Planning Scheme to Control Commercial Land Use Development in Duhok City: A Case Study

Shaheedan Street

A Thesis Submitted to the Council of the School of Planning, University of Duhok in Partial Fulfillment of the Requirements for the Degree of Master of Science in Spatial Planning

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To:

My dear parents,

My lovely husband,

My sister, brothers, and

All my friends.
Abstract

A planning scheme to control the commercial land use in the city is “Using a plan to describe and organize the future situation for the commercial land use in the city which is more beneficial to the costumers, sellers and the stakeholders”.

This study tries to investigate the commercial land use development in Duhok city, and explain the process of changing the land use from residential to commercial, in the absence of regulations, planning standards, and building permits, as a research problem. It has negative effects on the surrounding urban areas and residents of the city, particularly in commercial streets in the city, especially in one of the commercial streets, which is Shaheedan Street.

This study used methods for data collection depending on content analysis, and interview surveys. The core information in this thesis was based on maps and plans, physical imaging (photographs), and field survey (questionnaire and interviews) to investigate the problems.

To demonstrate the research hypothesis “Lacking of planning standards in implementing commercial streets, led to failure in reaching efficient urban requirements for commercial uses”, the researcher used some planning indicators, to control the random expansion of commercial land uses, and then compared them with the international and local planning standards. Also the researcher analyzed the issues related to the research variables to illustrate the indicators that affect the efficiency and the urban streetscape of the commercial street.

The findings show that most of the existing regulations and planning standards in Shaheedan Street do not match the international or local planning standards, and the commercial land use in Duhok city in general, particularly commercial streets that have no order. It needs planning standards, and regulations to be obligatorily followed up. Finally, the researcher recommends some planning standards as a proposal to control the commercial land use development in Duhok city as whole and case study area, to contribute a good cityscape image with positive economical, social, and environmental impacts.
**Acronyms**

**CBD**: Central Business District

**FAR**: Floor Area Ratio

**ROW**: Right of Way

**SBL**: Street Building Line

**NCCDP**: National Council of Certified Dementia Practitioners

**ICSC**: International Council of Shopping Center

**LISC**: Local Initiatives Support Corporation (supports community organizations and development in Chicago)

**CMDA**: Chennai Metropolitan Development Authority

**HCM**: Highway Capacity Manual
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Chapter 1

Introduction
1.1. Preface

This chapter presents the research problem and the research questions related to the commercial land use development in the city. Following this, the chapter presents: (i) the research significance, (ii) the research objectives, (iii) the research hypotheses, (iv) the research methodology, (v) relevance of previous work to similar researches in Kurdistan Region. Finally, summary of this chapter.

1.2. The Problem and Significance

1.2.1. The Statement of the Problem

The commercial land use planning faces many problems in cities of Iraq; however, the condition varies from one city to another. In Duhok city, the rapid pace of urbanization, and the increasing migration from rural to urban areas or from other cities to Duhok city due to political, economical and social issues of the population resulted in an increase and growing need for commercial projects in urban areas of Duhok city. The lack of clear planning scheme led to random distribution for commercial uses and commercial corridors in the city (changing the land use of Duhok Master Plan from Residential use to Commercial). This had negative impacts on the urban areas of the city such as traffic congestion in the main streets of the city, change of the urban pattern and townscape, loss of hierarchy in commercial uses, lack of regional shopping nodes or malls, and low quality of the commercial and shopping environment.

1.2.2. The research problem

Uncontrolled changing of the streets uses from residential to commercial and the negative impacts of the random distribution of commercial land use.

1.2.3. The Research Questions

1. What are the causes and effects of random distribution of commercial land use in Duhok city?
2. How to evaluate the change of commercial land use in Duhok city?
3. What planning indicators are needed for the commercial land use in Duhok city?
4. What planning standards and schemes are suitable for the commercial streets in Duhok city?
1.2.4. Significance of the Study

There is an urgent need for a better planning of commercial land use development in Duhok city, which requires more efficiency, attractiveness, and accessibility. Duhok may utilize the empirical experience of Iraq cities and other countries in developing urban planning strategies for development with special focus on commercial land-use issues which emphasize the role of the planning process.

1.2.5. Objectives of the study

1. Provide the orderly growth and distribution of commercial areas
2. Develop attractive, accessible and pedestrian friendly spaces
3. Minimize potential negative impacts
4. Carefully balance the supply of commercial space with the demand for commercial land use.
5. Provide standards for commercial streets to guide commercial development toward creating a cohesive urban pattern of buildings and streetscapes that balances the pedestrian and traffic needs of residents, while it protects and enhances the original pattern of development. It also aims to maintain and improve the image and appearance of commercial uses.

1.2.6. Research Hypothesis

*Lack of planning standards in implementing commercial streets in Duhok city led to failure in reaching efficient urban requirements for commercial uses.*

1.3. Data-Collection Methods (Methodology)

A case study approach is used in this investigation. The following methods for data collection are used:

1. **Content analysis** (unobtrusive research). This included official reports, census data, journal articles, newspapers, maps, photographs, and publications from internet.
2. **In-depth Interview and Case Study** (field research). Due to lack of sufficient information and data about the case study area, data collection was based mainly on in-depth interviews with decision makers of the planning body of Duhok City, site surveys.
3. **Interview surveys** (surveys research). Due to the nature of the research, data collection was based on questionnaires in addition to the field research. Quantitative analysis of the questionnaire. Responses of the residents in the area, the visitors, and the commercial buildings owners. The questionnaire was carried out and the forms were distributed in full totaling (251), in three types.

4. **Using AutoCAD, and Microsoft Excel** in addition to other software programs which were used for data analysis and presentation.

1.4. **Scope of Work and Limitations**

This research depends on an overview of commercial streets rationality, requirements, standard and criteria that affect the allocation of commercial land use. The land use planning illustrates international and local experience in commercial land use planning process. The outcome from other nations experience may also be elaborated to draw lessons for Duhok city commercial land use planning, considering it as the core concern of this research. Existing commercial streets status-quo will be analyzed comprehensively in relation to other factors intersecting commercial land use development process. The outcome of this research will anticipate commercial streets requirement in Duhok city and how to control the future development. The research may also come up with useful criteria. The outcome will be translated into maps and figures emphasizing on the idea behind each action.

The research is seeking for a re-allocation of commercial land use area in Kurdistan Region in the northern part of Iraq. It is an area that faced destructive actions for more than three decades, wars, eviction, genocide and other forms of repression which resulted in socio-political impacts, in addition to the creation of a society that is characterized by haphazard allocation of needs and ambitions. The last two decades hardly witnessed any spatial planning or old plan reviewing actions in Duhok city. The sparsely available data are not easily accessible in different governmental departments.

1.5. **Relevance of Previous Work**

Duhok City with its surrounding area does not receive adequate study done on this topic of commercial land use. After Duhok University was established in 1992, different types of research had been carried out for Duhok City in fields like tourism, soil, agriculture, history, but none of them was related to commercial land use planning. Nevertheless, the only attempt made was a master thesis done by Hirori (2007). His work was entitled (The Commercial Structure in Duhok city). His study was an attempt to show the functional
geographic distribution of commercial services in Duhok City. Hirori made a useful analysis for Duhok City commercial land use development for the period 1873-2000. Another master thesis was submitted to the Higher Institute of Planning by Othman (2008). Her work focused on land use (Urban Planning Strategies, Towards Sustainable Land Use Management in Duhok City).

1.6. Summary

This chapter illustrated that the subject of this study has a great significance for the city by focusing on the commercial land use problem of Duhok city, especially as commercial land use began to develop and expand dramatically over the past ten years, despite the lack of similar studies and lack of sufficient information.
Chapter 2

Literature Review
2.1. Preface

This chapter involves the following aspects: Theoretical Conceptual Framework (international and local studies), the land use and Master Plan, land use concepts (models), the commercial land use in the city, the streets, the commercial streets requirements, and planning standards for the commercial land use. These were used for analyzing and evaluating the commercial street, and show the variables related to the research investigation.

2.1. Theoretical Conceptual Framework

The theoretical studies illustrate international and local experiences and studies about commercial land use in the city. The outcome from the other nations’ experiences is also elaborated to draw lessons for Duhok city commercial land use planning, which is the core concern of this research.

2.1.1. Example of International Studies

2.1.1.1. Studies in The USA

According to revitalizing, commerce for American cities commercial districts play a central role in the life of urban neighborhoods. When vibrant and healthy, these districts attract residents and promote investment. When dormant and distressed, they attract criminal activity and promote disinvestment. The condition of the commercial district shapes a neighborhood’s image and signals its desirability as a place to live, work, play, and invest (Karl, 2004).

As the Journal of Cultural Geography shows, the evolution of a commercial strip can be understood in terms of collective and individual decision-making whereby private and public interests shape a linear space. Tentative actions accumulate to form commitments which cannot be easily reversed. Especially evident in one of time stage is the growth of the automobile-convenient establishments such as drive-in restaurants and motels with off-street parking facilities. The sizes of business lots increase through providing of parking lots. Business buildings tend to be larger and better constructed and a sense of commercial permanence pervades the thoroughfare. Street widening and the removal of trees substantially alter the street's personality in favor of commercialism. The number of residences declines sharply while the number of vacant dwellings increases. Income levels of residents along the street fall substantially and multiple-unit rental housing owned by absentee landlords prevails. However, in other time stage, residential functions along the street all but disappear. Only a
few relic rental units survive in what is otherwise a totally commercial landscape. Matters of street beautification and traffic improvement dominate public action. Commercial properties increase in size as more businesses provide off-street parking and expand their layouts to accommodate the growing number of customers (John, et al., 1979).

According to the Philadelphia Local Initiatives Support Corporation (LISC), vibrant commercial corridors have long been indicators of healthy neighborhoods. They have historically served as the centers of neighborhood life, providing residents with access to shopping, jobs and entrepreneurship opportunities. Today, commercial corridors remain critical that bind neighborhoods together and keep resident and business local (LISC, 2007).

Another study about Philadelphia’s commercial corridor revealed that it should be noted that some successful businesses in commercial corridors could have negative impacts on their surrounding neighborhoods. Certain types of retail establishments may attract undesirable individuals to the neighborhood. Other types of establishments may encourage teenagers to congregate in large numbers. Crime may increase instead of decreasing. Increases in retail activity can also be accompanied by traffic or other congestion problems or by increased levels of noise. Those who would encourage economic activity in corridors should be mindful of the potential for negative impacts (Econsult Corporation, 2009).

2.1.1.2. Studies in Canada

A commercial strategy study in the city of Welland shows that, the new commercial policies are needed for two reasons; firstly, the city does not have a comprehensive commercial policy in its current official plan; rather it relies on a series of site specific Official Plan Amendments (OPAs) and its zoning by-law to regulate commercial land use. The development of comprehensive official plan policies will allow the city to be more strategic in its approach to commercial land use planning; secondly, the city recently received several large retail commercial applications and it was important to understand the effect that the major applications might have on the city’s existing commercial hierarchy. In this respect, new commercial policies will provide a formal guideline for future decision making, establishing a clear policy direction and framework for Council and Staff to evaluate major commercial development applications (Scott, 2008).

Over the past five decades, retailing in urban neighborhoods has hollowed out, leaving most cities and inner-ring suburbs with too little to support healthy neighborhoods and strong communities. Many urban locations where retailing never recovered from the shift of buying
habits that led people to suburban shopping centers. Even in some of the most affluent
communities where first-generation, auto oriented shopping streets have begun to urbanize
and take on characteristics of urban shopping districts (Beyard, 2003).

As the research about site selection criteria for community shopping center finds that
even something such as poor access or the inability of the site plan to accommodate the
necessary parking requirements can singularly cause the failure of shopping center investment
(Bingamin, 2004).

2.1.1.3. Studies in China

Study about shopping center development, challenges and solutions showed, in recent
years, that shopping center in China becomes a more and more hotly discussed topic in China
due to its rapid development across China (Wang, 2010).

The Journal of the Society of Architectural Historians in 1984 shows that the post war
period was marked by a boom in the retail industry: population was increasing, private
incomes were rising, and the demand for consumer goods, long capped by the depression and
then by the war. Meanwhile, as use of the private car became commonplace and high-speed
freeway systems expanded, vast numbers of people moved to the suburbs. Consumer habits
changed as shoppers shifted their patronage from congested downtowns to suburban shopping
centers, seeking the convenience of safe, traffic-free access and ample free parking. Graced
with amenities such as landscaped open spaces, park benches, and children's playgrounds,
these innovative centers promoted themselves as marvelous, new entertainment centers,
presenting shopping less as a necessary chore than as a pleasurable, leisure time activity
(Clausen, 1984).

The commercial real estate is overheating through the market research. As commercial
business area supply is rapidly increasing, vacancy rates are on rise in the meantime. Since
2008, the situation continues to excess. This phenomenon means that commercial real estate
has already entered a period that risks and opportunities coexist. In the development of
"quality" for retailers, commercial real estate business if continues to pursue "pure quantity"
and "area", and ignores lists of professional services to clients, retailers must be in a dilemma
(Yang, et al., 2010).
2.1.1.4. Studies in Japan:

The 7th International Space Syntax Symposium explained that the shopping districts of the major cities have been declining. The change in customer needs and the increase in the automobile consumption have led the public to shop in the convenient shopping malls. Many Japanese cities have been developed around city center railway stations, where the core of the city was located and community was created through the shopping. “Since the walking route of the shopping customers is one of the major factors to contribute in the shopping motivations, therefore, architectural factor in shopping environment has significant influence” (Daniel, et al., 2009). Few things were done relating to the physical “space” and “location” taking into account the classifications of individual shops included in the area. It can be easily thought that the consumers’ shopping mind and the physical mapping of the roads and shops are strongly related (Daniel, et al, 2009).

In the past, retail site selection was relatively straightforward. Retail nodes coincided with the major city centers and any other lesser concentration of retail was simply representative of smaller outlying localities. But today, we find ourselves in a much more complex period of time with respect to successful development and location of retail development. Retail agglomeration, today, is located away from city centers and sometimes in sparsely populated location (Brubaker, 2004).

Land use patterns tell a story of human activity and environmental evolution, and future settlement patterns are of interest to many. Changes in land use alter the distribution of vegetation, homes and workplaces, and consequently influence biogenic and on-road mobile emissions. Numerous studies have shown that land use patterns and intensities have a direct impact on travel behavior (Bin, et al, 2005).

2.1.1.5. Studies in Egypt

Studies about the cities geography presented that in the years that followed the twenties of the last century, and due to the increased number of car use within the city and the corresponding traffic congestion within the CBD, the secondary commercial areas and shopping centers started competing with the CBD (Ismail, 1978).
2.2.2. Examples of Local Studies

2.2.2.1. Studies In Baghdad City

As Abdulrazaq stated in his study about the city's geography, “continuous increase in the population density, the rising tendency to live in the suburbs, and the institutions expanding there will be an increased need for commercial land in future, which causes the change of the different land uses to commercial use” (Abdulrazak, 1977).

Changing the residential streets to commercial ones is due to the high financial returns of the commercial property compared with residential. It is considered one of the largest planning problems in Baghdad city, and had a negative impact on the structure of the city urban areas (Saly, 2007).

2.2.2.2. Studies in Duhok City

There were many residential streets used for commercial activities and became formal role. These streets have an attribute of making congestion along these roads network (Mustafa, 2011).
Table (2-1) Summary of the previous international and local studies
Source: The researcher

<table>
<thead>
<tr>
<th>The study</th>
<th>Important points about the commercial land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 International studies</td>
<td>- The vibrant and healthy districts attract residents and promote investment.</td>
</tr>
<tr>
<td></td>
<td>- Vibrant commercial corridors have long been indicators of healthy neighborhoods.</td>
</tr>
<tr>
<td></td>
<td>- Retailing in urban neighborhoods is supporting healthy neighborhoods and strong communities.</td>
</tr>
<tr>
<td></td>
<td>Evolution of a commercial strip can be understood in terms of collective and individual decision-making whereby private and public interests shape a linear space.</td>
</tr>
<tr>
<td></td>
<td>Today, commercial streets remain critical that bind neighborhoods together and keep resident and business local.</td>
</tr>
<tr>
<td></td>
<td>Successful businesses in commercial corridors could have negative impacts on their surrounding neighborhoods. Certain types of retail establishments may attract undesirable individuals to the neighborhood.</td>
</tr>
<tr>
<td></td>
<td>Poor access or the inability of the commercial site to accommodate the necessary parking requirements can singularly cause the failure of shopping centers investment</td>
</tr>
<tr>
<td>2 Local studies</td>
<td>Due to the increased number of car use within the city and the corresponding traffic congestion within the CBD, the secondary commercial areas and shopping centers started competing with the CBD</td>
</tr>
<tr>
<td></td>
<td>Increase need for commercial land use due to increasing population density</td>
</tr>
<tr>
<td></td>
<td>Changing the residential streets to commercial is considered one of the largest planning problems and had a negative impact on the structure of the city urban areas</td>
</tr>
<tr>
<td></td>
<td>Changing the residential streets used for commercial activities have an attribute in making congestion along these roads network</td>
</tr>
</tbody>
</table>

In the following sections of this chapter, the research will present the main terms used in land use planning to help in identifying and understanding the practical part.
2.3. The Land Use

2.3.1. The Land Use Definitions

- It is defined as the human use of land. Land use involves the management and modification of natural environment or wilderness into built environment such as fields, pastures, and settlements. Land use is often used to refer to the distinct land use types in zoning.

It has also been defined as “the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it” (FAO, 1997, and 1999).

- It is the management of land to meet specified socio-economic objectives. Land use is described by the purposes for which the land is used, and the types and sequences of development, conservation and environmental management activities carried out upon the land (www.grida.no).

2.3.2. Urban Land Use Structure

- It is an interactive outcome of the functioning of market and political processes by means of which governments articulate and pursue the common interests of individual households, firms, institutions etc. The scope of the public interest and land use planning process is based on public common concerns which are expressed by goals (Othman, 2008).

- Public common concerns or the elements of public interest are strongly affected on the land use patterns and guidance system (Chapin, 1975).

The elements of public interests according to (Chapin, 1975) are identified as: health, safety, convenience, efficiency, energy conservation, environmental quality, social quality, social equity, social choice and amenity. Later (Lenung, 1989) added other elements of public interests like protection of agricultural land and other resources, heritage, transportation, infrastructure, affordable housing etc.

2.3.3. The Land Use Planning

- The land use planning: It is defined as" the term used for a branch of public policy encompassing various disciplines which seek to order and regulate land use in an efficient and ethical way; thus, preventing land-use conflicts". Governments use land-use planning to manage the development of land within their jurisdictions. In doing so, the governmental unit can plan for the needs of the community while safeguarding natural resources. To this end, it
is the systematic assessment of land and water potential, alternatives for land use, and economic and social conditions in order to select and adopt the best land-use options. Often one element of a comprehensive plan, a land-use plan provides a vision for the future possibilities of development in neighborhoods, districts, cities, or any defined planning areas (FAO, 1993).

