

## The development of the City of Kirkuk according to strategies for sustainable development

Qubad Sabah Haseeb

University of Kirkuk, College of Engineering

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### ABSTRACT

This study is summarized in the need to identify the problems of the city of Kirkuk as a case study, through a questionnaire conducted separate samples of the sons of the city of Kirkuk, in particular, staff in different districts in the city, in order to attempt to formulate policies and frameworks for the development of the city of Kirkuk, according to the general framework of sustainable planning, through creating balance and justice of land and public transport and distribution service buildings according to the population density of the city which is in the process of increasing population growth and remarkable. The study also aims to the need to preserve the environment and resources and wealth of the city of Kirkuk and the need to reduce the pollution through the identification of areas that can be further elaborated by the profusion of greenery to be therefore green belt surrounding the city to have an important role in the preservation of the environment. And through the indicators that have been drawn, which were represented as a group of points on the most important problems of the city, then take the recommendations of a holistic and harmonious with the sustainable planning policies in the framework of sustainable development, which means the various walks of life.

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**Keywords:** Sustainable development, Sustainable planning, Environment

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#### *Corresponding Author:*

Qubad Sabah Haseeb

College of Engineering, University of Kirkuk

Kirkuk, Iraq

qubads@yahoo.com

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### 1 Introduction

The idea of sustainable development that can be applied in the development of cities through several axes including the method of optimal exploitation of land through the provision of appropriate living environment, where the provision of services in the city through the equitable distribution of government departments according to population density and all areas of the city, and the preservation of the environment through the identification of areas that could be exploited for the hotel's Green surrounding the city, residential areas, and encourage citizens to use public transport in the modernization of the Pedestrian Navigation methods to reduce noise and environmental pollution. It is mentioned that the concept of sustainability stemming from the overall concept of sustainable development, closely linked to the functional and social composition within the urban fabric in the cities, and through that to reach indications and concepts can be derived from sustainable thinking can be employed in the development of any city. Hence, the study sample represented the city of Kirkuk, the city's importance in Iraq and the region through the wealth is increasing the density of population

significantly in recent times, which created various requests of problems should be addressed to develop criteria and plans for the creation of the urban environment in line with the concepts and principles of the sustainable development.

### **1.1 The essence of the sustainable city**

It has been planning the cities for many stages of rapid developments in trying hard to keep up with the acceleration of scientific and technological pattern of evolution of life, in the past was not an urgent need for city planning, limited elements and functions and activities. With the scientific and technological development, which had been accompanied by the development in most aspects of life, numerous activities and functions performed by the city and thus the need emerged to good planning and deliberate the process of cities in keeping pace with technological developments, and preceded to avoid inclination which may result from the unstudied growth or planned. Hence, the need emerged to urban planning in a scientific and practical and well thought out future-oriented to solve problems and to avoid the emergence of new problems, are a clear protective plan to work in search sustainability is achieved progress and integration and inclusiveness, and shows the urgent need to achieve a number of objectives, which can be summarized as follows: The achievement of social justice through the optimal and equitable distribution of income and revenues growth between individuals of different classes. The optimal exploitation of natural and human resources. The high rates of economic growth and improve the standard of living of the population, contribute to the development of appropriate solutions to the different economic, social, and environmental. The city is a stable society with high population density areas, where activities are often vary in population, economic and administrative services and the level of urbanization and management, which is variable in size and shape and function [1]. It is to coordinate between the foundations of sustainability, the site of any city that was not to be: (aesthetic returns - cost-efficiency - function - serviceability - compatibility with environmental design and geological survey) [2] [3].

