Alkeshwan, M., & Al Basri, N. (2022). Analysis of the urban spatial organization of ancient city centers: A Case Study of Najaf Old City Center. *Akkad Journal of Contemporary Economic Studies*, *2*(3), 236-263.

ANALYSIS OF THE URBAN SPATIAL ORGANIZATION OF ANCIENT CITY CENTERS: A CASE STUDY OF NAJAF OLD CITY CENTER

Mohemmed Alkeshwan
University of Kufa,
Najaf, Iraq
E-mail: ibnkeshwan@gmail.com

Naseer Al Basri
University of Kufa,
Najaf, Iraq
E-mail:
naseer.hasach@uokufa.edu.iq

Received: May 2022
1st Revision: August 2022
Accepted: September 2022

ABSTRACT. Commercial use is the core of services that meet all the needs of residential areas. The relationship between commercial and other uses must be established and grown in a natural framework with the new stages of growth of the city. Cities today suffer from many problems as a result of rapid urban growth resulting from a growing population, high economic level, scientific and technological development, citizens' pursuit of commercial services, employment opportunities and business investment, which result in multiple and diverse uses within cities, inadequate planning for commercial use in the city's basic plan, as well as lack of control by the Municipal Directorate, resulting in a change in the category of other uses in favour of commercial use. The fundamental problem of research is the randomness of city planning adversely affecting the phenomenon of spatial organization of urban city centres. The goal is to find planning and design solutions to upgrade and re-plan the centres in accordance with the principles of smart city planning. The research presupposes a basic premise on the development of commercial centers, which is that spatial organization in accordance with the principles of smart city achieves the upgrading of urban city centres.

JEL Classification: J60, J64, J68

Keywords: Spatial organization, Smart Cities, Urban Encroachment, urban city centers

Introduction

Spatial organization refers to the arrangement and distribution of various elements within a given space. This includes the population distribution, land use patterns, road network formation, and the generation of travel patterns within an urban setting. It encompasses a range of events and components that are associated with specific activities and functions within the spatial dimension. Consequently, certain areas are interconnected through diverse activities, primarily involving different types of movement and flows. These movements and flows constitute a stable system that can be influenced by both external and internal factors. The concept of spatial organization holds significant importance within the field of urban planning sciences. It pertains to the arrangement and distribution of elements, activities, and events in relation to various factors such as natural conditions, social dynamics, economic resources, and demographic characteristics. This includes the positioning of centers, their constituent parts,

and residential neighborhoods to effectively cater to the population's service needs in terms of both quantity and quality. The ultimate goal is to enhance the functionality of these elements and elevate their status, thereby improving the overall standard of living for the population. Additionally, this approach aims to bridge the gap in living standards between urban and rural areas while maximizing economic and social benefits within the framework of planning principles. The analysis is grounded on several scientific theories, taking into account both temporal and geographical factors. Land use pertains to the arrangement of many purposes that a city offers to its inhabitants and the neighboring regions. These functions include residential, commercial, industrial, service, and recreational activities. Urban land use refers to the various activities and practices undertaken by human beings on the Earth's surface, encompassing domains such as housing, trade, industry, and services. This concept encapsulates the entirety of human actions and events occurring on the planet, signifying the ongoing evolution of the human-earth relationship and the pursuit of equilibrium between them. Over time, urban land use expands due to population growth, as it serves as the spatial dimension upon which human settlements are established and natural resources are harnessed to fulfill societal needs and enhance well-being.

1. Literature review

1.1. The concept of spatial organization

But to address the definition of spatial organization, you must know the meaning of the organization, as itrepresents a pattern of stable activities aimed at individuals and groups, either the definition of the place has been defined as that space occupied by man, which contains traditions and customs, as well as its association with an important element, which is the element of dynamism (meaning the element of time), which represents the transformation in the function of the place, either the definition of a good place is the one that stimulates positive feelings of it and the person does not feel the performance of the place unless the place achieves that The human being needs ease of movement and giving an atmosphere that is aesthetic where the human being feels the desire to interact with the place by reviving the spirit of the city as well as creating a state of interdependence between the city being a place and the city being a human being (Sajida Al-Kindi, 2012).

Spatial organization is defined as the spatial distribution of the population, land uses, the formation of the road network within the urban organization, and the pattern of trips that are generated in the city, it is a set of events and components that are associated with special activities and specific function within the spatial dimension, so we find that a group of areas are linked to each other through different activities and these activities are only different types of movement and movement (flows of different kinds) that are a stable system that is affected by any external or internal variable. It can also be said that the concept of spatial organization is one of the most important scientific topics in urban planning sciences, and it means the spatial distribution of elements, activities and events in proportion to the conditions and natural, social, economic and demographic resources and the locations of centers, their parts and residential neighborhoods in order to meet the needs of the population of services in quantity and quality and in order to achieve a better development of the functions of the elements and upgrade them in order to improve the standard of living of the population and reduce the gap in life standards between cities and rural areas, and achieve the greatest possible economic and social benefits

within planning principles It is based on different scientific theses according to the temporal and spatial circumstance. (Naseer Basri, 2018)

1.1.1 Factors affecting the spatial organization of commercial use

The spatial-community organization is linked to a set of factors that are represented by two main groups:

1,1,1,1 Factors associated with the individual and society

- The personality of the individual and the degree of maturity
- Human age and sex
- The individual's sense, experiences and previous experiences
- The level of culture of the individual and his educational and social level
- The characteristics of the segments, which are the social and economic surrounding the individual, where the feeling of compatibility increases in a state in which the ethnic and economic characteristics of society are homogeneous.

1,1,1,2 Location-related factors

- The degree of protection and safety enjoyed by the individual
- The identity and personality of the place
- Meanings, symbols and aesthetic characteristics that the place possesses
- The system that appears in place and the relationship between the part and the whole
- Near the place and far from the workplace
- Focus topical services that help find spatial organization and belonging of residents to each other and to the place
- The change in the place that causes the individual disintegration with the place and with the population (Haidari, 1996)

From this we conclude that the factors that are related to society depend on his personality, as the personality, if it is good, it reflects well on the place, and if the personality is bad, it reflects badly on the place, as well as that age and gender have an impact, whether male or female, and their role in building society and rehabilitating children, either the advanced cultural and educational level works to make an advanced society in all respects in addition to To the characteristics of the social and economic segments of society, either in terms of factors associated with the place, they provide protection and safety, which reflects positively on the comfort of the population and society, and that the presence of a known identity of the place is also a recognized identity of the person and that the concentration of services in one place helps to facilitate access, but there are some negatives in terms of crowding of the population in one place, as well as that the factor of proximity and distance from services is also reflected in providing comfort to the residents The place must have meanings and symbols that in turn reflect the identity and personality of the place while providing order between all pillars

2.1 The concept of land use

Land use refers to the spatial distribution of the multiple functions that the city provides to its residents and the residents of the surrounding areas, represented by the residential, commercial, industrial, service and recreational functions. It was also defined as the activities practiced by man on the earth, which is directly related to it represented by housing, trade, industry, services, so the concept of urban land uses represents the totality of the events and activities practiced or carried out by man on earth, that is, the continuous change in the relationship of man with the earth and finding a state of balance between them and increases over time due to population growth because it is the spatial dimension that settles on it and exploits its wealth and resources in order to meet its needs and achieve its welfare.

1.2.1 Factors affecting the change of residential to commercial use

It is known that land uses are affected by a range of factors, the most important of which are: (Riad Alawneh, 2004)

1,1,2,1 Economicfactors

The economic factors that affect land use are local and regional forces that interact with each other to come up with the current figure. In other words, external economic forces and their relationship with the internal economy have an impact on the level of this land, that is, regional forces affect the rate at which the city runs in development processes.

2,1,2,1 Social factors

The community is the product of sequential and changing processes, there is in the commercial centers located in the city center a main activity and an activity affiliated with it outside the center, and there is a concentration of public services and population and at the same time there is a spread of them, and there are heterogeneous activities within the city, such as the presence of a high-level residential neighborhood surrounded by a different area, and there are main activities somewhere that are abandoned and replaced by other activities. The social processes affecting land use are divided into three categories: control and gradualism, centralization and decentralization, invasion and occupation.

1,1,2,3 Topographic factors

As urban activities tend to plain locations and close to transportation routes in order to achieve the principle of easy access to these activities and uses, which resulted in a shift in the forms of cities, which were dominated by a multi-arm form that is commensurate with the transportation lines associated with the urban center.

4,1,2,1 Soil factor

For example, buildings need excellent soil with a strong structure and ability to endure.

5,1,2,1 Competition Factor

The concept of competition is based on the fact that two activities cannot exploit the same space at the same time, there are prevalent uses in cities based on a factor of competition between different population groups and between different land uses on the other hand, and it is noted that commercial and industrial uses in cities are considered the best uses due to their economic returns, followed by residential uses in terms of competitiveness.

