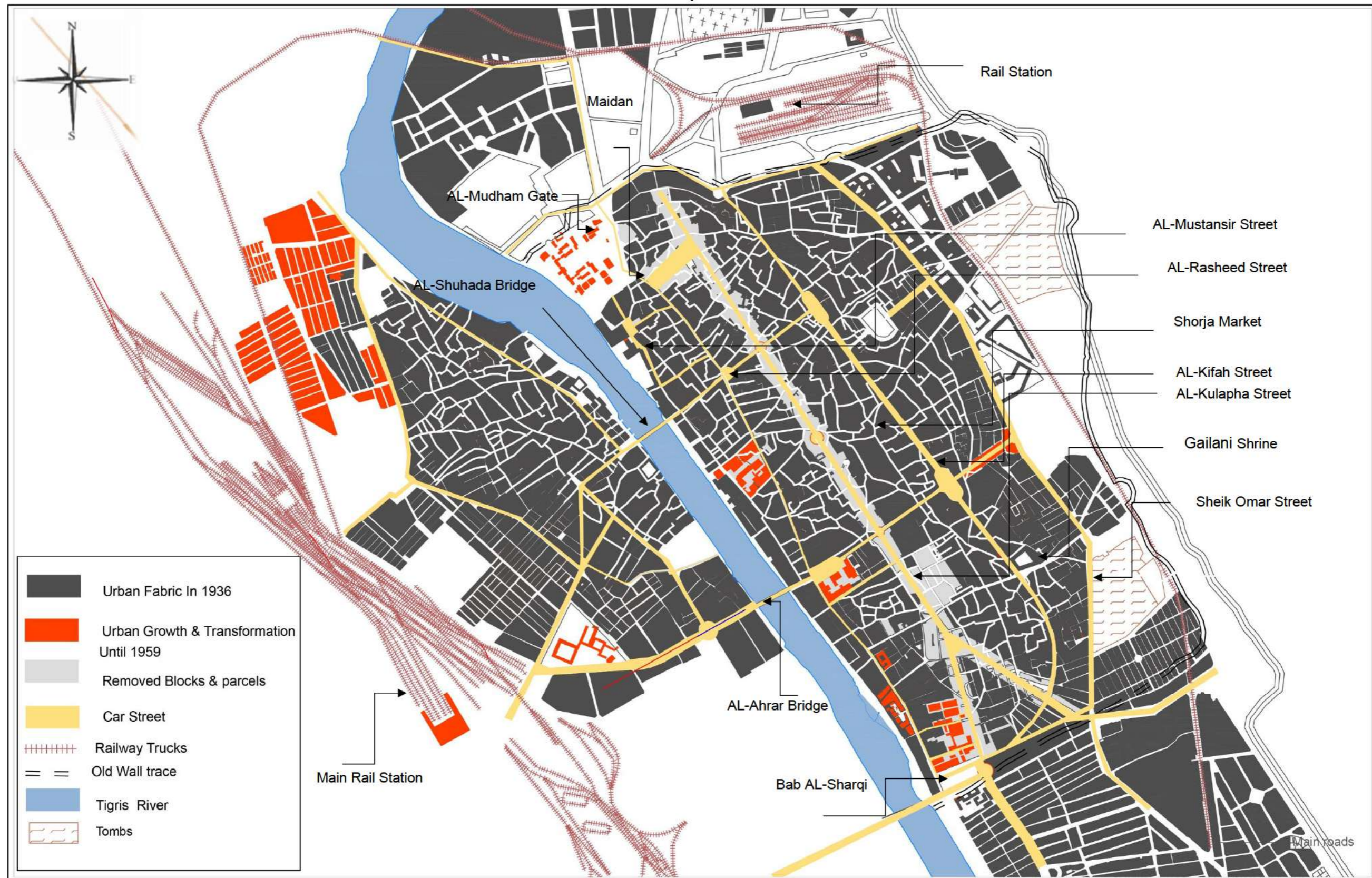


Figure -25-: Urban morphological change from 1936 to 1959, Source: Digitized and investigated by the Author.



Figure -26-: New AL-Khulapha street proposal in old core of Baghdad estimated before 1957, Source: The Mayoralty of Baghdad Archive.



Figure -27-: The plan of the street from AL-Kifah street up to Shorja in 1940, Source: The Mayoralty of Baghdad Archive.

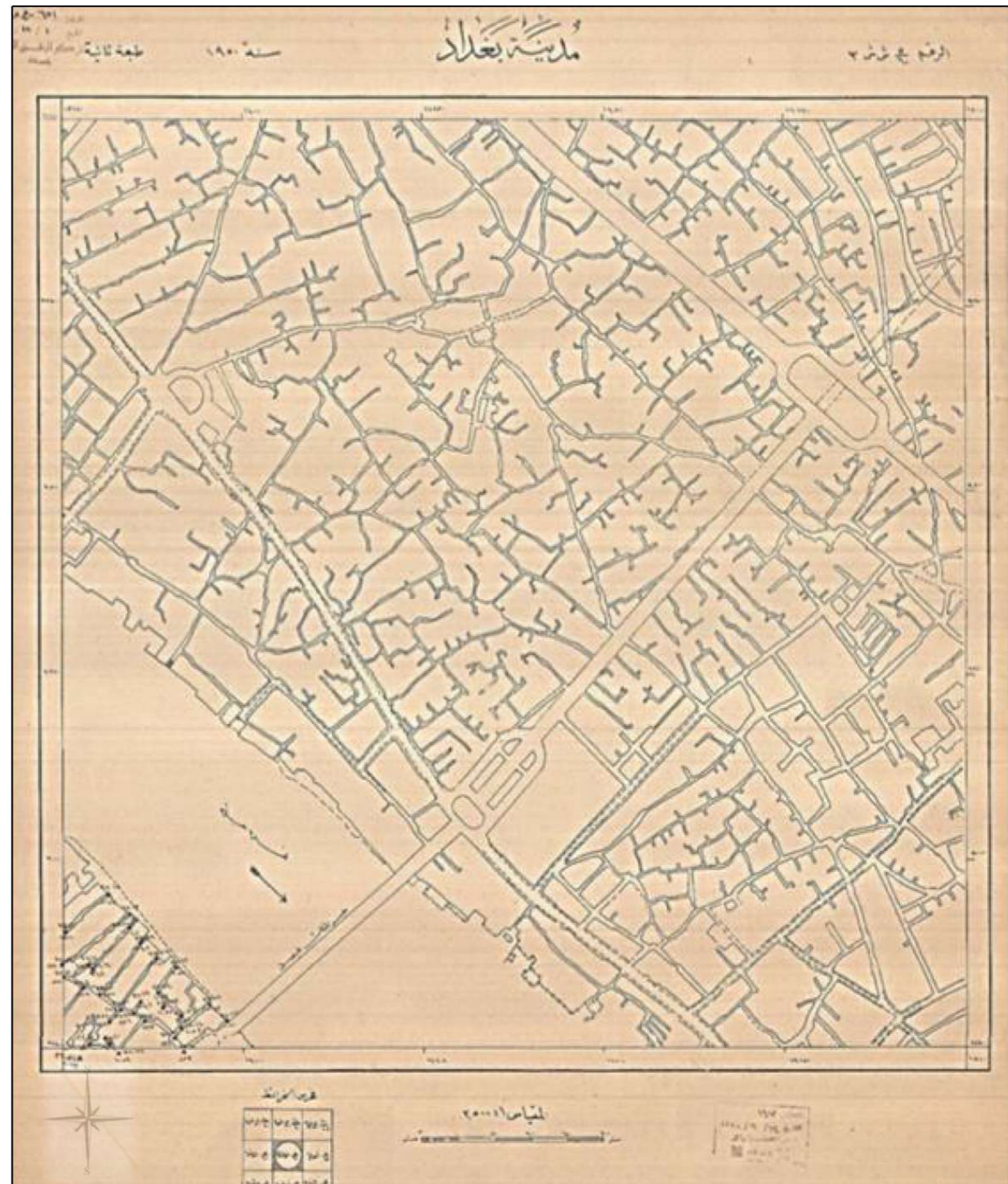


Figure -28-: Hafuth AL-Qathi square and the twin buildings, Baghdad Plan in 1950  
, Source: Iraqi National Archive.

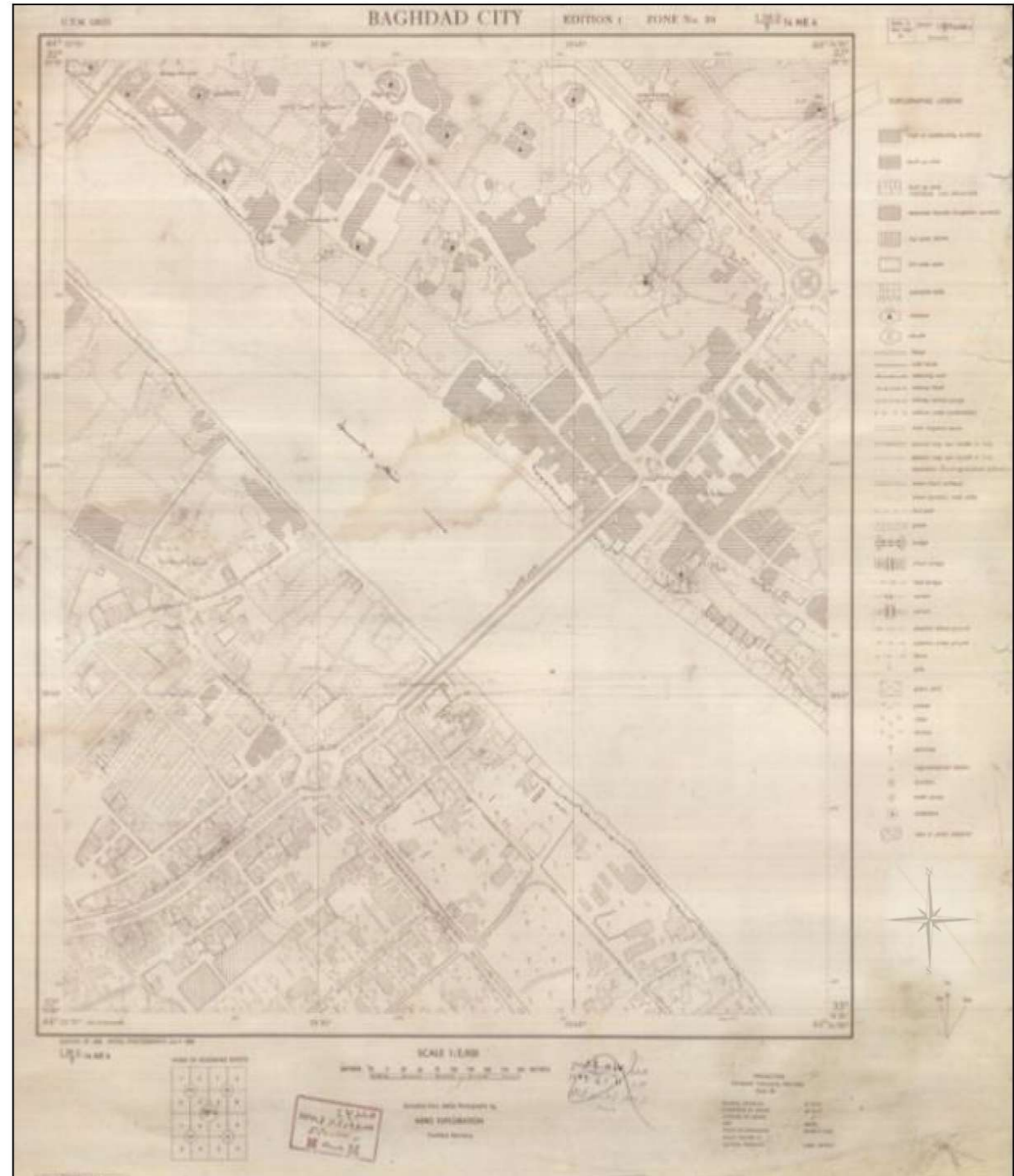


Figure -29-: Banking assembly in Baghdad plan in 1959  
, Source: AERO Exploration, Frankfurt, Iraqi National Archive.





Figure -30-: Baghdad aerial view in 1962, Source: Dutch KLM AEROCARTO, Former Iraqi Ministry of Agrarian Reform, survey department.



Figure -31-: Baghdad master plan in 1973, Source: HIC (Humanitarian Information center), Reference:332.

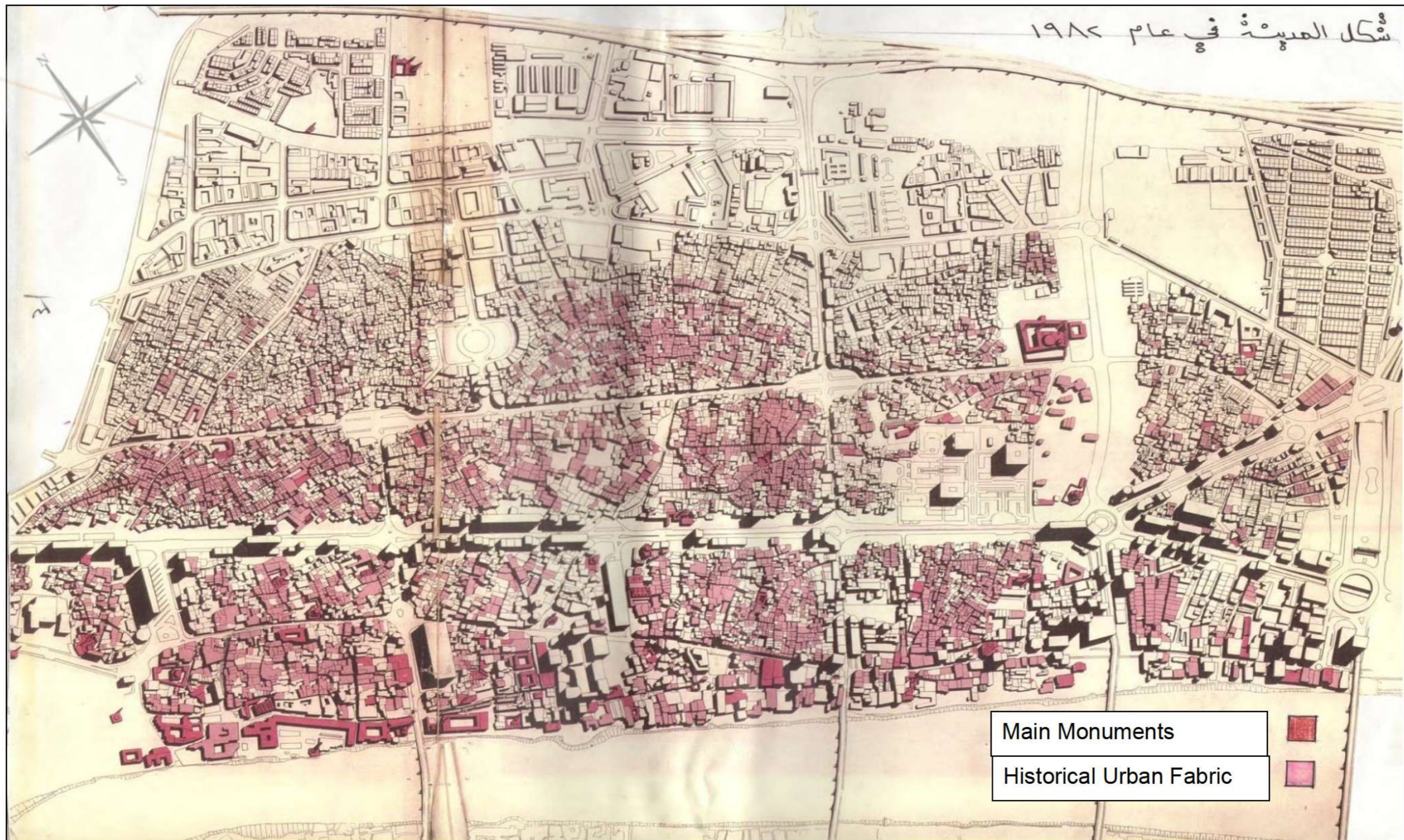


Figure -32-: Baghdad old core plan in 1983, Source: JCP & Mayorality of Baghdad:3-4.