### **1.2 The most important policies to achieve sustainability in urban planning**

To achieve sustainability in urban investigation, it can be pursued the following policies: [4] urban: M-109 reduce fragmentation (through reducing congestion within cities and increasing the rate of density in the suburbs of cities and small towns). Reduce the distances: (through the systematic distribution of local districts and reduce the distance between work and the home and increasing development in small towns and to reduce the reliance on large cities, to the creation of new communities balanced). Seek Economic and attractive public transport: (through a focus on the further development of mixed uses in the centers of intersections public transportation, and compatibility between the use of land, which is located within the administrative borders of the city, public transport, to achieve more balance in the flow). Reduce Road Traffic: (through the restructuring of urban areas so as to reduce flights in transport within the limits of the town and replaced by public transport and regularize the attitudes in the workplace). We find the close link between development in the formal composition of people in cities with the factors affecting its orientation to meet the needs associated with population growth, where the spatial, physical, psychological and social situation linked to the area of the city and its expansions and economic development, in addition to the cultural aspect of the city society [5]. The sustainable design is simply synonymous with sustainable development, when configuring a clear idea of what constitutes sustainable development necessarily produces a sound planning, it must be the face of contemporary needs without compromising the potential of future generations to meet their needs, the sustainable

planning features urban formations and space applications that contribute to urban development and ongoing compliance and changing the needs and systems of construction [6].

### 1.3 Sample study (Kirkuk) of the geographical location of historical significance and heritage

**The Website:** The city of Kirkuk in the north of the Republic of Iraq between the line length (43 23 - 42 - 45) East Greenwich line and latitude (35 53 - 34 1) north of the equator. The conservative limits of the North Province of Arbil and Sulaymaniyah governorate east and west Salah Al-Din and Ninawa governorate, and to the south the province of Diyala. Depart the city of Kirkuk, the center of the city of Arbil and Sulaymaniyah 92 km 109 km and 225 km of the capital Baghdad and Diyala province, 215 km away [7].

**The Administrative Border:** It includes maintenance within its administrative borders with a rich diversity of natural elements and topographical features, geology and the ethnic and religious diversity of the human - and match the administrative borders to maintain clearly with the topographic features of the region, where the borders of the north east maintain conformity with the Kirkuk and the Golan Heights plateau Chuan hamrin mountains [8].

**The History and Heritage of the City:** The current city of Kirkuk on the ruins of the ancient Assyrian city (arafa) which is estimated at about 5,000 years old, because of the importance of its geographical location between the most important two civilizations and politicians in the history of Iraq (Babylon and Nineveh), as well as the effects of Zagros mountains bordering Iran. The fertility of the soil of Kirkuk and its geographical center, trade movement has hosted several races of human societies and exchanged customs and traditions, and has reached the height of its fame in the 10th and 11th centuries BC under the rule of the Assyrians, unlike the recent decades, which has suffered from the neglect of the territory which was born kind of desertification, especially from the South, surrounding the city.

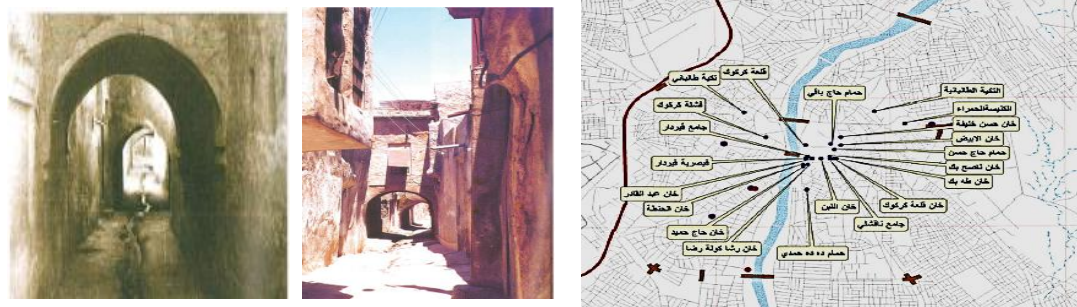


Figure 1. Places of historical sites in Kirkuk [7]

### 1.4 Profile of the urban identity of the City of Kirkuk

That Kirkuk City includes one traditional urban pattern spontaneously in the old center of the city and features modern in areas away from the city center. There are two players in the presence of the two patterns of urban landscape of the city of Kirkuk, the first historical factors that created the heritage attractions attended their presence on the forms of spaces and buildings which had the greatest impact on the center of the castle of the morphological configuration of the form of the Scene crystallized through the historical development of the second aspect is the factors of modernity and the development of the uses and growing activities and increasing population pressure and high posts and the inability of heritage buildings to accommodate these requirements, all that has led to this kind of architectural forms and systems of other spheres, which led to a shift in the urban scene, especially in the southern and western areas of the city. We find the traditional urban scene clear in the old part of the city through the housing units adjacent coasts, or modern buildings, they tend to be characterized

as is the case in some of the buildings which had taken a pattern vertically and focused in the city of Kirkuk in the main streets in the form of mixed-use buildings housing with trade where inhabited by some families and workers in the city where this pattern emerged as a result of the increase in the need for housing and services where the vertical and other facilities [7].