6,1,2,1 al-Kanluji factor

Technological progress directly affects the lives of the population and thus the nature of the patterns of uses practiced in cities, as well as technological progress affects the movement of residents and the architectural aspect.

1.3 Compatibility of commercial use with other urban uses (Mustapha Ghawali, 2004)

1,3,1 Compatibility of the commercial market with the surrounding environment:

- Compatibility of the treatment of climatic elements by: - Ideal orientation - Use of umbrellas for protection - Covering some parts of the commercial space - Protruding facades to provide shade - Planting shading trees - Narrowing and zigzag of the corridors - Adding fountains and the water element - Following the solution included in the market blocks.
- Compatibility with technology and the use of contemporary building materials that are compatible with the environment by using local materials that have a sustainable character - the use of materials with less energy in their classification, i.e. less polluting and suitable for the climatic conditions of the internal environment.
- Compatibility of the shopping environment by finding solutions to the change in the desires of shoppers and creating an unconventional environment for shopping, which is a shopper-friendly environment that suits his modern lifestyle and is compatible with this digital age and the emergence of the concept of e-commerce.

2.3.1 Market compatibility with the built environment:

- Planning compatibility by choosing the appropriate location - availability of parking spaces - solving pedestrian and public traffic interference.
- Architectural compatibility by:

✓ Attention to external formation and achieving the system of efficiency and aesthetics of the formation of the commercial market while achieving the foundations of designing market interfaces such as (organization - unity - continuity - proportions - scale - homogeneity - balance and symmetry - rhythm - contrast and contrast d)

✓ Choose the right scale.

✓ The gradation of internal spaces - determining the shape of the space - and the diversity in the sizes of shops - achieving clarity.

✓ The efficiency of architectural design in terms of: - Integration of market elements and achieving the requirements and needs of the shopper - Solving the architectural spaces of the market and its relations with entrances and horizontal and vertical communication elements.

3,3,1 Visual compatibility:

- Achieving the architectural character and creating a distinct architectural personality for the market that expresses the prevailing identity in society, which in turn is

reflected in (traditions, customs and values of society - prevailing beliefs - social and economic conditions - symbols of society - etc.)

- Intellectual communication between heritage and contemporary.
- Achieving the visual sequence and mental image that distinguishes one place from another while creating an attractive social environment and providing the appropriate conditions for that.

1,3,4 Compatibility with cultural, social, economic and political factors:

- Emphasizing the need for the commercial market to reflect the identity and personality features of society resulting from cultural symbols, cultural pattern, and social events of society in addition to economic, political, ideological and historical features, customs, traditions, customs and values prevailing in society to design a successful modern shopping environment.
- The requirements of shoppers and desired social activities must be known by: - Survey the opinions of users, tenants or shop owners
- Know the behaviors, habits, values and lifestyles of the shopper.
- Directing the commercial space or part of it does notuse a specific category of shoppers.
- Know shopper behaviors.
- Identify and provide the necessary financing for the establishment of the commercial market.
- The importance of regulating legislation

4.1 Business

Commercial activity is one of the most important main activities that make up the urban system within the city, and commercial uses, despite their small percentage (2-5%) of land uses in the city's urbanization, represent a special importance, through which the flow of economic life in the community, and the city's commercial centers represent the sites of retail activity, which is the final link in the commercial activity system, Business activity is divided into three levels: (Sherif El Attar, Mohamed Moslehi, et al., 2012)

1- Wholesale trade
2- Semi-wholesale trade
3- Retail

Table (1) General division of commercial activity

t	Wholesale trade	Semi-wholesale trade	Retail
1	It is found in the form of refrigerators, stores, warehouses, silos, storage spaces and wholesale markets	It is found in the form of refrigerators, stores, warehouses, silos and storage spaces	It is present in the form of commercial centers

2	Serving citywide	Serve at the neighborhood level	Serve at the level of: _Region _City _Biology _المجاورات
3	Close to industrial activities , commercial ports and airports (often on the outskirts of the city (	It is located near the dealing areas in residential areas and sometimes on the outskirts of the city	
4	Must be linked to the city center	Linked to the city center	

Source: Sherif El Attar, Mohamed Moslehi, et al., 2012

5.1 Commercial use

The commercial function greatly affects the morphology of the city, especially in the central area, as the density of construction increases and open spaces decrease, and the heights of buildings increase, which affects the sky line of its streets and spaces, that this great exploitation of the land came in line with the high value of the land and its rents in the heart of the city, as the commercial function has the possibility of paying the highest rents and the highest prices for land.

The commercial function in the old cities performs a basic and decisive act in the construction of many streets and the re-expansion of the old streets, as well as it works to restructure the fabric of architectural units and their forms with the change of their original uses, and one of the most important features of the commercial function is that it attracts towards it or expels away from it some other uses inherent or contrary to it. (BoualiKholo D, 2018)

1.5.1 Importance of commercial use

Commercial use is of great importance and positive results resulting from its establishment, the most important of which are the following: (Saleh Abu Hassan, 2004)

- It occupies a small percentage of the area of the city, not exceeding 5% of the area of the built-up area, and many studies that included American cities have shown that the percentage of this use is (3.5%) of the built part of the city and (1.8%) of the total area of the city
- The percentage of this use tends to increase with the increase in the size of cities, as studies have shown that the percentage of this use is (4.1%) in cities with a size of (10,000 people) and that this percentage increases to reach 5% in cities with a size of 250,000 people.

Although this use does not occupy a small percentage of the space, it provides job opportunities for a large number of the city's residents, as studies have shown that the percentage of workers in commercial activity reaches 40% of the volume of workers in the city.

- This use is not limited to the city's residents only, but extends to cities .

- Itreduces pressure and congestion, especially in the city center, and facilitates traffic.
- Ensure that there is parking for shoppers near the complex.
- Ease of movement and movement within the complex, as well as easy access to it from all sides.
- The malls work to meet humanitarian needs as they combine recreational, cultural, social and complementary services in the complex.

- Stores in malls rely on a customer service system where there are specialized vendors and in each section of the store to provide service, advice and help the customer in choosing what he needs.
- Facilitate the process of controlling prices and specifications

2.5.1 Spatial distribution patterns for commercial use

Movement can be linked with uses to interpret two main patterns in Distribution Spatial For types of commercial activities as Follows:

Centralization: Commercial uses are far from the consumer and are located in central areas because they can be accessed from all directions, where they are the ends or beginnings of moving trips, and often the concentration of activities comes associated with the collection of movement corridors and the recipe of concentration, distinguishing durable or transitional goods.

Proliferation:Approaching Uses From the consumer in operation Release So as to make it easy Contact and reduce movement, which is a characteristic that distinguishes goods Consumer Or Needs Daily. There are also two secondary types in Distribution Place For activities within the center Commercial Concentration and diffusion in Distribution Spatial For types of activities different.

Source: Sherif El Attar, **Mohamed Moslehi**, **et al., 2000**

Convergence: It is a pattern secondary of distribution patterns Spatial Distinguish the distribution of different activities which Linked in Relations Utilitarianism or integrative.

Dissonance: a secondary type of spatial distribution that characterizes polluting uses that require special equipment

* Commercial activities of different types are distributed on commercial centers at several levels, depending on the urban agglomeration they serve, and generally these levels can be dividedinto (regional level, city level, residential neighborhood level , residential neighborhood level). (Sherif El Attar, Mohamed Moslehi, et al., 2000)

6.1 Urban encroachment andits causes

Urban encroachment, known as urban sprawl, is a key concept in planning and land use. While definitions vary widely, urban encroachment is characterized by economic and commercial development outside concentrated urban centers. Urban sprawl is also characterized by low-density housing and retail development in suburban areas adjacent to larger urban centers.

The causes of urban encroachment vary by place, and there are some common factors. In the United States, one of the main causes of urban sprawl seems to be the desire for single-family housing, especially large homes with large lawns. Encouraging commercial development along major roads and highways, rather than in concentrated urban centers, contributes to urban

encroachment; shopping malls and strip centres are often the result. The lack of public transport in many areas and the excessive reliance on their cars, also reinforce urban encroachment. (Jihad Salameh, 2010)

1.6.1 Reasons for the transformation ofurban uses to commercial use (Youssef Fares, 2015)

1,1.6.1 Morphology of the city:

The morphology of the city is a reflection of the urban development throughout history, as the expansion of the city is a product of the growth of commercial activity in the heart of the old city, the lack of popular markets, the lack of shops in the residential shops, in addition to the increasing population density over time as a result of the population growth in the city in addition to the increasing migration from the countryside to the city, as well as the increase in immigration to it, all of these factors contributed to the high population density in thecity in a way Unplanned in the city

2.1.6.1 Government actions

Thecivil government may take some legislative readings and worktochange the prevailing type of use in the urban area of some main streets, i.e. containing it from residential streets to commercial use as a result of the lack of appropriate planning for this use, so it develops some controls and legislation in order to correct some of the Errors and lapses in the basic plan (the absence of planned commercial areas in residential shops) on the one hand, and on the other hand, this change may be imposed on the responsible authorities, as the owners of properties located on some main streets convert from residential use to commercial use without obtaining the approval of the responsible authorities.

