

CHAPTER ONE

INTERODUCTION TO RESEACH

1.1 Background

Khartoum is the national capital and the heart of the Republic of Sudan, where more than a quarter of the country's population lives. Thousands of villagers come to it each year to seek services and find works, making the city densely populated, causing increased pressure on resources and infrastructure, especially the transport sector, made this city constantly suffering from traffic congestion.

The traffic system in Khartoum, especially the study area, suffers from many problems despite the efforts of the local authorities to solve this problem, but traffic congestion remains a real problem that needs studies and research to solve them. These problems are the large number of cars brought to this city in the middle of the millennium, old urban planning, poor infrastructure, unstudied traffic plans, The location of study area between the Blue Nile and the White Nile in the Eastern and Western, railway facilities in the south, the concentration of health, education and commercial services in this site, has made it attractive to citizens who come to this area with their cars, causing traffic congestion.

Developed countries have used many techniques and methods to avoid or reduce the problem of traffic congestion, such as the use of tunnels and high roads and direct guidance to drivers to avoid the crowded areas.

The aim of this research is to study traffic congestion in Khartoum city to identify the causes of this problem and solve it by analyzing and processing its elements using GIS.

1.2 Related studies: There are some researches that dealt with this subject, but this research benefited from the possibilities of geographical information systems (GIS) and their programs in production of smart map, and focused on the elements causing traffic congestion to identify the

most road affected by this elements, and in a different way from the previous studies, Here are some research titles that dealt with topics related to the subject of this study .

Traffic congestion in the heart (Khartoum) Causes and treatment. Prepared by (Affan 2009) University of Khartoum.

Study the Characteristics of Traffic and Transport in Central Khartoum and its Impact On Traffic congestion,(Elias).

1.3 Boundary of the study area: Study area is located in the north of Khartoum city between the Blue Nile on northern and White Nile in the western side and railway in the southern and east. The study area located between the three main cities Khartoum, Khartoum North and Omdurman. Between longitudes 32 29 37.24 and 32 32 43.65, and latitude 15 36 44.75 and 15 36 47.52

