

Traffic Density At The Main Entrances To The City Of Samarra

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Abstract

The research concludes that the population movement is the most important, especially within cities, by linking the relationship between the population and the nature of the geographical distribution of economic and service activities, as the movement of goods, goods and services from their sources to the places of marketing and use is no less important than the field of economic development and growth. It has no value unless it is available in the right place and time. This depends on the availability of advanced road networks in terms of flexibility, ease of communication and overcoming traffic jams.

The research aims to study and analyze the traffic density at the main entrances to the city of Samarra

It also aims to reveal the role of different land uses within the city of Samarra in increasing traffic momentum or traffic density at the main entrances to the city of Samarra. Daily morning and evening, and at times of religious events, when very large numbers flock to the city of Samarra.

Introduction:

The element of transportation is very important since the beginning of human life on the surface of the earth, as it was an accompaniment to humans in all stages that human life went through. It is one of the most important factors that helped the development of man and the prosperity of his civilization, so its importance is evident in its being one of the most important economic sectors that affect all other sectors tangibly and clearly in various environments alike and being one of the important human activities closely related to the place. Movement in the geographical concept is the product of spatial relationships. As the geography of transportation is one of the most important branches of the main economic geography, which is concerned with the study of the transportation network and its geographical distribution, as it is one of the most important elements of the necessary foundations for the process of economic and social development.

The population movement is the most important, especially within cities, by linking the relationship between the population and the nature of the geographical distribution of economic and service activities, as the movement of goods and services from their sources to the places of their marketing and use are no less important than the field of economic development and growth. Goods are useless and have no value unless they are available at the appropriate time and place. This depends on the availability of advanced road networks in terms of flexibility, ease of communication, and overcoming traffic jams. The research aims to study and analyze the traffic density at the main entrances to the city of Samarra, so the research took a scientific context represented in raising questions about the research problem and answering them, so the main research problem was formulated as follows:

Research problem-:

(What is the nature and size of the traffic density at the main entrances to the city of Samarra)

Branching from the main problem are secondary problems or secondary questions, as follows:

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- 1- Is there a spatial and temporal variation in the traffic jams at the main entrances to the city of Samarra?
- 2- Do the different land uses within the city of Samarra have an effect on the intensity of one movement into the city of Samarra?

Research hypothesis:

The research hypothesis is meant to temporarily answer the research problem, so the research hypothesis was formulated as follows:

(There is heavy traffic at the main entrances to the city of Samarra)

Research Objective- :

The research aims to reveal the role of different land uses within the city of Samarra in increasing traffic momentum or traffic density at the main entrances to the city of Samarra and the process of random import of cars offset by the narrowness of the basic design of the city's streets and the lack of bridges that absorb and drain the traffic density that occurs at the entrances to the city, especially during peak times Daily morning and evening and at times of religious occasions, when very large numbers flock to the city of Samarra.