3.1.6.1 Economic factor

The economic factor is one of the main and important reasons that contributed to the process of change in the category of residential use to not commercial use, as most of the owners of housing units who have modified part or most of the facades of housing units in order to benefit from the financial return obtained as a result of registering these shops, as they have a large financial return in addition to benefiting from the housing unit for their families' housing, so they Two things, which are that the owner of the house stays with his family at home and adds an additional economic return to the owner of the house

4.1.6.1 Population growth

It is intended to vary the size of the population over different periods and is one of the most prominent demographic indicators, which depends mainly on knowing the size of births and deaths of the city's population as the basis for the natural increase and on the spatial movement of the population of arrivals to the city. The increase in population numbers occurs as a result of the impact of life events (births), while deaths are a factor of population shortage, while the migration factor has an impact according to migration trends, incoming migration works to increase the population of the immigrant area, while departing migration, i.e. residents who leave their old areas to move to a new area, work to decrease the population in this area that its inhabitants have left.

5.1.6.1 Site of use

The site of use has great effects in the process of changing the use of land to commercial use , whenever the site is in the city center or nearby areas, which have a high population density, due to the availability of services and job opportunities and the fluidity of access to them, it

causes competition to use urban land in the city for commercial and industrial use at the expense of other uses, which strengthens the work of competition, Which sometimes forceshim to change his location

1,6,2 Risks of changing urban uses to commercial use

Criminologists often claim that neighborhoods with a higher percentage of commercial land uses are more likely to be more prone to crime because commercial facilities attract strangers to the neighborhood, increasing their exposure to potential offenders. On the other hand, it is thus preferable to combine commercial and residential uses to reducethecrime by increasing opportunities for surveillance, and encouraging social interaction, Promote a sense of community and social control among neighborhood members. Studies have found a solution to bridge the gap by examining the association of residential burglary with the five types of commercial land use (such as offices, retail stores, shopping malls, restaurants, and grocery stores) most common in residential neighborhoods. The results show that grocery stores, restaurants and offices have a positive role in improving neighborhood safety, while neighborhoods with more shopping mall areas have experienced higher levels of residential burglary. The effects of commercial land use mix on burglary Homes vary by type of business, suggesting that not all commercial uses increase crime. (KamL. Kinani, 2008)

7.1 Smart Cities Concept

Smart cities are defined as cities based on electronic technologies produced by the era of information technology, starting from the digital city to the electronic city and then virtual until we reached the knowledge city, as knowledge is the most comprehensive framework for data and information, and many researchers have developed concepts for these terms and determine their characteristics, and it has been found that all these cities depend on digital technologies provided by the era of information technology, and all of them provide interactive services to individuals and virtual spaces through information networks and various applications. (AhmadMed Al-Qadi, Mohammed Al-Iraqi, 2015)

1.7.1 Requirements for the transformation of traditional cities into smart cities

The conditions of contemporary technology have imposed many requirements on various environments, most notably urban environments that have become affected by technological manifestations clearly, and this makes them of great importance, to accept all aspects of technological urbanization and in a way that makes the work environment amenable to integration into civilizational development, and the most important basic pillars that must be provided in smart commercial cities are: (Hatem Hassan, 2018)

1- Smart Government: It is intended to enable new forms of e-government that rely on new methods of advanced models of virtual reality and governance and with technical management capable of dealing with all variables of the information city, and this government is more participatory, transparent and subject to criticism and accountability
2- Smart user: It is for the urban user to be more creative, aware and comprehensive of all the variables of the smart city and its infrastructure, in order to achieve the principle of

active participation, empowerment and maximum use of all available services, in order to ensure the right to participate in making all decisions

3- Smart infrastructure: It is a complex and expensive system of electronic technical requirements from transmitting radio stations, cables, biometric means, transmission centers, high-precision networks, telexes, and computers, and this type of services is known as (telematic services), all of which work as a large unit to reach its lines for every building, institution and even the home

4- Smart mobility: It is a smart and multimedia transport systems, the use and exchange of data and the preservation of its results, where the smart structures of cities depend on the power of direct broadcasting and communication that is made through packages of optical fibers to transfer all data over the network, which needs a fast system to transfer the digital data packet between the electronic administration and the user on the one hand, and between the administration and users On the other hand, two basic dimensions of intelligent communication technology affect mobility, the first refers to an effective, independent and communication technology-based transmission system and is related to some extent to the use of one of the appropriate technologies, while the second dimension is related to the mobility system, which is characterized by a clear methodology and stability.

2.7.1 Elements of a successful transition to smart cities:

The necessity of changing the life of the traditional city for the better, makes that city smarter, and the success of this transformation requires the following: (Hatem Hassan, 2018)

1- Government and local support, with a clear strategic vision.

2- Attention to research centers, universities to encourage innovations on the concept of smart city.

3- Increase education and awareness of citizens on the importance of development and hold public lectures in the areas of key applications of smart cities.

8.1 Criteria for becoming smart malls

The land uses in traditional cities mix between the material and spiritual needs of man, as they were characterized by mixing their uses between governmental, religious, and commercial, and it is necessary to achieve the trend towards transforming into smart commercial centers, by providing various economic and recreational services to the population, reducing the number and length of daily trips for them and achieving social interaction, by increasing the movement of the Sabla by encouraging mixed use, Where the mixing of land uses is horizontal and vertical

1.8.1 Design criteria

First: Since the project is multifunctional, there are several trends in its design, including: (Omar Al-Qawasmi, 2018)

A - Considering the project as a single architectural block in which there are several main or subsidiary entrances from which access can be to a large main internal lobby that includes a group of stairs and branches from it a group of roads that reach the elements of the project
B - Dividing the project into parts according to the functions in it with spatial connectivity and the possibility of providing green areas as open areas, taking into account the relationship of the components of the project and its formation with the surrounding environment.
c. Distributing the project elements to wings branching from a main distribution center .
d. Distribute the elements of the project freely in one large space under the roof and on a regular basis.
C - Departure from the norm of the norm in architectural design that adheres to functional and structural determinants
H - Placing public attraction shops in a location that ensures the activation of public movement, and therefore it is necessary to know the negative locations of children's attraction areas
G- Taking into account the design, spaces and dimensions of the mall in order to facilitate the movement of the public to and from the center and not to conflict with the movement of cars with pedestrian movement
D - Classification of specialized shops with each other and not to mix between shops, such as mixing meat shops with industrial shops or others.
The sequence shall not interrupt any non-commercial use.
It is impossible to adjoin shops with similar activities, such as clothing stores, leather shops, as well as luxury shops and electrical appliances stores, for example.
Second: The formation of facades: The project is closely related to the human element through the various human activities it provides, and therefore the facades must respect human measurement in their dimensions in addition to having an explicit expression of the elements they contain. It must also *take into account the association of the various elements of the project so that it leaves a beautiful and endearing impact on the soul by carefully studying the facades, it must also be attractive and work to attract shoppers to the mall and its finishes are of high-quality materials, easy to maintain and withstand different weather conditions and the effects of solar radiation.*
2.8.1 Schematic criteria
Service centers in the city vary according to the degree of demand for them, *whether daily, monthly or seasonal*, so their *locations and distance from the residences, their sizes*, and the quality of services *available in each* of them are determined, and accordingly, *the city's service centers take several levelsto achieve* services *of different types such as: (Myriam Makdissi, 2015)*

× a central commercial service : in which the commercial center is in the middle of the city, and it gives a better opportunity to serve on and one of its disadvantages is the entry of cars
× Dual central commercial service: used in large, often rectangular areas where there are two centers, one main and the other sub-center, usually connected by a major pedestrian nerve,
× a widespread commercial service where the center is separated from other activities (non-commercial) and is located on the outskirts of the neighborhood in the form of small centers and its advantages are not to enter cars and its disadvantages are that it exceeds the scope of the area, and the increase in land allocated for commercial use
× a central strip commercial service: where the commercial center of the region takes the form of a *strip grouping, located along* a major *pedestrian nerve*, and one of the advantages of this method is that it *creates a homogeneous service* to *the area, and one of its disadvantages is that it is suitable only in the case of densely populated cities so that the size of the commercial center is proportional to the number of residents.*
3.8.1 Aesthetic criteria

It is considered one of the most important attractions, as the aesthetic aspect is an attraction surrounding the project, taking into account that the fabric surrounding the site represents a good and distinct view, whether in green spaces or the beauty of the roads leading to them or linking it to landscapes such as orchards and gardens ..... etc.

4.8.1 Lighting and ventilation standards

The project contains multiple elements and different requirements from an environmental point of view, such as lighting, ventilation and orientation, each according to its function and the success of the architect in providing the appropriate conditions for each element that gives strength to the project.

5.8.1 Building Materials Standards

Building Materials and Construction Methods There are many construction methods and building materials and there are no specific restrictions for activity buildings but they are mostly governed by two main factors:

A- The architectural character of the building that the designer wants. B- The economic factor.