### 1.5 Outline of the development of the city of Kirkuk: Duxiades

In 1973, the Greek advisory started Duxiades Company in the study of the general plan of the city of Kirkuk, where the study included: The natural settings, including the area geography, climate, green areas, The economic features of the city, The physical features of the city include: (land uses, population growth and density, The social and demographic features of life, The form of transport includes public transport links and traffic and parking, The social administrative buildings and public places open voids, The number of floors and condition of available housing and public utilities, including water supply and sewage system (which has not yet been implemented integrated settings till recently) and the most recent water, drainage, in addition to the electricity network and communications. The development program is distinguished between current and future requirements and to take advantage of the elements of geographical and historical city through a network of roads linking between Kirkuk and all the governorates of Iraq, and development. At first, the Special River currently neglected, maintaining an entertainment center and historic castle. The Development Program also included the distribution of land uses so that each region is classified according to the relevance of where geography is affecting the construction costs of the expected urban growth. Also it is classified based on the attractiveness of the area and the proximity of green areas and water sources, the climatic conditions and remoteness from the basic sources of pollution [9].

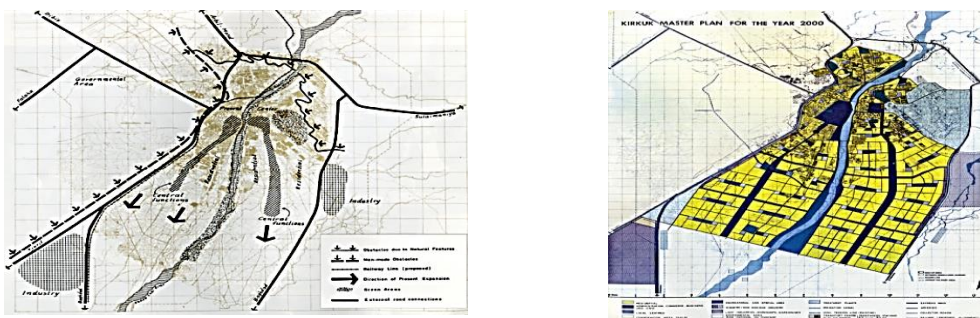


Figure 2. Focus of Duxiades on the main roads linking the city

And its neighborhoods from Governorates, districts, and districts, in addition to the method of distributing internal roads via the network system [9]

It was the proposal to develop the Territory of the city in three stages: **The first stage** was the proposal for the establishment of an industrial zone in the center of transportation in the western side of the city, it was suggested that the scheme in 1986, the end of this stage. **Phase II:** the growth proposed in the eastern side of the city is the goal of this stage is the year 1990. **The third phase:** between 1990 and 2000, development has included east and west of the city. Noting the structure built by the scheme has been the adoption of the network system as a pattern of the relationship between the streets of the city.

### 1.6 Bill Freshman's scheme from 2008-2027

The second study of Kirkuk city scheme is defined by Bill Freshman where the main action plans of the city and land-use allocations to accommodate the growth of the Israeli occupation in 2027. The

master plan has been prepared in 2008, based on the identification of the objectives of the future of the constraints and impediments to the development built on those assumptions and requirements of land capacity data [10].

- The objectives of the bill **Bill Farshmann** scheme: the preparation of a set of objectives that the study sought to achieve them, including: To promote community integration, including all categories of the population in the city, to promote economic development and employment of the population of this city at present and in the future in the government and non-government sector, to encourage the establishment of a green environment through the establishment of a connected network of roads woodlands, promote the development of high quality installations is attractive with maintaining their identity, distinct personality, the promotion of an effective pattern of urban development so that are ruining the land and infrastructure and encourage the future development and the development of the city center and business services.