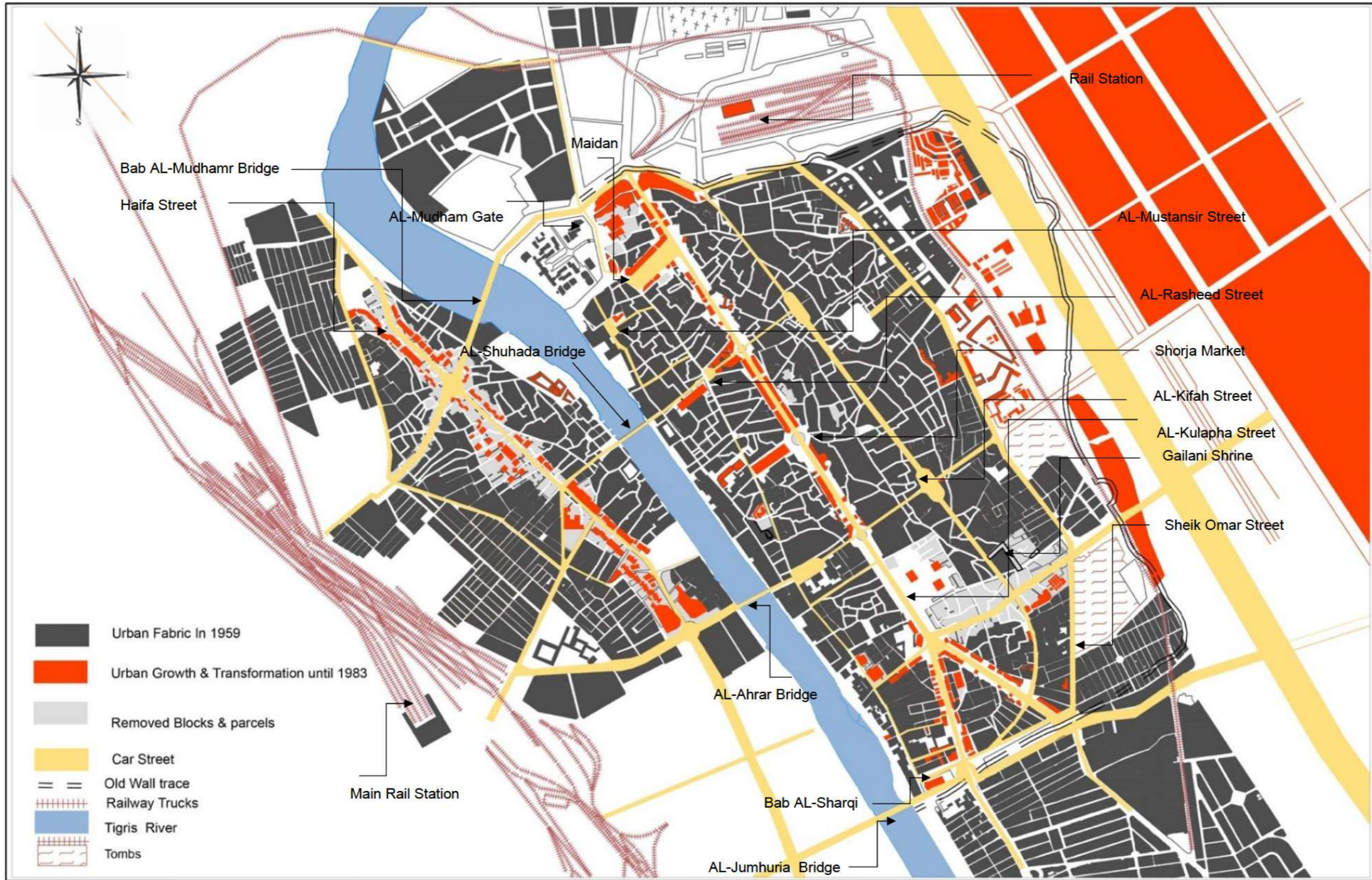


Figure -33-: Urban morphological change from 1959 to 1983, Source: Digitized and investigated by the Author.

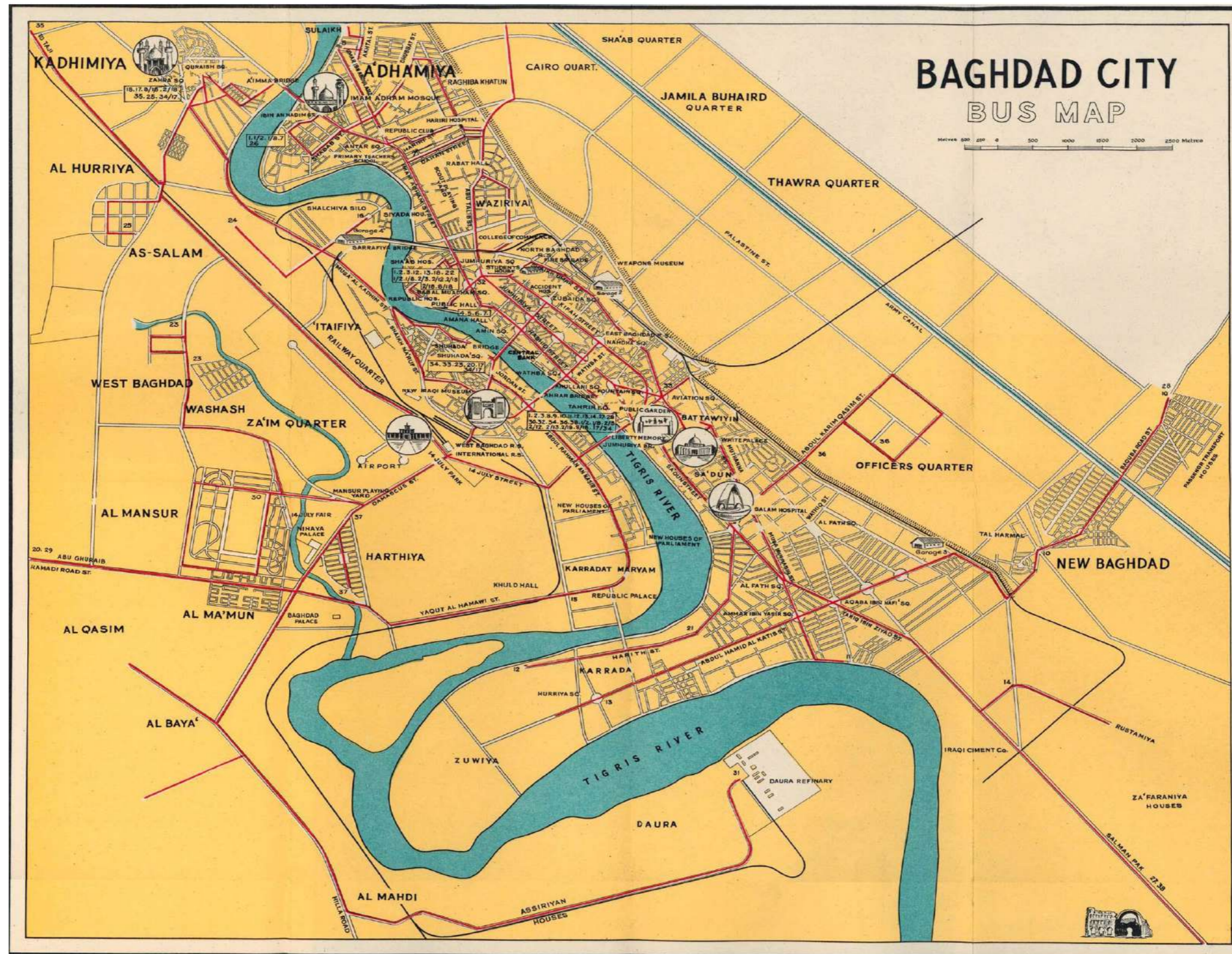


Figure -34:- - Baghdad Bus Map in 1961,Source: [https://mapcruzin.com/free-maps-iraq/baghdad\\_bus\\_1961.jpg](https://mapcruzin.com/free-maps-iraq/baghdad_bus_1961.jpg) ,(accessed 20 Feb.2019),

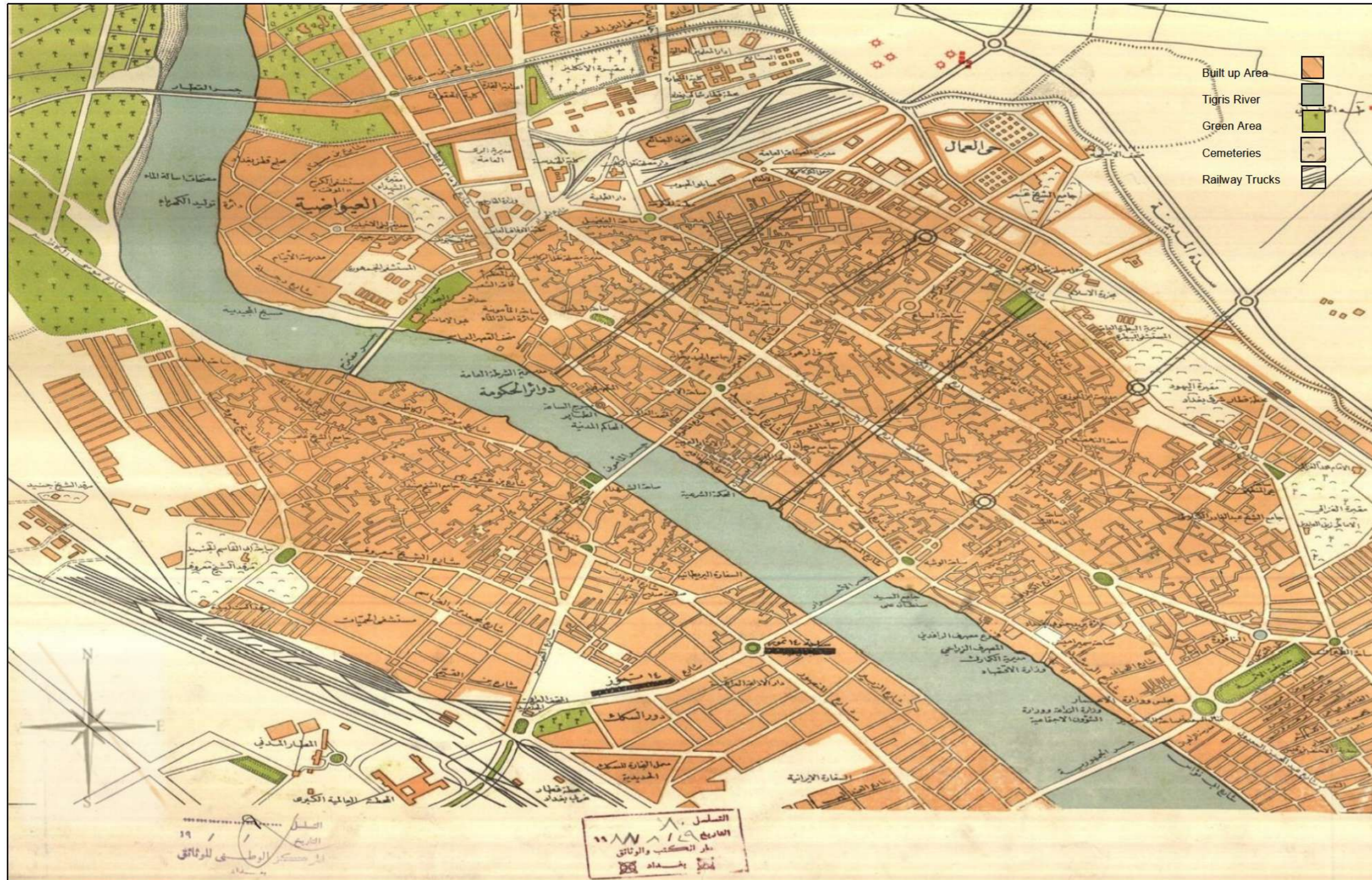


Figure -35-: New streets proposal for Baghdad old core, Estimated between (1959-1963), Source: Iraqi National Archive.

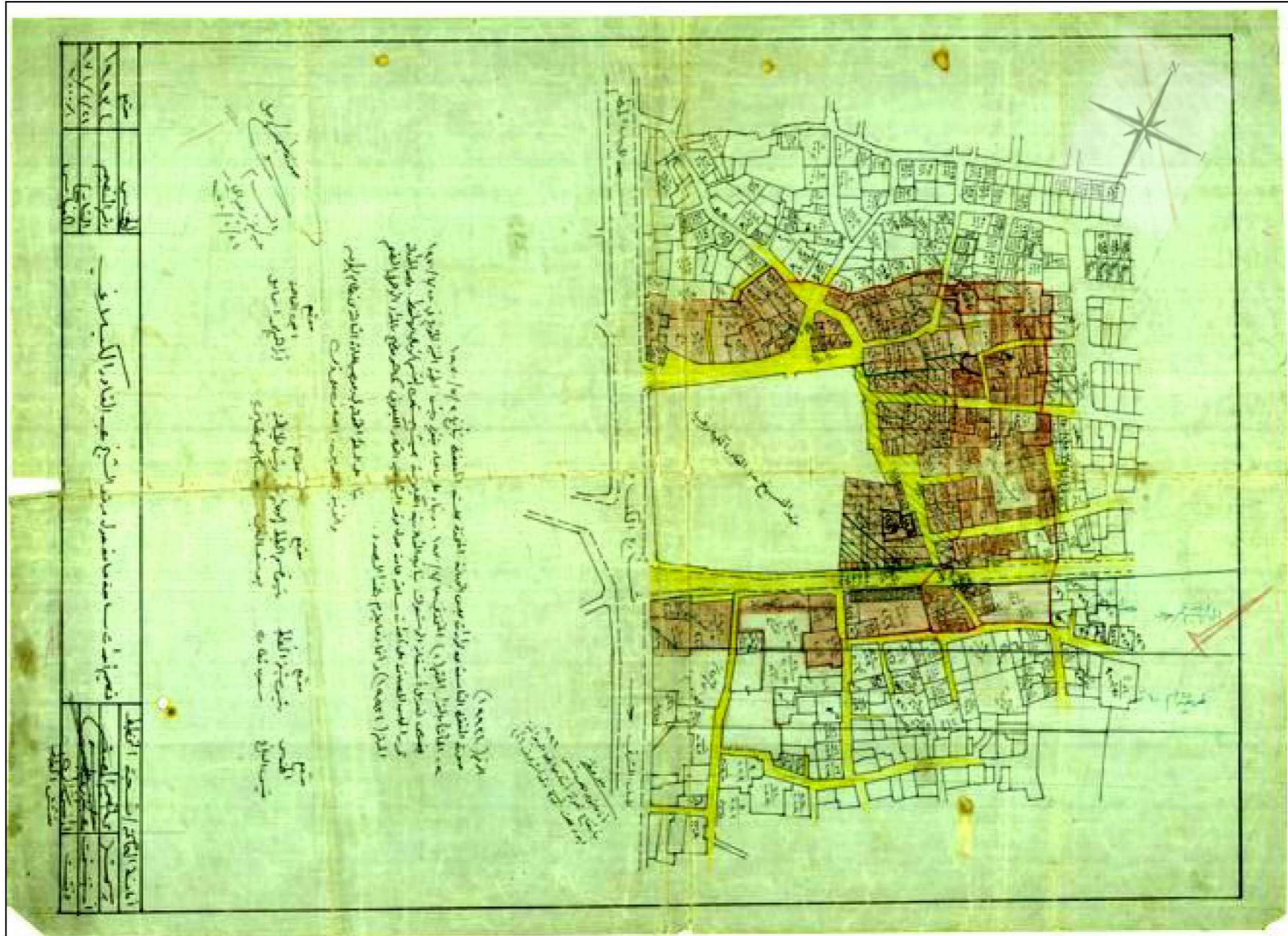


Figure -36-: The destroyed area before the construction of the connector road from AL-Khulani square to AL-Gailani shrine in 1972, Source: The Mayoralty of Baghdad Archive.