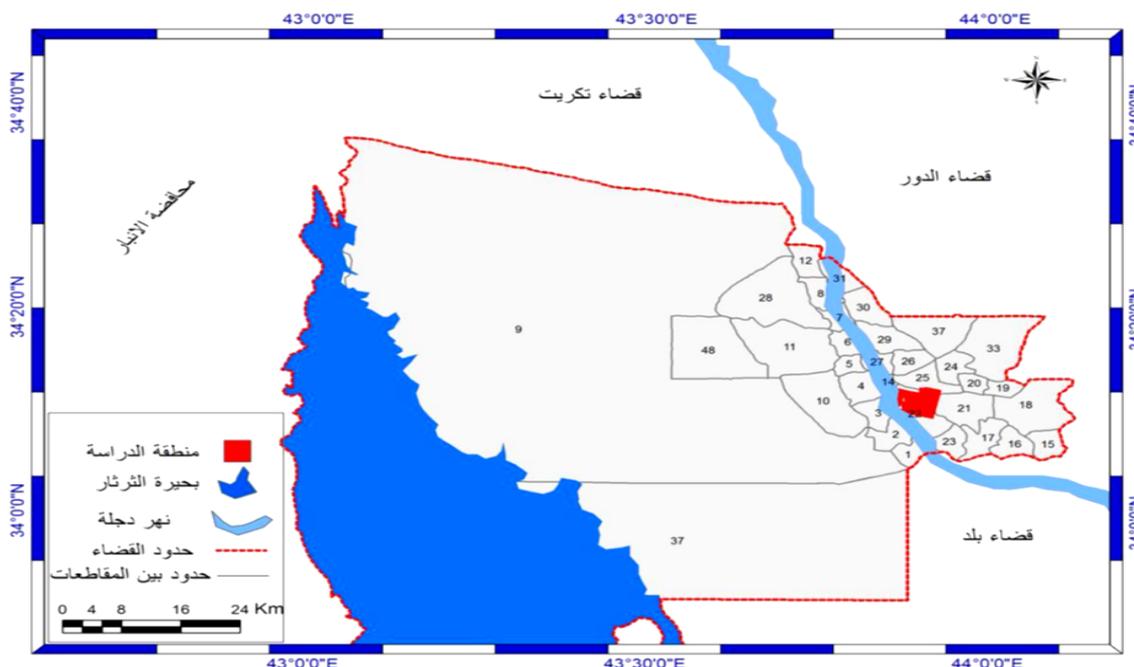
Research Methodology-:

The researcher relied on the on-site analytical method to detect the factors causing the traffic density at the main entrances to the city of Samarra.

Boundaries of the study area- :

The boundaries of the study area are the spatial and temporal research limits, which are represented by the reality of the different land uses within the study area on the traffic density at the main entrances to the city of Samarra,

The city of Samarra is located coordinates between two latitudes (34.50-34.57) north, and between longitudes (43.3-43.11) east, while its administrative borders are bordered to the north by the Tikrit district, to the northeast by the Dur district, to the west by Anbar province, to the east by the Dhuluiya district and to the south by the Balad district, map No. (1).



Source: From the work of the researcher based on the administrative map of Iraq at a scale of 1,000,000 and the map of the administrative province of Salah al-Din.

The relationship of traffic density at the main entrances to the city of Samarra with the distribution of uses different lands within the city:

The emergence and formation of the movement of transport are a result of the spatial relations between man and the nature of the distribution of different land uses within the spatial space:

1-Economic land uses:

Economic activities are defined as the effort that an individual makes to satisfy his needs or to obtain funds, goods and services .Economic activity is characterized by two types, one collective and the other individual, and the collective characteristic and mutual dependence between the individual and the members of the collective body with each other in their capacity as producers, and the bond of dependency also exists between the members of the collective body in their capacity as consumers.Economic activities and their spatial distribution have a close relationship with the intensity of traffic flow through the road network for any area or region (1),This is what we notice in the study area of the effect of the various land uses, including economic ones, in attracting transportation into the city through its three main entrances, as the city of Samarra thrives with various economic activities, and among these activities:

A- Commercial Activity :

Commercial activity is the economic activity that manifests itself in the form of the exchange of goods and services in society using different methods and between individuals until they reach the countries, it refers to organizations or commercial and industrial projects as it is used to refer to a specific sector of economic activity (2). The commercial activity in the city of Samarra is represented in three main areas: the dense commercial area, the medium-density commercial area, and the low-density commercial area, As there are shops within these areas for the trade of goods that are distributed into the study area through its three main entrances, especially the southern entrance located on the main road (Baghdad - Samarra). Which is witnessing momentum and high traffic density due to the flow of most of the commercial traffic of the city through this road or entrance, in addition to the entry of beneficiaries of commercial movement within the city from neighboring areas through the entrances to the different city, which also caused an increase in traffic density at the entrances to the city (3).