**-Bill Farshmann's Proposals on the Urban Design of the City:** The study pointed out the need to Infer ground conditions and types of soil, topography, climate and climatic factors on the level of the design, the quality of the air, agriculture, and preserving the heritage and archaeological resources, the environment and landscape, scenery and landmarks as well as the need for the development of joint use of the intensity of the plots of land and public space open.

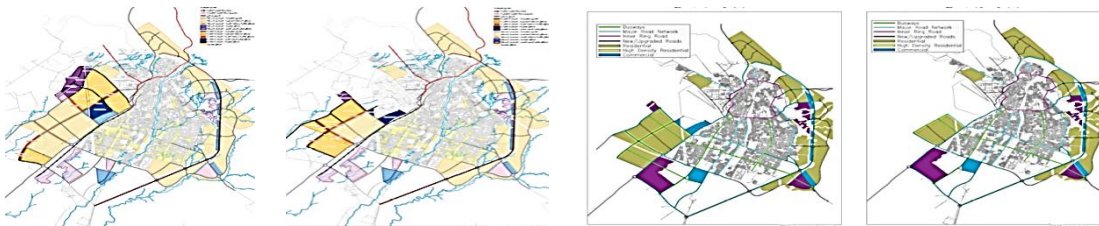


Figure 3. Bill Farshmann's focus in developing the city of Kirkuk on the annual roadmap they moved to the center in four stages [10]

## 2 Questionnaire is the various segments of the population of the City of Kirkuk

A questionnaire was conducted various segments of the population of the city of Kirkuk to identify directly about their opinions toward what they suffer from problems in their daily lives, according to the department of the city of services and that these services mean the purpose and elevate to the level required level to keep pace with the cultural cities of the world for the inhabitants of their towns, especially if we compare the city of Kirkuk in the cities of the world, we found that the material wealth enjoyed by the city of Kirkuk, much higher than the income of those cities, but we found that there are indications that the lack of sustainable environment in the city, according to the international standards of sustainable development strategies, and the purpose of the questionnaire in identifying the most important indicators that give us an idea of some being in the minds of the population, as well as to identify the mutual relations between people and the natural environment, the built environment and public transportation system, and, through that, the distribution of the sample (the questionnaire form) normally include all of the following five categories: The staff of the water of Kirkuk, the staff of the university professors of Kirkuk, Primary School Teachers, The shops' owners in separate areas of Kirkuk, the staff of the engineering department in the directorate of education of Kirkuk. It should be noted that the questionnaire covered a number of segments of citizens, taking into account the (older

persons - the social situation - the workplace - Housing - in addition to the possession of the vehicle from the lack thereof) to identify a considerable number of views and expectations of those segments of the citizens residing in the city of Kirkuk. We found that the majority of the samples selected are from the category of staff and the fact that the study is designed to collect the views of citizens who have specific dates for the msy level in the state, where the dominant category was between (35.45), and through the conduct of a questionnaire, the following should be noted: **A.** The nature of the flights that they carry out daily flights of the highest proportion, followed by special flights, shopping and social trips. The fact that the work trips that got the highest rate with a fixed schedule of coming and going, it was necessary to focus on the work of the thing in this aspect, the most important to focus on the role of public transport and the fact that the results were negative by the samples on the performance of the public transport network. **B.** The most important problems of the city, which impede the growth and the development of civilization centering a number of problems which impede the development of the city, which is in need of a lot of study and consideration, where we found that the bulk of the samples preferred hiking more of the other paragraphs, indicating the willingness of citizens to cut long distances on foot and certainly due to the need for the citizen to encourage the preservation of the public health, but the fact reported the results of the other, where we found that a large proportion of the samples according to the lack of safe pedestrian sidewalks, which is part of the main streets in the city, and expect that this problem under the indiscriminate expansion of the city continued increase in the number of its inhabitants. As for the other problems to the sufferings of the citizens in the city of Kirkuk, is environmental pollution and pollution audiovisual noise where totaling the equivalent of 61% of the specific problems of the city. The results came on the extent of the application of the concept of the sustainable development with very high rates in terms of who with cabul said that a paragraph of the special places to throw the recyclable waste as non-existent this indicates the low level of awareness and services if compared to the extent of the development of other countries, in addition to the lack of green belts around the city to limit the dust storms coming from the south side, which is the type of desertification and the reduction of traffic jams, environmental pollution generated through the development of public transport. In terms of the dissemination of a culture of rationalization of electrical energy to discover that large percentages of samples seminar pointed to the existence of a clear failure by the local administration to maintain, universities, schools and through the education of students represented a sound awareness for energy, which in turn provides for future generations of natural wealth instead of the currently general exhaustion.