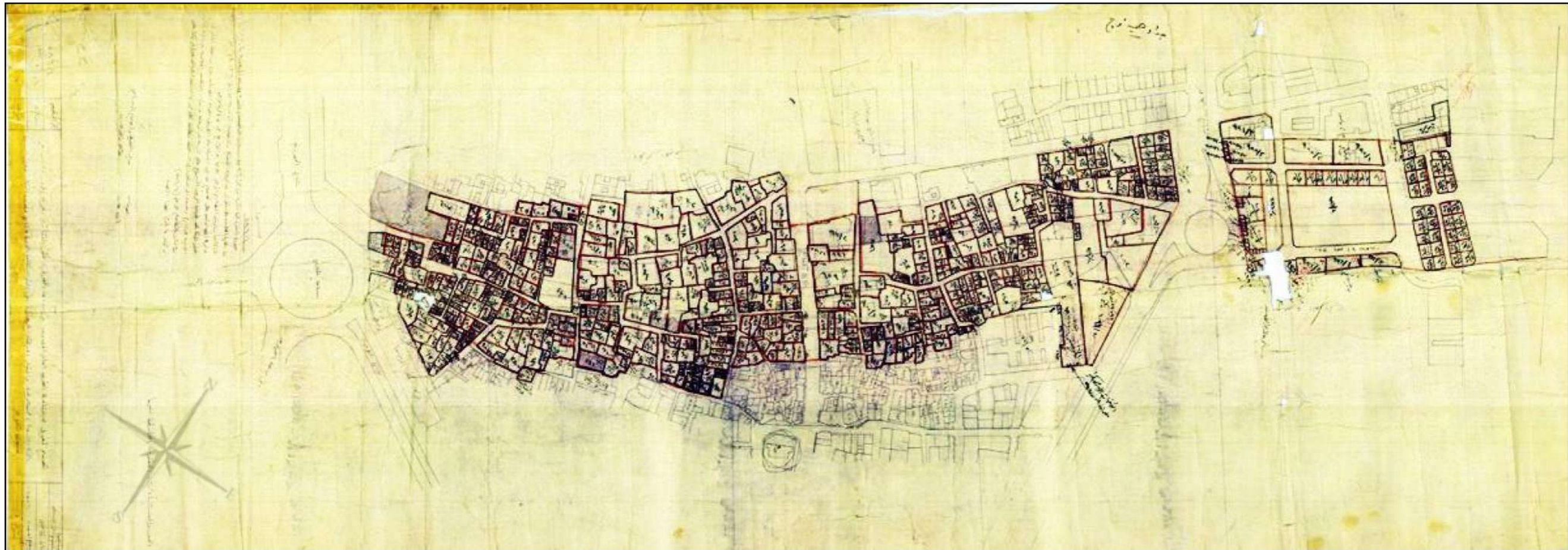


Figure -37-: The destructed area around AL-Gailani shrine in 1981, Source: The Mayoralty of Baghdad Archive.



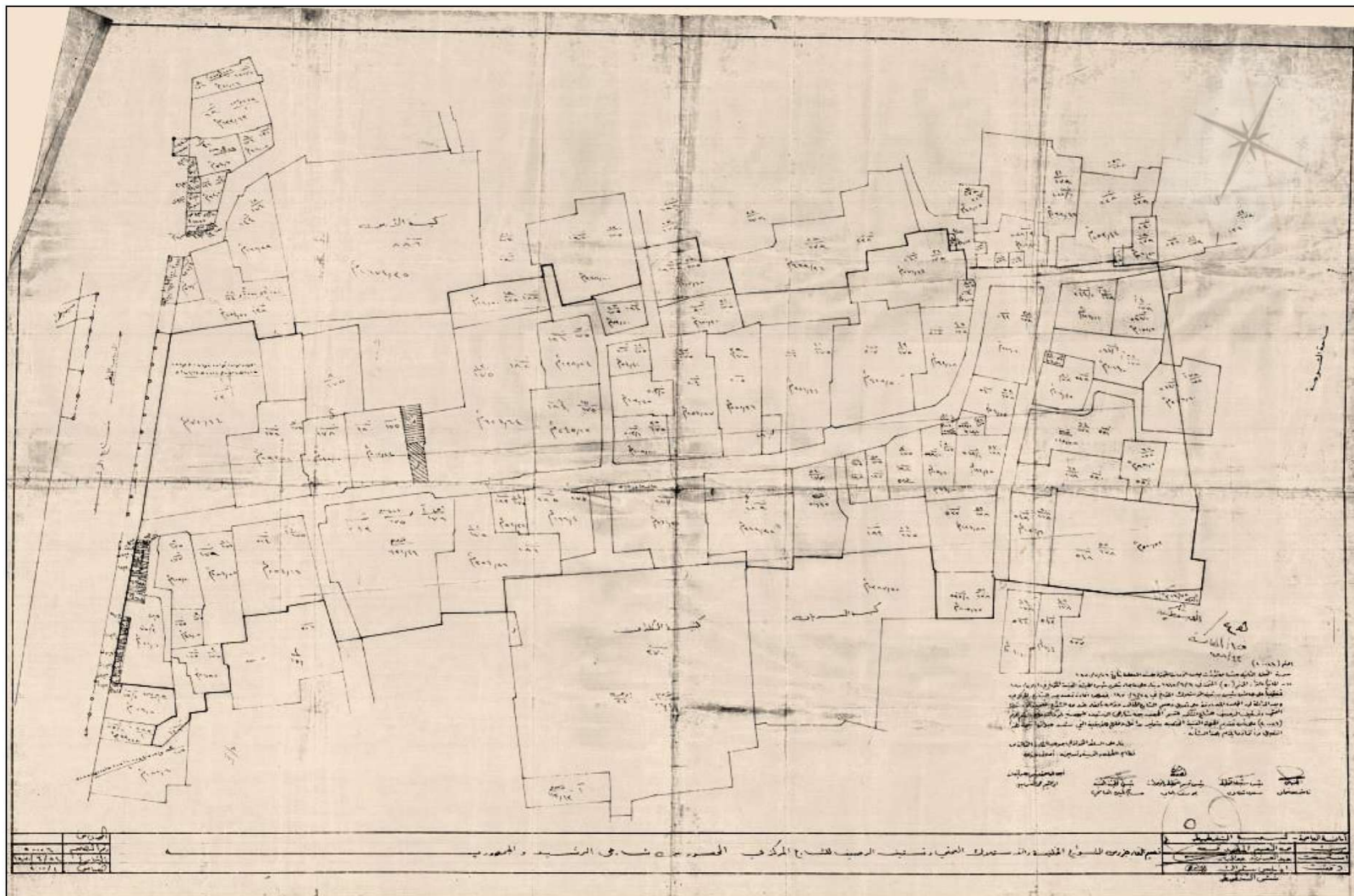


Figure -38-: The destroyed area before AL-Arabi shopping center construction in 1970, Source: The Mayoralty of Baghdad Archive.



Figure -39-: Old city urban structure after an initial survey in 2009, Source: Ministry of planning-GIS center.

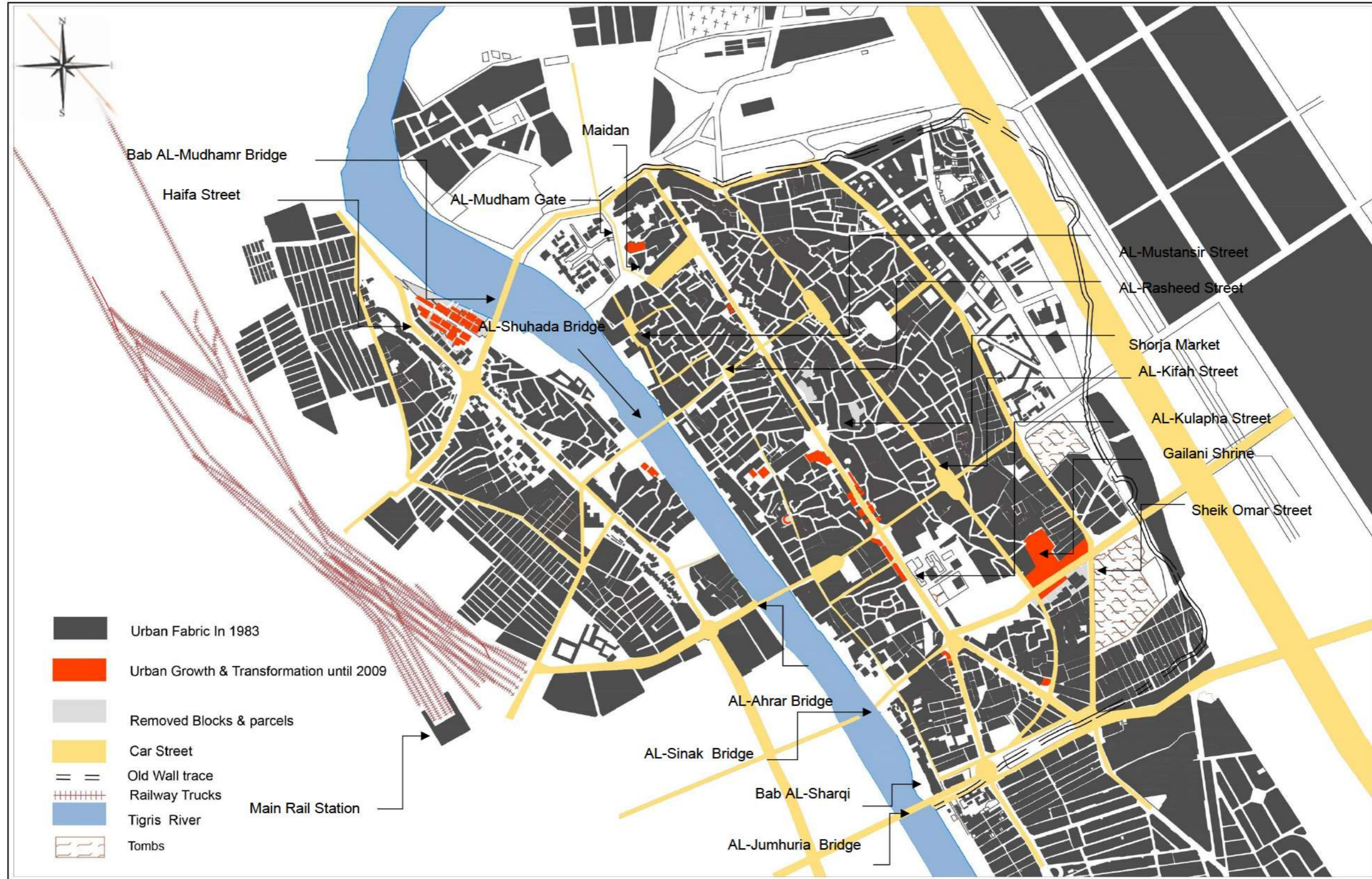


Figure -40-: Urban morphological change from 1983 to 2000, Source: Digitized and investigated by the Author

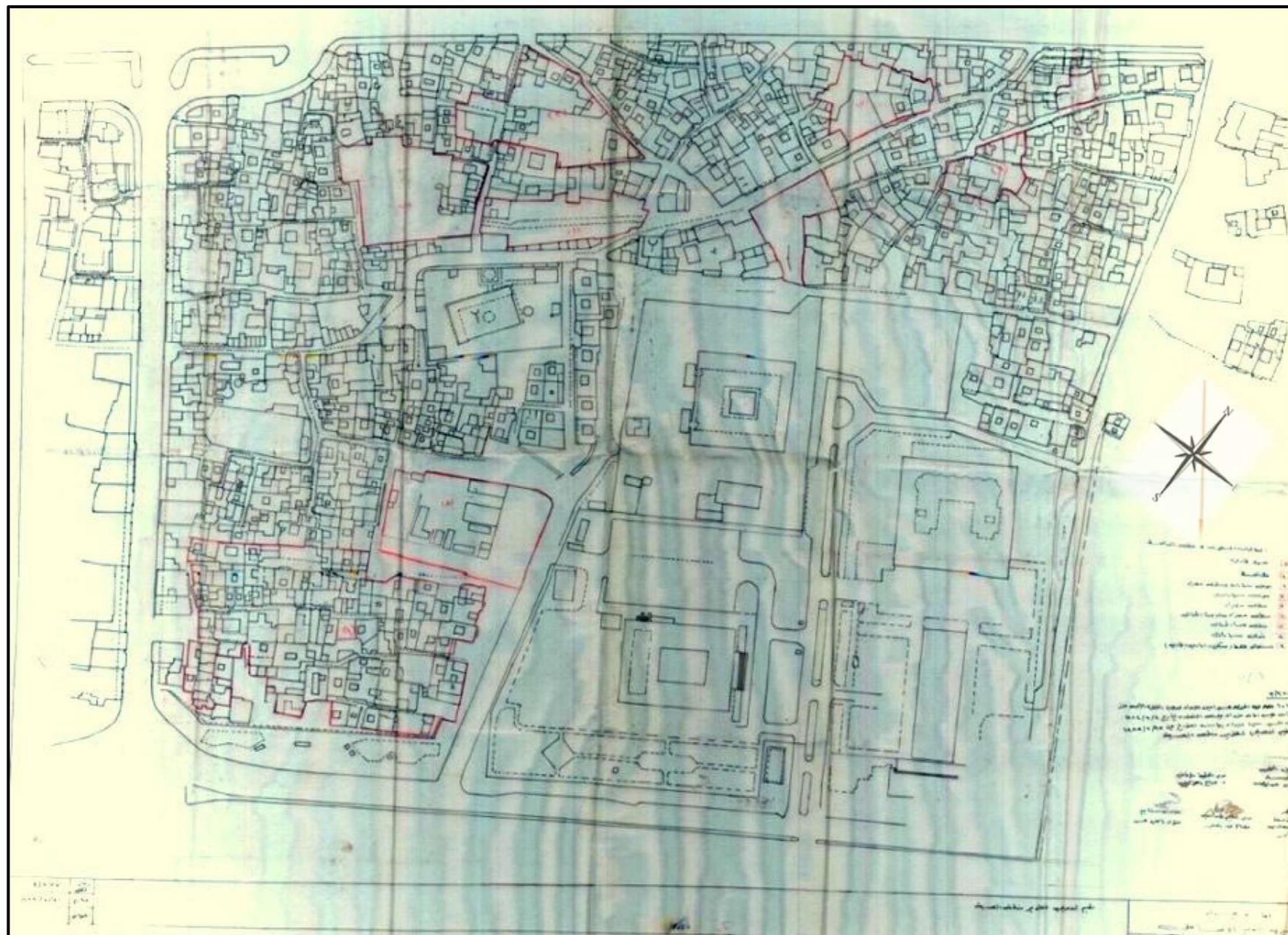


Figure -41-: Sadryah land use plan proposal in 1989, Source: The Mayoralty of Baghdad Archive.