- It can also be defined as “a systematic assessment of land potential, alternative patterns of land use and other physical, social and economic conditions, for the purpose of selecting land use options which are more beneficial to land users (Christou, et al., 2006).

- “Land-use planning must be positive. The planning team must find out about people's needs and also the local knowledge, skills, labor and capital that they can contribute. It must study the problems of existing land-use practices and seek alternatives while drawing the public's attention to the hazards of continuing with the present practices and to the opportunities for change. Regulations to prevent people doing what they now do for pressing reasons are bound to fail” (FAO, 1993).

2.3.4. The City Land Use Categories

The city land does not necessarily comprise urban built-up area, but also it may comprise various types of land uses; however, the majority of urban land is a built-up area. A brief description of the most important urban land use categories are listed below:

2.3.4.1. Residential Land Uses range from high density multi-unit structures located in urban centers to low density single family homes, where houses are on lots greater than one acre located on the periphery of suburban expansion. This use is approximately 40% - 60%, from the all urban land (Mikl, 1979).

2.3.4.2. Commercial land uses include urban central business districts, shopping centers, and commercial strips. These areas may also include some noncommercial uses too small to be identified separately. Institutional land uses such as the various educational, religious, health, correctional, and military facilities are also part of this category. This classification of land use is characterized by the small area used for, compared with the other land use area in the city. It takes no more than 5% of the urban area of city of USA (Murphy, 1971). The research will explain that in detail in the 2nd section of this chapter.

2.3.4.3. Industrial Areas include light manufacturing facilities designed for assembly, finishing, processing, and packaging, to heavy manufacturing facilities that use raw materials
such as iron ore, timber or coal. These heavy-manufacturing facilities can include mills, electrical power plants, tank farms, chemical plants, stockpiles, surface structures associated with the mining industry and heavy duty transportation facilities.

2.3.4.4. **Transportation, Communication, and Utility Land Uses** occur in some degree with all other urban or built-up land use categories. They will be included in each category unless they can be mapped separately from the land use in which they occur. For this reason, the statistical summary of these areas is only a portion of the total. Transportation classification typically includes highways, railways, parking lots, rail stations, rail yards, and airport facilities. Communications include, areas used for radio, radar, or television and phone towers. Utilities include facilities and stations used in the treatment, processing, and transportation of water, oil, gas, and electricity substations. The percentage of the allocation of land for the transportation network, (which mostly dedicated to the ways and parking) ranging up to ratio 5-10% of the area of the ground semi-urban roads, parking in the suburbs of the city and (20-30%) of urban land within the urban area of the city and (40-60) % of the commercial center of the commercial land use area in the city (Arnold, and Gabbon, 1996).

2.3.4.5. **Industrial and Commercial Complexes Category** include those industrial and commercial land uses that typically occur together or in close functional proximity. Such areas commonly are labeled with terminology such as “Industrial Park,” but since functions such as warehousing, wholesaling, and occasionally retailing may be found in the same structures or nearby, the more inclusive category title has been adopted (Anderson, et al., 1976).

2.3.4.6. **Mixed Urban or Built-Up Land** classification is used for a mixture of levels of categories where individual uses cannot be separated. This use typically includes development along transportation routes and in cities, towns, and other areas where separate land uses are mixed. Mixed land use promotes active transport between different activities by locating origins and destinations close to each other. This reduces travel distances and enables ‘linked trips’ where one trip is used to undertake many activities. The range of activities in each mixed use development also encourages social interaction as people fulfill more of their needs in their local area, (www.healthyplaces.org.au).

2.3.4.7. **Others**: Typically consists of uses such as golf courses and driving ranges, urban parks, cemeteries, waste dumps, water control structures, and ski resorts. It also includes land that is considered vacant or undeveloped within urban areas (Anderson, et al., 1976).
From the definitions mentioned above, the research defines the commercial land use planning as: “putting a plan to describe the future situation for the commercial land use which is more beneficial to the costumers, sellers and the stakeholders”.

2.3.5. The Land Use Control Elements

There are three important elements to control the land use planning: the location, population and their activities, as these elements interact with each other. They are shown in Fig (2-1).

![Diagram of Activity, Population and Location](image)

Fig (2-1): Land uses control elements
Source: Chapin, 1972

The existing land uses of any city are a reality in the domain that affect, the way for the adoption of land use controls. There are five goals that necessitate the use of public land use controls in favor of a public interest (Chapian, 1965). They are:

1. Promote the use of land for the purpose of pro-development community (and the protection of places of residence, commerce, industry, and other uses).
2. Prevent or deter improper use of the land so that it does not affect the community.
3. Avoid the misuse of the land.
4. Organizing cases of non-use of ground and the neglect of the ground.
5. Re-use of land for the purposes of more convenient.

The regulations mentioned above are implemented in the adoption of governmental regulation, regulating the use of land through the zoning process for the various uses of land. This process divides the city into sectors according to the kinds of activities for the purpose of direct control over the uses of the land (Kadum, 2010).

As urban areas or cities are dynamic (changing in size, shape and function), their expansion and physical development should be according to Master Plans. For that, the research in the next section will explain what is the “master plan”? 
2.4. The Master Plan

2.4.1. Master Plan Definition

Plan: It is an intellectual expectation of a desirable situation in the future, in other words plan describes how a situation will exist in the future (FAO, 1993).

Master Plan: It is a comprehensive long range plan intended to guide growth and development of a community or region (20-25) years (www.antrimcounty.org).

➢ According to (Nanocode, 2011), the Master Plan provides a portfolio of options, ideas and recommendations for the further development and implementation. It is intended to suggest the level of awareness as well as criteria and indicators of the level of implementation and application. It puts together all the feedback, comments, suggestions and conclusions from the different, extensive review and consultation phases

➢ According to Kadum’s definition, it identifies present and future needs and direction for developing system’s facilities. It should articulate a community’s “vision” for the future including appropriate development and open space protection (Kadum, 2010).

Master Plan also should include information and strategies for achieving community objectives. It offers the framework for the planning board and governing body to develop the elements of good land use including meeting local housing and economic development needs and protecting important natural resources (www.anjec.org).

➢ Ralf shows that, usually for Cities Master plans are for 20-25 years. Short Term (2-5) years. Medium Term (5-10) years. Long Term (15-25) years (Ralf, 2002).

2.4.2. The Properties of Master Plan (Alashaab, 1980)

1. Flexible and dynamic, not static.
2. Comprehensive.
3. It needs to be evaluated and amended periodically to keep it fresh and current.
4. It needs public participation.
5. Practical for implementation.
6. It must be able to respond to change as well as guide (need to updating).
2.5. Land Use Concepts or Models

Three models are used to help explain where different types of people tend to live in urban areas. They are concentric, sector and nuclei models. It has been indicated as theoretical work on urban spatial structure. Urban spatial structure involves the order and relationship among physical elements and land uses in urban areas as they evolve from interactions among the key systems and passes through transformations in time and space in Central Business District (CBD), known as the “Loop” because of the elevated railway lines. The concentric zone concept deals with the entire pattern of used area, whereas the sector concept of explanation was developed to explain the structure of residential area, and the multiple-nuclei approach is a description of the structure of urban land use pattern at a particular point of time (Othman, 2008).

2.5.1. Concentric Zone Concept

This concept is suggested by Ernest W. Burgess (1923). A city grows outward from a central area in a series of concentric rings. Precise size and width of rings vary, but the basic types of rings appear in all cities in the same orders. As the city grew and developed over time, the central business district (CBD) would exert pressure on the zone immediately surrounding it. The expansion of the CBD would invade nearby residential areas resulting in further expand to outward. Burgess suggested that inner-city housing was largely occupied by immigrants and households with low socio-economic status. As the city grew and the CBD expanded outward, lower status residents moved to adjacent neighborhoods, and wealthy residents moved further from the CBD. An important feature of this model is the positive correlation of socio-economic statutes of households with distance from the CBD (Chapin, 1965), as shown in fig (2-2).

Fig (2-2) The concentric zone concept model
Source: www.crimetheory.com/Images/icons/chicago/ZMODEL.gif
2.5.2. Sector Concept

Homer Hoyt observed in 1939 that the city develops in sectors, not rings. As cities grow, they do so outward in a wedge from the center. Many commercial functions would remain in the CBD, whereas other manufacturing activities would develop in the surrounding transport routes, but the residential land use would grow in wedge-shaped patterns with a sector of lower-income households bordering the manufacturing and sectors of middle- and higher-income households located away from industrial sites. In many respects, Hoyt's sector model is simply a concentric zone model modified to account for the impact of transportation systems (see fig. 2-3) (Chapin, 1965).

![Fig (2-3) The sector concept model](www.crimetheory.com/Images/icons/chicago/ZMODEL.gif)

2.5.3. Multiple Nuclei Concept

The concept was distinguished by Mckenzie (1933) and then by Harris and Ullman in 1945. They observed that the cities are complex structures which have more than one center around which activities revolve. Some activities are attracted to certain nodes while others try to avoid them. Incompatible land-use activities avoid locating in the same area (Harris & Ullman, 1945).

![Fig (2-4) Multi nuclei concept model](www.answers.com/topic/social-area-analysis)
2.6. The Commercial Land Use in the City

A commercial district or commercial zone is any part of a city or town in which the primary land use is commercial activities. In a city, it can take up about 5% of a city’s land used for commercial activities. These activities include buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business”. Even though these commercial activities use only a small amount of land, they are extremely important to a community’s economy. They provide jobs and bring money into the community (en.wikipedia.org).

In the USA, the commercial land use is characterized by small area, compared with the other land use area in the city. It takes no more than 5% of the urban area of city of the USA (Murphy, 1971), whereas Parthelo, in his studies, showed that the commercial land use was about 3.32% of the urban area of the city of the USA. Parthelo said that this ratio grows up whenever the city urban area increases (Alheti, 2009).

In Iraq cities, the area of this use does not exceed 0.43% of the urban area of Najef city and no more than 2% of Baghdad city till 2003, whereas in Basrah, it exceeds 9% of the all urban areas (Aljanabi, 1974).

2.6.1. The Commercial Land Use Hierarchy in the City

The commercial land use hierarchy: It shall be viewed as the way commercial systems and structures are organized to provide goods and services to their customers. Generally, there are a small number of large commercial centers and a larger number of smaller commercial centers within the retail hierarchy. The city's commercial hierarchy will be viewed as being intact so long as goods and services are provided efficiently and equitably within the city (eddyburg.it/article/articleview/6906/1/221).

Over the years, shopping area formats have taken on a confusing array of identities, with names that include such descriptors as centers, commons, crossings, hybrids, lifestyle centers, malls, markets, marts, mega-malls, mixed-use, outlets, parkways, places, plazas, promenades, shops, strips, squares, super centers, town centers, urban retail, vertical, and villages. Unfortunately, there is no agreement as to how many distinct types of shopping center format there really are, as well as how individual centers should be assigned to the various categories (James, 2005).
“The hierarchy has been developed primarily to ensure that people have a wide choice of facilities and services wherever they live or work within Canberra. The hierarchy of commercial centers will continue to be promoted although it is recognized that certain areas outside the hierarchy” (Clause, 2000).

2.6.2. The Commercial Land Use Hierarchy Examples

Many studies in the world tried to classify the commercial land use hierarchy in different cities as follows:

2.6.2.1. International examples

- **Proud Foot** in 1937 classified the commercial hierarchy in the USA cities as (Proudfoot, 1973):
  1. CBD
  2. The outlying business district
  3. The principle business through fare
  4. The neighborhood business street
  5. The isolated stores cluster

- Also **Burnes** in 1959 suggested the same classification for the commercial hierarchy in the city as shown in fig (2-5) (AlJanabi, 1987, and Carter, 1981):
  1. CBD
  2. District center
  3. Neighborhood center
  4. Sub center
Then Murphy in 1966 classified the commercial land use hierarchy in the USA cities as the following (Murphy, 1966):

1. CBD.
2. The outlying business district:
   - Unplanned area
   - Planned area
3. Commercial Streets which expanded from the CBD.
4. Commercial corridors:
   - Expanded on the main streets.
   - Expanded on the local streets.

(ICSC, 2005) classified the commercial hierarchy in general as:

**Malls:**

1. Regional Center General merchandise, fashion 400-800,000 Sq.ft.
2. Super Regional Center Same as regional; more variety & assortment Over 800,000 Sq.ft.

**Open-air Centers:**

1. Neighborhood Center Convenience 30-150,000 Sq.ft.
2. Community Center General merchandise; convenience 100-350,000 Sq.ft.
3. Lifestyle Center Upscale; national specialty; entertainment, outdoor 150-500,000 Sq.ft.
4. Power Center  Category-dominant anchors, few small tenant 250-600,000 Sq.ft.
5. Festival Center  Leisure; tourist-oriented; retail & service 80-250,000 Sq.ft.
6. Outlet Center  Manufacturer’s Outlet stores 50-400,000 Sq.ft.

2.6.2.2. Local Examples

➢ **Kharoofa** in 1998 classified the commercial land use in Baghdad city as follows (Kharoofa, 1998):

1. Centers (shopping centers):
   1.1. CBD
   1.2. Districts centers
   1.3. Neighborhoods center
2. Commercial ribbons:
   2.1. Arterial commercial ribbons
   2.2. Main commercial ribbons
   2.3. Local commercial ribbons
3. Specialized commercial areas
4. Single shops

➢ **Aljanabi Salah** in 1975 classified the commercial land use in Basrah city as (Aljanabi, 1975):

1. CBD.
2. The outlying business district:
   • Unplanned area
   • Planned area
3. Commercial Streets
4. Local commercial districts
5. Specialized function areas
6. Single shops

➢ As **Hirori** in 2007 recommended that “the nearest classification for the commercial land use in Duhok city is Brainj´s classification in 1963” (Hirori, 2007):

1. A hierarchy of business center ( CBD and smaller sectors )
2. Commercial corridor
3. Specialized function areas, see fig. (2-6)
According to these studies, the researcher concluded that the commercial land use hierarchy in the city classified in three classifications (planned and unplanned) as follows:

1. Commercial Nods or Centers
2. Commercial Streets or Corridors
3. Single Shops

2.7. The Street

A street is a paved public thoroughfare in a built environment. It is a public parcel of land adjoining buildings in an urban context, on which people may freely assemble, interact, and move about. A street can be as simple as a level patch of dirt, but is more often paved with a hard, durable surface such as concrete, cobblestone or brick, for example, a parking lot. Portions may also be smoothed with asphalt, embedded with rails, or otherwise prepared to accommodate non-pedestrian traffic (http://dictionary.reference.com).

Originally, the word "street" simply meant a paved road (Latin: "via strata"). The word "street" is still, sometimes, used colloquially as a synonym for "road" (Anderson). The city residents and urban planners draw a crucial modern distinction: a road's main function is transportation, while streets facilitate public interaction (http://dictionary.reference.com).

2.7.1. The Street Functions and Importance in the City

While dwelling is the most important city building, the street is the most important unconstructed area (Alheti, 2009). Its major functions are traffic arterial in the city, movement, and a way out of the residency on its both sides (Atoy, 1987).
The streets network and highways in the city are a component of the basic structure elements for gathering the urban areas, and linking them with the city functional relationships. Their interaction produces the final image appearance of the city (Jaber, 2009). “Many streets are becoming a commerce area, where shops abound it” (Alheti, 2009).

The street is one of the important urban transportation elements. Urban transportation has been focused on passengers, and cities were viewed as locations of utmost human interactions with complex traffic patterns linked to commuting, commercial transactions and leisure/cultural activities. Cities are also locations of production, consumption and distribution, activities linked to movements of goods (Paul, 2009).

“Conceptually, the urban transport system is intricately linked with urban form and spatial structure. Urban transit is an important dimension of mobility, notably in high density areas” (Paul, 2009). Transportation is essentially a service which enables people, firms, and various other entities to carry on activities at sites selected for these purposes (Chapin, 1965).

*The researcher will explain the transportation land use area to help in evaluating the commercial street use.*

### 2.7.2. Transportation Land Use Area

The percentage of the transportation network forms about (40-60%) of the commercial land use in the commercial areas of the city (Arnold and Gabbon, 1996).

Transportation land use area depends on several conditions as follows:

1. The demand for traffic.
2. Street design standards, which decides spacing, pavement, and shoulders etc.
3. Parking on the street.
4. Additional pathways design such as shoulders, sidewalks and canals.

The objectives of achieving transportation system (principles and standards) (Chapin, 1965):

1. Reducing time spent in movement.
2. Maintaining a suitable measure of safety and taking in to account tension and other consideration of health.
3. Minimizing capital and operating costs from a public point of view and user is point of view.
4. Promoting sound land development.
2.7.3. The Commercial Street

As the name implies, commercial street has been dominated by industrial and commercial activity (http://en.wikipedia.org).

Business Main Street: Business areas generally anchored around main streets that are intended to serve the surrounding residential neighborhoods (www.bouldercolorado.gov).

These streets have several functions for the city and its inhabitants, and designed to achieve the benefit of the places and specialization in specific functions. Some of them are serving commercial works as owners of businesses and different services prefer choosing the site for their organization along the street facades due to easy access by various transportation ways. Usually, the commercial street, especially the main one, occupies the main area in the city. It has strong attracting centers for the population, making it one of the most traffic congestion streets in the city. Changing street function without previous planning will generate traffic problems, as well as the technical structures issues related to the movement and traffic between these streets and other non-commercial streets (Kadum, 2010).

The commercial street is one part of the functional classification for the street in the city, classified according to present land use to: residential street, commercial street, entertainment street, and industrial street (Jaber, 2009).

A commercial street in the research is a concentration of retail stores, shopping centers, restaurants, hotels and motels, offices, and other commercial activities which serve a common trade area and surround and/or lie along a single street.

The research results in the following advantages and disadvantages of the commercial streets in the city according to the (Econsult Corporation, 2009), (Kamoona., 1988), and (Saly, 2007), (see Table 2-2).
Table (2-2) The advantages and disadvantages of the commercial streets in the city
Source: The researcher according to the (Econsult Corporation, 2009), (Kamoona, 1988), and (Saly, 2007)

<table>
<thead>
<tr>
<th>The terms</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Architectural</td>
<td>Diversity in the use and buildings forms generates the greatest of pleasure and sensual visual condition if this diversity had not reached to urban chaos degree.</td>
<td>Diversity in the use and loss of unity and harmony in form and style of building which affect the streetscape</td>
</tr>
<tr>
<td>2 Economic</td>
<td>Provide jobs for the inhabitants of the region in addition to increasing the efficiency of investment.</td>
<td>Increasing land value and rent in the area, led to increasing development cost which was reflected by the investor on the prices of goods and services provided. Increasing the load on the infrastructure</td>
</tr>
<tr>
<td>3 Social</td>
<td>Enhance the overall attractiveness of the surrounding area, Can help create a sense of community. Provide a diversity of opportunities in a region</td>
<td>Residential buildings close to these streets suffer from loss of privacy due to dominance of commercial buildings. These residential buildings live in non-calm and unsafe conditions due to heavy traffic.</td>
</tr>
<tr>
<td>4 Traffic</td>
<td>Increasing the movement at night and day and rising street importance in the city.</td>
<td>Increases in retail activity can be accompanied by traffic or other congestion problems. Lack of parking in these streets forces the customers, and the owners to use the street, which led to nuisance to the inhabitants of these areas, and congested the street</td>
</tr>
<tr>
<td>5 Environmental</td>
<td>Landscaping and commercial street furniture in the street giving an aesthetic addition to the visual appearance which gives convenience and enjoyment for the costumers.</td>
<td>The traffic or other congestion problems as that, results from the undesirable retail activity, will increase levels of noise, and air pollution. Negative environmental impacts results from the large amount of commercial activity waste in those streets, if not dealt with in healthy ways of disposal.</td>
</tr>
</tbody>
</table>

There are other classifications and systems for the street in the city as will be mentioned below.
2.7.4. Street Network Systems in the City

The accessibility is the most common goal in urban areas. Despite the fact that the streets and roads serve the traffic, accessibility has a significant effect and overall control on the city street network. That created due to the continued increase in demand for faster, more convenient and economic transportation, especially in large cities (Jaber, 2009). Complex urban patterns in the city reflect different land uses, including the street network of the city that takes multiple forms derived from the urban patterns of transport in the city. The impact of street network on the form and function of the city varies depending on the nature, age, location, and function of each street (Zenabaldeen, 2000).