6.8.1 Security: Many *security considerations must be taken into account against many expectations such as burglary, theft, fire, vandalism. ..* etc. The *relationship of private security to visitors and workers The ease or difficulty of applying these considerations depends on the urban formation of the building itself and external security can be achieved by:*

A - Separation of permanent or continuous frequency areas for the public so that they are specific and clear

B- The occurrence of exposed display parts inside a building block

C. Reduction of external openings

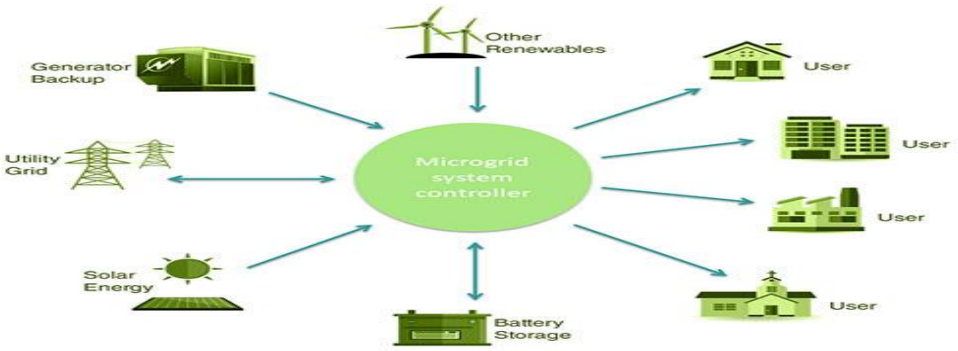
Equipping the building with technical equipment and the systems used for warning and control.

7.8.1 Smart infrastructures

1,7.8.1 Smart energy system:

Intelligent energy management systems (*sensors*, advanced *meters*, renewable energy sources, digital *controls*, analytical *tools*) are used *to automate*, monitor and *optimize energy distribution and use. These systems improve the operation and use* of the *network by balancing the needs of the various stakeholders involved (consumers, producers and suppliers). There are a number of innovations in smart energy infrastructures* , Such as (distributed renewable energy, smart *grid technologies, microgrid generation, energy storage*, automated demand *for response, virtual power plants and demand-side innovations such as (electric vehicles and smart devices). (Omar Makhlouf, 2020)*

Figure (5) illustrates the smart energy system



Source: Omar Makhlouf, 2020

For example, Japan's Kashiwa Noha Smart City Project uses a region-wide energy management system-based smart grid that combines household energy with management systems, and *real-time monitoring of energy supply and demand.*

2,7.8.1 Smart water system:

Cities are constantly trying to solve water scarcity problems in innovative technologies and better water management. Improved measurement, monitoring and management are the key to a good water distribution system. For smart water management, digital *technology systems* must *be used to help save water, reduce costs, and increase reliability and transparency of water distribution.*

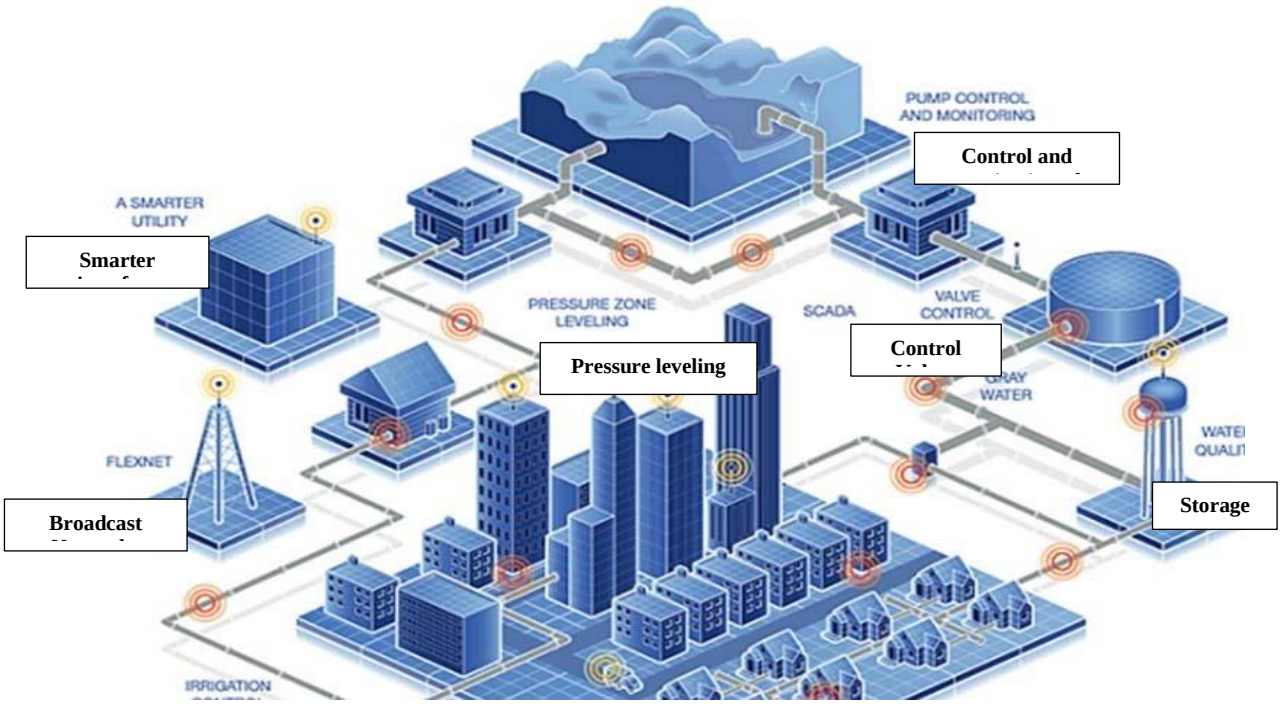


Figure (6) Smart Water System

Source: Naseer Al-Basri, 2014

Bearing in mind that physical pipe networks are overlapped with data and information networks. The system typically analyzes available flow and pressure data to identify anomalies (such as leaks) in real time to better manage water flow. Real-time information on water status and related information may be provided and help conserve **water,** ***resulting in lower water bills. For example, Mumbai, India, as part of improvements to the water supply system, has installed smart and remote-controlled*** **water meters,** ***resulting in a 50% reduction in water leakage. (Naseer Al-Basri, 2014)***

3,7.8.1 □□□□□□ □□□□□□□□ □□□□□□ ***smart waste system:***

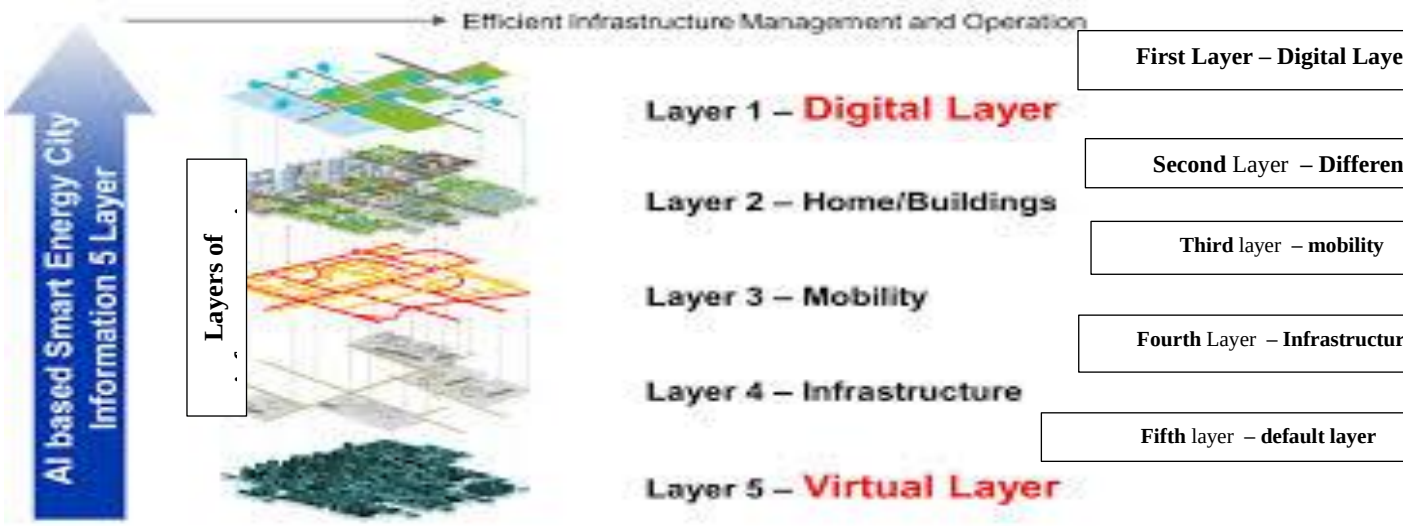
A smart waste management solution in cities enables the management and battle of increasing amounts of municipal waste. Theincreasing volume of waste is largely due to

two factors: (large-scale urbanization and industry growth). The modern lifestyle around the world produces far more waste per citizen than it did just a decade ago, with the United Nations predicting that 80% of the world's population will live in cities by 2045. To maintain all these factors, cities need a sophisticated and effective waste management tool, monitoring bins using sensors and improving capacity and methods. Assembly. (Joan Bairat, 2021)