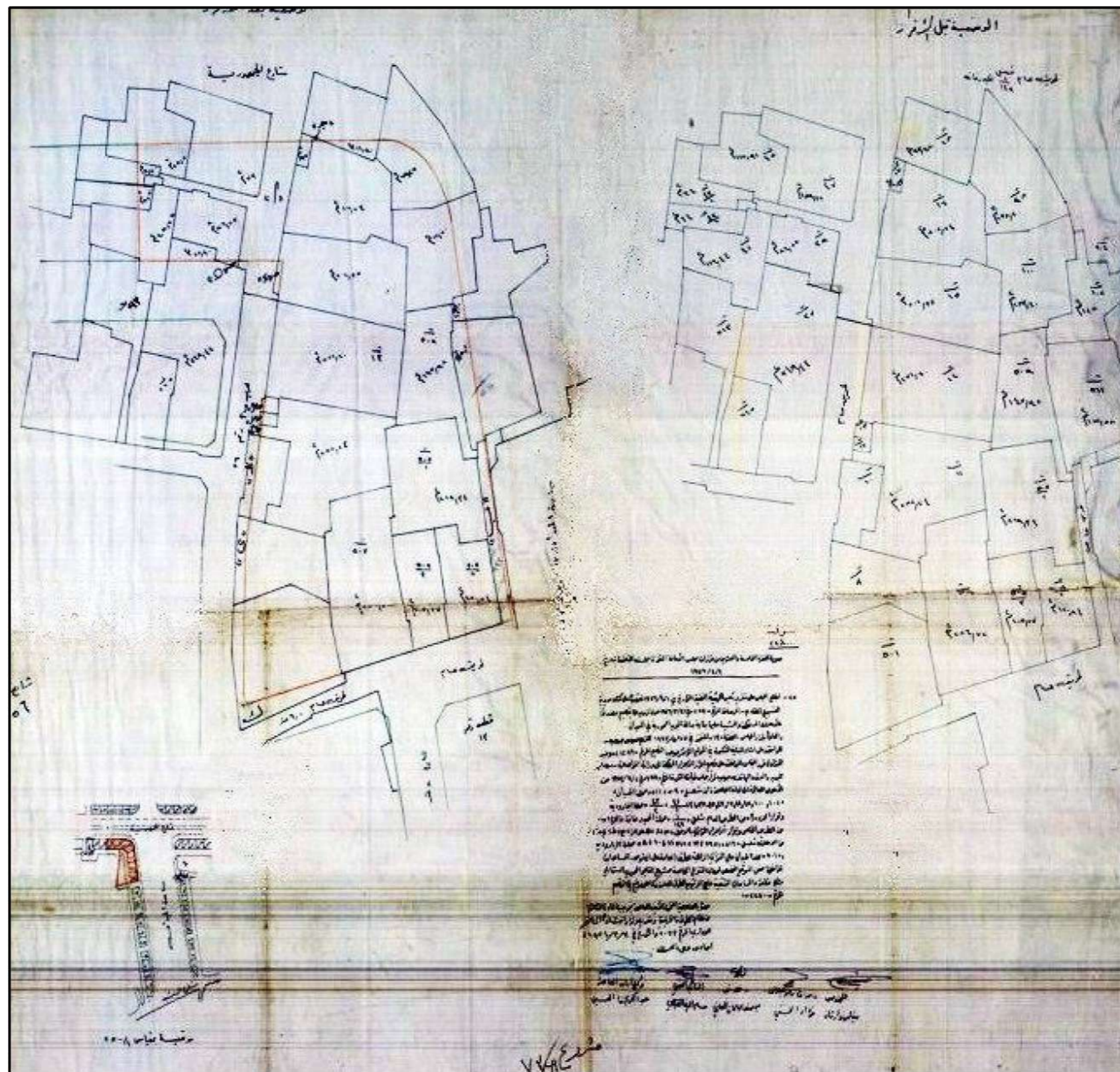


Figure -42-: The removal of residential units with cul-de sac streets to be substituted by big blocks in 1973, Source: The Mayoralty of Baghdad Archive.

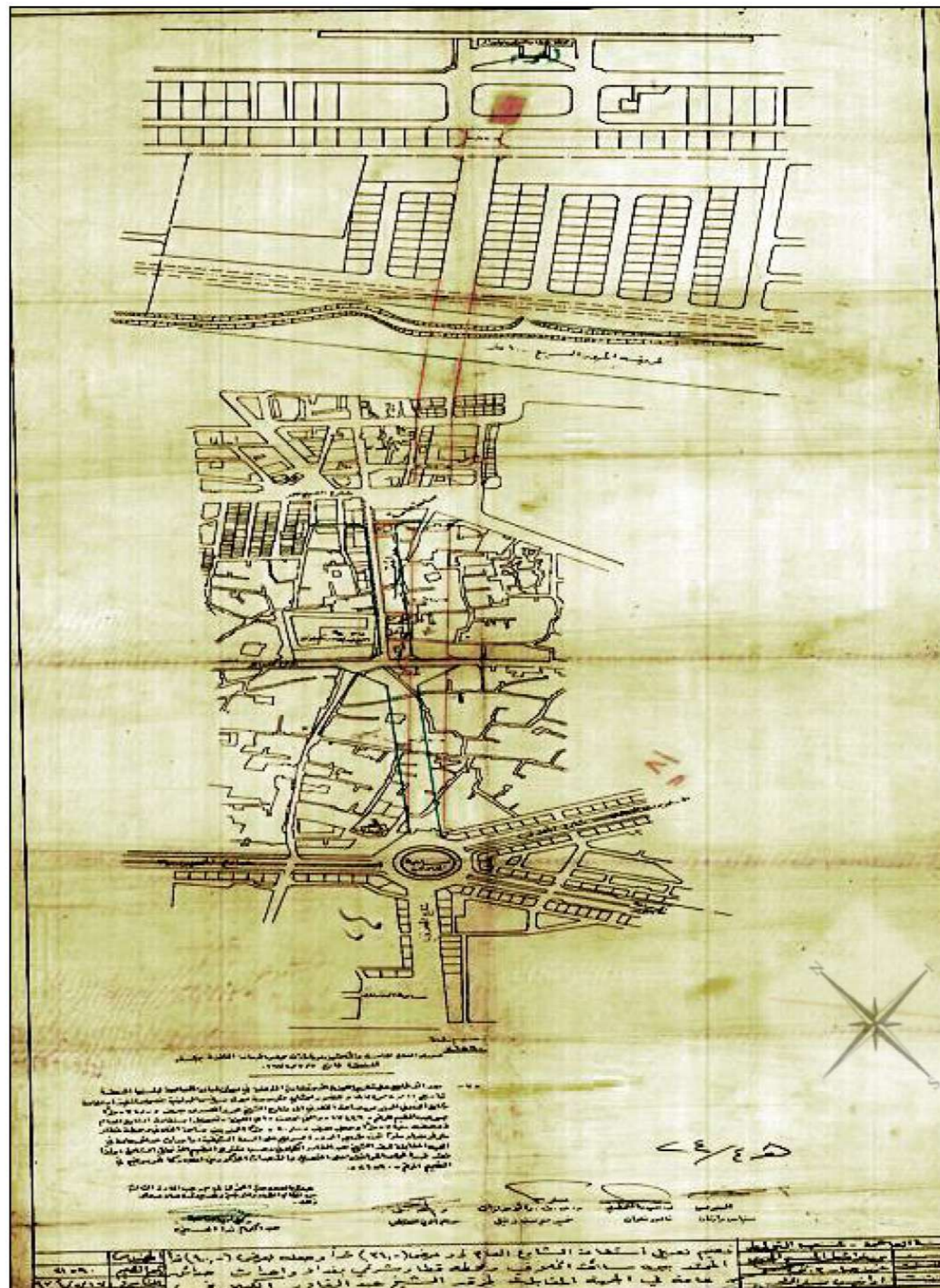


Figure -43-: Lining new breakthrough street from AL-Khulani mosque to AL-Gailani shrine in 1974, Source: The Mayoralty of Baghdad Archive.

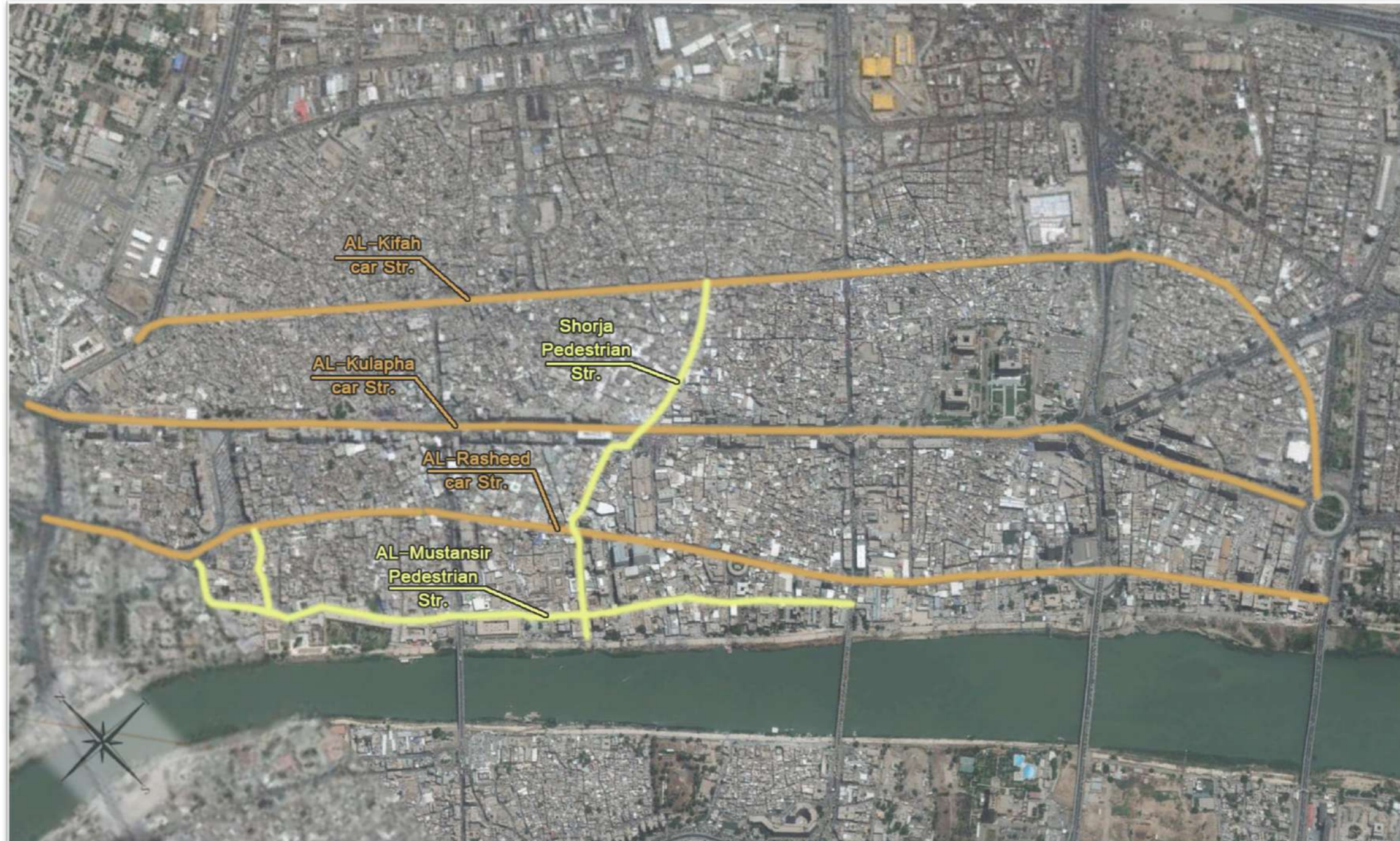


Figure -44-: The main pedestrian and car streets in the old city of Baghdad, Source: Drawn by the Author based on google map, (accessed 12 Jan. 2018).

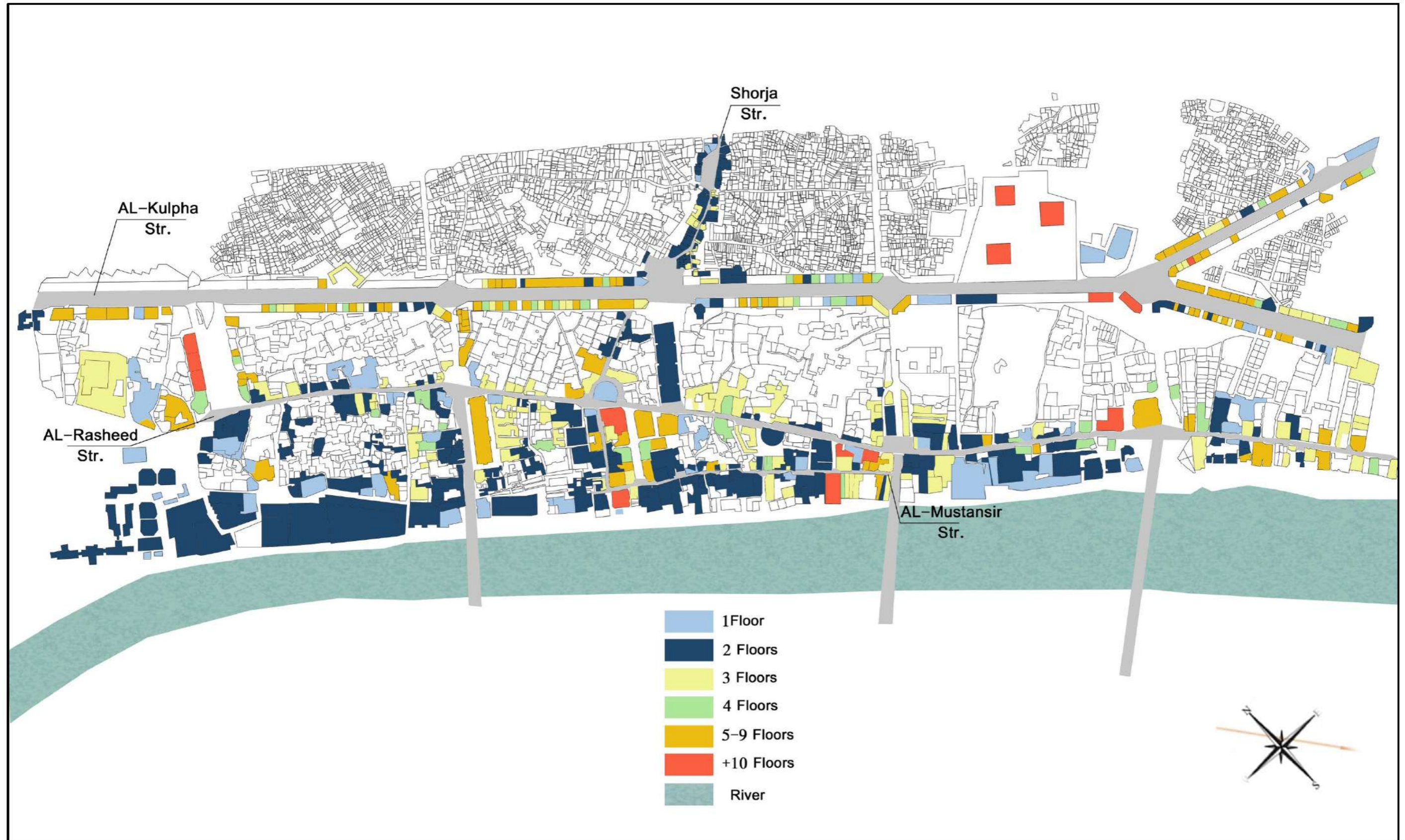


Figure -45-: The height survey for the buildings along the main pedestrian streets (Shorja and AL-Mustansir streets) and car streets (AL-Rasheed street & AL-Khulapha street) in the old city of Baghdad, Source: Drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017:14



