



Sudan University of Science & Technology
College of Graduate Studies

Submitted for Fulfillment of M. Sc. Degree in Civil Engineer

**Comparative Study of Traffic Safety and Geometric
Design of Roads in Khartoum and Abu Dhabi**

سلامة الطرق المرورية والهندسة الجيومترية

دراسة مقارنة لطرق الخرطوم و ابوظبي

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DONATION

To the spirit of the Holy Prophet, first teacher's for the human, our master Mohammad bin Abdullah peace be upon to him .

To all souls of the victims who died in traffic accidents, especially, my especially, my brother / Yasser Mohammed Ibrahim.

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يلعب التصميم الهندسي دورا مهما فى زيادة السلامة المرورية للطرق وعليه لابد ان تتوافر فيه خصائص معينة وهذا ماتبحث عنه الدراسة بصورة اساسية مع م مقارنة ذلك بالمعمول به فى دولة الامارات العربية المتحدة مع التنبيه على دور الادارة الجيدة للمرور فى خفض الحوادث المرورية

ففي مرحلة تصميم الطرق نجد انه من المهم جدا إقامة التناغم بين العنصر البشري وعنصر التصميم الهندسي وادارة المرور وعلى الرغم من أن العامل البشري ، ويشمل السائق والراكب والمشاة ، له دورا بارزا في حدوث الحوادث المرورية في الطريق أو قد تكون مجموعة من العوامل اشتركت في حدوث الحوادث. ومع ذلك ، فإن السيطرة على عامل الطريق أسهل بكثير من العامل البشري و ذلك، من خلال جعل التصميم الهندسي جيد وذلك للتعويض من عوامل اخرى ، وبالتالي انخفاض عدد الحوادث المرورية. وهذا يجعل من الواضح أنه من أجل إقامة سلامة الطريق ، من المهم زيادة الاهتمام بالتصميم الهندسي وتحديد مواصفات خاصة لأي طريق. والهدف من هذه الدراسة هو صياغة المبادئ الأولية لمواصفات الطرق في السودان ، والعمل على وضع مواصفات خاصة لإدارة المرور ، والتنبيه على أهمية العلامات المرورية واثر غيابها فى حدوث الحوادث المرورية. في هذه الدراسة ،الباب الأول شكل المقدمة لهذه الدراسة واستعرض أهداف الدراسة ومنطقة الدراسة وطرق جمع المعلومات لهذه الدراسة والصعوبات المتعلقة بهذه الدراسة

والباب الثاني شكل الأساس النظري لهذه الدراسة وذلك باستعراض العوامل المؤثرة في التصميم الهندسي والمتعلقة بالسلامة المرورية وأنواع الطرق وتقسيماتها.

تم إجراء الدراسة وذلك بأخذ عناصر التصميم الهندسي على الطرق والخصائص في الاعتبار ، والحوادث التي حدثت فى الطريق ويتم إعطاء تفسيرات عن كيفية تقديم تصميم هندسي جيد امن،

وتم إيضاح الأسباب المحتملة في حدوث الحوادث وطرق معالجتها الهندسية وكيفية إجراء التحليل الهندسي للحدث وهذا ما تمت مناقشته فى الباب الثالث.

ووضح جليا أن هناك تأثير لإدارة المرور على حدوث الحادث كوجود العلامات المرورية وهذا ما تضمنه الباب الرابع.

كما تم عمل التوصيات اللازمة بعمل المواصفات الخاصة للطرق السودانية وإجراء التحليل الهندسي للحوادث واقتراح بحوث مستقبالية كبحث المواصفات الخاصة للطرق السودانية وهذا ما تمت مناقشته في الباب الخامس.