B _ industrial activity- :

Industrial activity is one of the most important economic activities whose location is chosen to achieve the optimal use of its elements to reach the possible costs (4)As industrial activity constitutes one of the important activities within the cities, and it is concentrated at the transport roads, central areas, planned industrial areas, and others. Often the planning of this use is affected by the mentality and outlook of the urban planner by a large percentage of the individual decisions of the owners of some industries in an important percentage in the Iraqi cities, which was reflected in a large number of errors and problems within the cities in terms of transportation, pollution, comfort and urban expansion (5).

The city of Samarra is one of the cities that witnessed a developmental movement in the field of industry. In addition to the governmental signature of industries within the city, the private sector played an important role in the prosperity of industry within the city.Industrial activity is one of the most important economic activities that affect the movement of transport.Where it is represented in the city of Samarra in the Industrial District Street, which represents the southern entrance to the city, which combines industrial activity and commercial activity related to industrial activity on the other hand.Which impedes the movement of transport at the main entrance to the city of Samarra, causing a high traffic density permanently.

C _ Tourism activity - :

Tourism is defined in language as multiplication in the ground, that is, moving from one location to another, whether in a specific country or region or around the world to obtain a specific need and far

from the place of permanent residence or business environment (6). Tourism is divided into two parts: internal tourism, which means the movement of people within the country itself, meaning the citizen of the country itself within the country, while the other section is foreign tourism, which means the movement of people to another country outside the borders (7).

The tourism activity in the city of Samarra is represented by two main parts: religious tourism, which is represented by the presence of the shrine of the two military imams, peace be upon them and Radwan, in the city of Samarra. Where very large numbers of visitors flock to this shrine, whether from inside or outside Iraq and on multiple occasions, which constitutes a huge traffic momentum at the main entrances, especially the main southern entrance to the city located on the road (Baghdad - Samarra), forcing those in charge of regulating traffic to discharge traffic through Street (50), which was newly established southeast of the city, which drains traffic to the streets around the city and then into the city in order to ease traffic density at the main southern entrance to the city, The other section of the tourist activity in the city of Samarra is the archaeological sites in the city, which are spread in the northeastern side of the city, where a small number of tourists flock to it and on holiday occasions, which do not cause traffic density, whether at the main entrances or within the city (8).

2-Service land uses:

Service activities, or what is known as the service industry, is one of the most important fields of industries that form part of the economy that is concerned with the production of services rather than tangible goods .As economists divide economic activities into two parts, namely (goods - services), where the commodity industry includes all products, whether agricultural, industrial, or mining, while the service industry includes everything else such as educational and health services, customer service, banking services (9), and other services. The educational and health services in the city of Samarra are among the most important services or main services affecting the traffic density at the main entrances to the city of Samarra, as follows:

A- Educational Services:

Education began a long time ago in prehistoric societies, where it was in the form of training young people for societies on the experiences and skills of that era in pre-writing societies, where it was done orally by telling stories that were passed on from one generation to another, But the perceptions of cultures expanded to more than just the skills back in formal education (10), The educational services in the city of Samarra are represented by various educational levels, including higher education represented by the University of Samarra, which includes many colleges such as the College of Engineering, the College of Education, the College of Islamic Sciences and the College of Applied Sciences, in addition to the College of the Great Imam of Islamic Sciences affiliated to the Sunni Endowment, in addition to secondary and preparatory schools, especially private schools. These educational institutions have a clear impact on the traffic density at the main entrances to the city of Samarra, due to the influx of large numbers of students to these educational institutions from outside the administrative borders of the city of Samarra to learn or study in these educational institutions, where the effect is clear on the traffic density, especially at the beginning and end of the morning hours. At noon, this is what is known as the peak time for transport and traffic.

B- Health Services:

Health services are defined as a set of services and public and private institutions provided by the state to take care of human health in its sector or within the private sector, and it includes all hospitals and health centers that provide services to the population (11.) Health services are represented by a group of hospitals and health centers that are located in the city of Samarra, represented by the Samarra General Hospital, Al-Hadi Hospital, and Dr. Jamal Hospital, in addition to the primary health care sector in the city of Samarra. These health institutions have an impact on

the traffic density at the main entrances to the city of Samarra, but in a small percentage, as residents of the outskirts of the city, in addition to residents of the neighboring areas of Samarra, and from all entrances and directions to the city of Samarra, flock to these health institutions. The impact of health institutions on transportation and traffic density is not limited to a specific time, as is the case with educational services at the beginning and end of working hours, but rather the length of time, Whether these health institutions are governmental or private health institutions, in addition to clinics, pharmacies, laboratories, ultrasound and resonance devices, and other health centers located within the city of Samarra.