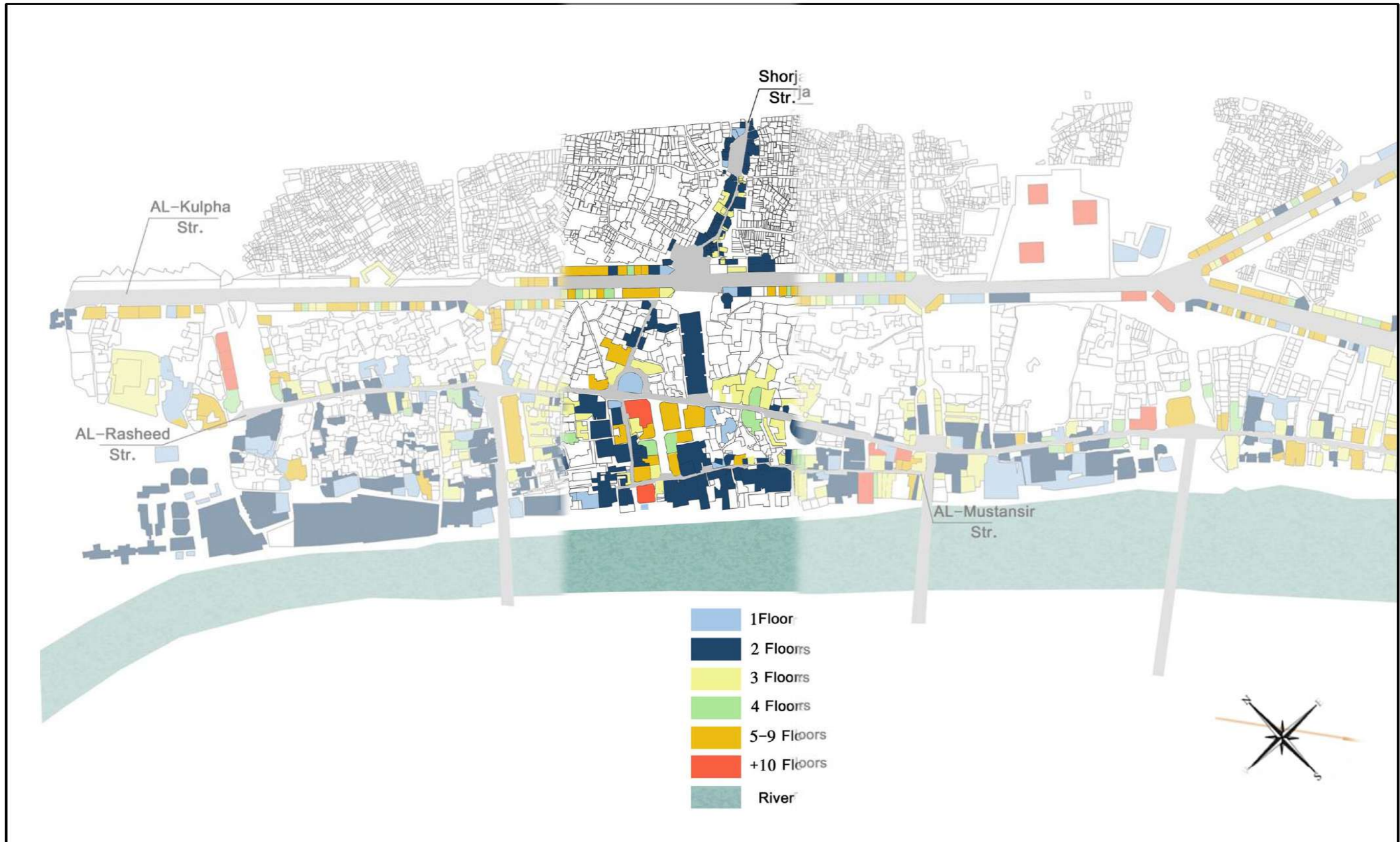


Figure -46-: The height survey for the buildings along the main pedestrian street (Shorja street) in the old city of Baghdad, Source: Drawn and surveyed by the Author.



Figure -47-: The height survey for the buildings along Sarai street & AL-Mustansir street in the old city of Baghdad, Source: Drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017:14.



Figure -48-: The height survey for the buildings along AL-Rasheed street in the old city of Baghdad, Source: Drawn by the Author based on personal survey accompanied with reviewing and editing a survey that was done in 2008 for both AL-Rasheed street and AL-Mustansir street cited in Abdul Hadi.T 2017:14.

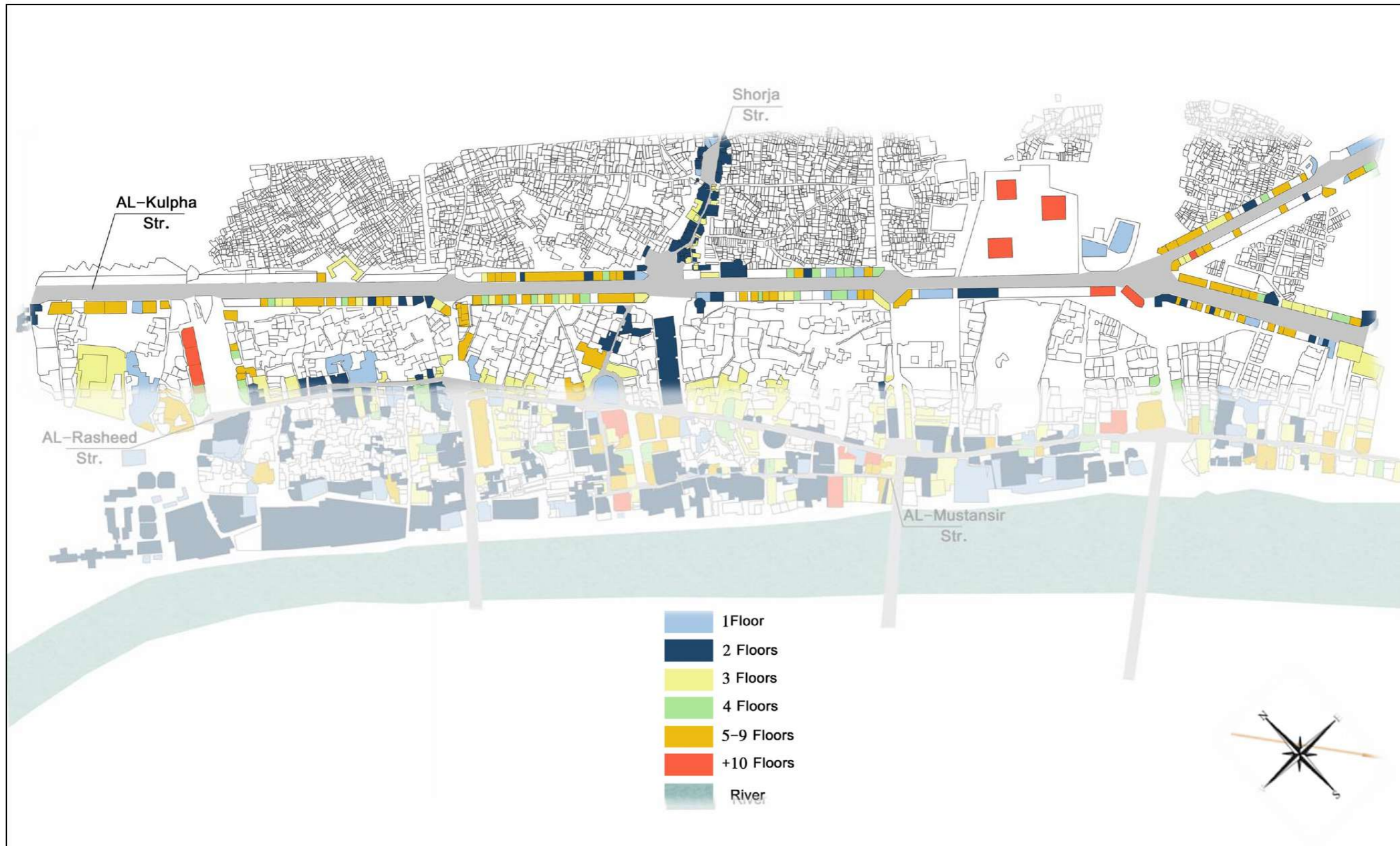


Figure -49-: The height survey for the buildings along the main AL-Khulpha street in the old city of Baghdad, Source: Drawn and surveyed by the Author.

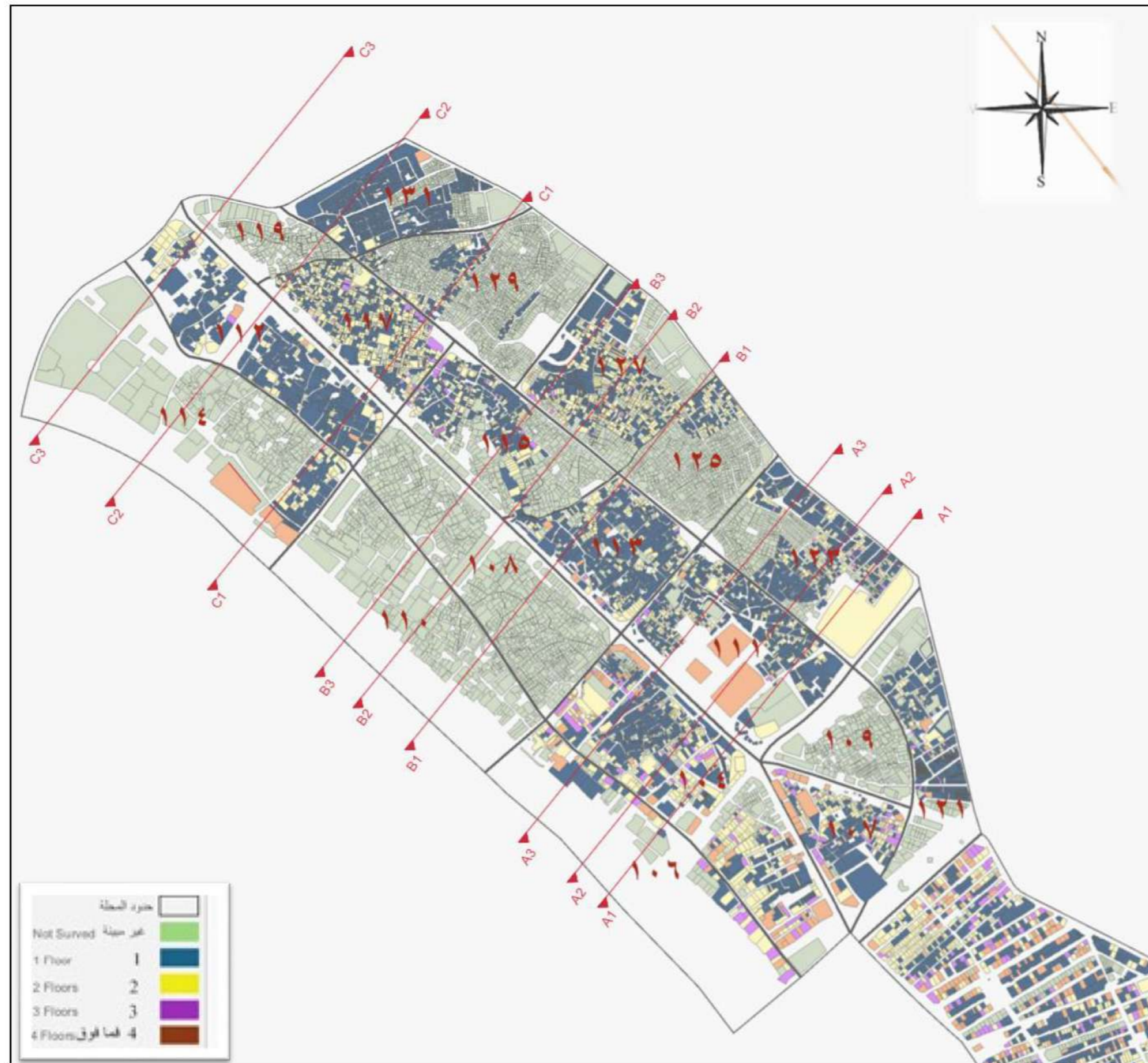


Figure -50-: Floors Number survey in some parts of the old city core of Baghdad showing the selected urban sections, Source: Ministry of Planning, GIS Department, Edited by the Author.