The important street systems seen in cities are (Alashaab and Mohammed, 1983):

1. Rectangular street system or chess board
2. Gridiron street system
3. Radial street system
4. Concentric street system
5. Topographical informal street system: Duhok city has mix Gridiron and Topographical system due to its mountain topographical area.
6. Irregular street system
7. Double radial street system
8. Radial blended with gridiron
9. Combined street system

Fig (2-7) Types of street systems numbered as mentioned.
Source: Alaashab and Mohammed, 1983
2.7.5. The Street Hierarchy (Street Classification According to the Street Rank)

A system of classification, in general usage, specifies the design classes of streets according to the size of urban area and local preferences. The National Committee on Urban Transportation has suggested four classes for street hierarchy; the expressway system (generally include freeway), the major arterial system, the secondary street system, and feeder streets (Chapin, 1965).

2.7.6. The Street Classification According to its Use (Sarte, 2010):

1. Auto – oriented streets are those designed primarily to accommodate automobile traffic to and from any activity center.
2. Transit – oriented streets are those designed primarily to accommodate large volumes of transit vehicles.
3. Pedestrian – oriented streets have a significant pedestrian activity and, thus, warrant wide sidewalks, crosswalks with pedestrian crossing signal, corner or midblock bulb outs, scramble pedestrian signals, pedestrians-scale lighting, and streetscape treatment.
4. Bicycle - oriented streets are street with bicycle lanes, bicycle signals as well as parking and storage.
5. Pedestrian malls are outdoor, pedestrian – only streets from which vehicle traffic is prohibited.

2.8. The Commercial Streets Requirements

2.8.1. Traffic Flow Requirements in Commercial Streets

The process of changing land use contains many requirements within the city Master Plan, especially transport planning and coordination between land use planners and transport planners to achieve the best change by providing the possible efficiency for comfort movement.

Important matters with extensive and complex information should be taken into account when planning the traffic flow for the vehicles and the consumers (Saly, 2007).

Knowledge of fundamental traffic flow characteristics are essential requirements in planning, design, and operation of transportation systems (Geetam, 2000).

In case of changing street use, many issues must be taken into consideration to achieve high efficiency and reduce the negative impact created by this change.
2.8.1.1. The Required Issues for Changing the Street Use

In case of changing any main street use, the followings should be taken into consideration (Jackson, 1963):

1. Collecting information about the nature of the transport system, capacity, and roads length.
2. Counting number of lanes, their width, and number of bridges intersections.
3. Surveying crossing points to find out suitability for the pedestrians.
4. Surveying accidents points and reducing them.
5. Studying the possibility of establishing parking (parking types). Parking types include parking on the ground area, on street, and parking floors in commercial buildings are designed to minimize the negative impact on adjacent properties or on the streetscape (city of San Jose, 1990).

There are other planning procedures in addition to those mentioned above (Kamoona, 1986):

1. Re-examine the city Master Plan and study the transportation network and elimination of many streets that cause traffic confusion.
2. Expanding parts of the street, and establishing local areas for isolating the main street from local traffic and pedestrian movement.
3. Establishing tunnels for pedestrians at the intersection of movement within the main streets, especially at intersections and yards.
4. The intersections where the traffic is intensive should have facilities to cross at different levels.

2.8.1.2. Parking and Circulation Requirement

Easy accessibility, high visibility, a sense of personal security, and adequate, convenient parking are all preconditions for successful retailing, and without them retail likely will fail, regardless of the sophistication of the shopping environment or the quality of the tenants. Parking is arguably the most important of these requirements (Michael, et al., 2003).

Vehicular movements on commercial sites include customers, employees, as well as delivery trucks and trucks that remove trash. Pedestrians include people walking and bicycles. There are also visual impacts to circulation. “For the customer, the arrival to the site is part of the ‘first impression’ that can contribute to a positive experience” (Michael, 2003).
2.8.2. The Issues which must be Taken into Account when Planning for Parking in Commercial Street:

As mentioned in NCCDP for city of Sacramento in USA (Michael, 2003).

1. Parking should be provided to meet but not exceed expected demand, taking into account pedestrian and transit trips, ride-share programs, and shared parking agreements.

2. Parking lot access should be generally provided from side streets.

3. Lighting in parking areas is a key design component. Lighting should avoid glare that affects adjacent properties.

4. Pedestrian circulation through parking areas should be treated with attention equal to that of auto circulation.

5. Landscaping and walkways should be provided between parking lots and public streets, right-of-ways, and pedestrian routes.

6. Parking areas visible from the street right-of-way should be screened from view with landscaping plants, partial walls, or other types of architectural features.

Another local study about evaluating the commercial streets in Baghdad city mentioned that, providing car parking is an important procedure and must be taken into account when changing the street use from residential to commercial use. Municipality of Baghdad approved providing car parking for the commercial stores with (5 meters) setback. Whereas it didn’t take into account the special parking area for loading and unloading goods (Saly, 2007).

As a summary, providing parking in commercial streets is one of the most important requirements to achieve convenience for both drivers and customers, and also to mitigate the negative impact on the surrounding area as it will be clarified later.

2.9. Urban Structure Cohesion Elements for the Commercial Streetscape (Architecture Characters)

The streetscape term refers to the various components that make up the street, both in the Right of Way, and on private lot frontages (Urban Cod, 2003). The purpose of the streetscape standard is to ensure coherent the streets and to assist property owners with understanding the relationship between the street and their own front yard. In other words,
they are parts of an overall streetscape plan designed to give special character to each street and coherence to each neighborhood.

Visual pollution is usually given to unattractive visual elements of a streetscape; commonly cited examples are billboards, commercial signs, litter, graffiti, telephone and electric power lines, and poles (Dunn, 2006, and Cullen, 2000).

The following urban structure cohesion elements are significant parts of streetscape standards:

### 2.9.1. Built Forms

There are three dimensions for the building forms which are (Saly, 2006):

#### 2.9.1.1. Built Density and Form

Districts have different built density standards that correspond to that streetscape, plot coverage and FAR standards.

- **Plot coverage** is the total square footage of all levels measured to the outside surface of a building or a portion of the building.

- **FAR** (Floor Area Ratio) is the ratio of the floor area of a building to the area of the lot on which the building is located. Figure (2-8) illustrates three simple ways that a 1:1 FAR might be reached: one storey covering the entire lot, 2 storeys covering half of the lot, or 4 storeys covering a quarter of the lot all result in the same FAR (see fig 2-8 below) (www.bouldercolorado.gov).

Fig (2-8) Explain FAR
Source: www.bouldercolorado.gov/.../density_floorarearatio

Also there are different built forms which affect the built density as shown in fig. (2-9).

Fig (2-9) Explain different built forms
Source: Naeem, 1990
2.9.1.2. Buildings Rise (Skyline):

The skyline means outline of a group of buildings or a mountain range seen against the sky (www.answers.com). It is the most important influential element on the townscape, which “is the art of giving visual coherence and organization to the jumble buildings, streets, and space that make up the urban environment” (Cullen, 1961). Changing buildings style and a height over time lead to breaking the skyline (Saly, 2007).

![Fig (2-10) Silhouettes of streetscapes](source: Portella, 2007)

2.9.1.3. Building Front Width (Building Frontage)

Narrow or wide frontage each type of them has advantages and disadvantages on the commercial building and streetscape. Front widths reinforce the existing streetscape by creation of the visual continuity and harmony with the other adjacent building front shape.

![Fig (2-11) Building rise standards according to the street or space between them](source: Donald watson, time saver standards for urban design)

2.9.2. Building Setback and Street Line

Setback is a line beyond which the building shall not extend. The building is not required to extend to this line. For example, a building setback of 8 feet means that the building shall come no closer than 8 feet. The setback is the standard technique of conventional zoning. This code more often uses the required building line to define the street, whereas the Street Building Line (SBL) is the required building line (no setback). The building (generally the front porch) shall be built-to the SBL. The SBL distance from the
street frontage for each lot is defined in the building placement standards. Both of them have a positive role on the commercial streetscape (Urban Code, 2003). Building setbacks should be similar to those of surrounding existing buildings and should reinforce the existing streetscape. While some variation of building placement adds interest to the streetscape (city of San Jose, 1990).

2.9.3. Facade Details and Building Material Used

It has an important role for creation of harmony and visual coherence; also it is an essential element for achieving an affiliation sense the building to the surrounding environment (Tleb, 1996). The façade detail is more important than building material. Whenever finding uniform details for group of adjacent buildings giving coherent commercial streetscape (Saly, 2007).

Facade detail means the textures of small scale details, material, colors and patterning, as shown in fig (2-12) (Portella, 2007).

```
<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Small elements perceived as details (facade + details)" /></td>
<td><img src="image" alt="Elements too small and distant to each other to be perceived as details" /></td>
<td><img src="image" alt="Small elements close to each other perceived as detail (facade + details)" /></td>
<td><img src="image" alt="Elements too small and close to each other perceived as texture" /></td>
</tr>
</tbody>
</table>
```

Fig (2-12) Facade details (Modalities of user perception of facade details)
Source: Portella, 2007

“Color is the first aspect perceived by users in public spaces and, in many cases, it can re-create the visual character of places” (Portella, 2007). Places can become unpleasant for a majority of users, and human behaviour can be affected negatively when colors are chosen and applied in public areas without taking into account their effects on human perception (Naoumova, 1997; Kuppers, 1995; Porter, 1982). High variation of colors can cause negative effects on user’s perception (Portella, 2007).

```
<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Small elements perceived as details (facade + details)" /></td>
<td><img src="image" alt="Elements too small and distant to each other to be perceived as details" /></td>
</tr>
</tbody>
</table>
```

Fig (2-13) Façade colors. Buenos Aires, Argentina, and Pelourinho in Salvador, Brazil
Source: www.astro.uvic.ca ; www.un-limited.travelcom
Portella categorized facade details to the following (Mousa, 2011):

1. Texture created by facings (such as by stones or bricks).
2. Trim (such as door and window frames, and railings).
3. Decorative ornaments (such as frames on base, body, and crowning of facades).

2.10. Coordination of the Commercial Street Furniture

Street furniture is a collective term (used mainly in the United Kingdom) for objects and pieces of equipment installed on streets and roads for various purposes. It includes benches, traffic barriers, bollards, post boxes, phone boxes, streetlamps, traffic lights, traffic signs, bus stops, tram stops, taxi stands, public lavatories, fountains, watering troughs, memorials, public sculptures, and waste receptacles. An important consideration in the design of street furniture is how it affects road safety (http://en.wikipedia.org).
It has equipment such as lights, road signs and telephone boxes that are positioned at the side of a road for use by the public (http://dictionary.cambridge.org).

As stated in commercial street furniture guidelines in city of Boroondara/ Australia, commercial streets have three zones (Local laws department, 2012):

2.10.1. Trading zone: In front of the business premises. The width of these zones may be varied at the discretion of the officer depending on the total width of the footway.

2.10.2. Pedestrian zone: This is the area immediately adjoining the shop front in which traders have historically displayed goods, tables, chairs and signs.

2.10.3. Kerb side zone: This zone will create a safety buffer between the face of the kerb and any commercial street furniture.

In general the commercial street furniture as follows:

1. Sidewalks
2. Seating
3. Lightening
4. Signs
5. Street trees and plantings
6. Bus stop area
7. Trash container
8. Others.

In commercial street furniture care should be paid to the following (Saly, 2007):

1. Scale: The relationships between the furniture and surrounding area.
2. Position: Choosing the best suitable area at the side of a road for use.

2.11. Planning Standards for Commercial Land Use

They are defined as developing technical standards that are the bases for determining the number, size and domain of the commercial services impact with different qualities (Kadum, 2010).

Zoning regulations have a major influence on the locations and characteristics of retail businesses in commercial streets. The first and the most important issue that has to be addressed when collecting data is to properly define the unit of analysis (Econsult Corporation, 2009).
2.11.1. Definitions

2.11.1.1. Planning: The process of setting goals, developing strategies, and outlining tasks and schedules to accomplish the goals (Investor words dictionary, 2012).

2.11.1.2. Criteria: Criterion is a basis for comparison; a reference point against which other things can be evaluated; "they set the measure for all subsequent work" (syn: standard, measure, touchstone), (askdefine.com/).

2.11.1.3. Standard: It is applied to any definite rule, principle, or measure established by authority (Merriam Webster dictionary, 2012).

➢ In the broad sense of the word, a sample or model used as an original for purposes of comparison with other objects; a normative technical document related to standardization that establishes a set of norms, rules, and requirements for the object being standardized and is approved by a recognized authority. Standards may be formulated for materials and technical objects (products, models, samples), as well as for norms, rules, general technical requirements, and requirements relating to organization and methodology. Standards are used in all spheres of human activity, including science, engineering, industrial and agricultural production, construction, public health, and transportation (Reference dictionary, 2012).

➢ It is a basis for comparison; a reference point against which other things can be evaluated; "they set the measure for all subsequent work" (syn: criterion, measure, touchstone) (askdefine.com).

➢ Standards, criterion, yardstick, gage touchstone mean a means of determining what a thing should be (Merriam Webster dictionary, 2012).

As the research found, many sources submitted the same definition for the criteria and standard. For the researcher tends to use the term ‘standards’ in the research.

2.11.1.4. Service Domain: It is a spatial boundary occupied by the population that a service covers in terms of access to the service. Its theoretical form looks like a circle the service in the center and its boundary is the maximum distance between the service and population (Serkes, 2008).See fig (2-16).

2.11.1.5. Housing Sector: It is a residential area containing the (3-5) neighborhoods with a population ranging between (30-45) thousand people (Kadum, 2010).
2.11.1.6. Building Code, Building control, and Regulations: It is defined as a legal document which involves the minimum acceptable requirements level of safety for constructed objects such as buildings and non-building structures based on socio-political and/or community considerations which differ from country to country and should be applied by a local, or national government authorities to control building process (development of the CIB proactive program on performance based building codes and standards, 1998).

➢ The cities need building codes to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures (www.answers.com).
➢ The practice of building codes varies between countries. Building codes are developed by the government agencies or quasi-governmental standards organizations and then enforced across the country by the central government (www.answers.com).

2.11.1.7. Building Permits: The importance of commercial building permits and inspections required is for law, to ensure that structures are designed and constructed according to the building codes and standards and inspections are conducted to ensure construction conforms to the approved building plans, city codes, city ordinances and other requirements (How to obtain commercial building permit, 2007).

2.11.2. Examples of Commercial Land Use Planning Standards

The research will study some commercial land use standards. Kingdom of Saudi Arabia (KSA) cities, Iraqi cities, and other cities’ planning standards. That will help in comparing and evaluating the commercial land use in Duhok city.

2.11.2.1. Planning Standard in Saudi Arabia (KSA):

The commercial land use hierarchy in KSA cities depends on the commercial service level and its location as shown below (Guide the planning standards for commercial services in KSA, 2005) (see fig 2-16):

1. Neighborhood level: It includes the basic daily requirement from goods for the residents
2. Housing sector level: It includes the retail trade and clothes shops and other small industrial activity which don’t have negative impact on the surrounding area. Serve the sector residents.
3. City level: The central business districts (CBD) serve the whole city residents.
4. Regional level: It is located in suburb area or outside of the city. Serve city and surrounding area residents
Fig (2-16) The commercial land use distribution in the city and the maximum service domain requirements for each one
Source: Planning standards for commercial services in KSA, 2005

Table (2-3) Commercial service domain and accessible way used
Source: Planning standards for commercial services in KSA, 2005

<table>
<thead>
<tr>
<th>Type of commercial center</th>
<th>Service domain (Radius)</th>
<th>Accessible way</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Neighborhood commercial center</td>
<td>500 m</td>
<td>Walking or by car</td>
</tr>
<tr>
<td>2 Housing sector commercial center</td>
<td>1200 m</td>
<td>By car or public transportation facilities</td>
</tr>
<tr>
<td>3 City commercial center (CBD)</td>
<td>Depend on the level of city impact domain : different from city to another</td>
<td>By car or public transportation facilities</td>
</tr>
</tbody>
</table>

Table (2-4) Planning standard for housing sector commercial
Source: Planning standards for commercial services in KSA, 2005

<table>
<thead>
<tr>
<th>Details</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
</tr>
<tr>
<td>Area per person from all commercial area</td>
<td>1 m²</td>
</tr>
<tr>
<td>Single shop area</td>
<td>50 m²</td>
</tr>
<tr>
<td>Area of circulation corridor and open area for single shop</td>
<td>20 m²</td>
</tr>
<tr>
<td>Single shop area with circulation and open area</td>
<td>70 m²</td>
</tr>
<tr>
<td>Car parking ( ratio from the commercial area)</td>
<td>8 parks for 100 m² FAR</td>
</tr>
</tbody>
</table>
Table (2-5) Planning standard for floor height in the commercial buildings

Source: Planning standards for commercial services in KSA, 2005

<table>
<thead>
<tr>
<th>The floor height in the commercial buildings</th>
<th>Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Ground floor</td>
<td>4.5 -5</td>
</tr>
<tr>
<td>2  First and typical floor</td>
<td>3.75 – 4.5</td>
</tr>
<tr>
<td>3  Last floor</td>
<td>3 – 4</td>
</tr>
</tbody>
</table>

2.11.2.2. Planning Standards in Iraq (Baghdad city)

The researcher chose Baghdad city although it is larger than Duhok city but it has planning standards, whereas other cities don’t have.

The commercial land use hierarchy in Baghdad city depends on the commercial service level and its location as shown below (Final general Developing report for Baghdad city, 2000):

1. Neighborhood level
2. Housing sector level
3. District level: It includes the retail trade and clothes shops and other small industrial activity which don’t have negative impact on the surrounding area, and it serve many sectors residents.
4. City level

Every unit served from different levels as explained in KSA commercial standards, but the difference between Baghdad and others Baghdad city has district level, as shown in fig (2-18).