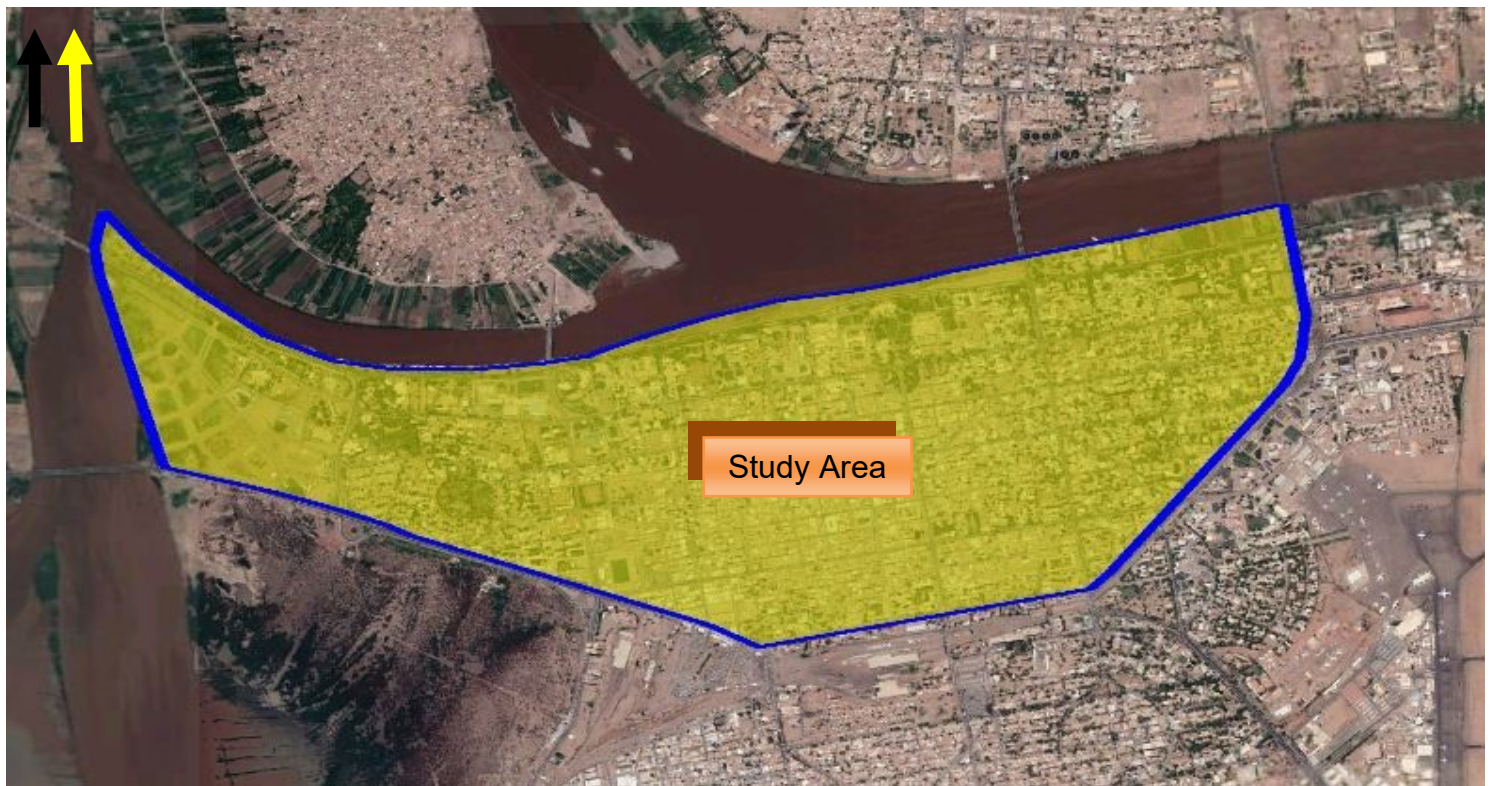


Figure (1.1): Sketch show the Boundary of Study Area

1.4 Problem Statement: The citizens of Khartoum use public and private transport as an easy way to reach their destinations and work, but the Khartoum city Center (Trade Zone) has become a heavy burden for all those wishing to enter or cross because of the accumulation of thousands of cars in this area where long queues of cars are moving slowly, Especially in the morning and afternoon. People find themselves stranded for long periods in the streets in order to reach their work in the morning and increase the suffering in the afternoon after an exhausting working day and sometimes when temperatures rise, leading to a violation of traffic rules and wasting time and fuel. All these reasons invite us to study this problem, to devise solutions that may eliminate or at least reduce the waste of effort, time and energy and try to stop this suffering.

1.5 Objectives of the Research:

The objective of this research is to study traffic congestion in Khartoum city center using Geographical Information System GIS by:

1. Create base maps showing roads and buildings of the study area.
2. Study of traffic rules in the region (road directions, lengths, capacity and traffic signs).
3. Determining the influential factors of traffic such as Status of roads, service organizations, pedestrian traffic, commercial markets and car stations.
4. Determining the entrances and exits of the region and provide knowledge of efficiency and absorptive capacity.
5. Preparation of car counts within the regain
6. Processing and analysis of data gathered using GIS technique to gain access to Immediate and future solutions.

1.6 Research Contents: This research contains six chapters, Chapter one: Introduction to research where we discussed the importance and reasons for choosing this topic. Chapter Two:

Literature review, where the issue of traffic congestion, its causes and effects, and experiences of other countries in solving this type of problems and the contribution of GIS in spatial and statistical analysis were discussed. Chapter Three: Study area and methodology. Chapter Four: Data Analysis. Chapter Five: Results. Chapter six: Conclusion and Recommendations. There is one attachment (Maps).