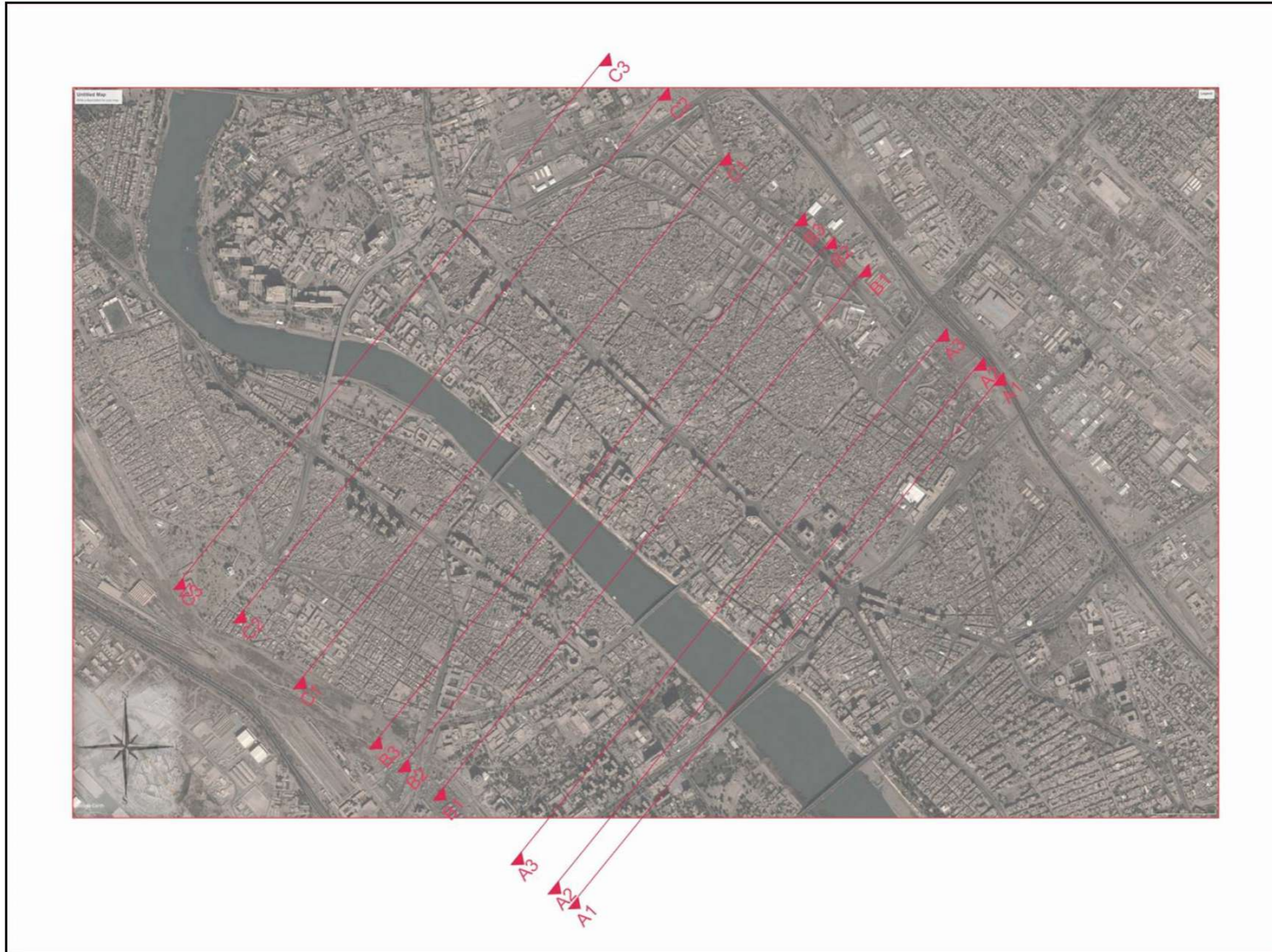


Figure -51-: Aerial image in 2009 in the old city core of Baghdad showing the selected urban sections, Source: Google Pro, (accessed 12 Jan. 2018), Edited by the Author.

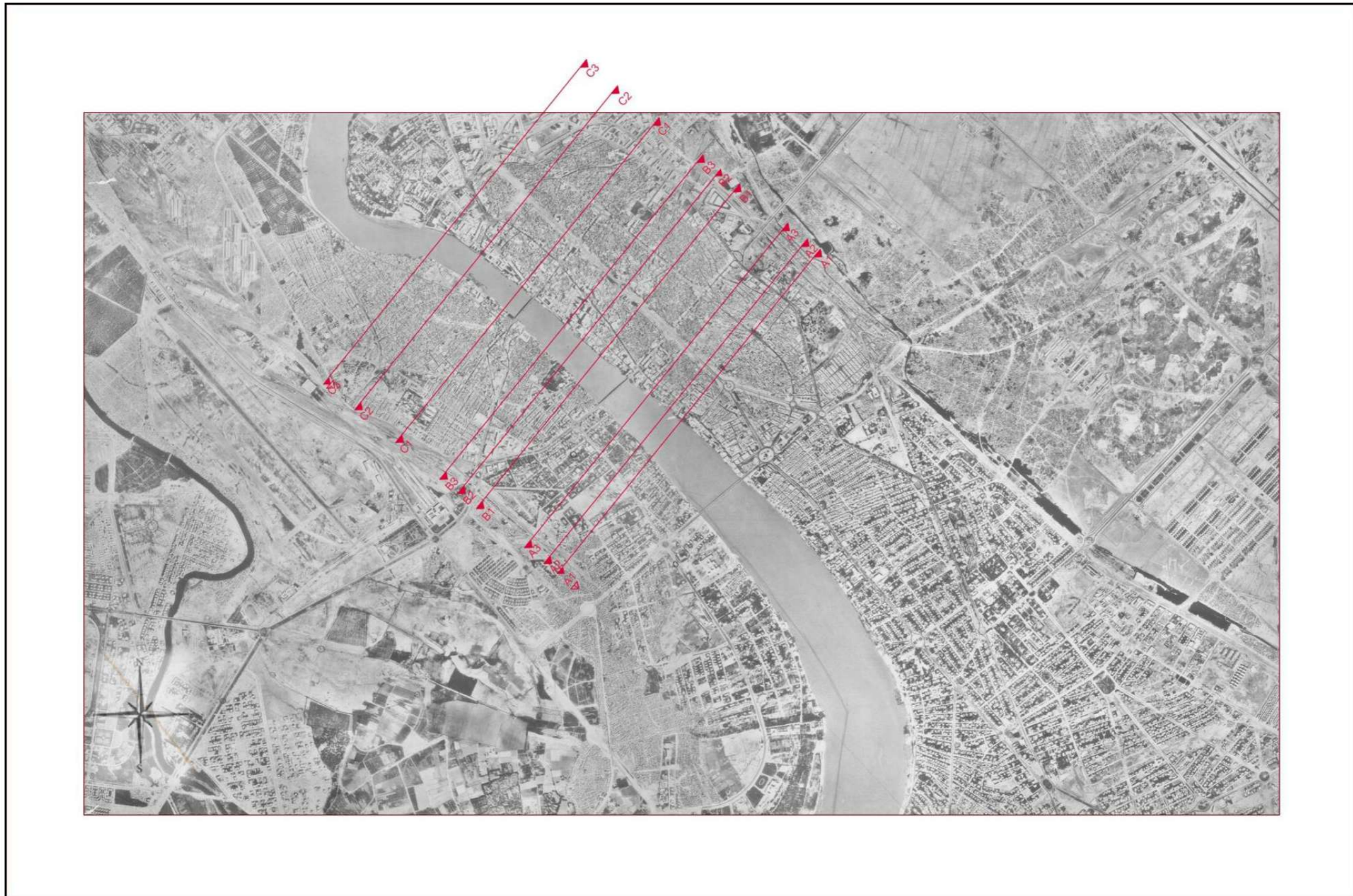


Figure -52-: Aerial image in 1962 in the old city core of Baghdad showing the selected urban sections, Source: Dutch KLM AEROCARTO, Former Iraqi Ministry of Agrarian Reform, Edited by the Author.

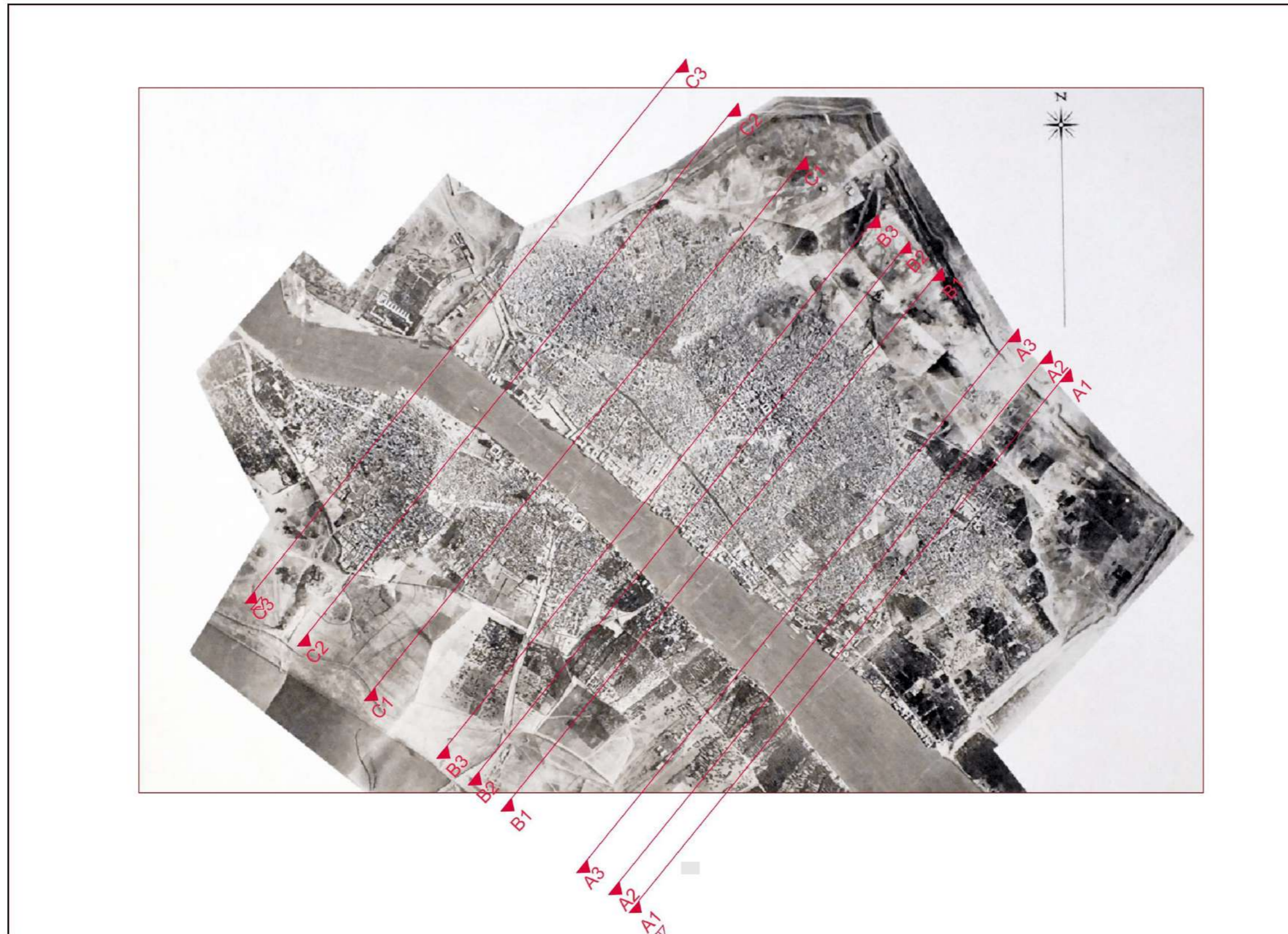


Figure -53-: Aerial image in 1917 in the old city core of Baghdad showing the selected urban sections, Source: British Archive, ref. WO 302/55, Edited by the Author.



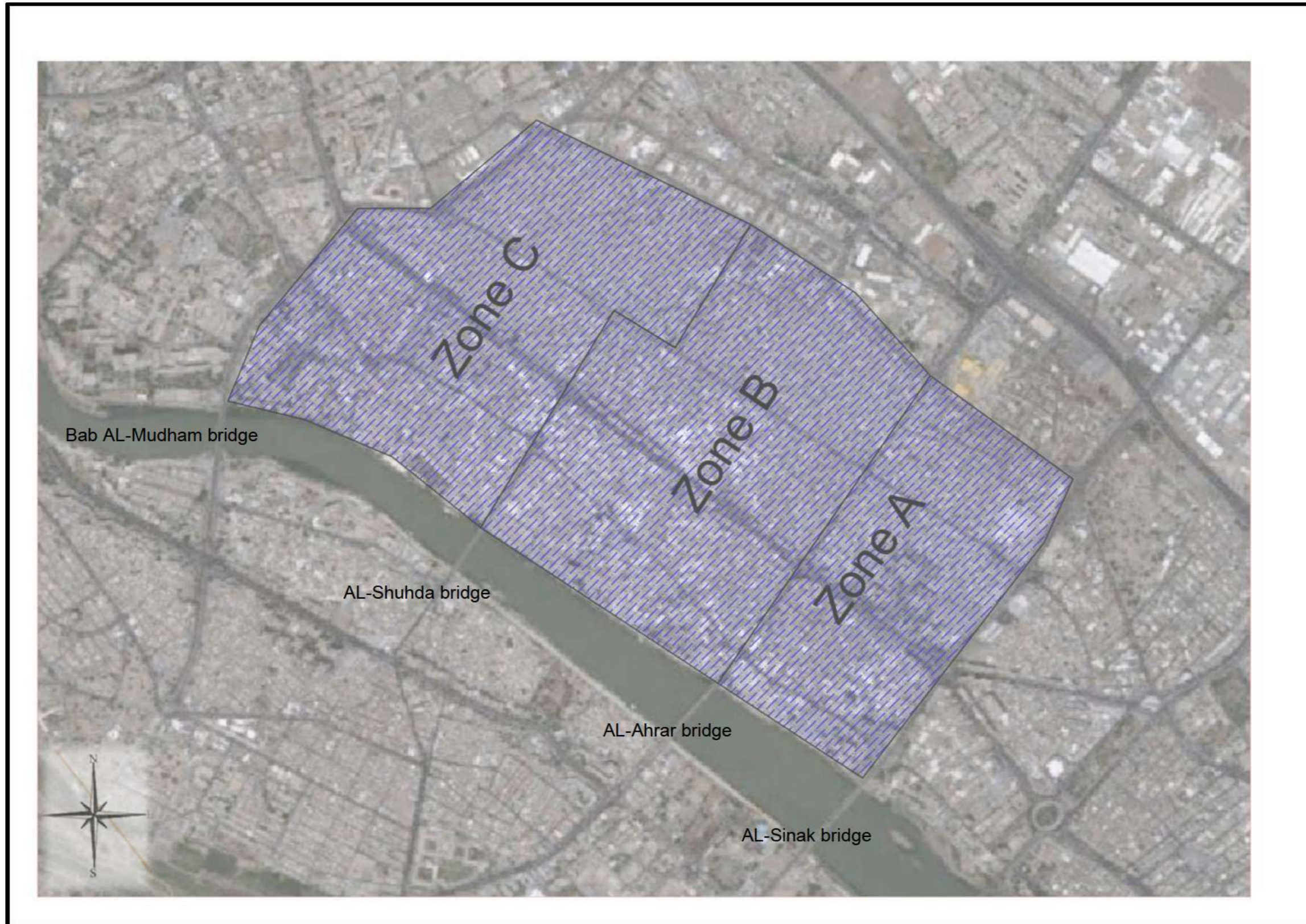


Figure -54-: The selected action zones, Source: Google Pro, modified by the Author, (accessed 12 Jan. 2018),