Table No. (1) The most important service and economic institutions in the city of Samarra for the year 2022

Seq.	Company name	Enterprise type	sector type
1	samarra University	Service - educational	governmental
2	The Imam Aladahm College	Service - educational	governmental
3	Samarra General Hospital	Service - sanitary	governmental
4	Primary healthcare sector	Service - sanitary	governmental
5	Hadi Hospital	Service - sanitary	private
6	Dr. Jamal Hospital	Service - sanitary	private
7	Samarra Pharmaceutical Factory	Economical	governmental
8	Dubai Pharmaceutical Factory	Economical	private
9	Dijla Pharmaceutical Factory	Economical	private
10	Aswar Al Khaleej Pharmaceutical Factory	Economical	private

Source: - From the researcher's work, based on the field study.

Second: Analysis of the transport movement and traffic density at the main entrances to the city of Samarra

The development of the urbanization process in the world in its current form could not have taken place without the development of the process of moving space and various goods within and between cities (12) Where the movement of transport or the process of moving includes the movement of people, small cars, trucks, trains on railways, and other means of transport, and they move on public roads either individually or together with each other for movement or travel. Hence the importance of geography in studying the transportation factor within the city as one of the factors or uses that occupies an important position within the city, as the transportation factor within the city is linked to the study of traffic problems and movement of cars and roads, including congestion, traffic jams and difficulty of access. In addition to a statement of the impact of economic and service activities within the city of Samarra on the volume of traffic density at the main entrances to the city of Samarra, and from here came this survey to detect the gathering points of transport or traffic density and analyze them within the three main entrances to the city of Samarra.

1-Entrance to the city:

It is the spatial space through which entry is made to the geographical city block by moving from the international or regional transport axes surrounding or passing through it, by land, sea or even air, to the internal transport network and vice versa. Hence, this spatial space represents the most important urban element in the positive interaction with the one who comes to it and generating the impression he has of the beginning of entering the city and expressing to him as much as possible its identity and personality that distinguishes it from other cities and at the same time meeting the necessary needs of this guest when he is welcomed there. (13).

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2 Classification of traffic through the main interior of the city of Samarra:-

It is intended to study the classification of vehicle traffic and its distribution between small private cars and between (Starex) and light-duty vehicles, as well as heavy-duty vehicles that enter the city at specific times after being detected by the sonar device. The types of vehicles entering the city of Samarra will be classified through its three main entrances, and the extent of the variation in vehicle movement rates at each of the main entrances will be clarified, according to the enumeration times that the researcher made for the entrances to the city of Samarra during the hours of one day to reach the maximum traffic volume of vehicles witnessed at the entrances. And the confusion caused by heavy load vehicles to traffic, which negatively affects the elements of transport (driver - passenger - road - transported goods) (We notice through the inventory and spatial analysis of the entrances to the city of Samarra that there is a discrepancy in the number of vehicles according to the times of the inventory and the resulting momentum and traffic density because it is related to the official working hours and work in the service, economic and administrative institutions located in the city of Samarra. And we will show through Table No. (2), (3), and (4), the number of passing vehicles according to their classification through each of the entrances to the city of Samarra, as follows:

Table No. (2) Vehicle movement through the main southern entrance to the city of Samarra

Restriction times	small vehicles	%	Starex	%	light load	%	heavy load	%	the total
(7-12) noon	437	59	46	6.2	187	25.2	70	9.4	740
(1-5) in the evening	287	67.3	=	=	79	18.5	60	14	426
the total	724		46		266		130		1166

Source: - From the researcher's work based on the field study.