4,7.8.1 □□□□□□ □□□□□□□ □□□□□□□ □□□□□□ Smart digital layers system:

Intelligent digital infrastructures help increase understanding and control processes and improve use Limited resources in the city. where moan One of its most prominent advantages in addressing ICT proposals in the city Smart, She (ability to capture Information and share it in time). Provided that the information is provided at the time Real, and in a way Exact This helps take action before the problem starts to escalate. where Consider in digital infrastructures in the form of supporting digital layers different. As follows: (Joan Bairat□ 2021)

Figure (7) shows numeric layers



Source: Joan Bairat, 2021

A. *Urban: The class where physical and digital infrastructures meet. These include smart buildings, smart mobility, smart grids (for utilities such as water, electricity, and gas) and smart waste management systems.*

B. *Sensor: The layer that includes smart devices that measure and monitor the city's various landmarks and environment.*

C. *Connectivity: This layer involves the transfer of data and information from the sensor level for storage and data collection for analysis.*

D. *Data Analytics: This layer includes the analysis of data collected by various systems of smart infrastructures to help predict certain events (such as traffic congestion).*

E. *Automation: An enabling digital interface layer that enables automation and scalability for a large number of devices across multiple domains and headers*

5,7.8.1 system Smart Mobility:

Intelligent mobility is best described as approaches that reduce congestion, care and faster, more sophisticated, and cheaper transportation options. Most intelligent mobility systems use data, *collected from a variety of sources on* mobility patterns, *to help improve traffic in those conditions in a comprehensive manner. Intelligent* mobility systems include mass transit systems, as *well as individual mobility systems that feature bicycle* sharing, *ride sharing (or car sharing), Vehicle sharing and, more recently, on-demand transport*, for example, the *bike-sharing system in São Paulo, Brazil, has reduced 570 tonnes of CO2 emitted since it began operations in 2012.*

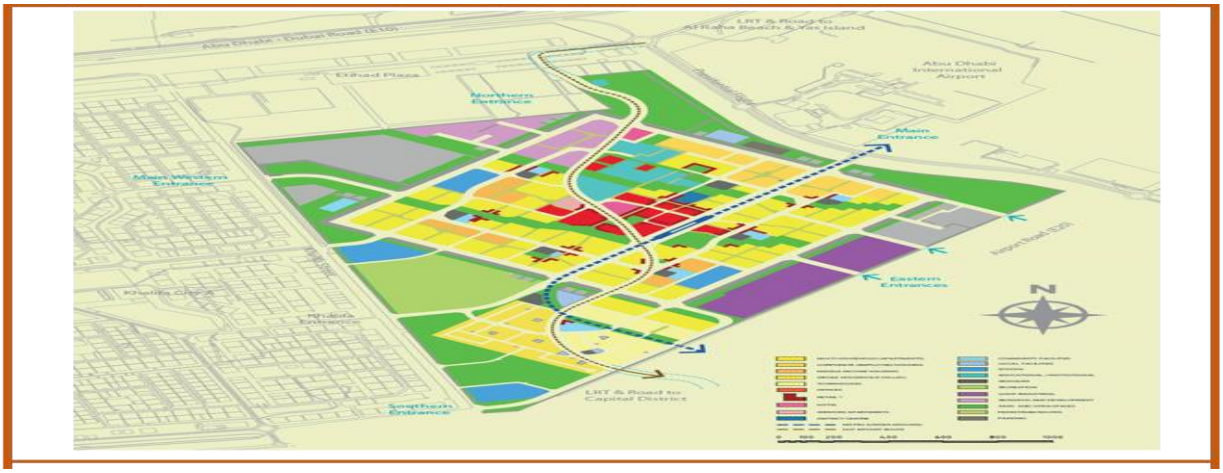
ITS integrates all types of transport, including individual and group mobility in an efficient manner. Modern ITS usually includes sophisticated issues including a network of GPS sensors, passenger information boards, traffic *light dynamics, navigation facilities, vehicle registration plate readers (automatic), circuit surveillance systems. Enclosed, signaling systems and most importantly the possibility of integrating all live data from sources in the above. (Omar Makhlouf, 2020)*

9.1 Arab and international experiences *on smart cities*

1.9.1 Masdar City in the United Arab Emirates (Abu Dhabi)

Established in 2008 in Abu Dhabi, UAE, Masdar City aims to accommodate rapid urbanization and reduce pollution by relying on clean energy and recycling waste based on modern technologies.

Map No. (1) showing the plan of Masdar City



Source: Osama Al-Mishrifawi, 2021

The most important smart projects that Masdar City relies on are: (Osama Al Mushrafi, 2021)

1- Smart Transport Network: Masdar City relies on a smart transport network that provides the following options for mobility: self-driving cars, an electric car exchange program, where the car is owned by more than one person, and in the future, a public central transport network will be developed that relies on an automation system and does not cause any kind of carbon emissions.

2- Natural resource sustainability: Masdar City's designs focused on reducing water and energy demand by 40% through the smart design of ASHARE-based facilities, in addition to establishing a laboratory to monitor and study the behavior of cities in

consuming and sharing resources, and the city meets global sustainability standards to conserve resources and avoid energy waste.

3- Smart Facilities: Masdar City adopts a typical building pattern. For example, rooftops will contain solar panels and technologies that will reduce water and energy consumption.

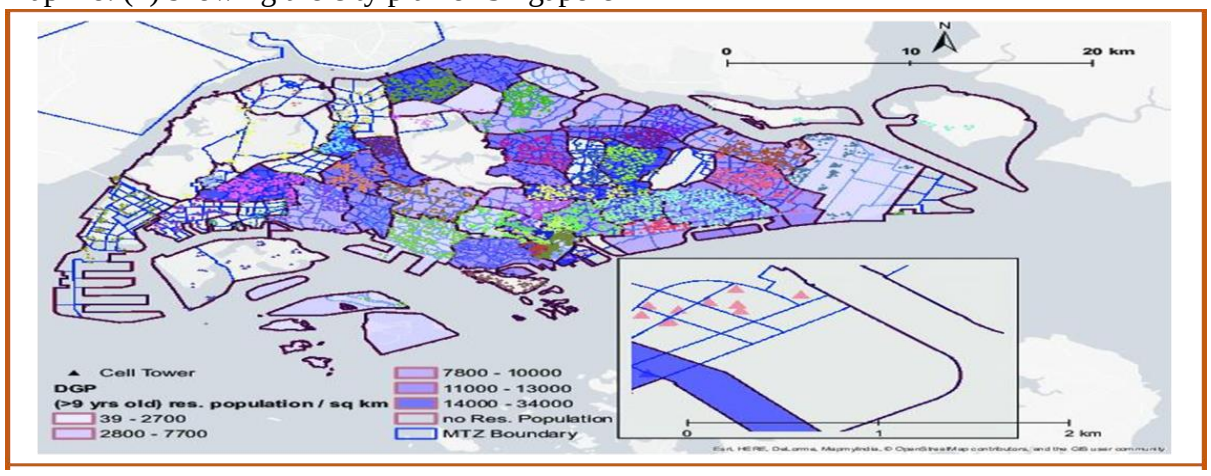
4- Masdar City is a free and investment zone, allowing foreigners to own real estate and companies within it, and it also attracts clean technology companies of all sizes and specialties to test, market and deploy clean energy technologies.

We conclude from this that Masdar City has taken care of all aspects in terms of transportation, building and services in providing a smart city and was not limited to one aspect only, as the development of commercial areas is not only the development of one part, but the development of all aspects as well as its dependence on investors, and this in turn helped to link the city with various countries of the world and its survival in continuous development.

1.9.2 Singapore Capital City in Singapore

Singapore, located in Southeast Asia, is one of the most prominent countries that rely on modern technology in managing its affairs, which made it the title of the smartest city in the world according to the Smart Cities Index issued by the International Institute for Management Development in Switzerland and the Singapore University of Technology and Design

Map No. (2) showing the city plan of Singapore



Source: Ebtisam Al Ameri, 2010

Singapore has developed a plan to create a digital economy, digital society and digital government, at the level of a company, industry and government agency, and increase digitization efforts and build a digital society of the future. Singapore's plans include the development of national projects in the areas of service delivery and digital infrastructure. The Government Technology Agency (or GovTech) has a central role in the creation of Smart Nation platforms for infrastructure services. GovTech uses information and communication technologies (ICTs) and associated engineering, for example, sensors, to facilitate the Internet of Things (IoT). GovTech is establishing a nationwide sensor network known as the Smart

Nation Sensing Platform (or SNSP). Singapore, I. D. A. o. 2013/2014.p12) formerly known as the Smart Nation Platform, with services and infrastructure, such as video and data analytics capabilities and a data sharing portal.