### **3 Results**

The analysis of the results of the questionnaire was run through to identify the most important problems of the city now and through what is expressed by the inhabitants of the city, according to the samples of the different categories of citizens: The absence of modern public transport in line with the evolution in this area. The absence of compatible streets and traffic volume at peak times. The lack of safe pedestrian walkways in the city streets, in line with the continuing population increase. The proportion of environmental pollution and noise, high in the city because of the perfect deal with accumulated waste in some areas of the city, in addition to traffic congestion resulting from the lack of sufficient expertise to resolve the crisis. There are no green belts around the city to limit the dust storms, which exposed the city in seasonal times of the year.

Table 1. The table on the distribution of the sample depending on different AGGREGATES: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of teachers The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
The Special variable By the age	Less than 30	12%	5%	16%	8%	10%	10.2%
	30-35	20%	16%	30%	25%	31%	24.4%
	35-40	26%	26%	20%	35%	35%	28.4%
	40-45	30%	30%	18%	21%	15%	22.8%
	> 45%	12%	23%	16%	11%	9%	14.2%
The Special variable Sex	Male	44%	60%	0%	100%	59%	52.6%
	Female	56%	40%	100%	0%	41%	47.4%
The Special variable The social situation	Married	81%	73%	65%	56%	69%	68.8%
	Single	19%	27%	35%	44%	31%	31.2%
The Special variable The Profession	Employees	100%	100%	100%	0%	100%	80%
	Employer	0%	0%	0%	100%	0%	20%
	Students	0%	0%	0%	0%	0%	0%
The Special variable The workplace (where The focus was on The center of the city	The Region East Timor On one hand the castle	0%	10%	0%	75%	0%	17%
	The Region Bank Quria Side	100%	90%	100%	25%	100%	83%
The Special variable Important Housing	The Region East Timor On one hand the castle	35%	25%	20%	30%	15%	25%
	The Region Bank Quria Side	65%	75%	80%	70%	85%	75%
The Special variable The scientific degree	Case Studies The Supreme	2%	50%	0%	0%	0%	10.4%
	B.s.	90%	50%	10%	15%	100%	53%
	Junior high schools	8%	0%	0%	40%	0%	9.6%
	The Institute	0%	0%	90%	0%	0%	18%
	Medium	0%	0%	0%	35%	0%	7%
	Primary schools	0%	0%	0%	10%	0%	2%
The Special variable	Have A car	40%	65%	25%	100%	55%	57%
	You do not have A car	60%	35%	75%	0%	45%	43%

Table 2. The special nature of the transport network in the city of Kirkuk: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
An assessment of the performance of the network Public transport	Excellent condition	0%	0%	0%	0%	0%	0%
	Good Condition	15%	5%	5%	20%	4%	8.8%
	Medium	20%	15%	20%	25%	15%	19%
	Poor quality	70%	80%	75%	55%	81%	72.2%
The assessment of the The streets and the extent of the Their incompatibility with the size of the Traffic in times of The Rush Hour	Conveniently located	30%	10%	25%	8%	25%	17.6%
	Not suitable	70%	90%	75%	92%	75%	80.4%
The maximum distance can be Walking Distance Toward the house	Km	(1-3)	(2-5)	(1-4)	(3-5)	(2-5)	(1-5)
Do you support the corridors The pedestrian corridors in The streets of the city	Yes	100%	100%	100%	100%	100%	100%
	Do not	0%	0%	0%	0%	0%	0%