Fig (2-17) Master Plan of Baghdad city, and the commercial land use distribution in the city then the maximum service domain requirements for each one

Source: The researcher according to general developing report for Baghdad city, 2000, and planning standards for commercial services in KSA, 2005
Table (2-6) Planning standards for the commercial land use hierarchy in Baghdad city
Source: Final general developing report for Baghdad city, 2000

<table>
<thead>
<tr>
<th>The classification</th>
<th>Area m²/1000 person</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBD</td>
<td>900</td>
</tr>
<tr>
<td>District centers</td>
<td>500</td>
</tr>
<tr>
<td>Sector center</td>
<td>740</td>
</tr>
<tr>
<td>(Neighborhood center)Single shops</td>
<td>160</td>
</tr>
<tr>
<td>Total</td>
<td>2300</td>
</tr>
</tbody>
</table>

Table (2-7) Planning standards for housing district commercial center
Source: Alatief, et al., 2009

<table>
<thead>
<tr>
<th>The buildings</th>
<th>No.</th>
<th>Area (hectare)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify (0.6 -0.8) m² for every one capita</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Shopping center (stores, cafés, restaurants, community shopping center)</td>
<td></td>
<td>7.0 – 10.0</td>
</tr>
<tr>
<td>Central business district</td>
<td></td>
<td>2.5 – 3.0</td>
</tr>
<tr>
<td>Offices</td>
<td></td>
<td>1.5 -2.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>11.0 – 15.0</td>
</tr>
</tbody>
</table>

*\ 1 hectare equivalent to 10000 square meters

Another important part which the research emphasizes is the street standard. For that the researcher needs to explain and study it in detail standards to help in comparing and evaluating the present conditions.

2.11.2.3. Planning Standards in Other Area:

The researcher is supposed to study some other international commercial buildings planning standard to compare and evaluate the existing situation in Duhok city. Table (2-8) shows how to decide the commercial buildings setbacks according to the road width.
Table (2-8) Commercial building front setback
Source: CMDA, 2000

<table>
<thead>
<tr>
<th>Abutting road width</th>
<th>Front Set Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 10 m , but less than 15 m</td>
<td>3.5 m</td>
</tr>
<tr>
<td>Above 15 m, but less than 30 m</td>
<td>4.5 m</td>
</tr>
<tr>
<td>Above 30 m</td>
<td>6 m</td>
</tr>
</tbody>
</table>

Table (2-9) below explains the **floor area ratio and plot coverage** planning standards for commercial buildings.

Table (2-9) FAR and plot coverage ratio
Source: Galway city council development plan, 2005

<table>
<thead>
<tr>
<th>1</th>
<th>FAR</th>
<th>Not exceed 1:1 ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Plot coverage</td>
<td>Depend on the buildings setback, Not exceed 90%</td>
</tr>
</tbody>
</table>

The planning standards for commercial buildings signs in UAE as follows:

The following figure (2-17) shows the permitted signage zones in commercial street. Such zones which have been identified are based on the location of the commercial within the building and the design of the building.

Such zones include (Abu Dhabi Urban planning council, 2012):

1. Storefront fascia signage zone,
2. Parapet signage zone,
3. Mezzanine (banner signage zone),
4. Building body; and building top signage zone.

Fig (2-18) Commercial signs standards in UAE
Source: Abu Dhabi Urban planning council, 2012
2.12. The Streets and Parking Standards

Table (2-10) Transportation network hierarchy and standard in Baghdad city

Source: General developing report for Baghdad city 1973

<table>
<thead>
<tr>
<th>The Classification</th>
<th>Local street</th>
<th>Collector street</th>
<th>Local arterial street</th>
<th>Main Arterial street</th>
<th>Express ways</th>
<th>Free ways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessible streets</td>
<td>Accessible</td>
<td>Traffic and accessible</td>
<td>Traffic and accessible</td>
<td>Traffic and accessible</td>
<td>Traffic</td>
<td>Traffic</td>
</tr>
<tr>
<td>Service streets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The basic Usage</td>
<td>Accessible</td>
<td>Accessible</td>
<td>Traffic and accessible</td>
<td>Traffic and accessible</td>
<td>Traffic</td>
<td>Traffic</td>
</tr>
<tr>
<td>R.O.W*</td>
<td>11-8 m</td>
<td>20-10 m</td>
<td>30-15 m</td>
<td>50-30 m</td>
<td>60-40 m</td>
<td>50 –70 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lanes number</th>
<th>2 One way</th>
<th>2 Two way</th>
<th>4-2 Two way</th>
<th>6-4 Two way</th>
<th>6-4 Two way</th>
<th>6-4 Two way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spacing</td>
<td>80 m</td>
<td>200 m</td>
<td>0.5 km</td>
<td>0.8 km</td>
<td>1.6 km</td>
<td>6-3 km</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed* Km/hr</th>
<th>20</th>
<th>40</th>
<th>60-50</th>
<th>60</th>
<th>80-70</th>
<th>100-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian service</td>
<td>Free crossing</td>
<td>Free crossing</td>
<td>Different levels and free crossing</td>
<td>Different levels and free crossing</td>
<td>Different levels</td>
<td>Different levels</td>
</tr>
</tbody>
</table>

* \ ROW: is the Right of Way

\ km\ hr: is kilometer per hour

According to the Trails and Enhancements Program Manager, Washington in 2011, the following are some planning standards for pedestrian sidewalks:

The sidewalk grades: As shown in fig. (2-19) the ramps must be used instead of stairs with 14% as a maximum grade.

Fig (2-19) The sidewalk grade standards

Source: Trails and Enhancements Program Manager, Washington, 2011
Sidewalks’ width: As shown in fig. (2-20) a minimum width with safety strip for passing to passenger must be not less than 2 meters.

![Sidewalk width standards](image)

Fig (2-20) Sidewalk width standards
Source: AASHTO, 2001

Table (2-11) Baghdad city Planning standards for car Parking numbers
Source: Jaber, 2009

<table>
<thead>
<tr>
<th>Land use</th>
<th>Parking number</th>
<th>25 m² park *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling unit (single family House)</td>
<td>1</td>
<td>House</td>
</tr>
<tr>
<td>Commercial land use</td>
<td>1-3</td>
<td>100 m² from built area</td>
</tr>
<tr>
<td>Mixed land use (commercial – residential)</td>
<td>1-3</td>
<td>100 m² from built area</td>
</tr>
<tr>
<td>Mosque</td>
<td>10</td>
<td>100 m² from built area</td>
</tr>
</tbody>
</table>

*\ 25 m² equivalent area for 1 car parking with circulation

2.13. Commercial Building Permits on Commercial Streets in Baghdad City

According to the municipality of Baghdad to build any commercial building on the commercial street some building permits must be taken into account (see Appendix no.2). Table (2-12) below explains some of these permits.

Table (2-12) Some planning standards for commercial buildings in Baghdad city
Source: Jaber, 2009

<table>
<thead>
<tr>
<th>Details</th>
<th>The range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 FAR</td>
<td>4.4 :1</td>
</tr>
<tr>
<td>2 Plot coverage ratio</td>
<td>Not exceed 75%</td>
</tr>
<tr>
<td>3 Floor height</td>
<td>3.5 m \ Ground floor, and 2.70 m \ Typical floor</td>
</tr>
<tr>
<td>4 Building height (no. of floors)</td>
<td>3 floor</td>
</tr>
<tr>
<td>5 Setback</td>
<td>5 m</td>
</tr>
<tr>
<td>6 Shop area</td>
<td>Not less than 6 m²</td>
</tr>
<tr>
<td>7 Façade details</td>
<td>Islamic style</td>
</tr>
</tbody>
</table>
2.14. Summary

The researcher summarized the following checklist, which presents the main indicators require for practical study part according to the theoretical study part (see fig 2-21).

1. Physical (architecture) Characters:
   1.1. Existing building conditions: height, frontage, and so on (see section 2.9).
   1.2. Furnishings: sidewalks, seating, lighting and others (see section 2.10) were representing landscape design issues.

2. Accessibility and Services Indicators:
   2.1. Accessibility
      ➢ Traffic: Mentioned before in details (see section 2.8)
      ➢ Pedestrian circulation: Pedestrians include people walking and bicycles. There are also visual impacts to circulation. “For the customer, the arrival to the site is part of the ‘first impression’ that can contribute to a positive experience” (Michael, et al., 2003).
      Safety, security, continuity, coherence, comfort and convenient facilities and means of access should be provided for pedestrian and bicyclists (city of San Jose, 1990), and (Harvey, 1978).

   2.2. Services:
      ➢ Parking and circulation: Mentioned above in details (see section 2.8).
      ➢ Storm drainage, sewage disposal, electricity, water and telephone, which is not a field of study within the search, but the researcher resorted to a brief study of the electric power elements that directly affecting streetscape, such as the electricity lines, generators, and others.
Fig (2-21) The indicators required for the commercial streets analysis
Source: The researcher
Chapter 3

Case Study
3.1. Preface

In this chapter the researcher will study Shaheedan street practically as a case study area by using many methods for collecting data as follows.

1. Content analysis (unobtrusive research).
2. Interview surveys (surveys research).
3. In-depth Interview and Case Study (field research).
4. Using AutoCAD and Microsoft Excel programs for data analyzing and presentation.

3.2. Background of the Case Study Area

3.2.1. Duhok City

Duhok governorate forms the western governorate in Iraqi Kurdistan Region. It has a strategic location since it is considered to be a point of joint among the three parts of Kurdistan (Syria- Turkey- Iraq).

The city of Duhok is the center of the Duhok governorate. It is located in the North-western part of Iraq at 585m above sea-level and 470km North of Baghdad at the latitude (36°51'43.56"N) and longitude (42°59'51.47"E) in the city center. The territory area is about (107) Km²(www.eduhok.net) .The City of Duhok has engulfed eight villages which are (Upper Malta, Lower Malta, Gavariki, Shindokha, Shakheki, Baroshki, Nizarki , Qasara , and Eatitti) and these villages became quarters of the city (Othman, 2008).

Fig (3-1) Iraq and Kurdish Region
Source: www.eduhok.net
Duhok city expanded enormously in the last 35 years. This expansion proceeded largely in an east–west fashion (Mousa, 2011). The greatest developments took place between 1973, and 1984 as well as between 1986, and 1994 then between 2000, and 2012, which present the greatest change in Duhok population density and area (see chart 3-1) (Municipality of Duhok, 2012). This great change in the last ten years was due to rapid pace of urbanization, and the increasing migration from rural to urban areas or from other cities to Duhok city due to political, economical and social issues of the population. The historic settlement of an approximately 2*2 Km compact center evolved into a settlement strip of approximately 15*3 Km with approx 323 400 of official inhabitants (see figure 3-2 below). In 2010, the Master Plan proposal suggested expanding the city border in 2032 to be 22*25 km (Municipality of Duhok).

Fig (3-2)  Dohuk city urban extension through five time stages
Source: The researcher according to municipality of Duhok

Chart (3-1) The population number in Duhok city
Source: Municipality and general directory of Census in Duhok
The expansion, which took place in the city after 1996, exceeds in speed and size than earlier time stages in response to (interview, 2012, and Hirori, 2007):

- The requirements of the population growth,
- Increasing migration from rural to urban areas or from other cities to Duhok city due to political, economical and social issues of the population.
- In line with the developments and changes cultural,
- The development of internal and external commercial and the city turned into a point of transit commercial.

### 3.2.2. The Commercial Land Use Development in Duhok City

Duhok city started from the city center (CBD Now) then expanded enormously with time through four time stages, 1873-1947, 1947-1977, 1977-2001, and 2001-2012 as shown in fig (3-3) below. In 1947 the CBD area was about (800 m²), in 2012 its area become about (100000 m²).

The new Master Plan proposal for Duhok city in 2010 suggested expanding the CBD in order to be appropriate the size of the city borders expanded as shown in fig (3-4) below.

![Duhok CBD development through four time stages](image)

**Fig (3-3) Duhok CBD development through four time stages**

Source: 1st, 2nd, and 3rd time stage (Hirori, 2007), and 4th stage (The Researcher, 2012)
In addition to the CBD, Mazi supermarket, and single shops, the commercial land use expanded as liner shapes (commercial streets and corridors). Fig (3-5) below shows four main liner commercial streets.

Duhok city has many commercial streets, such as Baroshke Street, Shaheedan Street, Malta, KRO Street, reported sequentially from the oldest to the newest, in addition to many other secondary commercial streets. Most of them lack of planning standards and regulations which led to many physical, accessibility, and services problems in these streets.
According to interview with the head of the building permits department in the municipality of Duhok (interview, 2012).

- “Before 2010 there was no Master Plan in Duhok city. Since 1873 the city witnessed accumulated organic growth. The First Master Plan for Duhok city has been put in 2010 by Ingenieurburo company”

- “After the illegal construct of some commercial buildings in many streets, a committee was performed from responsible parties to study and take the decision of changing land use from residential to commercial in the Master Plan”.

- “The lack of Master Plan for Duhok city and the random increase appearance of commercial streets randomly assigned the city municipality to set controls for the commercial building according to the street right of way (ROW) which the building lies on and the present condition of the area”.

According to the municipality of Duhok to build any commercial building on the commercial streets must take some regulations into account to get building permits. These regulations are set back, set front, and number of floors (see appendix no1).

As the above mentioned regulations are the only factors affecting the commercial streets in Duhok city, and due to the increasing impacts of these streets on Duhok city, the next sections will cover the practical case study of the chosen commercial street (Shaheedan Street) in Duhok city.

### 3.3. The Reasons for Choosing Case Study Area

The following points are reasons for selecting Shaheedan Street as a case study area:

1. Shaheedan Street will expand to CBD to decreasing the density at the CBD as mentioned in the Duhok Master Plan (Duhok Master Plan, 2010). This demands a planning.

2. Lacking of planning standards is one of the largest problems in this street, and then the research tries to a solution to control the future commercial development.
3.4. Shaheedan Area (Location and History)

Shaheedan Street is (as a case study area) located in the north part of Duhok city. It lies among three residential sectors (Shaheedan, Shorash, and Grebase sector), which are different in population density (see fig 3-6, and table 3-1 below). At the beginning, case study area was a rural area after that changed to urban areas. The first plan was put in the area by the responsible authorities in 1977 after the area was a village of the city and has many slums which have been introduced within the Master plan in 1987. Many changes have been on the plot area design in 2003. Most recent changes got after putting the Master Plan proposal for the city, which considered Grebase residential sector a part of the CBD, but till now this proposal is not implemented. It has a strategic area due to its significance in traffic movement between east and west parts of the city, representing the nearest commercial street to CBD (about 500-600 meters from the CBD), and it is one of the most attractive commercial streets in the city. The area is approx 740550 square meters (see fig 3-6) below:
Fig (3-6) Case study area for the Duhok city

Source: The researcher according to municipality of Duhok
Table (3-1) The population number in 2012

Source: General director of Census in Duhok

<table>
<thead>
<tr>
<th>The residential sector</th>
<th>Number of residential buildings</th>
<th>Population number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaheedan</td>
<td>432</td>
<td>3744</td>
</tr>
<tr>
<td>Shorash</td>
<td>889</td>
<td>6428</td>
</tr>
<tr>
<td>Grebase</td>
<td>649</td>
<td>5102</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1970</strong></td>
<td><strong>15274</strong></td>
</tr>
</tbody>
</table>

Due to its centric area among the residential sectors, the study area has different services for the residential area, some of these services like schools serve Duhok city as a whole. The large distance between the street center and the residential sector border is about 620 m. Fig (2-8) shows Shaheedan Street area according to the three sectors then the maximum service domain for each sector.
In the next section, the researcher will start the field study about Shaheedan Street.

### 3.5. The Field Study (Measurement)

In this part of study, the researcher will examine the research hypothesis variables on Shaheedan Street which are:

1. **Dependent variable:** Efficiency of commercial street land use.
   
   It will be examined by studying the following indicators, which are shown in fig (2-21) through theoretical part study:
   
   a) The physical (architectural) indicators:
      
      - Problems of changing the land use from residential to commercial
      - Problems of the streetscape
      - Problems of street furniture
   
   b) The accessibility and services indicators:
      
      - Accessibility of the pedestrians and cars
      - Parking
      - Other services such as electric lines and the other elements which the research will tackle in the field of their effect on the streetscape only.
2. Independent variable: Planning standards.

It will be examined by studying the following indicators:

a) Absence of commercial building permits on Shaheedan street.

b) Absence of regulations related to commercial land use standards in Duhok city

These indicators will be studied by using three methods:

3.5.1. Drawing the maps and plans depending on Duhok Master Plan and field visits.

3.5.2. Physical imaging (Photographs)

3.5.3. The field survey (Questionnaire) of a sample at the study area

3.5.1. The Maps and Plans:

The maps and plans are one of the important methods which are used by the researcher to make the exact calculations for the dimensions of land uses, areas of plots, width of street, sidewalks and setback of buildings of the street edge. In addition to the details of streetscape related to openings and the sky line to support the studying and analyzing the Shaheedan Street according to required planning indicators of the theoretical part of the research.

3.5.1.1. Shaheedan Street Land Use Plan

At the time between 1977 and 1986, Shaheedan Street was a main street located among the residential sectors. The main services in these residential sectors, such as school, and main commercial nod named modern bazaar (Suq Alasry) were located in this street. After 1986 some commercial buildings were built illegally. In 1989 this street was legally changed from residential to commercial land use see fig (3-9).

![Fig (3-9) Shaheedan Street](source: Google earth)

The street length is about 870 meters. Number of plots on this street are 84 plots with different areas. The average commercial use constitute 40.37% of the total urban area. Other
plots form 32.10 % residential land use, 20.20 % mix (commercial and residential) land use, 1.19% mosque, 4.76 % educational land use, 2.28% vacant land (see plan 3-1).

Table (3-2) The land uses on Shaheedan Street

Source: The researcher according to the land use plan

<table>
<thead>
<tr>
<th>The Land use</th>
<th>No. of plots</th>
<th>Percentage from all plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial land use</td>
<td>34</td>
<td>40.37%</td>
</tr>
<tr>
<td>Residential land use</td>
<td>27</td>
<td>32.10%</td>
</tr>
<tr>
<td>Mixed land use (residential and commercial)</td>
<td>17</td>
<td>20.20%</td>
</tr>
<tr>
<td>Educational land use</td>
<td>4</td>
<td>4.76%</td>
</tr>
<tr>
<td>Mosque</td>
<td>1</td>
<td>1.19%</td>
</tr>
<tr>
<td>Vacant land</td>
<td>2</td>
<td>2.28%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>84</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### 3.5.1.2. Shaheedan Street Elevations

The researcher noticed non-unification of the heights of the commercial buildings in the area. The buildings’ heights range from one floor to seven floors as a maximum limit for the existing situation of the buildings on Shaheedan Street. This means (4-24 m) height. Plan (3-2) below shows in detail, the building rise and frontage then sky line and small facade details of the streetscape as a whole.