Among the most important reasons that made Singapore the smartest city in the world are the following: (Ebtisam Al Ameri, 2010)

1- Housing for All: The Housing Development Council provides access to free housing for all citizens, and the residences are community areas that encourage self-sufficiency, connection, inclusion and sustainability, with more than 80% of its 5.6 million inhabitants living in government housing.
2- Healthcare: "Healthy Citizens for a Healthy City"; Singapore adopts an integrated comprehensive healthcare plan that believes in innovation and continuous education, and includes adequate infrastructure such as underground parking, green spaces to improve the patient experience, and pedestrian walkways, which contribute to enhancing the health of citizens, thus creating a healthier city.
3- Mobility system: Ease of mobility plays an important role in improving the quality of life for smart cities, and the mobility system in Singapore relies on modern technologies such as self-driving vehicles, and seeks to reduce pollution, rely on clean energy sources in addition to integrating active means with public transport services such as walking and cycling.

In order for Singapore to maintain economic leadership, it had only the upgrading of knowledge technology, which in turn led to its strategic orientation towards knowledge and creativity, which allowed it to be a smart island, and Singapore is considered one of the first developing countries that realized the advantages of information and communication technology, and since foreign trade represents a cornerstone of the Singapore economy due to being one of the economic activities on which the country has long relied through:

A. Developing Singapore's trade in world markets

(b) Assist in exploring new markets for the country's exports and expanding sources of supply.

(c) Work to make Singapore an attractive environment for world trade.

(d) Development of the infrastructure for trade and business.

(e) Laying scientific and sound foundations for investment abroad

We conclude from this that the commercial side of Singapore relied heavily on technological development because it is an island that does not have natural advantages, the provision of technology helped to provide investors and the desire of traders to invest within the country, as for commercial buildings, they did not have smart building factors as much as it is available in the marketing method, but they were linked to a smart transport network and smart vehicles to transport goods, and the following figure shows the most

Table (2). the main elements of Masdar and Singapore cities

t	Arab State	Economic component	Environmental component	Industrial component	Smart Evolution	Urban development
1	Masdar City	✓	✓	✓	✓	✓
2	Singapore City	✓	✓	✓	✓	•

✓ available

- Not noticeable in malls

Source/researcher based on the above information

After studying the international and Arab experiences and knowing the most importantmain elements, and now we will linkthem in the study area (the old center of the city of Najaf) as shown in the diagram below

2. Practical side (study area)

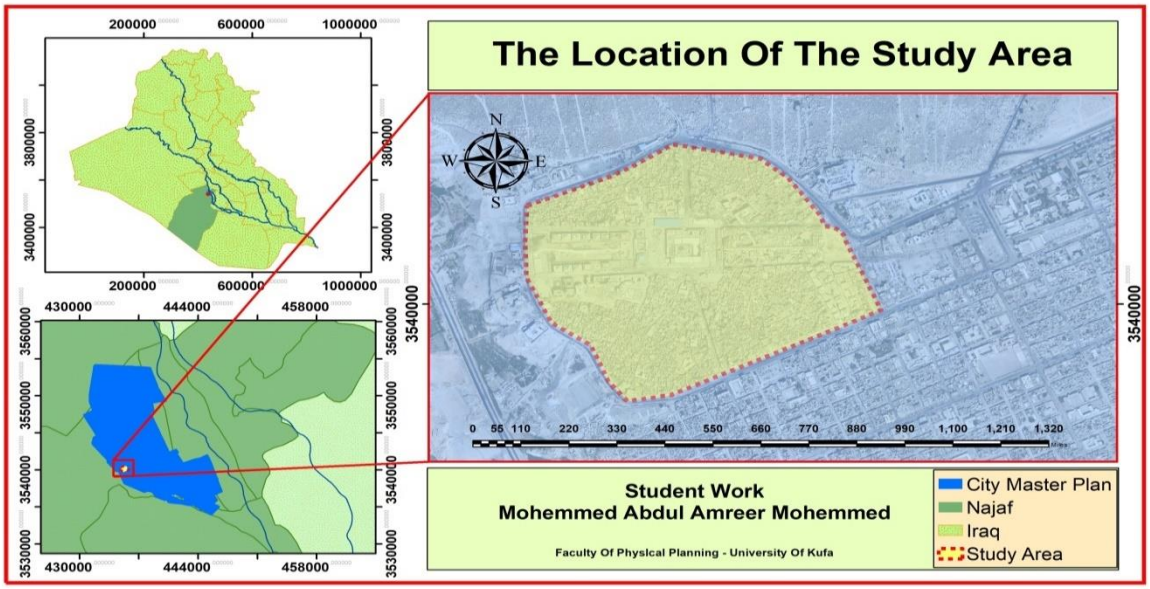
1.2 Location and placement

The old city of Najaf is located in the southwest of the province of Najaf, and its area is about 60 hectares of the original area of Najaf, which is estimated at about 7,500 hectares, and the urban planning of the city of Najaf since its inception in 170 AH (786 AD) is densely housed, which were mainly centered around the shrine of Imam Ali (peace be upon him), and this is due to the spiritual relationship that binds people to the shrine, Al-Rawdah Al-Haidaria, which represents the spiritual and actual center of the old city, and the density of houses increases as you approach it and decreases as you move away from it, and therefore you notice that most of the houses are contiguous, while the corridors and alleys leading to these houses are more often twisted and with zigzag shapes, and may end with dead ends that have no exits

Reasons to follow this planning at that time

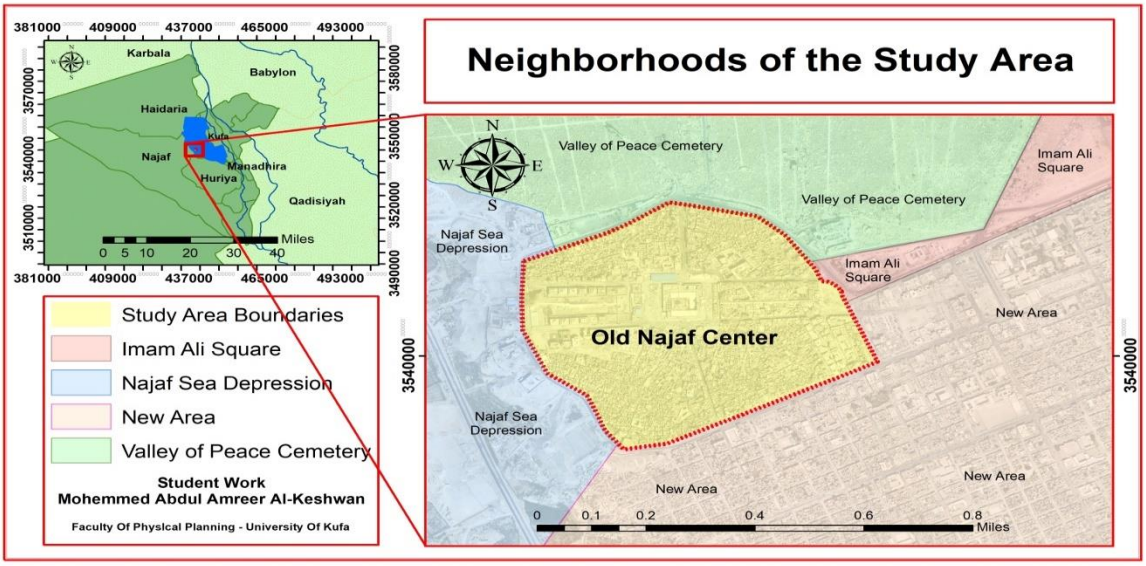
- Depth of social bonds
- Maintaining the security of the city from robberies and assaults
- Prevention of extreme cold and extreme heat

2.2 Astronomical position: The study area lies between longitudes 33' 44°18' and 14'44'19' and latitudes 31° 59' 27' and 31°59" 56' and its coordinates 44°18'44' E, '35°59'31 N, It has an area of 17.1 hectares, where it is located on a high hillock on sandy land with a height of (55-60 m) above sea level and is located within the contouring of 55 m and slopes steeply towards the Najaf Sea and gradually in other directions.



Map No. (3) Location of the study area from Najaf city

3, Neighborhoods: overlooking from the northeastern side of the Wadi Al-Salam cemetery, which is one of the largest cemeteries in the world, while from the western side , it overlooks the Najaf Sea depression, so both the cemetery and the Najaf Sea region formed obstacles that prevented the city from expanding in the northern and western directions, while the southern side is bordered by the Jdeidat area and the eastern side of the city is Imam Ali Square (peace be upon him), which is the main access point for visitors and the city's soil on the Najaf-Kufa road.



Map No. (4) The boundaries of the study area and the neighborhoods of the old city .