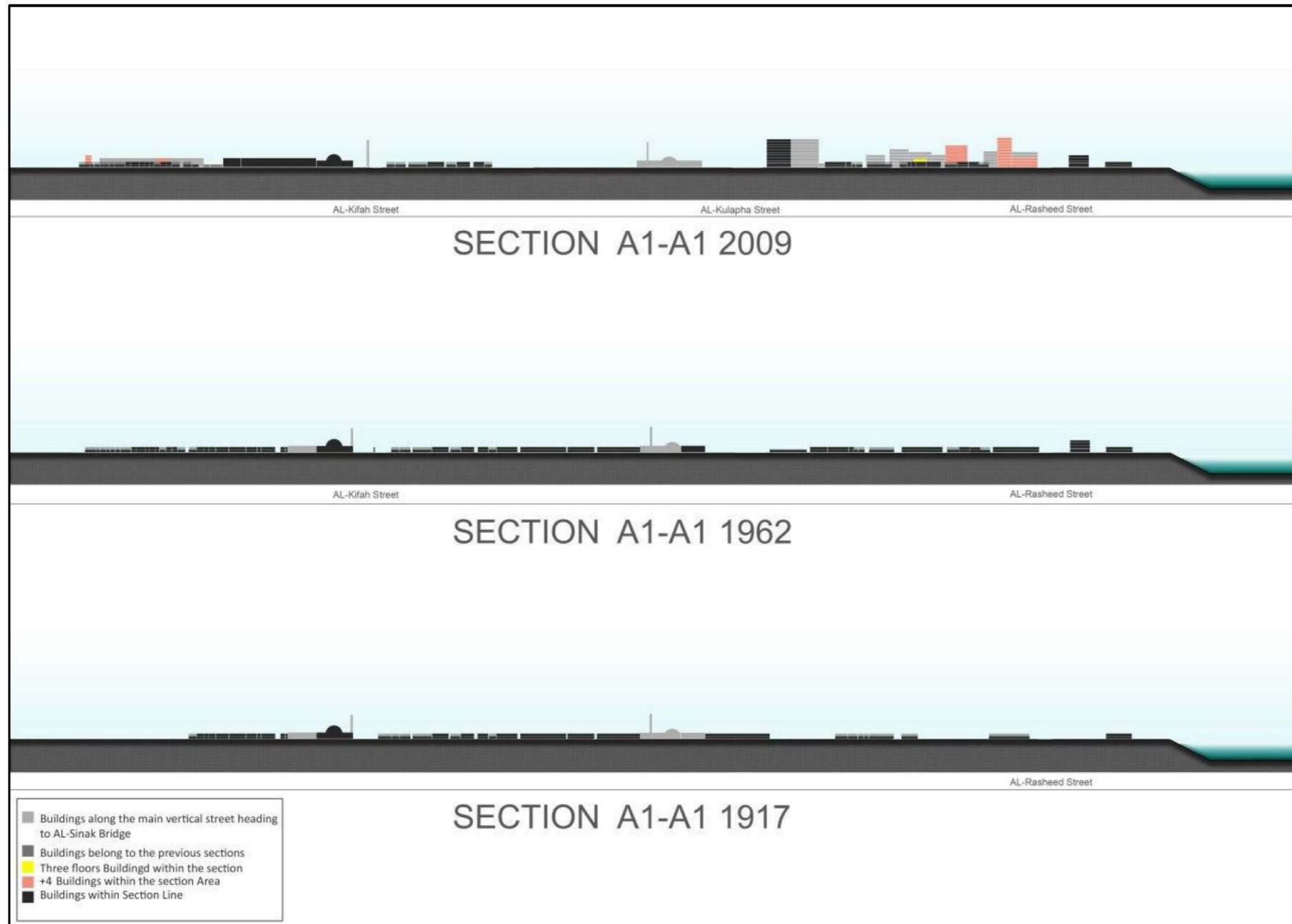


Figure -55-: The transformation in urban structure shown by -Section A1-A1-( in Zone A) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

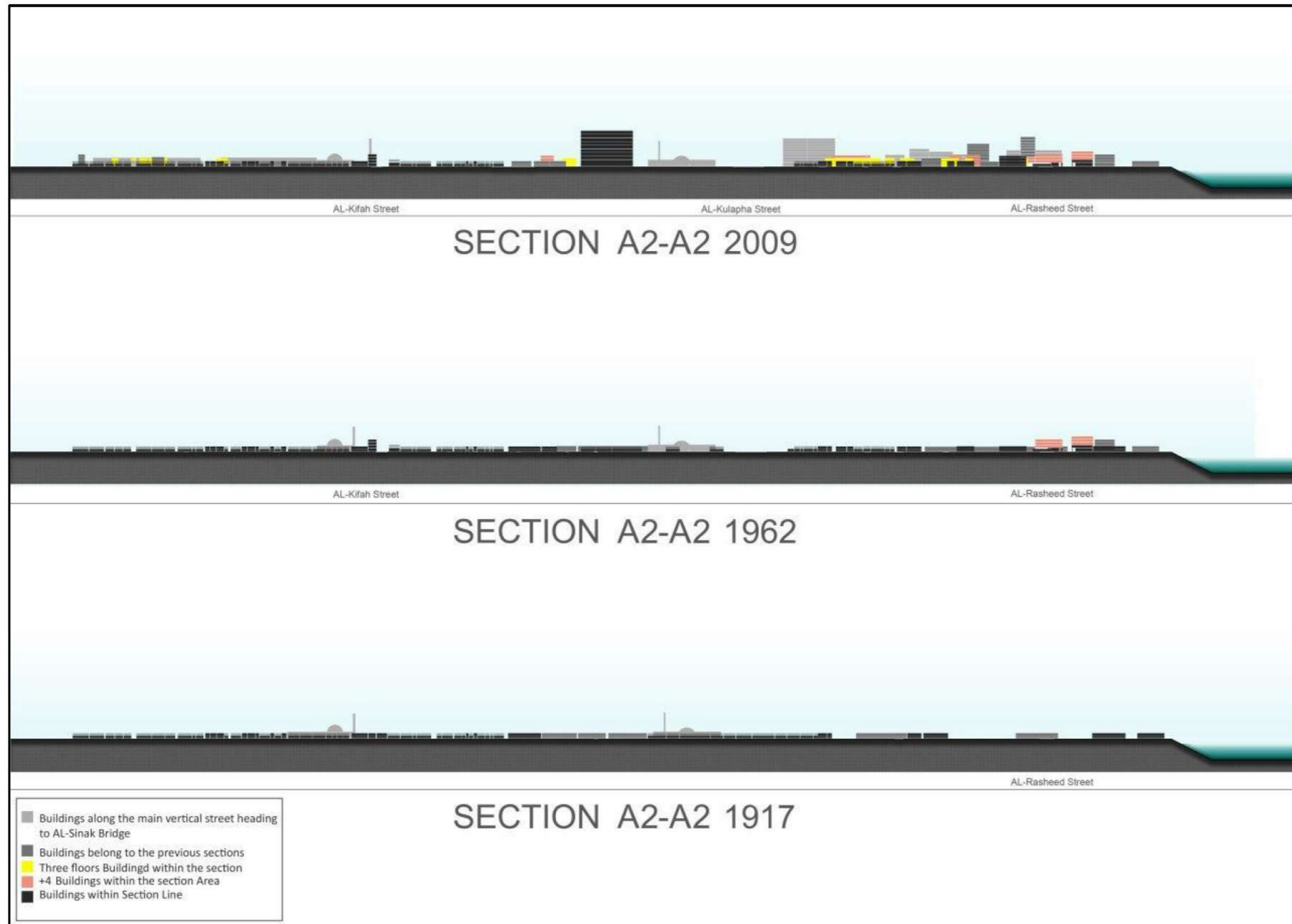


Figure -56-: The transformation in urban structure shown by -Section A2-A2- (in Zone A) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

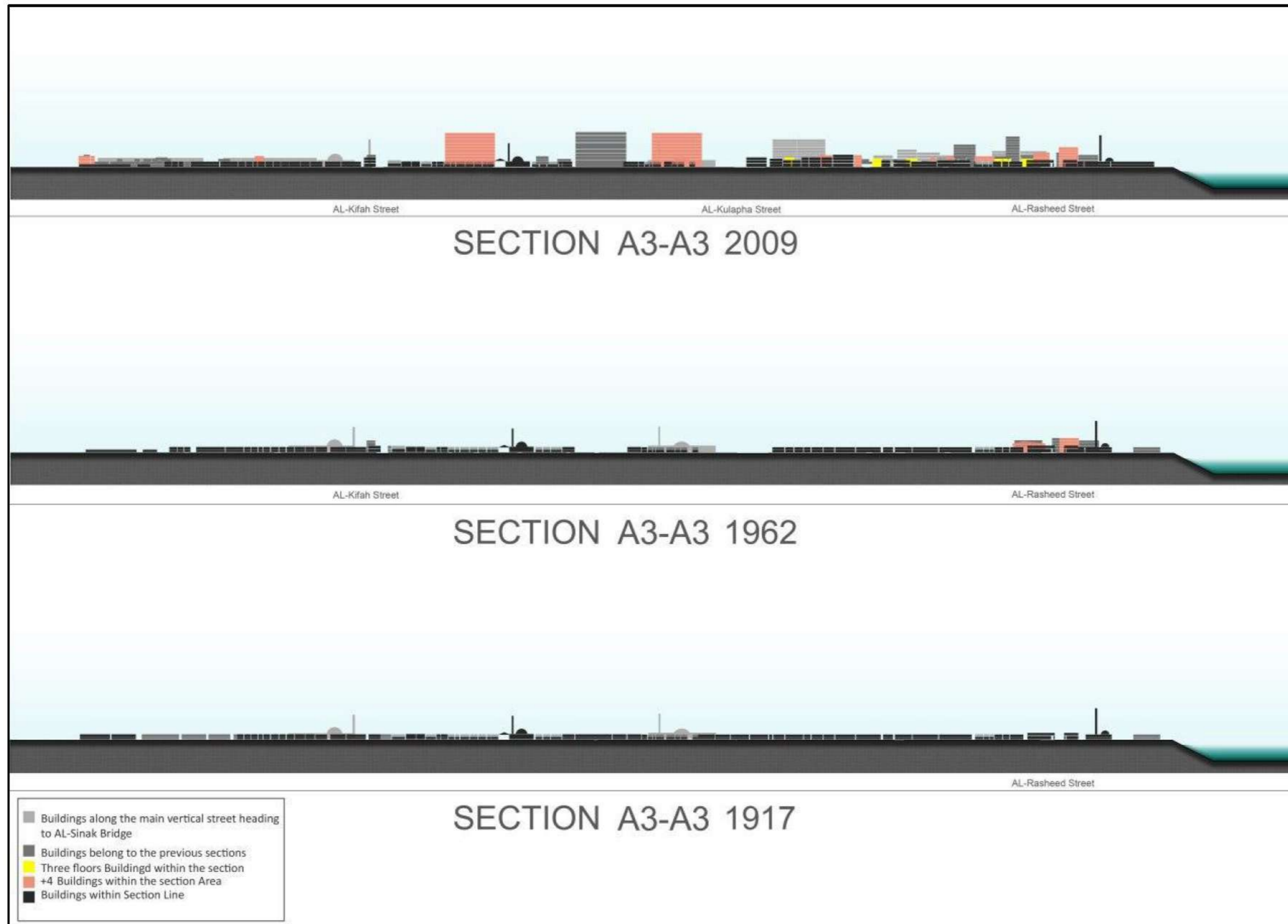


Figure -57-: The transformation in urban structure shown by- Section A2-A2- (in Zone A ) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

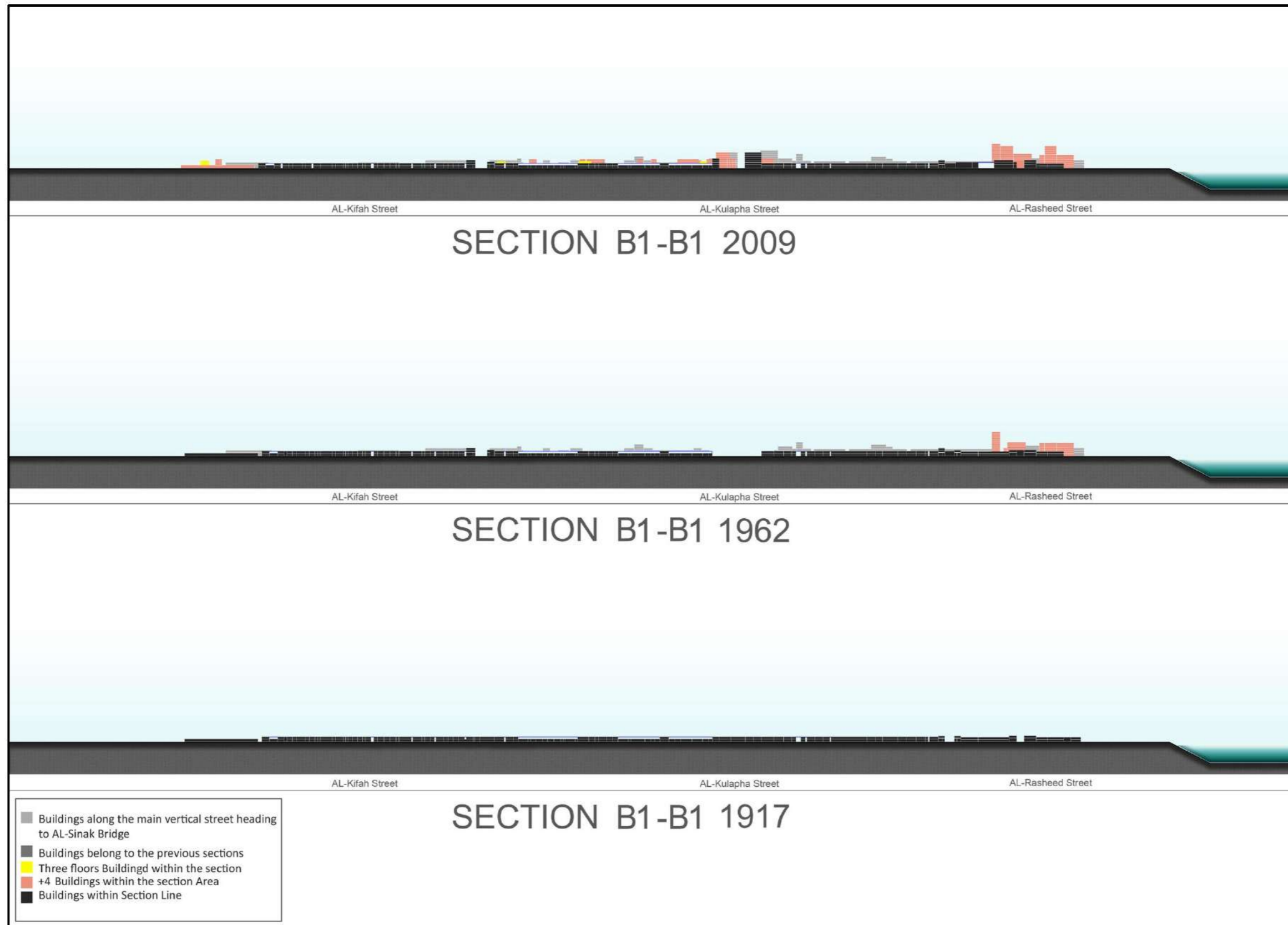


Figure -58-: The transformation in urban structure shown by -Section B1-B1-( in Zone B) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