Table (3-3) The buildings high in Shaheedan street

Source: The researcher according to elevation

<table>
<thead>
<tr>
<th>No. of buildings on the street</th>
<th>Building rise (No. of Floors)</th>
<th>Building rise (meters)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1 floor</td>
<td>3.8 - 5</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2 floors</td>
<td>7 - 10.5</td>
<td>Different heights due to different number of floors</td>
</tr>
<tr>
<td>10</td>
<td>3 floors</td>
<td>10 – 11.5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4 floors</td>
<td>12.5 – 14.6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>5 floors</td>
<td>14 - 20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6-7 floors</td>
<td>20 - 24</td>
<td></td>
</tr>
</tbody>
</table>
As presented in the elevations, there is difference between commercial and residential buildings, then among the same building types in terms of floor rise, frontage, and façade details.
Non-unification of the heights of the commercial buildings caused random sky line for the streetscape. Some buildings are too high in relation to the other buildings on both street sides.

3.5.1.3. Shaheedan Street Plan:

According to the street planning standards, Shaheedan Street is Local Arterial Street. Plan (3-3) and table (3-4) for the case study street shows the street section dimensions in details for the existing situation in terms of the right of way (ROW), lanes, pavements, and sidewalks. These terms directly affect the accessibility indicators for both vehicle and pedestrians.

Table (3-4) Shaheed Street

Source: The researcher according to street section plan

<table>
<thead>
<tr>
<th>The classification</th>
<th>The details</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification grade</td>
<td>Local Arterial Street</td>
<td>Among three residential sectors</td>
</tr>
<tr>
<td>ROW</td>
<td>30-22 m</td>
<td>Different from building to another due to different buildings setback</td>
</tr>
<tr>
<td>No. of lanes</td>
<td>4</td>
<td>Two sides direction</td>
</tr>
<tr>
<td>Pavement</td>
<td>18 m</td>
<td>Total for both sides</td>
</tr>
<tr>
<td>km/hr Speed</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Pedestrian service</td>
<td>Free crossing</td>
<td>No specific crossing area. Randomly mixed the vehicles and pedestrians.</td>
</tr>
</tbody>
</table>
3.5.2. The Physical Imaging (Photographs):

The physical imaging is considered one of the important operations for the field study to visually demonstrate the problems which would require solutions for the studied area. The physical imaging was done by the researcher in 20/10/2012, at 5:30 to 8:00 AM.

3.5.2.1 The Physical (Architectural) Indicators:

1. Building Condition
   1.1. Built forms
      1.1.1. Built density and form

During the repeated field visits to Shaheedan Street by the research she found that architectural problems are concentrated in a certain part of the street. Due to the difficulty of measuring Floor Area Ratio (FAR) and plot coverage for the street as a whole, the researcher selected that part as a sample to study the forms and building density. See fig (3-10) panorama of the part and fig (3-11) top view for the selected part.

Fig (3-10) Panorama for the case study section (x: y FAR, whereas x% is Plot coverage)
Source: The researcher

Fig (3-11) Top view for the case study section
Source: The researcher

The studied maps, plans, and photographic pictures whose details were stated above show that there is no certain value of the Plot Coverage Ratio for the land or Floor Area Ratio. This is due to un-unified buildings setbacks in addition to different floors numbers and plots.
areas. The researcher also found that the reason for such differences dates back to a number of things; the change of land use from residential to commercial, and few planning standards for building permits on Shaheedan Street. On commercial streets certain values should be defined for built forms as shown in previous studies of Baghdad city and other countries.

a) **FAR**

The Floor Area Ratio of the selected part ranges between 6:1 as a maximum limit for buildings and 0.3:1 as a minimum limit which represents one floor residential unit.

b) **Plot Coverage Ratio**

The ratio of coverage for buildings in the selected part ranges between 96% as a maximum and 35% as a minimum limit which represents a residential unit.

c) **Built Form**

With regard to the built form for all the commercial buildings, they are all lined and there is no setback off the sides or the rear facade only a front setback off a street edge. For the residential buildings, there is a setback of the front and rear facades in most residential units to provide the natural lighting and ventilation including gardens and trees.

1.1.2. **Buildings Rise (Skyline)**

Non-unification of the commercial buildings heights in the area, in addition to absence of harmony between them was a result of several stages of various laws that organized the land uses in this area and few regulations for building permits see fig (3-12) below.

The buildings heights range from one floor to seven that is (4-24 m height). The planning standards for building permits were set on Shaheedan Street as five floors maximum limit for the commercial buildings, along with non-definition of a floor. The height of floor differs from one building to another, and within the same building. The heights range from (3 to 5 m), (plan (3-2) shows details of skyline of Shaheedan Street as a whole.

“The finished buildings that didn’t follow the planning standards and face no penalty as it is considered a weakness in the follow up by the city municipality” (interview, 2012 ), while most countries including Baghdad city impose a penal fine on the violation of planning criteria.
1.1.3. Building Front Width

The facades of the buildings at the commercial street differ in their width and depth. The narrow facades’ width ranges between (7-10m) and the wide facades’ width ranges between (20-30 m), while the depth ranges between (7-30m). The difference in width and depth is due to:

a) Change of the land use from the residential to commercial
b) According to the planning laws of Duhok city, the owner could merge more than one piece of land lying at the street for the purpose of a commercial use and the piece of a commercial land could not be less than 75m²,

c) In case of changing the residential use to commercial one, the city municipality would have the right to own the piece of land whose area is less than 75m².
1.2. Building Setback and Street Line

The buildings in the street are in different non-unified setbacks, as a result of several stages of various laws of land use arrangement the area went through. In addition to violation of planning regulations for licenses. Shaheedan Street defines (3 m) as a minimum limit for a setback of the ground floor for the building off a street edge. For the rest of floors, the pavement could be ceiled at depth of (1.5 m set front) as a maximum limit. The existing setback of buildings ranges (1.5m - 6m), see fig (3-15) below.

As showed from the figures above, setback of the buildings forms one of the most important problems which would hamper the accessibility of the pedestrians when crossing street for the purpose of shopping or other purposes.

1.3. Facade Details and Building Material Used

Lack of harmonious architectural patterns for the buildings facades, and absence of the finishing materials and color for the buildings facades, due to absence of building regulations related to the details of the facades in terms of patterns, finishing, and colors, led to chaos and non-cohesive streetscape.
a) **The facades architectural patterns:** The used architectural patterns differ in the facades of buildings from one building to another. There is a traditional pattern and the modern architectural pattern within the same street, see fig (3-16) below.

![Fig (3-16) The different building patterns between two façades in the same street (the right one used modern, the left one use traditional pattern with balconies and arches)](image)

Source: The researcher

b) **Details of the openings:** The scale of openings differs from one building to another and within the same building. This affects the streetscape and proportion as a whole, see fig (3-17) and plan (3-2) for details of a street panorama as a whole.

![Fig (3-17) Different small detail scale for façade of building](image)

Source: The researcher

c) **Façade Colors and Material Used:** The used colors and materials differ in facades from one building to another, and the reason for this diversity is the use of various coverage materials for the facades such as coupon, cement, stone block, marble, and tile (see fig (3-18) below).
Fig (3-18) Different colors and materials used for the façades of building
Source: The researcher

From what was shown above, and after the physical survey of the studied area, the researcher found the randomness in selecting the architectural patterns, building materials, and colors used in covering the facades in addition to the advertisement signs which were put randomly (the research will tackle them as part of street furniture). All these led to non-cohesion of the streetscape and loss of the architectural identity of the area.

In addition to what was mentioned above, the researcher found that many buildings in Shaheedan Street lack the proper of a curtain wall on the top of the buildings to conceal services such as water stores, and other services. This led to visual pollution in the buildings facades (see fig (3-19) below).

Fig (3-19) Visual pollution in Shaheedan street
Source: The researcher
2. Street Furniture

The street furniture is considered as a basic part of street design and one of the complementary design elements of open space that has role in the beautification of the urban façade for the street, in addition to its importance to visitors as well as residents. The researcher noticed a shortage in street furniture such as gathering places and sitting areas as necessary elements for open spaces.

2.1. Sidewalks

As mentioned in theoretical study part, the sidewalks in the commercial street are one of the main factors that would affect success of commercial projects and considered as attraction points to the area, and of a vast importance in providing comfort for clients during shopping and moving in the commercial streets.

The design or position of the pedestrian sidewalks would have a direct effect on the accessibility of pedestrians. The researcher liked to explain this in detail within the accessibility indicators of pedestrians.

2.2. Seating

There would be no sitting places or rest in Shahidan Street during shopping in the area as it was shown throughout the visits and the physical survey of the area by the researcher and the questionnaire related to the visitants prepared by the researcher.

2.3. Lightings

Regarding the illumination, it is available in the street within the middle part in addition to some elements of illumination put by the owners of commercial shops before the building façade, see fig (3-20).

Fig (3-20) Shaheedan Street lightings
Source: The researcher
2.4. Signs

Absence of harmony and coordination in the commercial buildings signs in terms of measurement, colors, and harmony. The signs are considered one of the elements affecting the urban façade of street for having a huge effect on the facades in general in addition to creation of a visual pollution for the urban façade. There were some buildings covered 100% by the signs, whereas others were different in covering percentage (see fig.3-21).

![Commercial buildings signs](image1)

Fig (3-21) Commercial buildings signs

Source: The researcher

2.5. Street Trees

The researcher found that there are attempts in improving the way of planting trees on Shaheedan Street related to interest of planting trees in Duhok city streets as a whole.

![Shaheedan street trees](image2)

Fig (3-22) Shaheedan street trees

Source: The researcher
2.6. Bus Stop Area

The researcher noticed by the follow-up and the physical survey for Shaheedan Street, carelessness and ignorance of public and private transport facilities stop areas. Even if they were found in some places, they were available at random. Opposite to the advanced countries in which bus stop area or any other transport means were found.

Fig (3-23) Bus stop area on Shaheedan street
Source: The researcher

Regarding the designs, they were designed by an unstudied way in terms of shape and size of the station to a number of seats or the capacity, in addition to carelessness and non-maintenance to the parts that would need maintenance leading to deform the urban façade of street and creating a visual pollution instead of adding beauty to the street (see fig3-25 above).

2.7. Trash Container

In the area there would be trash containers distributed in the street long at random and unfit to the urban appearance for street in terms of color and shape in a way to the beauty of the area in addition to misuse status as shown in fig (3-24) below. While, in the advanced countries the trash containers, became a mark of prosperity depending on numerous ideas for formats or shape to conform to adjacencies and be a friend to the environment.

Fig (3-24) Trash container on Shaheedan street
Source: The researcher
2.8. Others

On the Shaheedan Street absence of some complementary elements was observed in relation to design of the open spaces such as fountains, light signs, and others that would add the street beauty, in addition to having a good effect on the psychological comfort of the human.

2. Accessibility and Services Indicator

2.1. Accessibility indicator

2.1.1. Vehicles

This indicator needs to use more than one method for measuring. Statistical methods are used in addition to field survey in order to measure the traffic congestion and its impact on the accessibility depending on the V/C ratio

2.1.1.1. Analysis Traffic Congestion by Using Indicator V/C ratio

The traffic demand to supply ratio is the main indicator for planning and design decisions for road traffic situation, traffic demands to traffic volume (V) in peak time period, and measured in terms of passenger car unit per hour per lane. Whereas road capacity (C) is a function of road design characteristics measured by passenger car unit per hours per lane (Mustafa, 2011).

Based on (HCM-2000), values of V/C were classified to four classes as shown in table (3-5). However, acceptable planning value of V/C ratio was about (0.85), and when its value reached one the situation of flow in the road would be at severe congested.

Table (3-5): V/C Ratio Description
Source: HCM, 2000

<table>
<thead>
<tr>
<th>Critical V/C Ratio(X)</th>
<th>Capacity Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>X≤0.85</td>
<td>Under capacity</td>
</tr>
<tr>
<td>0.85&lt;X≤0.95</td>
<td>Near capacity</td>
</tr>
<tr>
<td>0.95&lt;X≤1.00</td>
<td>At capacity</td>
</tr>
<tr>
<td>X&gt;1</td>
<td>Over capacity</td>
</tr>
</tbody>
</table>
Based on socioeconomic factors, mobility growth faces development due to urbanization, so it is necessary to estimate traffic growth for future. Future traffic volumes were calculated according to extrapolation growth equation (Robert, 1999):

\[ V_f = V (1 + r)^n \]  \hspace{1cm} (3-1)

\( V_f \) = future traffic volume for the target year.
\( r \) = growth rate (for Duhok city is equivalent to 0.25 according to Mustafa, 2011).
\( n \) = forecasting planning period

### 2.1.1.3. Measuring the Traffic Congestion in Shaheedan Street

The V/C ratio indicator for measuring congestion is the easiest common and representative way for planning and decision design issues. For measuring the traffic congestion in 2013 depending on 2010 data could be implemented more easily because traffic growth is usually following extrapolation growth equation (3-1). “On the other hand, capacity is a function of road characteristics, which remains constant in case of no action in the improvement program of road networks” (Mustafa, 2011).

According to Mustafa’s study in 2011, the data for Shaheedan Street in 2010 as follows:

\( V_{2010} = 702 \) (Pcu/h/L) for east west direction
\( V_{2010} = 587 \) (Pcu/h/L) for west east direction
\( C = 860 \) pcu/h/l, which is constant because of don’t changing the street width

By using these data in (3-1) equation, then (V/C ratio), the traffic volume for 2013 result, is as follows:

1. For east west direction is equivalent to 1.59
2. For west east direction is equivalent to 1.33

When comparing these results with the Table (3-5) above, means severe congestion in Shaheedan Street in both sides, see fig (3-25).
2.1.2. Pedestrians

The research focuses on sidewalk characteristics that have the greatest impact on accessibility such as grade, surface type, and sidewalk width. Other characteristics such as location, type of street also have indirect impact access. Access characteristics directly affect usability of a sidewalk. The amount of attention paid to these details will determine whether a facility is accessible or not.

Concerning Shaheedan Street, there are many problems which the sidewalks suffer as follows:

a) **Difference of the area topography** created the need in some areas to use the ladder or lift the pavement level/ grade in front of shop so that it might be compatible with height of the level of the building floor and non-taking the public right into consideration causing sudden move of the floor level in addition to non-use of slant (steepness) for the possibility of transport of babies carriages or the handicapped which would be considered one of the important elements to be provided in the move sidewalks, see fig. (3-26).
b) **Non-pavement** of the sidewalks in some places that would form one of the problems against the move because of the pits and projections in some places and difficulty of moves in addition to the unacceptable civilizational landscape which would not conform with the commercial street (see fig 3-27), while some other places were paved with material that should not be used in paving the pavement floors because of non-availability of safety properties in them like a smooth ceramic and in other places the rough cement was used that was absence of a clear trimness in the pavements coverage.

![Fig (3-27) Shaheedan street sidewalks](image)

Source: The researcher

c) The researcher also found that difference of the **buildings setbacks** off a street edge whose details were set forth above that would affect the pavement width would also be considered one of the problems that cause hindrance on the pedestrians walk where in some places the pedestrians would be obliged to leave the pavement walk on street, especially in crowd cases leading to traffic accidents and absence of the safety element when wandering in the area.

d) Using the **sidewalks for buildings material**, trash, or for other special purposes which directly affecting the normal use for the sidewalks and pedestrian accessibility.

### 2.2. Services

#### 2.2.1. Parking

Providing parking in Commercial Streets is one of the most important requirements to achieve convenience for both drivers and customers, also to mitigate the negative impact on the surrounding area. As presented in the planning standards through theoretical study part there are standards for parking and its area depending on the built area.
Regarding parking in Shaheedan Street there are no areas allocated for parking in the studied area due to the changed land use in addition to lacking of buildings permit standards and planning standards for the city as a whole.

During field surveys, the researcher observed that there is a vacant land on the street whose area was about 200 square meters used for parking, whereas it is a private property not allocated for parking as shown in fig (3-28).

Fig (3-28) Vacant land used as car parking in Shaheedan street
Source: The researcher

As shown through the photographs and maps in some places in Shaheedan Street, owners and customers use the sidewalk or the street in front of the building as car parking, which is one of the main causes of obstructing pedestrians and vehicles accessibility on the street, see fig (3-29). While others use the nearby local streets as a parking for their cars, which is leading to the creation of social problems as mentioned in the theoretical part of the research. This will be explained in detail through the questionnaire.

Fig (3-29) Unplanned parking in Shaheedan street
Source: The researcher
2.2.2. Electricity Power Lines

Although electricity is not a field of study within the research, but the researcher resorted to a brief study of the electric power elements that directly affect streetscape such as the electricity lines, generators, and others.

The researcher found through the field surveys and photographs that electricity power lines in some areas created visual pollution and had a negative impact on the buildings elevation and streetscape. That results from random distribution of the electricity lines indifferent heights without standards.

Fig (3-30) The electricity power lines distribution in Shaheedan street
Source: The researcher

Electricity poles in some areas have a negative impact on the sidewalks and buildings elevation in addition to street aesthetics’, see fig (3-31) below.

Fig (3-31) Affecting the electric poles in Shaheedan street
Source: The researcher
The generators and their related elements also had an effect on the street aesthetics’, streetscape, and sidewalks (see fig (3-32) below).

Fig (3-32) The generators and its related elements in Shaheedan street
Source: The researcher

3.5.3. The Field Survey (Questionnaire) of a Sample in the Studied Area

This section of the study presents the results of the quantitative analysis of the questionnaire. Responses of the residents in the area, the visitors, and the commercial buildings owners, were analyzed and compared. This section discusses user’s responses related to:

- The land uses
- The physical (architectural) indicators
- The accessibility and services indicators

The questionnaire was carried out and the forms were distributed in full totaling (251), in three types, distributed as follows:

- **a) (100) forms for the residents** in the studied area in the sectors: Shorash, Shaheedan, and Grebase which represent the three sectors close to the target street (see the fig 3-33) below.

- **b) (100) forms for the visitors** of Shaheedan Street due to the importance of people impressions about the existing situation.

- **c) (51) forms for the commercial use** that is the owners of the commercial shops on Shaheedan Street
A form for the residents: Concentration was made on the questions related to the positive and negative points of changing the land use from residential to commercial and how much effect it had on people.

A form for a commercial use: There are five questions only related to the commercial and mixed use (residential and commercial) to know the year of building construction, nature of lands uses, a number of the shops in a single building and their areas but the remaining questions are common in both forms of commercial and visitors use.

A form for visitors: There are two questions only regarding a visitor to familiarize his/her residence and the goal of his/her visiting to Shaheedan Street but the rest questions are joint between forms of commercial use and visitors.

Regarding how to calculate a number of forms, the researcher depended on the assistance of the statistics specialists (statisticians) then she analyzed the results using Microsoft Excel program.