4.2 Urban characteristics

The old city of Old Najaf and its borders to the east and south are the Jdeidat area, to the west by the Najaf Sea region, and to the north by the Wadi al-Salam cemetery, and includes the following four old shops:

1- Al , Mishraq District
2- Al , Buraq District
3- Al-Huwaish locality
4- Al Amara District

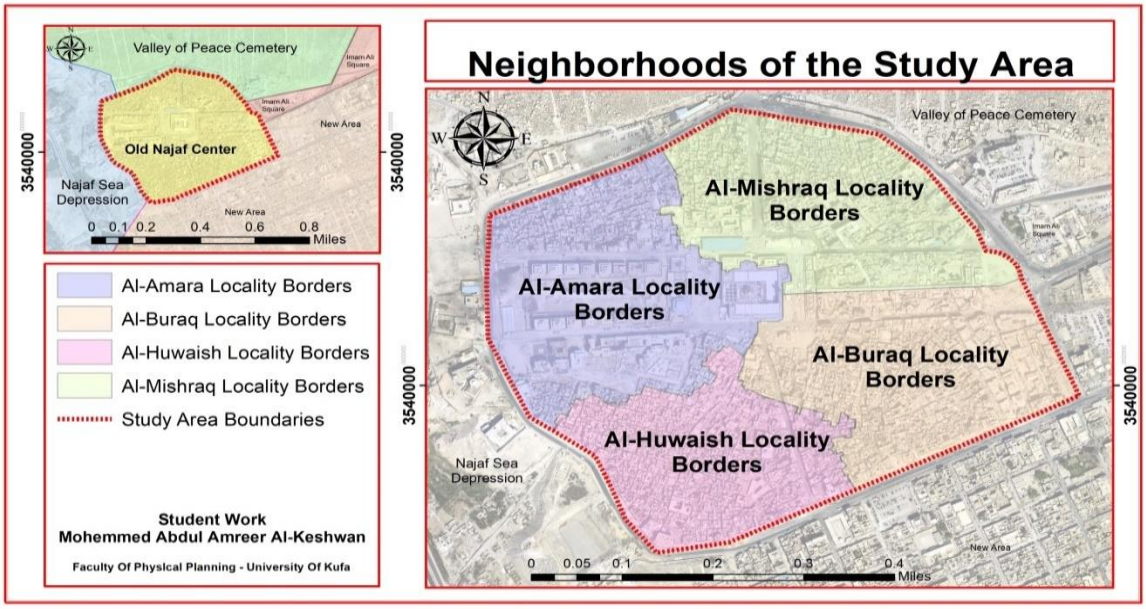
1.4. 2 Mahallat al-Mishraq Mahallat al-Mishraq is located on the northeastern side of the holy Rawdah al-Haidariyya to the interior of the city wall (which previously surrounded the city). And its borders from the north, northeast and northwest Al-Soor Street and Wadi Al-Salam cemetery, and from the eastern side Imam Ali Street (peace be upon him) and the district of Kufa, and from the west Sheikh Tusi Street and Mahallat Al-Amara, and from the southwestern side Al-Rawda Al-Haidariya holy and Mahalla Al-Huwaish, and from the southern side A about the Buraq locality, the big market, and the locality of Al-Mishraq is the oldest of the four shops and has old alleys and ends some of the alleys of the locality of Al-Mishraq to (Fadwa Al-Mishraq) and the space is a social forum, and the population of the locality is 885 people and an area of 150479 m^2

2.4. 2 locality Buraq located in the south to the southeast of the shrine Tahir and south of the locality of Al-Huwaish, which is the latest shops Najaf and that the name Buraq came from Jabiya around a well from which water is drawn and approaching the word (pond), and at the end of Buraq swabit or collars have been removed at the present time, and the population of the locality 2000 people and an area of 152594 m^2

3.4. 2 Al-Huwaish locality is located in the south to the southwest of the upper Al-Haram Al-Tahir and its name came from the word Hosh or House, where it overlaps from the west with the locality of Al-Amara and from the north with the locality of Al-Buraq and east towards the area of Al-Jadidat either to the south of it is Jabal Al-Huwaish, which is adjacent to the slope of the Najaf Sea, with a population of 3250 people and an area of 119531 m^2

4.4. 2 locality architecture located north of the locality of Al-Mishraq known as the building of the believers located from the Haram al-Sharif in the northwest to the southwest through the west and is the largest shops of Najaf old has been the name of the architecture for the place of the cemetery of Sheikh owner jewels and its approach, with a population of 5000 people and an area of 175623 m^2

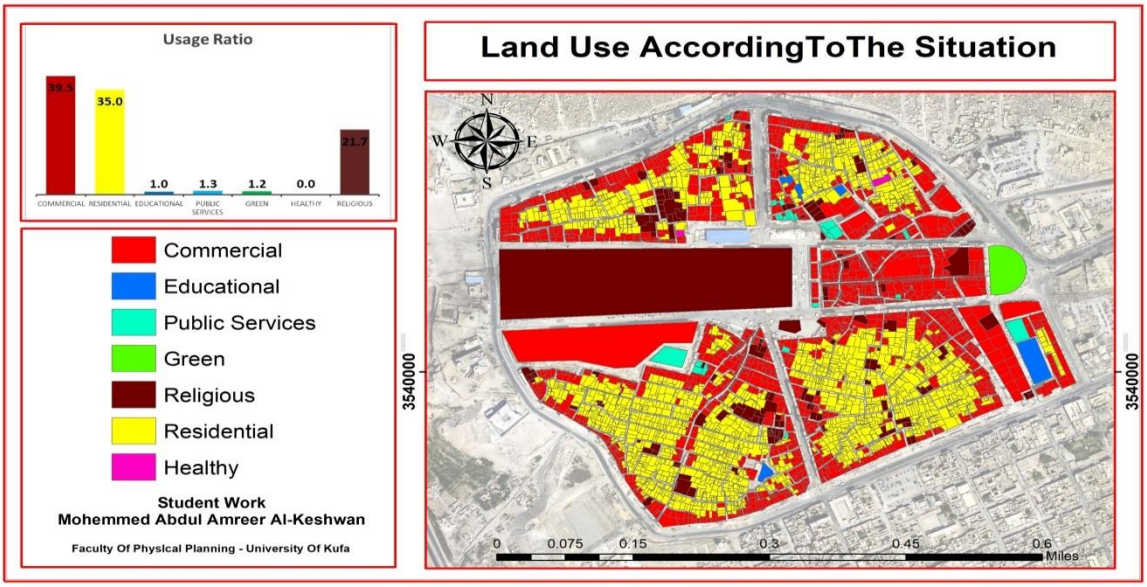
Map No. (5) Boundaries of the Four Shops in the Old City

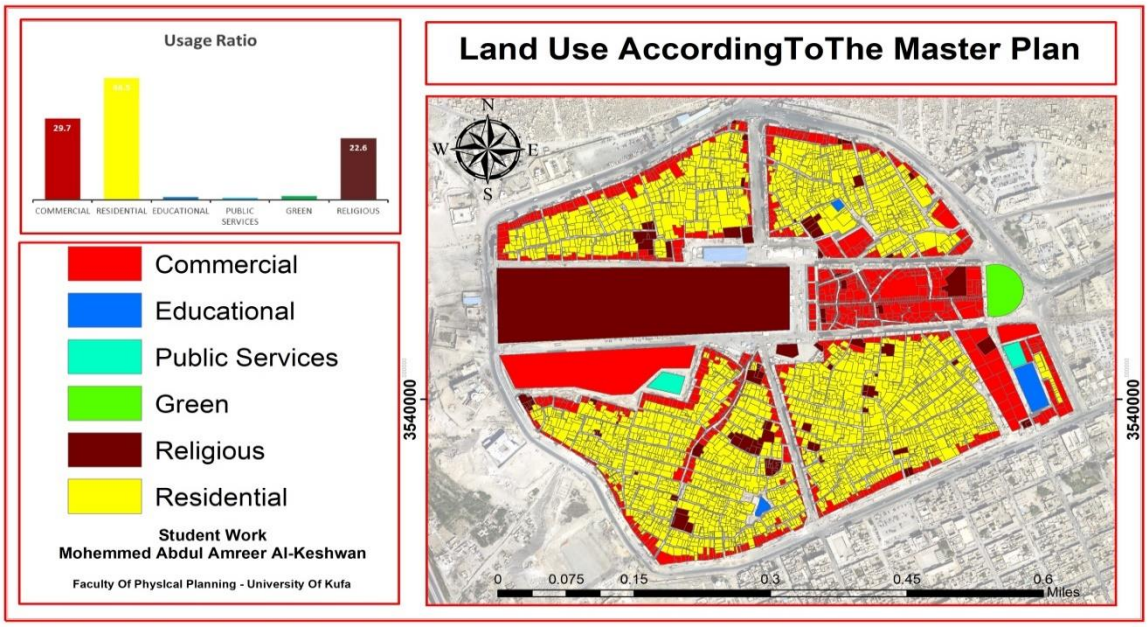


Source: The researcher based on the excretory maps of the old city of the Southern Real Estate Registration Department in Najaf for the year 1948

5.2 Land uses

Map No. (6) and (7) Land Uses in the Old City according to the Basic Plan and the Reality of the Situation





6.2 Distribution of land use for the study area

There are differences between the reality of the situation and what is planned in the basic plan of the city and Table (4) shows the differences in the areas of land distribution between what is planned in the master plan and the reality of the situation according to the survey prepared by the researcher for the year 2022, and map No. (7) shows the land uses of the old city of Najaf for the reality of the situation for the year 2022.