Table 3. The special nature of the problems of movement and means of transport: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
A means of transportation That prefer Use	Your vehicle Private	30%	40%	20%	25%	30%	29%
	Taxi	10%	5%	15%	10%	10%	10%
	The bus	30%	15%	30%	30%	30%	27%
	Hiking	30%	40%	35%	35%	40%	36%
The time to waste Your Drive Daily	Minutes	(20-30)	(30-45)	(20-30)	(30-40)	(25.45)	The rate (20-45)
Do you encourage the use of Public transport	Yes	70%	80%	75%	60%	55%	68%
	Do not	30%	20%	25%	40%	45%	32%



Table 4. The special scale proposals for improving public transport: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
Any of the proposals More priority To improve public transport The variables	The minibuses Modern	20%	30%	35%	40%	25%	30%
	The dates Departure	10%	20%	20%	10%	15%	15%
	Create The positions of the Wait	10%	10%	15%	10%	5%	10%
	The price of the Low 0413	20%	15%	10%	20%	20%	17%
	The use of the Buses After Improved	10%	5%	10%	5%	10%	8%
	The development of the The Passage The 4th Infantry Division	30%	20%	10%	15%	25%	20%

Table 5. The table on the specific problems of the city: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
Any of the problems Which of the following Your city	Pollution The environment	30%	35%	35%	25%	30%	31%
	Pollution Audiovisual Noise	30%	25%	35%	40%	20%	30%
	The Streets Home Unsafe The pedestrian zone	30%	15%	20%	20%	25%	22%

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
	The absence of a The pavements Safe	15%	25%	10%	15%	25%	17%

Table 6. The Special criteria for the realization of the concept of sustainable development: [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the TRACY The University of Kirkuk	Airli School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
Is the equitable distribution of The Wealth of the city in The implementation of projects Development	Yes	60%	55%	40%	30%	60%	49%
	Do not	40%	45%	60%	70%	40%	51%
Is there places For the throw The recyclable waste	Yes	0%	0%	0%	0%	0%	0%
	Do not	100%	100%	100%	100%	100%	100%
Are there Seat Belts Green Takes The city to reduce Dust storms	Yes	0%	0%	0%	0%	0%	0%
	Do not	100%	100%	100%	100%	100%	100%
Do you have a culture of Energy rationalization Promote the use of Clean Energy.	Yes	30%	35%	20%	10%	20%	23%
	Do not	70%	65%	80%	90%	80%	73%
Do you support the City planning The redistribution of Service Facilities	Yes	70%	60%	45%	80%	50%	61%
	Do not	30%	40%	55%	20%	50%	39%

Table 7. The special problems of land use (slums in the city): [the researcher]

The variables	The age group	The staff of the Department of The water of Kirkuk	The staff of the Tracy The University of Kirkuk	School Teachers	The owners of Stores	The staff of the education Kirkuk	The total
Is there a mixture Between modern shops Workshops and housing In that one	Yes	90%	80%	85%	75%	70%	80%
	Do not	10%	20%	15%	25%	30%	20%
Does Mixing (Slums) between Housing and The uses Industrial development in your life Daily	Yes	100%	100%	95%	80%	90%	93%
	Do not	0%	0%	5%	20%	10%	7%

- **The Mechanism for the Application of the Standards and Principles of Sustainability in the Study Area**

After the analysis and the assessment of the most important problems of Kirkuk city from previous studies on the city and the questionnaire which was to be out of indicators that help in the process of developing criteria for the application of the concepts of sustainability in the region, in order to improve the environmental, physical reality, and this could be done through good planning and land uses and filled in the blanks, including incompatible with urban development and service in the world. The green spaces and pedestrian paths and the development of transport networks and urban buildings that met the criteria of sustainability, which in turn serve the residents of the city to maintain its wealth without draining. In order to achieve the desired objectives, it was necessary to develop strategies that can solve the problems on the ground, which in turn helps in the application of the standards and principles of sustainability in the city, even small proportions, where it. It is obvious that design operations and improvements in a short period of time the fact that the city suffers from accumulated problems over the past decades. In order to identify the most important problems of the city, it was necessary to reconsider the re-employment of land, where the practical must be integrated organization is inseparable from the planning process and public transport managed so as to provide the highest degree of reliability to reduce the phenomenon of traffic congestion resulting from private cars to citizens and encourage them to use public transport and thus provide a sustainable environment through the preservation of the environment and also helps to promote the national economy and savings of the monthly income of the citizen through the understanding and application of the most important principles of sustainable development in daily life.