![Fig(3-33) Shaheedan street location among three residential sectors (Shorash, Saheedan, and Grybase)](image)

**Source:** The researcher

**3.5.3.1 Results of Questionnaire Related to Residents Only**

The residents forms were distributed in the studied area with various ratios according to a number of the residential units in the area which comprised Shorash sector at ratio of (23%) of forms, the residential Shaheedan sector at ratio of (29%) of forms, the residential Grebase sector at ratio of (48%) of forms. The reason of distributing the biggest ratio of questionnaire forms to both Garebase and Shaheedan sectors is because these two sectors are set to be
changed from residential to commercial land use in the Master Plan of Duhok city. Results of the residents questionnaire were according to the charts below.

1. **If a house lies beside commercial shops, do you consider it suitable?**

   Results of this question seemed very similar, ratio of the answer was (Yes) formed (43%), the answer (No) formed (44%), while (13%) of the residents seemed ignorant of the answer as stated in chart (3-2).

   ![Chart (3-2) Answers for Q1: if a house lies beside commercial shops, do you consider it suitable? Source: The researcher according to the statistical analysis](image)

   Chart (3-2) Answers for Q1: if a house lies beside commercial shops, do you consider it suitable?
   Source: The researcher according to the statistical analysis

   Regarding the (No) answers of residents, the biggest reason goes back to a loss of a housing privacy, random mixture between the residential and commercial functions, traffic congestion and noise according to the ratios stated in chart (3-3) below.

   ![Chart (3-3) The reasons of answers (No) for Q1: if a house lies beside commercial shops, do you consider it suitable? Source: The researcher according to the statistical analysis](image)

   Chart (3-3) The reasons of answers (No) for Q1: if a house lies beside commercial shops, do you consider it suitable?
   Source: The researcher according to the statistical analysis
2. Do you think a change of the land use from residential to commercial led to positive results?

Results of the questionnaire sample answers as stated in the chart (3-4) below show (59%) out of answers ratio with (Yes) and the answers (No) formed (30%) at the same time the others seemed ignoring of the result and at ratio of (11%).

Chart (3-4) Answers for Q2: Do you think a change of the land use from residential to commercial led to positive results?
Source: The researcher according to the statistical analysis

3. In case that the results are positive are they social or economical or environmental?

The results stated in chart (3-5) below show that the positive results mentioned by residents were very relative compared to the rest positive points. Economically, they were at ratio of (58.06 %) followed by the social aspect at ratio of (37.10), and then environmental the results were at ratio of (4. 84%) only.

Chart (3-5) Answers for Q3: in case that the results are positive (social or economical or environmental)?
Source: The researcher according to the statistical analysis

Regarding the positive points (good points) mentioned by residents:

a) Social:

➢ Nearness or accessibility to the daily needs from the residence place
- Accessibility to the work place and to residence
- The area became an attraction point due to its commercial services

b) **Economical**: increase of the real estate value
c) **Environmental**: increased care of cleanliness, street lightening, street trees, and so on.

4. **Do you want the street to develop in order to be efficient commercial street, and serves at the city level as a whole?**

A ratio of (71.58%) out of total of residents answers was (Yes), and a ratio of (22.11%) of answers was (No), while a ratio of (6.31%) was (I don’t know) or the residents kept their opinion as stated in chart (3-6).

![Chart (3-6) Answers for Q4](image)

Chart (3-6) Answers for Q4: Do you want the streets to develop in order to be efficient commercial streets and serviceable at the city level as a whole?
Source: The researcher according to the statistical analysis

5. **What are the problems that face you as a resident in the area?**

Regarding the problems faced in the area, according to the opinion of residents, the questionnaire sample is at ratio of (55%) due to traffic issues, a ratio of (25%) environmental, a ratio of (16%) social, and a ratio of (4%) economical problems as stated in chart (3-7) below.

![Chart (3-7) Problems](image)
Chart (3-7) Answers for Q5: What are the problems that face you as a resident in the area?
Source: The researcher according to the statistical analysis

**With regard to the problems mentioned by residents:**

**a) Social:** at ratios as stated in chart (3-8):

- A gathering for strangers in the area
- Loss of housing privacy
- Using the local street for stopped the visitors and owners cars

![Chart](image)

Chart (3-8) Answers for Q: social problems?
Source: The researcher according to the statistical analysis

**b) Economical:** A rise in the price of estates then a rise in the rental prices.

**c) Environmental:** The noise is caused by cars or peoples.

**d) Traffic issues:** It represents the greatest ratio among the mentioned problems, the traffic crowd at ratio of (97%) and a lack of car parking lots at ratio of (3%).

**In brief, the results of questionnaire related to the residents in study area:**

- There is a large variation between the opinion of the residents about the suitability of housing beside the commercial shops where the answers (yes) and (not) were very similar.
- The highest ratio of residents think that change of the land use of lands from residential to commercial led to positive results especially at the economical level.
- A very huge ratio of residents desire that Shaheedan street is developed to serve the city
- The most important problems which residents faced are the traffic congestion and then the noise problem.
3.5.3.2 The Questionnaire Results Related to the Commercial Use as Follows:

1. Residence/ housing place?

The ratio of (19.61%) of workers in the commercial shops lived in Shorash sector. The ratio of (23.53%) of workers lived in Shaheedan sector. The ratio of (31.37%) lived in Grebase sector, and the ratio of (25.49%) are from the other areas in the city as stated in chart (3-9) below.

![Chart 3-9](image)

Chart (3-9) Answers for Q1: Residence / housing place?
Source: The researcher according to the statistical analysis

2. When the buildings were constructed?

As stated throughout the questionnaire results for the commercial use, the biggest ratio of the buildings that have the commercial use were built in the nineties of the past century at ratio of (37.25 %) out of the total commercial buildings on Shaheedan Street because of the stability in the area after the continuous wars and fights, a ratio of (29.41 %) of the buildings were constructed at the beginning of 1979-1990, a ratio of (27.45 %) of the buildings were built in 2001-2010 while the buildings which were built after 2010 formed a ratio of (5.89%) as stated in table (3-6) below.

Table (3-6) Date of commercial buildings construction in Shaheedan Street
Source: The researcher according to the statistical analysis

<table>
<thead>
<tr>
<th>The construct Date</th>
<th>No. of buildings</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979 -1990</td>
<td>15</td>
<td>29.41%</td>
</tr>
<tr>
<td>1991 -2000</td>
<td>19</td>
<td>37.25 %</td>
</tr>
<tr>
<td>2001- 2010</td>
<td>14</td>
<td>27.45 %</td>
</tr>
<tr>
<td>After 2010</td>
<td>3</td>
<td>5.89 %</td>
</tr>
</tbody>
</table>
3. The number of shops in a single building?

The number of the shops in a single building ranges between one to eight according to what is stated in table (3-7) below. The reason of the biggest ratio of buildings that have one shop or two goes back to existence of shops with huge areas as stated in table (3-8) below or building one shop or two within the façade of an existing residential building. A ratio of (37.52%) of the buildings in which there was one shop and a ratio of (37.52%) of the buildings comprising two shops only within the ground floor.

Table (3-7) The number of shops in single building in Shaheedan street
Source: The researcher according to the statistical analysis

<table>
<thead>
<tr>
<th>No. of shops in the building</th>
<th>No. of buildings</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>37.25 %</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>37.52 %</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>13.73 %</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>28.57 %</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>28.57 %</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1.96 %</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1.96 %</td>
</tr>
</tbody>
</table>

4. Area of the shop?

The areas of the commercial shops at Shaheedan street range from (10-300 m²), as stated in table (3-8) below. The ratio of shops whose areas over (30 m²) are relatively high and that is one of the reasons that made the number of shops few in a single building.

Table (3-8) The areas of shops in Shaheedan street
Source: The researcher according to the statistical analysis

<table>
<thead>
<tr>
<th>Shop area (m²)</th>
<th>No. of shops</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 30</td>
<td>21</td>
<td>41.18 %</td>
</tr>
<tr>
<td>31 - 50</td>
<td>8</td>
<td>15.68 %</td>
</tr>
<tr>
<td>51 - 70</td>
<td>2</td>
<td>3.92 %</td>
</tr>
<tr>
<td>71 - 90</td>
<td>3</td>
<td>5.88 %</td>
</tr>
<tr>
<td>91 -110</td>
<td>7</td>
<td>13.73 %</td>
</tr>
<tr>
<td>More than 110</td>
<td>10</td>
<td>19.61 %</td>
</tr>
</tbody>
</table>
5. Location of the commercial building construction

The ratios stated in chart (3-10) below show the location of constructing the commercial buildings in Shaheedan Street. The ratio of the commercial buildings which were built in the place of a residential completely removed building was (50.98%), and the ratio (41.18%) from modification residential building, like a commercial shop within the façade of a residential house, and the ratio (7.48%) was built on a vacant land due to change of use from residential land to commercial.

Chart (3-10) Answers for Q5: The location of the buildings construction in Shaheedan street?
Source: The researcher according to the statistical analysis

In brief, the results of questionnaire related to the commercial use are

- Most workers in the commercial shops at Shaheedan Street lived in the nearby residential sectors,
- Most of the buildings comprised of one or two shops, and
- Most shops areas exceeded (30m²).

3.5.3.3 The Questionnaire Results for Visitors are as Follows:

1. The age

The ages of the questionnaire sample ranged (15-65 years) at various ratios. A ratio of (13.68%) to the age category: 20-15 years and a ratio of (45.26%) to the age category: 30-21 years, a ratio of (21.06%) to the age category: 50-41 years and a ratio of (6.32%) only to age category (more than 51 years) as stated in chart (3-11) below:
2. Place of residence

Chart (3-12) below shows that a high ratio (53.68%) of the visitors questionnaire sample on Shaheedan commercial street did not live in the residential sectors close to the street (Shorash, Shaheedan, and Grebase) in which the ratio of (46.32%) were for visitors from residents of the residential sectors nearby.

3. The goal of visiting Shaheedan Street

The question results on the goal of visiting the street is as stated in chart (3-13) in which the highest ratio (58.95%) was for visitor of Shaheedan Street for shopping then entertainment goal was at ratio of (23.16%), but the least ratio was for other goals (e.g., passing only, a special visit, contacting a bureau or hairdressing saloon, and going to school at ratio of (17.89%).
Chart (3-13) Answer for Q3: the goal of visiting Shaheedan street?
Source: The researcher according to the statistical analysis

In brief, the results of questionnaire related to Shaheedan Street Visitors are:

- The most visitors to Shaheedan Street are of the youth category.
- A high ratio of visitors didn’t live in the residential sectors nearby (Shorash, Shaheedan, and Grebase), and
- The highest ratio of the goal of visit to Shaheedan Street was for shopping and then for entertainment.

3.5.3.4. The Results of the Joint Questions Between the Visitors Forms and the Commercial Use are as Follows:

The questions regarding the attraction elements on street are type of the favorite commercial markets, the (physical) architectural, accessibility and service indicators.

1. Attraction elements of Shaheedan Street

As stated in chart (3-14) below, the attraction elements on Shaheedan Street were at a ratio of (60.99%) the shops, at a ratio of (18.06%) for restaurants and cafes, in addition to this, a ratio of (20.95%) mentioned other attraction elements such as schools, bureaus and hairdressing saloons.
Chart (3-14) Answers for Q1: Attraction elements of Shaheedan Street
Source: The researcher according to the statistical analysis

2. Your favorite commercial markets

Chart (3-15) below shows the favorite commercial markets as (53.79%) of the questionnaire sample prefer the commercial shops on street (commercial corridors), the ratio (30.40%) prefer malls, and the ratio (15.81%) only prefer the single shops.

Chart (3-15) Answers for Q2: Your favorite commercial markets
Source: The researcher according to the statistical analysis

3. Physical (Architectural) Indicators

1. How do you see the idea of unifying the buildings at one height (the same number of floors) on the main commercial streets as a future approach?

According to the ratios stated in chart (3-16) below, the greatest majority of the questionnaire sample answered about the idea of unifying the heights of the buildings on the main streets in the city as a future approach, for being a good idea, with a ratio of (67.66%). The ratio (23.70%) answered (Moderate), and the ratio (8.73%) said it is a bad idea.
Chart (3-16) Answers for Q1: How do you see the idea of unifying the buildings at one height (the same number of floors) on the main commercial streets as a future viewpoint?

Source: The researcher according to the statistical analysis

2. **How do you see the idea of unifying the buildings setbacks (the distance between the street edge and the building façade) in one level for the commercial streets as a future approach?**

According to the ratios stated in chart (3-17) below the greatest majority of the questionnaire sample gave the answer on the idea of unifying the buildings setback on the main streets in the city as a future approach for being a good idea, and at a ratio of (77%). The ratio of (16.75%) answered (moderate), and the ratio of (6.25%) said it is a bad idea.

Chart (3-17) Answers for Q2: How do you see the idea of unifying the buildings setbacks in one level for the commercial streets as a future approach?

Source: The researcher according to the statistical analysis

3. **What do you think about the idea of finishing the buildings facades with certain materials as stones or aluminum or both of them etc.... for the main commercial streets as a future approach?**

According to the ratios stated in chart (3-18) below, the majority of the questionnaire sample answered about the idea of determining the materials of covering the facades of the
buildings on the main streets in the city as a future approach as a good idea and at a ratio of (49.56%), while the ratio of (31.16%) answered (Moderate), and the ratio of (19.28%) said that it is a bad idea.

Chart (3-18) Answers for Q3: What do you think about the idea of finishing the buildings facades with certain materials such as stones or aluminum or both of them etc…. on the main commercial streets as a future approach?

Source: The researcher according to the statistical analysis

4. How do you see the status quo of the street furniture such as (street trees, lighting, commercial signs, and so on)?

According to the ratios stated in chart (3-19) below, the greatest majority of the questionnaire sample described the status of Shaheedan commercial street furniture as bad at a ratio of (64.24%) , while a ratio of (27.94%) said that it is not bad, and a ratio of (7.82%) said that it is good.

Chart (3-19) Answers for Q4: How do you see the status quo of the street furniture such as (street trees, lightings, commercial signs, and so on)?

Source: The researcher according to the statistical analysis
3. The Accessibility and Services Indicators

1. **If you have a private car where do you park it?**

   As stated in chart (3-20) below, the greatest majority of people park their cars on the street and inside the nearby branches, where the ratio of (44.35%) park their cars on the street, a ratio of (44.22%) park their cars inside the nearby branches. A ratio of (11.43%) only park them in a private parking such as a house garage, as there are no allocated parking on Shaheedan Street.

   ![Pie chart showing car parking preferences](chart3-20)

   Chart (3-20) Answers for Q1: If you have a special car where do you park it?

   Source: The researcher according to the statistical analysis

2. **How do you see the pedestrian accessibility on Shaheedan Street?**

   The results, in chart (3-21) below show that the highest ratio of questionnaire sample said it (Not difficult) about the accessibility status, for walking in Shaheedan Street at a ratio of (51.88%), and a ratio of (38.87%) said walking transport is (Difficult), and a ratio of (9.25%) said it is (Comfortable).

   ![Pie chart showing pedestrian accessibility](chart3-21)

   Chart (3-21) Answers for Q2: How do you see the pedestrian accessibility on Shaheedan Street?

   Source: The researcher according to the statistical analysis
3. **How do you see the accessibility on Shaheedan Street when moving by car?**

The results stated in chart (3-22) below show that the biggest ratio of questionnaire sample confront a difficulty in driving car through Shaheedan Street at a ratio of (67.64%), a ratio of (27.70%) of residents said it is Ok (Not difficult), and a ratio of (4.66%) said that it is (Comfortable).

Chart (3-22) Answers for Q3: How do you see the accessibility on Shaheedan Street when moving by car?  
Source: The researcher according to the statistical analysis

4. **What do you want to be available on Shaheedan Street?**

The chart (3-23) below shows desire of questionnaire sample for availability of car parking lots with a ratio of (42.03%) and a ratio of (41.78%) of the questionnaire sample desire existence of gathering and sitting place for rest, while a ratio of (16.19%) desire the availability of other activities on Shaheedan Street.

Chart (3-23) Answers for Q4: What do you want to be available on Shaheedan Street?  
Source: The researcher according to the statistical analysis
5. What are the problems you find on Shaheedan Street?

The results stated in chart (3-24) below show that there are problems on Shaheedan Street stated by questionnaire sample as follows, from top to bottom ratio:

a) Accessibility problems: A ratio of (48.65%):
   - For cars: The traffic crowd
   - For the pedestrians: Problems of sidewalks such as the pavement, various levels, and width, in addition to problems of a dumping building materials on the sidewalks which led to mixing pedestrians movement with cars.

b) Services problems: A ratio of (32%) such as a shortage of car parking lots, poor maintenance of street and pavement, in addition to other maintenance services which require for commercial streets.

c) Physical (architectural) problems: Most of questionnaire sample at a ratio of (19.35%) mentioned that random mixture between residential and commercial uses, in addition to difference in the buildings facades, lack of harmony between them. The various buildings heights which happened, due to change from residential to commercial use created different floor heights ranging from one floor (residential) to six floor (commercial) which causes the randomness and loss of cohesion in the streetscape.

Chart (3-24) Answers to Q5: What are the problems you find on Shaheedan street?

Source: The researcher according to the statistical analysis
In brief, the results that appear in the charts above are:

- Most of the questionnaire sample found the shops as attraction element on Shaheedan Street.
- Most of the respondents prefer the commercial shops on the street (commercial streets).
- The greatest majority of the respondents certified the idea of unifying the heights of the buildings on the main commercial streets in the city as a future approach.
- The greatest majority of the respondents certified the idea of unifying the building setback on the commercial streets as a future approach.
- The greatest majority of the respondents found badness of the existing situation of Shaheedan Street furniture.
- Almost an equal ratio of the questionnaire sample parked their cars on the street and at the nearby branches.
- The biggest ratio of respondents said that it Ok (Not difficult) about the accessibility status, for walking in Shaheedan Street.
- Almost an equal ratio of the respondents would desire the existence of parking lots and places for gathering and seating on Shaheedan Street.
- Regarding the most important problems on Shaheedan Street within the questionnaire sample was accessibility problems.

3.6. **Summary**

Through this chapter, the researcher presented information about the commercial land use in Duhok city in general then the case study area (Shaheedan Street). The study was done by three methods; maps, photographs, and questionnaire results showed that there were many problems in Shaheedan Street due to changing of residential use to commercial. That means lacking of planning standards in implementing Shaheedan Street, led to these problems and failure in reaching efficient urban requirements for its commercial uses.
Chapter 4

Discussion
4.1. Preface

In this chapter, the researcher will measure the research hypothesis variables (*efficiency requirements for commercial land use*) which represent dependent variable and (*the planning standards*) which represent independent variable. This will be done by analyzing and comparing each indicator which was found in the practical case study with local and international planning standards mentioned in the theoretical study part.

4.2. The Physical (Architectural) Indicators

4.2.1. Building Condition

The building condition was studied by measuring the built form, and building setback. Regarding the built forms and setback, the researcher found that there is a correlation between them. This correlation was found through the skyline (number of floors), building setback and set front, plot coverage, and floor area ratio (FAR) as will be illustrated later.

Table (4-1) below shows the **setback and set front** for the buildings on Shaheedan Street showing that the existing situation is not within the range. The researcher suggests a range for them according to the Shaheedan Street ROW, which is 30 meters (see table 2-6).