Table No. (3) Vehicle movement through the northeastern entrance to the city of Samarra

Restriction times	small vehicles	%	Starex	%	light load	%	heavy load	%	the total
(7-12) noon	189	49.7	17	4.4	160	42.1	14	3.6	380
(1-5) in the evening	57	46.7	=	=	65	53.2	=	=	122
the total	246				225		14		502

Source: - From the researcher's work based on the field study

Table No. (4) Vehicle movement through the eastern entrance to the city of Samarra

Restriction times	small vehicles	%	Starex	%	light load	%	heavy load	%	the total
(7-12) noon	215	65.7	27	8.2	67	20.4	18	5.5	327
(1-5) in the evening	97	83.6	4	3.4	15	12.9	=		116
the total	312		31		82		18		443

Source: - From the researcher's work based on the field study

3 -The main southern entrance to the city of Samarra:

The importance of the southern entrance and its acquisition of the first position in terms of the volume and intensity of traffic entering the city of Samarra is due to its connection to the main road (Baghdad - Samarra), which in turn is linked to the capital, Baghdad, in addition to its connection to the areas surrounding the city of Samarra, which represent districts and districts administratively affiliated to the Samarra district. As the residents of these areas take this road to reach the southern entrance of the city, through daily trips that include frequenting educational and health institutions, in addition to that most of the commercial movement that takes place within the city of Samarra enters through this entrance. This is not to mention the heavy traffic that occurs during religious visits to the city, where most visitors enter the city through this entrance.

Table No. (2) shows that there is a difference in the number of vehicles passing through this entrance from one hour to another, as well as in the type of vehicle, as we notice an increase in the number of vehicles entering the city of Samarra during the first hours of the day, especially at the morning peak time between seven o'clock and until o'clock From nine until twelve o'clock in the afternoon, to reach a climax of (740) vehicles for all types of vehicles. As for the number of vehicles after twelve o'clock in the afternoon until five o'clock in the evening, it reached a peak of (426)

vehicles for various types of vehicles, because most of the population starts their daily journey at the beginning of the day and for various purposes.

4-The northeastern entrance to the city of Samarra:

The northeastern entrance comes second in terms of the number of vehicles passing through this entrance because this entrance is connected with the district of al-Dur, in addition to its association with the agricultural region of the city located in the north-east of the city, because most of the traffic passing through this entrance is a journey of the residents of this region into the city to seek The necessities of life, whether service, health, educational or economic ,It includes marketing agricultural crops produced in this region to the city market to sell them. The interaction of the Al-Dur district with the city of Samarra is little compared to the city region. Table No. (3) shows that there is also a difference in the number of vehicles passing through this entrance from one hour to another, as well as in the type of vehicle, as we notice an increase in the number of vehicles entering the city of Samarra during the first hours of the day, especially at the morning peak time between seven o'clock and until twelve o'clock in the afternoon, to reach (380) vehicles and for different types of vehicles. As for the number of vehicles after twelve o'clock in the afternoon until five o'clock in the evening, they reached a peak of (122) vehicles for various types of vehicles, because most of the residents start their daily journey at the beginning of the day and for various purposes and requests for needs.

5-The eastern entrance to the city of Samarra:

The traffic through this entrance is no different from the northeastern entrance to the city in terms of the number of entering vehicles, as it ranked third in terms of the volume of traffic. This entrance connects the city of Samarra with the district of Dhuluiya from the eastern side, as this entrance has spatial relations with the place of the district of Dhuluiya, represented in the request for services Whether educational services or health services, as well as shopping trips for various goods and commodities ,In addition to the use of this entrance by the residents of the city's agricultural region, represented by Al-Mu'tasim district, which is administratively affiliated to Samarra district and the villages surrounding the city. Table No. (4) shows that there is a discrepancy in the number of vehicles passing through this entrance from one hour to another, as well as in the type of vehicle, as we notice an increase in the number of vehicles entering the city of Samarra during the first hours of the day, especially during the morning peak time and official working hours between the hours From seven to nine o'clock until twelve o'clock in the afternoon, reaching a climax of (327) vehicles for various types of vehicles. As for the number of vehicles after twelve o'clock in the afternoon until five o'clock in the evening, they reached a peak of (116) vehicles for various types of vehicles, for the same reason that the residents make their daily journey at the beginning of the day.