- **One of the most important strategies that can be followed to achieve the goals of sustainability in the city of Kirkuk**

Through the findings of the study, since the questionnaire and the study of geography and history of the city, the Anf strategies and solutions for achieving the goals of sustainable development in the development of the city where:

1- The restructuring of residential neighborhoods and the environment through the review of its planning for compliance with the requirements of the society and the conditions for sustainability. This can be achieved in stages through the recruitment of the thought of Green Architecture because of its impact on human rights and the environment together and its role in the operation of the air and convert carbon dioxide to oxygen, the corrupt pure green architecture that meet people's needs and requirements of comfort, public health, and reduce costs and increase production capacity of humanity [11]. If we take the definition of Portland, the term- sustainable development is defined as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It must draw the conclusion that human settlements will need to work to achieve environmental sustainability in the context of sustainable development, and that green architecture is considered one of the modern trends in architectural thought which focuses on the relationship between the building and the environment, and the design of the buildings, the totalitarian entrance is the fact that all the resources or capacities must be taken into account if we are to achieve sustainable architecture [12]. The development of archaeological centers Kirkuk Castle czarist market in the old alleys and preservation of alnaftajia on cultural heritage sites and historical quarters, focusing on the importance of open spaces and natural landscapes including the maximum utilization of natural resources as private suffering from neglect and drought is the need to bring water to them. Creation of a green belt surrounding the city to increase the green areas and thus control the urban extension. And through the study of the Administrative Map of the city of Kirkuk, we found that it was possible to identify the areas around which we covered greenery and through the deliberate stages to work on the reduction of environmental pollution of the city, where the dust storms and monsoon season suffered by the city, as well as alleviate the hot climates of the city during the summer season. The tendency to reduce the use of vehicles through good planning and neighboring streets, especially in the center of the city so as to help the 4th infantry division on the move more freely in addition to encouraging the use of bicycles to preserve the environment, thus promoting the sustainable development based on the optimal design of streets and pavements and stop and wait. The redistribution of service buildings and all administrative departments of the State on the map of the city of Kirkuk, where it was noted to have the most government departments that had been deployed in the western side of the city without taking into account of the population density of residential areas, which old severe delays in areas without other city, especially at peak times.

#### **4 Conclusions**

1- There must be a comprehensive study to outline the foundation of the city of Kirkuk to be effective by adopting flexible policies to the people of the city of Kirkuk by officials of municipal services through the cover of related information base international standards for sustainable development, in order to achieve the desired goals in accordance with the principles of sustainability.

2. The largest role rests with the central government departments, namely the Department of the governorate of Kirkuk in coordination between the competent departments for the design and

development of the foundation of the city of Kirkuk, in particular, the planned municipal services and urban planning, water, sewage and electricity as well as to the circles of zuwarah urban planning in the county, the fact that the overall design process requires the interaction of these constituencies with some central supervision.

3- There must be involvement of academics and specialists to sustainable development programs of the university professors who have extensive knowledge with the world in this field and have the scientific research to develop the city according to the principles of the sustainable development.

4. Any design process for the planning of the city of Kirkuk should be characterized by flexibility so as not to tighten the noose on the expansion of continuing population increase, and exhausted the resources of the city in order to preserve them for future generations.

5- There must be more than a paragraph review of the comprehensiveness of the public transport both in terms of design or administrative standpoint, there are several problems in this side of where the streets and absorbed the special transport vehicles at peak times, passing through to the need to add infantry methods according to international specifications to encourage citizens to employ for their importance in maintaining public health and the environment.

6. It must be re-distribution of the sites of the government departments, the fact that the vast majority of the buildings of the Chambers are located on the west side of the city, which generated a severe traffic jams, especially in the early morning periods and the end of the official working hours as a result of the great momentum on the streets by private citizens.

7. The responsibility of the municipality of Kirkuk, the need to study the reforestation of open spaces available within the limits of the city of Kirkuk, and by the Permanent greens to provide a green belt around the city, like the rest of the world cities and sustainable development in order to reduce the dust storms.

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