Table (4-1) Buildings setback on Shaheedan Street
Source: The researcher

<table>
<thead>
<tr>
<th>Setback and Set front</th>
<th>Duhok planning standards</th>
<th>Local or international planning standards</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The existing situation</strong></td>
<td><strong>Setback</strong></td>
<td><strong>3 m</strong></td>
<td><strong>Local\ 5 m</strong></td>
</tr>
<tr>
<td><strong>Duhok planning standards</strong></td>
<td><strong>International\ 4.5 m</strong></td>
<td><strong>According to Shaheedan Street ROW the setback is 4.5 m</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Plot Coverage Ratio</strong></td>
<td><strong>Set front</strong></td>
<td><strong>1.5 m (equivalent to half of setback)</strong></td>
<td><strong>Local \ 2.5 m (equivalent to half of setback)</strong></td>
</tr>
<tr>
<td><strong>Measurement</strong></td>
<td><strong>Results</strong></td>
<td><strong>Suggestions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Local\ 5 m</strong></td>
<td><strong>International\ 4.5 m</strong></td>
<td><strong>According to the suggested setback is 2.25 m</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table (4-2) illustrates the **Plot Coverage Ratio** for the buildings of Shaheedan Street. The researcher finds that the existing situation is not within the range. She suggests a maximum
range for it, which depends on the setback suggested above and the maximum plot area of Shaheedan Street.

Table (4-2) Buildings plot coverage on Shaheedan Street

Source: The researcher

<table>
<thead>
<tr>
<th>Plot coverage ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>The existing situation</td>
</tr>
</tbody>
</table>
| 96% - 35% | None | Local\ 75 %
International\ 65 % max. | The existing situation is not within the range. | According to the setback suggested and existing situation in plot areas does not exceed 83% as a maximum limit |

Table (4-3) and (4-4) studied the **skyline** of Shaheedan Streetscape which depends on **number of floors** and **floor height**. Note that although there is a planning standard for the number of floors on this street, but it is not implemented in many buildings. The researcher found that this planning standard is good for implementing on Shaheedan Street due to its moderate ratio for the buildings height and the street width between them which is presently 1:2 ratio, see fig (3-13). According to this ratio, the floor number is suggested in table (4-4).

Table (4-3) Buildings rise on Shaheedan Street

Source: The researcher

<table>
<thead>
<tr>
<th>Number of Floors (building rise )</th>
</tr>
</thead>
<tbody>
<tr>
<td>The existing situation</td>
</tr>
</tbody>
</table>
| 1 – 7 floors | 5 floors | Local\ 3 floors
International\ depend on the space between the buildings or the ratio between the space and buildings. | The existing situation is not within the range. | The researcher suggests implementing Duhok city planning standards 5 floors, due to its moderate ratio (1:2) between the building and space. |
Table (4-4) The floors height in the buildings on Shaheedan Street

Source: The researcher

| Floor high |
|-----------------|-----------------|-----------------|-----------------|
| The existing situation | Duhok planning standards | Local or international planning standards | Measurement results | suggestions |
| 3 - 5 m randomly | None | Local\ m ground floor 2.70 m other floors International\ 4.5 - 5m ground floor 3- 3.75 other floors. | The existing situation is not within the range. | The researcher suggests 4- 5m ground floor 2.70 -3 m other floors to achieve 1:2 building height ratio. |

As a result that is clear from the above tables, Floor Area Ratio is suggested in table (4-5) because it depends on the plot coverage and buildings height. The researcher suggests (4.4:1 ratio) as a maximum limit depending on the maximum plot area for existing situation and maximum building rise suggested by the researcher on the Shaheedan Street.

Table (4-5) Floor area ratio of the buildings on Shaheedan Street

Source: The researcher

| Floor Area Ratio (FAR) |
|------------------------|------------------------|------------------------|------------------------|
| The existing situation | Duhok planning standards | Local or international planning standards | Measurement results | suggestions |
| 0.3 :1 - 6:1 | None | Local\ 4.5 :1 International\ depend on the setback, no. of floors, and plot coverage | The existing situation not within the range. | According to the setback, plot coverage, and number of floors which the researcher suggested, the FAR is 4.4:1 as the maximum limit |

Regarding building's frontage which affects the coherence of the building with the adjacent buildings in the streetscape, there is a different building front width on Shaheedan Street due to different plots area which negatively affected the streetscape. No planning standard mentioned in the theoretical part study specified the building frontage. The
researcher suggests in case of different frontage creates, coordination between the building height and width to prevent the negative effects on the streetscape.

Regarding to façade details and building material used, the researcher found different materials, colors, and details used in Shaheedan Streetscape without planning standards. According to the international and local studies, every region or street has a specific standard for the material, colors, and details which reflect the identity of this area.

As mentioned in the theoretical part of study, façade details and building materials have an important role in the creation of harmony and visual coherence, and it is the first aspect perceived by users. For this reason, the researcher studied the response of the visitors and the owner’s questioners to specify what is suitable for Shaheedan Street.

According to many studies (ar.wikipedia.org/wiki/), the city of Duhok is regarded as one of the fast growing cities compared to other Iraqi cities, and it is still under expansion. Using modern materials and colors, in addition to traditional materials, should be done with care, thorough study, and in consistency with streetscape. Furthermore, details of building openings, to avoid the random selection of materials and colors in commercial streets’ buildings.

4.2.2. Street Furniture

The researcher found a big shortage in the requirements of commercial street furniture such as places for gathering, sitting, and the complementary elements for designing open spaces. These have direct and indirect effects on the architectural, accessibility, and services indicators. The researcher used maps, plans, and photographs of Shaheedan Street, in addition to responses of the visitors, and the owners of the commercial shops to clarify the status of the commercial street furniture. The majority of them agreed that the street in a poor current status.

4.2.2.1. Seating

As observed during the practical part study of research, there are no sitting or resting places, while they should be available in the commercial areas. The width of the pavement and lack of required specifications on Shaheedan Street do not encourage placing benches or places for rest and seating. In addition to the high ratio of the area visitors, and employees who desire places for gathering and seating.
The researcher proposes selecting areas in which the pavement width is (6m) to place benches for seating and rest (see plan 3-3). In addition to choosing an area in Shaheedan Street as an open space for gathering and seating, to be attractive point for the commercial use. It could be designed to exhibit the architectural beauty of the area with touches of beauty and distinction including greenery and fountains, to give a comfort to the visitor or shopper.

The researcher suggests two proposals for the location, after many field visits to the area, the study and analysis, as shown in fig (4-1) and (4-2) below:

**Proposal 1**: Choosing two areas as attractive nodes and focal points, one at the beginning of street in Grebase sector, and the other at the end in Shorash sector, as acquisition by the government for this purpose.

![Fig (4-1) The location of first proposal for open space at Shaheedan street](image)

Source: The researcher

**Proposal 2**: Choosing an area of a primary school nearly located in the middle of street to serve the purpose of open gathering space. Shaheedan Street represents one of the major and important streets in Duhok city, and one of the conditions of primary school location is that it must not lie at a main street.

![Fig (4-2) The location of second proposal for open space at Shaheedan street](image)

Source: The researcher
4.2.2.2. Signs

The commercial building signs showed negative effects on the streetscape of Shaheedan Street, due to absence of harmony in their dimensions, and various heights at the same building.

After studying international planning standards of commercial building signs the researcher found that there should be similarity and harmony in terms of dimensions heights. Therefore, the researcher suggests using planning standards for building sign at Shaheedan Street, as stated in the following table:

Table (4-6) Buildings signs in Shaheedan Street
Source: The researcher

<table>
<thead>
<tr>
<th>Building Signs</th>
<th>The existing Situation</th>
<th>Duhok planning standards</th>
<th>Local or international planning standards</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rise from the ground\0-4m</td>
<td>None</td>
<td>International\ far from the hand touch\ 2.5 m rise from the ground\ 50 cm signage height</td>
<td>Not all signs in the existing situation are within the range</td>
<td>Implementing the international planning standards because many sources mention the same standards, then implemented</td>
</tr>
<tr>
<td>Colors\ different from one sign to another</td>
<td>None</td>
<td>coordinating between the sign writing and background colors with the facade of the building</td>
<td>Not all signs in the existing situation are within the range</td>
<td>coordinating between the sign writing and background colors with the facade of the building</td>
</tr>
</tbody>
</table>

With regard to the signs of hotels, motels and offices, they are possibly placed on the top of the building in a way not to cross the building height itself as in fig (4-3) below, sample of Shaheedan Street in which the researcher clarifies the proposed mode for the building signs.
4.2.2.3. Bus Stop Area:

The study of Shaheedan Street showed carelessness of bus stop area, in terms of design or location. The researcher clarifies the necessity of using suitable design for these stations, as used in many countries, to enhance the service and comfort users, and decrease the bad effects on traffic in the street such as the sudden stop of public and private vehicles, or the sudden crossing of pedestrians as one of the huge problems, affecting the traffic flow. Fig (4-4) represents one of the simple examples used worldwide.

Regarding the location choice on the street, the international criterion is; a bus station in every (300 m); it means that there is a need of three bus stops in Shaheedan Street.
4.2.2.4. Trash Container

As for trash containers, they were distributed randomly in addition to misuse in Shaheedan Street. The researcher proposes using the fixed trash containers with top covers to avoid moving them randomly from one place to another. Fig (4-5) below represent simple samples of the trash containers as proposed by the researcher.

Fig (4-5) Trash container
Source: Internet picture

Concerning other street furniture of the commercial street such as; the trees bases, the flower beds, the fountains, and other supplements of the open space on Shaheedan Street, they should be considered carefully to add beauty and order to the streetscape.

4.3. The Accessibility and Services Indicators

4.3.1. Accessibility

Throughout the practical part of the study via the photographs, the questionnaire, and the statistical analysis, the researcher found that the traffic congestion of vehicles is one of the main problems on Shaheedan Street.

It is necessary to state the reasons that led to the traffic congestion directly or indirectly as follows:

a) A big shortage in car parking that pushed the vehicles owners to park their cars within the street which affected the flow of passing cars.
b) Non-existence of places was allotted for the pedestrians crossing which led to the random mixture of movement between pedestrians and cars.

c) Negligence in bus stop areas for public and private vehicles which led to the sudden stop of taxi cars in non-allotted places.

d) The narrow width of sidewalks in some places, and using them to store building materials, forced pedestrians to leave the sidewalks in some places and walk on streets.

The researcher proposes the above mentioned side problems and their causatives are to be controlled so that the control over traffic congestion may become obvious such as provision of cars stop areas, determination of building setback to control the sidewalks width. Preventing the building’s owners from leaving the buildings materials or wastages or offal on sidewalks allotted for the pedestrians in addition to paying heed to the stop areas for the public and private cars and allocation of places for the pedestrians crossing.

*The researcher concluded that there is a mutual relation between the cars accessibility and pedestrians and if any of the above mentioned reasons was controlled, the others would be controlled directly or indirectly.*

a) The problems of the pedestrians’ sidewalks mentioned during the practical part of study, and difference of their levels is due to topography of the area. The researcher proposes to use the international planning standards for the pedestrians’ sidewalks where slope did not exceed 14% instead of a sudden change of levels by using the steps. The importance of using the slopes in the commercial areas is to enable the movement of children’s carriages and the handicapped.

b) Regarding the pavement, the researcher proposes using non-slippery finishing materials of the safety qualities such as concrete, brick or stone.

c) A big ratio of a questionnaire sample (51, 88%) clarified that walking on foot on the street is easy (see chart 3-21). The researcher concluded that if the buildings setback off the sidewalks edge are controlled, in addition to provision of car parking, and preventing car parking on the pavement, width of the sidewalks will be controlled. As for the pavement width, the least width suitable for two persons passing, should not be less than (2m) of street edge including (0.5 m) width for the safety strip of the street edge.

d) Stopping the building’s owners from using sidewalks for storing materials, and imposing a penalty in case of using public property for private purposes.
4.3.2. Services

Throughout the practical study of Shaheedan Street, it became clear that there is a huge shortage in car parking lots, which affected the accessibility indicator directly and negatively. Due to the planning standards mentioned in the theoretical part of the study, the number of car parking which must be provided on Shaheedan Street is (185) car parking as a minimum, and (481) car parking as a maximum as stated in table (4-7):

Table (4-7) The requirement of car parking in Shaheedan Street
Source: The researcher

<table>
<thead>
<tr>
<th>Land use</th>
<th>Details</th>
<th>Local planning standards for Parking number</th>
<th>Car parking requirement in Shaheedan street</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>Commercial land use</td>
<td>11856 m²</td>
<td>1-3(for every 100 m² of built area)</td>
<td>119</td>
</tr>
<tr>
<td>Mixed land use (commercial – residential)</td>
<td>2900 m²</td>
<td>1-3(for every 100 m² of built area)</td>
<td>29</td>
</tr>
<tr>
<td>Residential land use</td>
<td>27 house</td>
<td>1 (for every House)</td>
<td>27</td>
</tr>
<tr>
<td>Mosque</td>
<td>1000 m²</td>
<td>1(for every 100 m² of built area)</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td><strong>185</strong></td>
</tr>
</tbody>
</table>

The researcher proposes to build a multi-storey car parking area on Shaheedan Street with capacity of (185) car parking as a minimum limit and (481) car parking as a maximum limit, by the government acquisition of an area (plot), to end the shortage of the car parking on the street, and controlling the accessibility problem directly.

Regarding the future expansion of the commercial use, the researcher proposes using the above planning standard (1-3 car parking area per100 sqm building area) as a condition within the license permits of commercial buildings on Shaheedan Street. The basement floor can be used for this purpose.
The research proposes the following sketch design for both open gathering space and multi-storey building for car parking (see fig (4-6) and (4-7)). Choosing an area of a primary school nearly located in the middle of street which mentioned and showed in fig (4-2). Its area is about (6400 sqm).

Fig (4-6) The proposal of gathering open space and car parking for the surrounding buildings in Shaheedan Street
Source: The researcher

Regard the electric power lines, poles, and generators, that affect the streetscape in terms of visual pollution, because of the various heights of the power wires or unsuitable shapes of (control panels) hanging randomly from the power poles. The researcher proposes some solutions related to setting fixed heights for power wires such as; (3m) for safety. Selecting certain places for control panels related to the power generators within safe and proper boxes.
4.4. Summary

Through this chapter the researcher measured the variables, and put some suggestions as solutions for the physical, accessibility, and services problems on Shaheedan Street. They are suggested due to lack of planning standards for the commercial land use in Duhok city generally and Shaheedan Street specially. In order to control the commercial land use development on this street, the following planning standards are suggested:

1. Setback: 4.5 m, Set front: 2.25 m as maximum limit,
2. Plot coverage ratio: not exceed 83%,
3. FAR: not exceed 4.4: 1,
4. Number of floors: 5 floors,
5. Floor height: 4-5 m ground floor and 2.70 -3 m other floors,
6. Commercial buildings signs: 2.5 m rise from the ground and 50 cm signage height,
7. Hotel, motels, and offices: the signs on top of the building, and
8. Car Parking: 1-3 car parking for every 100 m² built. Using the basement for this purpose as well.
Chapter 5

Conclusions

&

Recommendations
5.1. Conclusions

5.1.1. In General

1. The requirements of the population growth, in line with the developments and changes in culture, and the development of internal and external commerce led to more request of commercial land use in Duhok city.

2. There are three types of commercial land use as a hierarchy in Duhok city. Most of them lack of planning standards:
   a) Nods:
      - Central Business District (CBD): Accumulation of organic growth is without planning
      - Mazi Super Market
   b) Main Commercial Streets: Changed from residential to commercial use.
      - Baroshke
      - Shaheedan
      - Malta
      - KRO
   c) Single shops

3. Haphazard and poorly planned commercial land use and lack of neighborhood and district commercial centers in Duhok city led to illegal change of the residential land use to commercial. These are the causes of random distribution for commercial land use in the city.

4. Changing the residential land use to commercial led to create physically, socially, and accessibility problems in Duhok city such as randomly mixing between the commercial and residential functions, loss of the housing privacy, and traffic congestion.

5. Lack of regulations for the commercial buildings permits, on the other hand, some buildings owners don’t follow the planning standards when they build the buildings. That led to negative impacts of the commercial use on the surrounding urban area.

6. No penalty on the violation of planning standards.

7. Overlapping levels of service domain for the commercial streets with the CBD.
5.1.2. The Case Study

5.1.2.1. Physical (Architectural) Indicators

1. Shaheedan Street location is the centric area among the residential sectors (Shorash, Shaheedan, and Grebase); therefore, it has different services for the residential area, such as schools and mosque, as well as commercial services.

2. The commercial use and mixed (residential - commercial) uses in Shaheedan Street represent largest ratio of the land uses (60.57%) of the total existing land uses on the main street. Changing of these land uses was not controlled.

3. Violations in planning standards led to many problems in the urban streetscape and surrounding urban area.

4. Overlapping levels of service domains between Shaheedan Commercial Street and the CBD. The questionnaire clarified that, the largest number of visitors to Shaheedan Street (53.68%) are from the other areas of Duhok city, not from the surrounding residential sectors (Shorash, Saheeda, and Grebase).

5. Large number or residents accepted the idea of developing Shaheedan Commercial Street to serve at the city level.

6. Economic benefits are gained from changing the land use from residential to commercial in Shaheedan Street.

7. Many social and physical problems created in Shaheedan Street are due to random mixing between the residential and commercial functions.

8. Significant difference in the areas of shops on Shaheedan Street, and the presence of a large number of shops with an area more than (30 m²).

9. The shops, along the main streets (commercial corridor), are the favorite for shopping.

10. The poor condition of the existing situation of the commercial street’s furniture (seating, commercial signs, sidewalks, etc.), in addition to the desire of the visitors and commercial buildings owners in Shaheedan Street call for the need of providing places for sitting and gathering.
5.1.2.2. **Accessibility and Services Indicators:**

11. There is an overlap between the physical, accessibility, and services indicators, so if some of the physical and services problems are controlled, this leads to control largely accessibility problems.

12. The problem of traffic congestion is the most important problem left behind by changing the land use in Shaheedan Street.

13. The existing deficit in parking lots in Shaheedan Street estimated by (185) car parking as a minimum limit, and (480) car parking as a maximum limit.
5.2. Recommendations

The lack of planning laws, regulations and planning standards increased the gap to reach the developing aim. It could be more effective to move towards spatial planning from the existing commercial land use system. The following recommendations are essential to remedy the current problems in the commercial land use planning of Duhok city generally and in Shaheedan Street specially.

5.2.1. In General

1. Reconsidering the distribution of commercial land use in the city of Duhok in a hierarchy approach considering the residential sectors, and at neighborhoods level, as well as control of the process of changing the land use according to planning standards.

2. Activating the role of building permits and develops new regulations that define the land uses change through responsible planning authorities in Duhok city. This will control the process of changing land use, and prevent the phenomenon of random changing.

3. Setting penalty fines against violation of planning standards according to the type of violation reduces the phenomenon of violation of planning standards in the city of Duhok.