6-Traffic density through the main entrances to the city of Samarra:

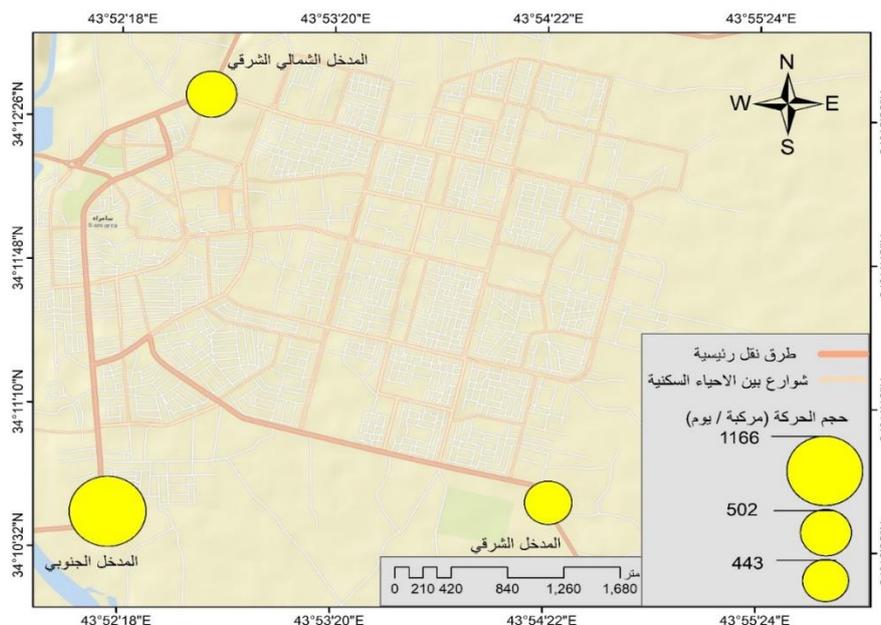
That the study of the density of transport traffic through the main entrances to the city of Samarra is to reveal the size of the daily rate of vehicle movement at each entrance on the one hand, Then reaching the extent of transportation efficiency at each entrance on the other hand, as it represents a good indicator that helps in spatial analysis and shows the dimensions of the spatial relationships between the main road network of entrances from a third hand. To obtain the size of the traffic density of vehicles, the researcher collected the number of vehicles entering through the main entrances to the city of Samarra, then divided them by the number of monitoring hours. Where we notice an increase in the volume and intensity of traffic through the southern entrance of the city, which recorded first place with a volume of traffic amounting to (1166) vehicles per day and a density of (106) vehicles/hour. As for the northeastern entrance to the city of Samarra, it came in second place, with a volume of traffic amounting to (502) vehicles per day, with a density of (45.6) vehicles/hour. As for the eastern entrance, it came in the third place, with a volume of traffic amounting to (443) vehicles, and a density of (40.2) vehicles/hour.

Table No. (5) The volume of traffic density at the main entrances to the city of Samarra from the hour (7 AM - 5 PM)

Seq.	Entry name	Traffic volume (vehicles/day)	Traffic intensity (vehicles/hour)
1	South entrance	1166	106
2	Northeast entrance	502	45.6
3	The eastern entrance	443	40.2