Table (3). Distribution of Land Uses of the Old City of Najaf by Area and Proportions

	Fact		Chart	
Use	Area in hectares	Percentage	Area in hectares	Percentage
Commercial	17.42141585	39.53	11.51167114	29.72
Residential	15.43474466	35.03	17.24820992	44.53
Educational	0.458391548	1.04	0.393512727	1.02
General Services	0.58833097	1.34	0.300991752	0.78
Green	0.537095403	1.22	0.537095403	1.39
healthy	0.062161909	-	-	-
Religious	9.564584344	21.70	8.73908364	22.56
Total	44.06672468	100	38.73056458	100

The preliminary analysis of the above uses note the dominance of commercial and residential use on the rest of the uses of the reality of the situation has been found that the scheme is the dominance of residential use clearly evidence indicates the existence of the percentage of infringement of commercial use on residential use either the rest of the uses have maintained their percentage and we will show according to the maps the percentage of infringement.

Table No. (4). the land use areas for the study area

Use	Area in reality	Area in the plan	Difference area	Percentage of variation
Commercial	17.42141585	11.51167114	-5.90974471	-9.81
Residential	15.43474466	17.24820992	1.81346526	9.5
Educational	0.458391548	0.393512727	-0.064878821	-0.02

General Services	0.58833097	0.300991752	-0.287339218	-0.56
Green	0.537095403	0.537095403	0	0.17
healthy	0.062161909	0	-0.062161909	-0.00014
Religious	9.564584344	8.73908364	-0.825500704	0.86
Total	44.06672468	38.73056458	-5.3361601	0

We note that the percentage of infringement for commercial use was the largest percentage due to the economic factor and the lack of infringement for residential use because the area is uninhabitable due to noise and difficulty in access due to roads and delivery of materials to the dwelling, as for infringement for religious use, we note that there is no infringement rate, religious use is as planned because there is no need to add religious use due to the dominance of the shrine, which is an important religious landmark in the old city, which is supported by commercial use.

Table No. (5). the areas of difference for land uses for the study area

Mahalla	Its area in reality	Its area in the plan	Encroachment Area
Al-Mashrak and Al-Amara locality	198620.0308	198620.0308	0
Al-Barrak and Al-Huwaish locality	242047.216	188685.615	-53361.601

7. 2 Reasons for infringement

In the study area, urban encroachment occurred, and we see the reasons for this encroachment, and for the purpose of identifying the case of urban encroachment in detail, we resorted to the questionnaire form.

1.7. 2 Reasons that led to the spread of the phenomenon of urban encroachment

1- The large number of visitors coming to the old city as religious tourism.
2- A religious center that attracts religious and seminary studies.
3- The closure of some internal roads for security reasons has encouraged venture capitalists and investors to intensify their investments in open roads.
4- The establishment of central events of a regional nature in this specific space, unlike the urban plan, led to spatial functional changes in the region.

5- The dominance of capital owners of a specific category and politically or religiously supported on real estate speculation in the center and control over the purchase of specific properties to change their type and type of use to a different use of urban plans .

2.7. 2 Strategies developed to address the problems of urban encroachment

1- Using applications that work to conserve, develop and sustain basic resources (green economy).

2- A supportive community for technological innovation to maintain the sustainability of available resources.

3- Employing information technology applications in the field of energy to develop the city and ensure its sustainability.

4- The Information City, which works to encourage community participation through electronic management methods.

5- Providing capabilities and technological tools to support planning and preserving the environment.

6- Life in smart ways to preserve an environment and ensure its continuity for future generations.

Conclusions

The phenomenon of urban encroachment has a significant impact on sustainable urban development. The effects of infringement on services are very harmful due to losses in water and electricity networks as a result of irregular connections and infringement on these networks. To adjust the process of change in spatial structure requires an understanding of the nature of the place and its spatial characteristics. Economic benefits include reducing the cost of infrastructure, improving transport efficiency, and supporting industries that rely on local resources. Environmental benefits include maintaining open spaces and green areas, saving energy and reducing pollution. Urban improvement aims to rehabilitate the region by improving the quality of life and achieving economic balance. The dominance of the percentage of encroachment of commercial use over residential use, while the rest of the uses maintain their proportions. It was found that the percentage of religious use did not exceed the basic scheme for the dominance of the shrine, which is considered the most important sign in the region. It has been proven that Al-Buraq and Al-Huwaish shops are more infringing on the privacy of the area in terms of visitor turnout, in addition to the closure procedures for the movement axes in other areas. The increase in land values in the region has led to a significant change in use and encroachment. The change in use from residential to commercial use, which resulted in urban problems, including pressure on public services, in addition to problems in the economic , social and urban aspects. As a result of the change in residential use to commercial, it led to the creation of more job opportunities, and this is a positive indicator to reduce unemployment rates in the city.

References

Naseer Abdul Razzaq Hasj Al-Basri, Technological progress and its impact on theorganization of the city's elements, University of Kufa/College of Urban Planning, Knowledage Engaging minds, Volume 2018

Riyad Farhan Hassan Alawneh, Land Use Patterns, Urban Growth Trends and Internal Structure in Some Villages in Nablus Governorate, An-Najah National University, 2004

Mustafa Abdul Jalil Ibrahim Al-Qara Ghawali, Study and Analysis of the Functional Interaction between Urban Land Uses, University of Baghdad, Higher Institute of Urban and Regional Planning, 2004

Prof. Sherif Mohamed Sabry Al-Attar, Assoc. Prof. Dr. Mohamed Saeed Moslehi, Eng. Lamia Khamis Mohamed Hassan, A Proposed Model for Evaluating Commercial Centers in New Urban Communities, Fayoum University - Faculty of Engineering, Journal of Engineering Volume (2) Issue (2) 2012

Bouali Kholoud, Commercial Activities and their Impact on Land Use: The Case of Ain Melil City, Larbi Ben M'hidi University, Institute of Urban Technology Management, 2018

Saleh Ahmad Saleh Abu Hassan, Organizational Plans and Land Use Reality in Dura City (Hebron Governorate), An-Najah National University, Faculty of Urban and Regional Planning, 2004

Jihad Saleh Abdel Latif Salameh, Socio-Political Dimensions in Urban Development of Slums, An-Najah National University, Regional Urban Planning Engineering , 2010

Eng. Youssef Harran Fares, Reasons for changing the use of residential land to commercial use in the city of Numaniya, Journal of the College of Education, Issue (10), 2015

Dr. Kamel Kazem Al-Kinani, An Analysis of the Mechanisms of Economic Action in Origin and Development, Baghdad City, Journal of Planning and Development, Issue (19), 2008

Assoc. Prof. Dr. Ahmed Naguib Abdel Hakim Al-Qadi, Eng. Mohamed Ibrahim Al-Iraqi, Characteristics of Smart Cities and their Role in Transforming into the Sustainability of the Egyptian City, Al-Azhar University - Faculty of Engineering, Journal of Architecture, Engineering and Technology, 2015

Assoc. Prof. Hatem Hamoudi Hassan, Smart Cities and their Role in Solving Community Services Problems in Cities (Baghdad City) as a Model, Iraqi University - College of Arts, Medad Al-Adab Magazine, 2018

Omar Al-Qawasmi, Commercial Complex in Palm City, Palestine Polytechnic University, Faculty of Engineering, 2018

Eng. Myriam Marwan Makdissi, The Impact of Architectural Design of Modern Commercial Centers on the Social Reality in Syria, Case Study (Damascus), Lattic, Tishreen University, Faculty of Architecture, 2015

Joan Omar Bairat, Challenges Facing the Smart City of Ram Hilala, Faculty of Arts, Birzeit University, Palestine, 2021

Assoc. Prof. Naseer Abdul Razzaq Al-Basri, Planning for the sustainability of water resources in the light of innovative solutions, College of Urban Planning / University of Kufa-Iraq

Dr. Omar Makhlouf, The Need for Smart Cities to Achieve Sustainable Development: Opportunities and Challenges, University of Setif 20, Journal of Construction and Construction, Volume 04 / Issue 01 / Serial Issue 13 / March 2020

Osama Jassim Mohammed Al-Mushrifawi, Digitization and analysis of spatial information and its impact on transforming the city of Kufa into a smart city - a smart transport model, University of Baghdad - Center for Urban and Regional Planning for Graduate Studies, 2021

Assoc. Prof. Ibtisam Mohammed Al-Ameri, Development Experience in Singapore, Center for Strate*gic and International Studies, 2010*