5.2.2. Case Study

5.2.2.1. Physical(Architectural) Indicators

1. With regard to Shaheedan Street, the following planning standards could be implemented as suggested by the researcher to control the future expansion process for the commercial use, especially for the future lands that will be changed to commercial use:

   a) Setback: 4.5 m , Set front : 2.25 m as maximum limit,

   b) Plot coverage ratio: not exceeding 83%,

   c) FAR: not exceeding 4.4 :1,

   d) Number of Floors: 5 floors,

   e) Floor height: 4-5 m ground floor and 2.70 -3 m other floors,

   f) Commercial buildings signs: 2.5 m rise from the ground and 50 cm signage height,

   g) Hotel, motels, and offices: the signs in top of the building, and
h) Parking: 1-3 car parking for every 100 m² built area. Using the basement for this purpose.

2. Providing open space for gathering and sitting, to be attractive point for the commercial use as well as it will fill the urgent need for open space.

3. Issuing regulations for existing buildings that unregulated according to the building permits on Shaheedan Street.

4. Development of commercial use in the Shaheedan Street such as constructing super markets, and multi-storey commercial centers. On the other hand, encourage residents on the main street to change the current residential use to commercial to reduce the problem of random mixing between the housing and commercial functions.

5. Organize Shaheedan Street furniture (building signs, street trees, seating areas, etc.) with a unified format and arrange to reflect beauty of the region, and then give real character for the area.

5.2.2.1. The Accessibility and Services Indicators

6. Building multi-storey car parking to accommodate the traffic congestion in the street as well as it will fill the urgent need for parking lots in the region.

7. Specify custom stop areas for public and private transport facilities in addition to the allocation of places to pedestrian cross to reduce the problem of random mixing between the movement of pedestrians and cars.
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In Depth Interview With:


Appendixes:

**App. No.1:** The commercial building permits on the main streets in Duhok city. The Municipality of Duhok, 2012

<table>
<thead>
<tr>
<th>Street name</th>
<th>Street width</th>
<th>Set back</th>
<th>Set front</th>
<th>Number of floors</th>
<th>Pedestrian space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nohadra zone1</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
<td>5-6</td>
<td>0</td>
</tr>
<tr>
<td>Nohadra zone 2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>5-6</td>
<td>0</td>
</tr>
<tr>
<td>Mangesh</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Kajin</td>
<td>12</td>
<td>0</td>
<td>1.25</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Drengaha</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>More than 10</td>
<td>0</td>
</tr>
<tr>
<td>Dokan</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Azadi</td>
<td>15</td>
<td>2.5</td>
<td>1.25</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Joori</td>
<td>15</td>
<td>0</td>
<td>1.25</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Kanemahamadke</td>
<td>15</td>
<td>0</td>
<td>1.25</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Bajer</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Sarok</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Nojdar</td>
<td>20</td>
<td>2</td>
<td>0</td>
<td>More than 10</td>
<td>0</td>
</tr>
<tr>
<td>Zozan</td>
<td>20</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Spee</td>
<td>20</td>
<td>2.5</td>
<td>1.25</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Nawroz from M.Z to K</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Nawros</td>
<td>20</td>
<td>0</td>
<td>1.25</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Jaladatbadrkh Khan</td>
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<td>2</td>
<td>2</td>
<td>4</td>
<td>0</td>
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<td>Gavarke</td>
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<td>3</td>
<td>0</td>
</tr>
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</tr>
<tr>
<td>Asia</td>
<td>20</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>0</td>
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</tr>
<tr>
<td>Halgord</td>
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*Continuation on the Next Page*
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</table>
App. No 2: The Commercial building permits on the commercial streets In Baghdad city. The Municipality of Baghdad, 2010

1- توفير ارتفاع امامي مقداره 5 م من جهة الشارع العام و 3م للشارع الفرعي كمواقيف للسيارات وفقاً للشروط التالية:

أ: لا يقل نزال القطة عن 10 م
ب: لن تتوقف مسافة بين ثابت كونكريتي وأخر على نفس استقامة الشارع ضمن موقع الأرض عن 40 م وبالتالي لركن 30 م.

ج: لكل 75 م² للطابق الأرضي وكل شققين للطوابق الأخرى موقف سيارة واحد
د: في حالة عدم توفير الشرطين أعلاه تؤخذ رسوم مواقف السيارات.
ه: في حالة عدم كفاية مواقف السيارات كم عدد السيارات المطلوبة تكمل الحاجة باخذ الرسوم.

2- لا يزيد ارتفاع البناء عن ثلاثة طوابق بضمنة الطابق الأرضي.

3- عمق القطع المشمولة بالاسواق هو ملك واحد على الشوارع المحددة للاسواق.

4- نسبة البناء لكل طابق 75% شريطة توفير الأثاث والإضاءة الطبيعية الكافية

5- يجوز تشديد نصف الارتفاد للطوابق عدا الطابق الأرضي

6- يجوز تشديد نصف الارتفاع الباقين من الطوابق الأخرى بشكل بالكون مكشوف.

7- بالمكاسب تشييد القطع بدون ترك مع المجاورين وفي هذه الحالة لايجوز فتح شبابيك اما في حالة الترك فلا منع من فتح شبابيك على ان لا يؤثر على المجاورين.

8- بالالوان السماوي بان يكون سقف السرادب مرتفع عن مستوى الأرض كحد اعلى 80 سم ولا يوجد تحديد ثابت لذلك.

9- استعمال الشق منفصل بين السكن والشق التجاري او المكاتب.

10- ارتفاع كل طابق بحدود 2.70 م عن الطابق الأرضي فهو بحدود 3.5 م

11- لا يقل ارتفاع البالكونات المكشوفة التي على الشوارع العامة بالنسبة للإعالة التي لا يشملها الارتفاع أو الترك عن 4 م

12- يسمح بخصر الدار واستغلاله للاغراض التجارية عند توفير الارتفاع الامامي البالغ 5 م

13- لا منع من الجمع بين السكن والتجارة عن توفر الارتفاع 5 م

14- لا تقل مساحة الشقة السكنية عن 75 م² والتجارية والمكاتب عن 45 م²

15- لا تقل مساحة الدكان عن 6 م²

16- تنظر موضوع التهوية والإقامة من قبل البيئة البشرية ويبعد توفير مواقف صحية لكل محل أو توفير مجموعة مواقف.

17- توفر ملحاً كافياً حسب تعليمات مديرية الدفاع المدني إذا كان الارتفاع ثلاث طوابق او المساحة المشيدة أكثر من 800 م²

18- تكون واجهات الأبنية ذات طابع عربي اسلامي. 
جامعة

1. العمر
2. التحصيل العلمي

اضع من فضلك علامة (ص) داخل المربع:

3. محل السكن: شورش كري باسي شهيدان

4. هل ترى تغير استعمال الأرض من سكنية إلى تجارية أدت إلى نتائج إيجابية؟
   نعم لا لا أعرف

5. إذا كانت الاجابة (لا) يرجى ذكر الأسباب: .............................................................

6. هل ترغب أن يتم تطوير الشارع لكونه شارع تجاري كفوء على مستوى المدينة ككل؟
   نعم لا لا أعرف

7. هل تملك العائلة سيارة خاصة؟
   نعم لا لا أعرف

8. إذا كان الجواب (نعم) فكيف يتم إيقاف السيارة عند المدخل إلى شارع شهيدان:
   موقف خاص للسيارات محاذاة الرصيف داخل الافرع

9. ما الذي ترغب بتواجده في الشارع؟
   أماكن جلوس للراحة مواقف سيارات أخرى تذكر

10. ما هي أهم المشاكل التي تواجهك كسائق في المنطقة؟
    اجتماعية اقتصادية بيئية مرورية
**App. No.4 : Visitors Questionnaire**

إسْتِمَارَةِ اسْتِبَانَةٍ (للزوار)

هذا الاستبيان هو لأغراض البحث العلمي فقط والمعتمد من قبل طالبة ماجستير في المعهد العالي للتخطيط الحضري في جامعة دهوك.

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<thead>
<tr>
<th>الالسنة</th>
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<tr>
<td>1-</td>
<td>الهدف من التجول في الشارع؟</td>
</tr>
<tr>
<td>2-</td>
<td>عناصر الجذب في الشارع؟</td>
</tr>
<tr>
<td>3-</td>
<td>الأسواق التجارية المفضلة لديك؟</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>العامل العمراني</th>
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</thead>
<tbody>
<tr>
<td>4- كيف تجد فكرة توحيد الادبية بارتفاع واحد ( نفس عدد الطرق ) في الشوارع التجارية الرئيسيه توجه مستقبلي؟</td>
</tr>
<tr>
<td>5- كيف تجد فكرة توحيد ارتداد الادبية (المسافة بين حالة الشارع وواجهة المبنى ) بنص واحد عن الشوارع التجارية توجه مستقبلي؟</td>
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<tr>
<td>6- كيف ترى فكرة تحديد تغييرات الاجهادات الادبية بمواد محددة كالحجر أو الطينيوم أو كلاهما... الخ في الشوارع التجارية الرئيسيه كوجه مستقبلي؟</td>
</tr>
<tr>
<td>7- كيف تجد وضعية أثاث الشارع (التشجير إضاءة إبراق...) في الإعلان الرؤية؟</td>
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date: 
Place of Issue: 
Number of Visitors: 

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<td>مريحة لا بأس</td>
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<tr>
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<tr>
<td>ما هي المشكلات التي تجدها في الشارع؟</td>
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<tr>
<td>اذكرها تفصيلا .......ان امكن</td>
<td></td>
</tr>
</tbody>
</table>
**App. No.5: Visitors Questionnaire**

استمارة استبانة (للاستعمال التجاري)

هذا الاستبيان هو لاغراض البحث العلمي فقط والمعد من قبل طالبة ماجستير في المعهد العالي للتخطيط الحضري في جامعة دهوك.

<table>
<thead>
<tr>
<th>1- العمر</th>
<th>2 - التحصيل العلمي :</th>
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<thead>
<tr>
<th>4- سنة تشييد المبنى :</th>
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<tbody>
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<td>5- عدد المحلات في المبنى :</td>
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</tbody>
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<td>المطاعم والكافيه</td>
<td>أخرى</td>
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<tr>
<td>محلات متفرقة</td>
<td>محلات على الشارع</td>
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<tr>
<td>(شريطة)</td>
<td>وضح في الجدولCU</td>
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<td>متوسطة</td>
</tr>
<tr>
<td>رديئة</td>
<td>متوسطة</td>
</tr>
<tr>
<td>رديئة</td>
<td>لا بأس</td>
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</tbody>
</table>

1. موقع البناء؟
2. عنصر اللذين في الشارع؟
3. الأسواق التجارية المفضلة لديك؟
4. كيف تجد توحيد الأبنية بارتفاع واحد (تمارض عدد الطوابق) في الشوارع التجارية الرئيسية تحتوي مستقبلي؟
5. كيف تجد فكرة توحيد ارتفاع الأبنية (المستوى بين عادة الشارع وواجهة المبنى) بنفس واحد عن الشوارع التجارية تحتوي مستقبلي؟
6. كيف ترى فكرة تحديد عادات الأبنية بمواد محددة كالحجر أو الالمنيوم أو كلاهما... الخ في الشوارع التجارية الرئيسية تحتوي مستقبلي؟
7. كيف تجد وضعية أثر الشارع (التسجیل بالإضافة إلى العلامة) الأطراف (الخ)؟
<table>
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<tr>
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<td>موقف خاص في الشارع</td>
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<td>إذا كنت تمتلك سيارة خاصة ابن تركنها؟</td>
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<td>صعبة</td>
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<td>كيف تجد مرحكي في الشارع أثناء التنقل مشيا؟</td>
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<td>كيف تجد مرحكي في الشارع أثناء التنقل بالسيارة؟</td>
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<tr>
<td>خدمات عمرانية</td>
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<td>انذكرها تفصيلا... إن امكن</td>
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التخطيط للسيطرة على توسع استعمالات الأراضي التجارية
في مدينة دهوك: منطقة الدراسة - شارع شهيدان

بحث مقدم إلى سكول التخطيط في جامعة دهوك

كجزء من متطلبات نيل شهادة الماجستير في علوم التخطيط الحضري

للطالبة

حنان محي حسين شنكالي
بكليرويوس في الهندسة المعمارية

بإشراف

د. مها جميل الملائكة

(1434 هـ)

نيرور(1371م)

مارس/2013(م)
الملخص

التخطيط للسيطرة على التوسع المستقبلي لاستخدام الأراضي التجارية في مدينة دهوك يعني "استخدام خطة لوصف وتخطيط الحالة المستقبلية لاستخدام الأراضي التجارية في المدينة بما يتناسب ومصلحة الزبائن والبائعين وأصحاب المصلحة".

تناولت هذه الدراسة التحري عن استخدام الأراضي التجارية في مدينة دهوك، وشرح عملية تغيير استعمال الأراض السكنية إلى تجارية، في غياب التنظيم والمعايير التخطيطية، وركز البناء، كمشكلة بحثية، اثربت سلبا على المناطق الحضرية المحيطة وسكان المنطقة، ولأسما في اعد الشوارع التجارية في المدينة، والذي هو شارع شهيدان.

استندت المنهجية البحثية في جمع المعلومات الأساسية في هذا البحث إلى تحليل المعلومات القائمة والمسح الميداني. واعتمد البحث على الخرائط والمخططات، والتصوير المفتوح (صور)، والمسح الميداني (الاستبان والمقاربات) كأداة لتوسيع المشكلة البحثية.

لأثارا الفرضية البحثية "قدان المعايير التخطيطية في تنفيذ الشوارع التجارية دأى من الفشل في التوصل لمكتلبات حضرية كفاءة في الاستعمالات التجارية ". اعتمد البحث جملة مؤشرات تخطيطية للسيطرة على التوسع العشوائي للاستعمال التجاري في المدينة، ومقارنتها مع المعايير التخطيطية العالمية والمحلية، وحلت الباحثة القضايا التي تتعلق بتغيرات البحث لتوضيح المعايير التي تؤثر على الكفاءة والمشهد الحضري للشارع التجاري. اعتمدت التحليلات والمقارنات المستخدمة لتقدير مدى تأثير تغيير استخدام الأراضي السكنية إلى تجارية بدون تخطيط مسبق، من ناحية المؤشرات العمرانية وسهولة الوصول والخدمات.

بينت النتائج أن الغالبية العظمى من الأنظمة القائمة والضوابط المستخدمة في شارع شهيدان التجاري ليست مطابقة للمعايير التخطيطية العالمية والمحلية. ونذالك بينت أن استخدام الأراضي التجارية في مدينة دهوك بشكل عام، والشارع التجارية بشكل خاص تقترب من نظام تصميمي، وبحاجة إلى الأنظمة والمعايير التخطيطية مع ضرورة الالتزام بها ومتابة تطبيقها. واحيرا توصلت الباحثة إلى بعض المعايير التخطيطية التي اقترحتها كتوصيات للسيطرة على توسع الاستخدام التجاري في مدينة دهوك عموما ومنطقة الدراسة.لتعكس صورة جيدة للمدينة بالإضافة إلى الفوائد الإيجابية من الناحية الاقتصادية، والاجتماعية، والبيئية.
بولخته

پلادانان ذ ب دمسترکتا ل سر فردیونا وکشپیدان باشدویی ژیو بکارهیناتان پارچین بازرگانی ل پاژیری دهوکی رامان دی چندی دید "ب کارهیناتان پلانکا ذ ژیو ناسیا هزرو شگهستن باشدویی گریدی د بکارهیناتان پارچین بازرگانی ل پاژیری دهوکی".

بازرگانی ل پاژیری دهوکی بیپتی بهریا دگل مقالی خانکی و فروشکه هین و خودانی پاژیری".

دیفی تامی دا فکولین هاتینه هنلنام تونولیون ل سر بکارهیناتان پارچین بازرگانی ل پاژیری دهوکی، وهورسو ناشکارکن جاوايتا گیوهریتا بکارهیناتان پارچین نیشتی جی بوییتی بو پارچین بازرگانی. دژوئیتیوننا نهوا هاتینه هنلنام زیمر نهیوبونا ریسمستن وستاندروت پلانداناوت و مولهتی ناکارکی. وکارتیکرتا وی ب خرایی ل سر دوروبیا وخمکین پاژیری ونهاسه لسر جادین بازرگانی ل پاژیری و نهک دا نارین بازرگانی نهوری جادا شهیدان.

پینزان دناهیرویی فی نامي دا پشتا خو گوکرنا پنژانیت گیرت دینگ فکولینی دا ل سه نهها ونخشیت پنیاتی ونیتی کیشپینی، وارکریس ودگیفکه هفت هاتینه هنلنامان.

ژیو سمالاندا فکولینی "ندومو سنادناریت پلانداناوت ل کاتیجی بچهکرنا جادین بازرگانی نهههی کاتیکرنا نمایشی ل سر چلاکا باکارهیناتان پارچین بازرگانی هاتینکن." فکولینیر پشتا خو ب کومهکا سنادناریت پلانداناوت ژیو دمسترکتنا ل سر گشهپیدان نویسیبی بو بکارهیناتان بازرگانی ل پاژیری. وهامنگانا دان دگل سنادناریت خویاکان وجویانی دا فکولینیر رایبی بو دشاکرنا تودیزین هاتینه گریدان ب گیوهراتی ژیو ناشکارکن افکاریی بانوی کارتیکرتا ل سر چلاکا ودیمنین وروییین جادین بازرگانی. شرودوکرنا ونالسگاندیان هاتینه بکارهینات ژیو ناشکارکن کاتیکرنا گیوهریتا بکارهیناتان پارچین نیشتی جی بوییتی بی پلنادانا نهیوبونا پیاکارکنی خرومی گوزاری.

یتیزکیتی باکارهیناتان پارچین نیشتی جی بوییتی بو پارچینی بازرگانی بی پلادانان هاتینه هنلنامان نذیکا فکولینی خرومی گوزاری.

هنلنام هاتینه نذاقیکن کو بهرا پتر ریمناون و سنادناریت هاتینه بکارهینان ل جادا شهیدان ناگونجیت دگل ریمناون وستاندروت خویاکان وجویانی. ونیتی سنادنی هاتینه دیبیکری بکارهیناتان پارچین وجادین بازرگانی ل پاژیری دهوکی بیشودکی گشته وجادین بازرگانی بیشودکی. فکولینی ریمناون وسیلیتیت نسنادنی بازرگانی ودگل بیگری بیپتی کرن ل کاتیجی بچهکرنا ندی. ودلادیکیری بو دزیزین پرینتیت ژیوی بیشودکی وسیلیتیت بیشودکی بیپتی کرن ل سر گشپیدانی بکارهیناتان پارچین بازرگانی ل پاژیری دهوکی بیشودکی کشتی وفوسیما بیپتیتی جادین بازرگانی بیپتیتی کمرتریک کرن ب نوییتی یباسی ژیو جوانکرنا دیمیتین ونیتیتی بیشودکی داکو مقباپیتی شربیکیا ژالیی نامبوری وکومولاییتی وزینگه یی بیپتی کرن.