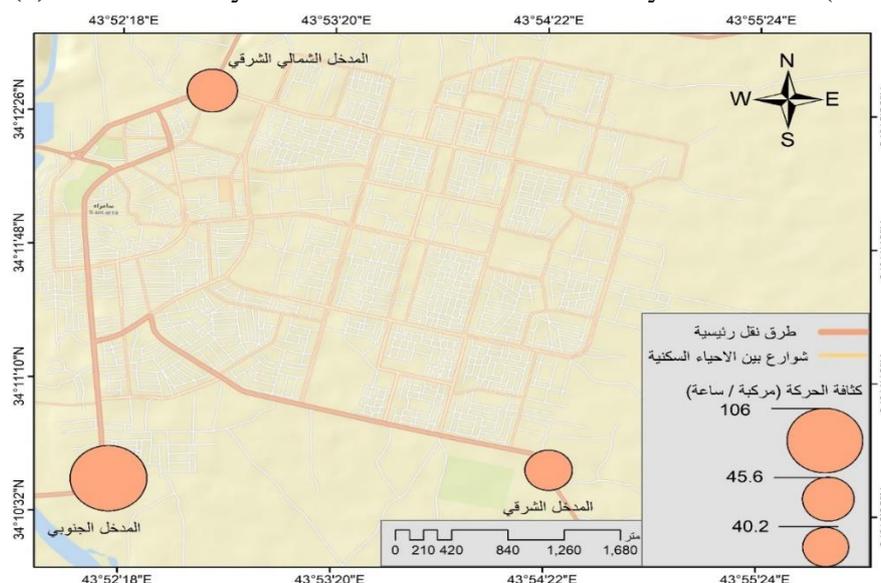
Source: - From the researcher's work based on Table No. (2) - (3) - (4).

Map No. (2) Traffic volume at the main entrances to the city of Samarra (vehicles / day)



Source: - From the researcher's work based on Table No. (5), and the outputs of the ARC GIS program

Map No. (3) Traffic density at the main entrances to the city of Samarra (vehicles / hour)



Source: - From the researcher's work based on Table No. (5), and the outputs of the ARC GIS program

7 -Problems facing transportation or traffic through the main entrances to the city of Samarra:

The problem of traffic or transportation, in general, means the inability of road users, pedestrians, drivers, or passengers, to move from one place to another at the appropriate speed or without exposure to accidents and environmental pollution, which causes severe damage to the national economy in various fields. The truth is that traffic studies are currently receiving a lot of attention in various countries of the world. This interest did not spring out of a vacuum but was born out of several considerations that made traffic problems of the age. From this consideration, the traffic problem is one of the most important problems that threaten human life, as well as the damage these problems have to the national economy, which represents the backbone of life.

The most important problems facing the transport movement through the entrances to the city of Samarra can be summarized as follows:

- A- The absence of a proper traffic design for all entrances to the city, which constitutes traffic congestion points, especially the southern entrance.
- B- the poor state of the structure of all the entrances to the city, led to a deterioration in the safety of vehicles and sometimes reluctance to enter the city.
- C- The low capacity of all the city's entrances, especially the northeastern entrance and the eastern entrance, in terms of accommodating the volume of traffic flow.
- D- the absence of traffic operating systems and traffic technical requirements for all entrances to the city.
- E- Overcrowding in the number of small, light-carrying, and heavy-carrying vehicles at the same entrance and for all entrances.
- F- the absence of bridges working to drain and relieve traffic congestion from the city to the outside and vice versa, which led to the occurrence of traffic jams at all entrances.
- G- The presence of security controls led to traffic congestion at all entrances to the city.

Results:

1. Through the field study, the researcher concluded that the main southern entrance ranked first in terms of the number of vehicles entering the city of Samarra, due to its connection to the main road (Baghdad - Samarra) and its connection to the city's region.
2. The researcher also found that the other entrances to the northeastern and eastern city have increased traffic, but at a lower rate than the southern entrance, due to its connection to secondary roads, the first road (Samarra - Al-Dour) and the other road (Samarra – Dhuluiya)
3. The lack of traffic systems and the poor condition of the road at all entrances caused traffic jams, especially the southern entrance.

Recommendations and suggestions:

- Improving the condition of the main entrances to the city in terms of road construction, road width, and traffic regulations for operating these entrances.
- Transforming the southern entrance corridor to the city of Samarra and removing it from the commercial activity of the industrial district in the city because of its impact on the occurrence of traffic jams.

Conclusion

Results :-

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