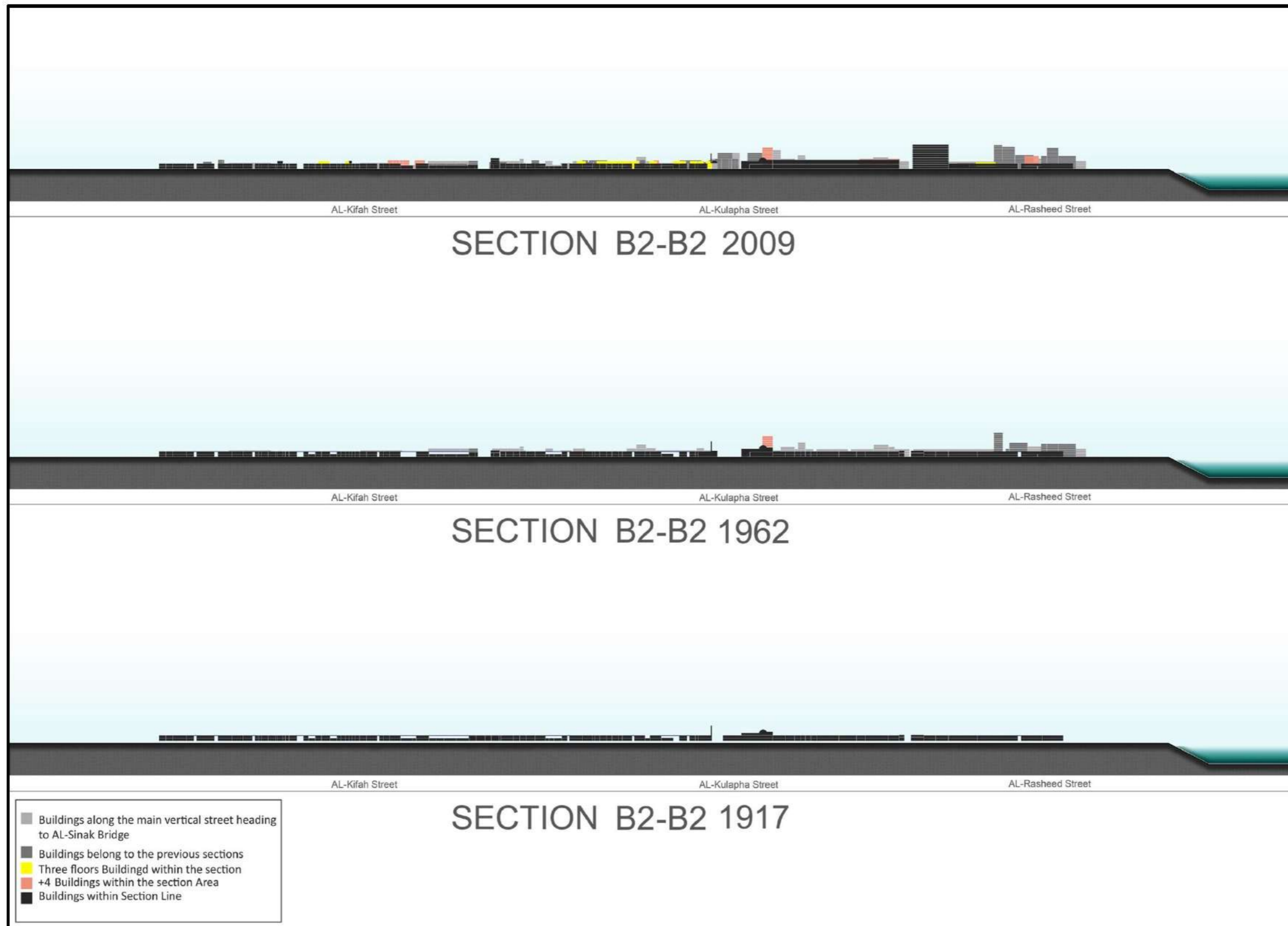


Figure -59-: The transformation in urban structure shown by -Section B2-B2- (in Zone B) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

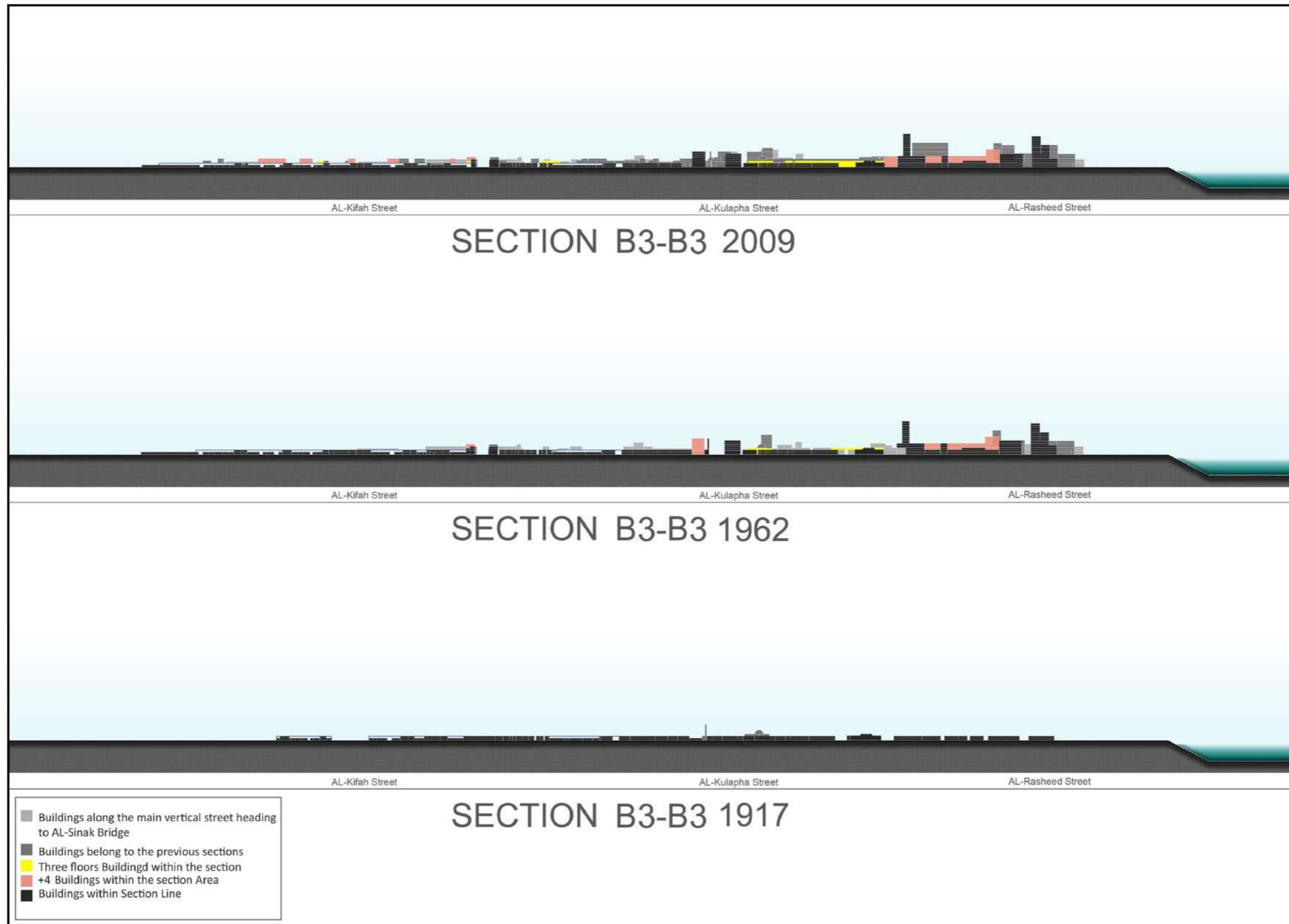


Figure -60-: The transformation in urban structure shown by -Section B3-B3 - (in Zone B) from 1917 via 1962 up to 2009,Source: Surveyed and drawn by the Author.



Figure -61-: The transformation in urban structure shown by -Section C1-C1- (in Zone C ) from 1917 via 1962 up to 2009 ,Source:Surveyed and drawn by the Author,



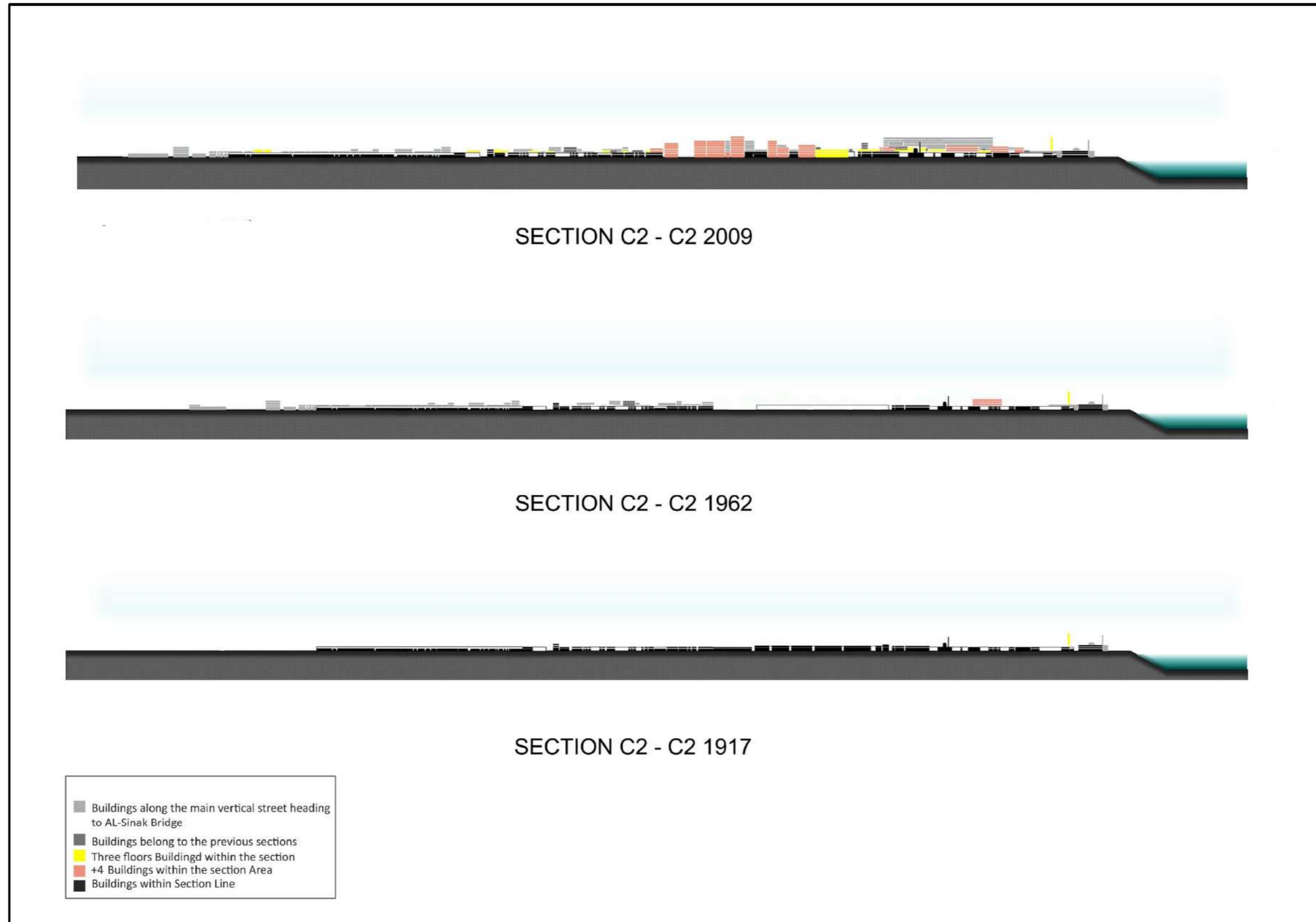


Figure -62-: The transformation in urban structure shown by- Section C2-C2- (in Zone C) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.

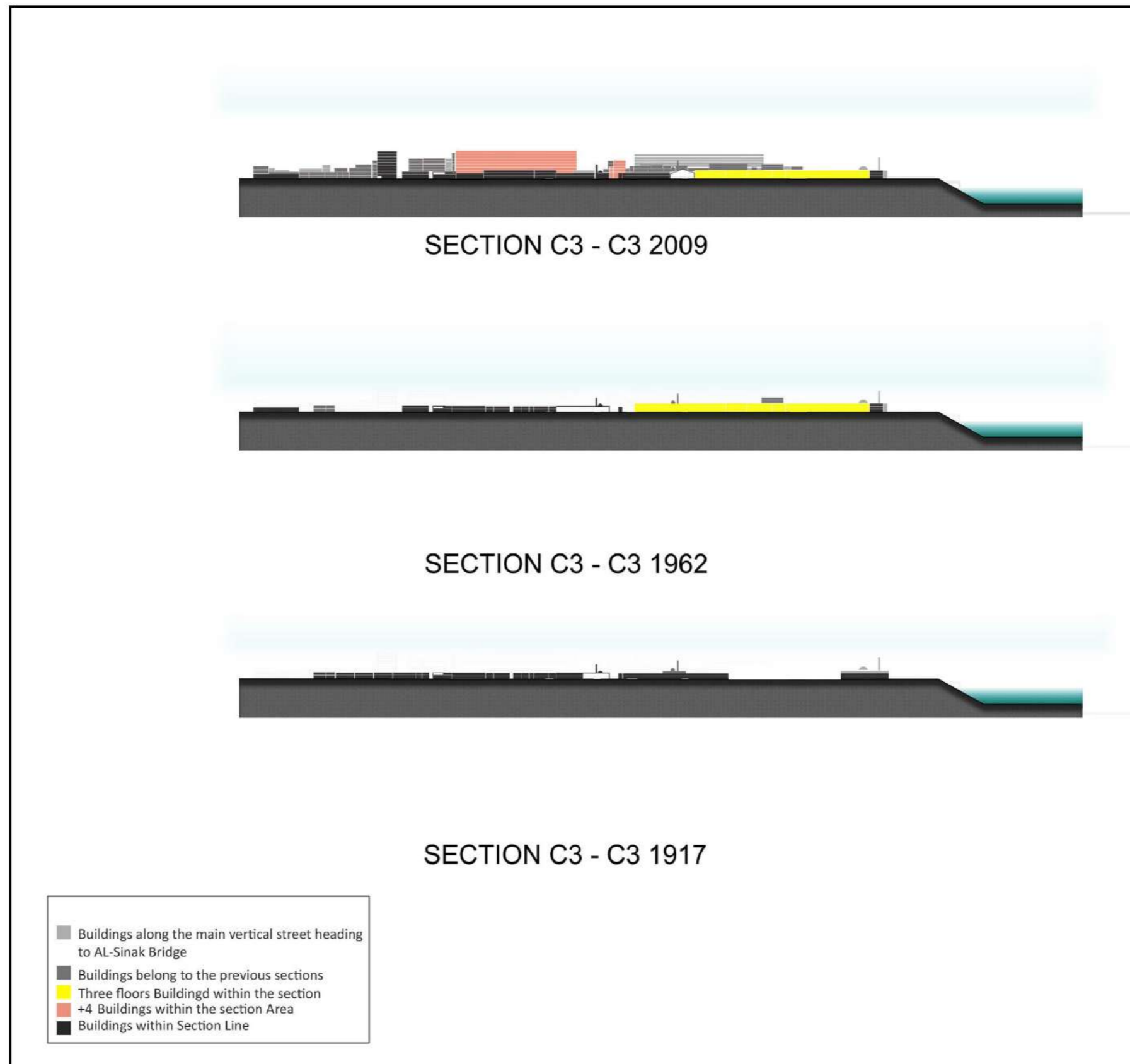


Figure -63-: The transformation in urban structure shown by- Section C3-C3- (in Zone C) from 1917 via 1962 up to 2009, Source: Surveyed and drawn by the Author.