ABSTRACT

Geometric design plays an important role in increasing the traffic safety on roads. In order to be the case, there must be certain characteristics available and this what the study has been discussing mainly, with a comparison that doing in the United Arab Emirates with the alarm on the role of good management of the traffic to reduce . traffic accidents

In the design phase of the roads we find that it is very important to establish harmony .between the human element , element of geometric design and traffic management In spite of that the human factor, including the driver , the passenger and the pedestrian, has a prominent role in the occurrence of traffic accidents on the road or may be a combination of factors involved in the occurrence of accidents . However, to control the roads factor is much easier than the human factor and that, by making .good geometric design, to compensate for other factors This makes it clear that in order to establish the safety of the road, it is important to increase attention to the geometric design and limited particular specification of any . road

The aim of this study is to formulate the initial principles of the Sudanese specifications roads.

work on developing specifications for traffic management and alert to the , importance of traffic signs and the impact of their absence in the occurrence of traffic .accidents

In this study, the first chapter form introduction provided for this study , reviewed the objectives of the study , the study area , methods of collecting information for the study and difficulties of this study

Chapter form the theoretical basis for this study by reviewing the factors influencing the geometric design and safety-related traffic and the types of roads and subdivisions.

Study was carried out by taking the elements of geometric design on the roads and properties in mind, accidents that have occurred in the roads and we are given explanations on how to make good safe geometric design. We were clarify the possible causes of occurrence of accidents and ways to address engineering and how to conduct engineering analysis of the incident and this is discuss in chapter third..

Its has been clear that there is the impact of traffic management

on the occurrence of the accident as the existence of traffic signs as the existence of the optical reflector and this is set forth in Chapter IV.

We make recommendations as necessary to the work in specifications of the roads in Sudan and to conduct engineering analysis of accidents and

to propose future research as Inquiry specifications of the roads in Sudan and this is what has been discussed in Chapter Five.

TECHNICAL TERMS

ABBREVIATION	MEANS
AASHTO	American Association of State Highway and Transportation Officials
NCHRP	National Cooperative Highway Research

	Program
FHWA	Federal Highway Administration
GIS	Geographic Information System
GPS	Global Positioning System
CBR	California Bearing Ratio
AADT	Annual Average Daily Traffic
TRL	Transport Research Laboratory
AASHO	American Association of State Highway Officials
AC	Average Curvature
HF	High Frequency
NVC/L	Number of Vertical Curves per km
NHC/L	Number of Horizontal Curves per km
PA	Porous Asphalt
HDM	High Density Macadam
DBM	Dense Bitumen Macadam
HRA	Hot Rolled Asphalt
MIS	Management Information System
ITS	Intelligent Traffic System
UTC	Urban Traffic Control
CCTV	Closed-Circuit Television
VMS	Variable Message Signs
SMS	Short Message Service
TCC	Traffic Control Center
TVR	Traffic Violation Recording
TCS	Traffic Counting Stations
U, A, E	United Arab Emirate
RAI	Road Accident Investigation
GPRS	General Packet Radio Service

TABLE OF CONTENT

Item	Page No
Dedication	I

Acknowledgment	II
ملخص البحث	III
Abstract	IV
Technical Terms	V
Chapter One INTRODUCTION	1
1.2Traffic Accident	2
1.3 Target Study	3
1.4The Studies Area	4
1.5 Case Study	5
1.6Collecting data	6
1.7Difficulties	7
Chapter Two The theoretical foundation	8
2.1Over View	9
2.2Factors affecting geometric design	9
2.3 Basic geometric design	11
2.4 Road classification	13
2.5High way alignment	14
2.6Pavement design	19
2.7 Element contribute to the safety of irrigate	20
2.8 Relation between geometric design and safety	25
2.12 Analyses	27
2.13 Previous studies	29
Chapter three Research methodology	30
3.2_Standard geometric design for Sudan	31
3.3TRAFFIC SIGNAL CONTROL	39
3.4Traffic account at the entrance Khartoum-Omdurman	40
3.6Standard geometric design for U.E.A	54
3.7Traffic Control Center	59
3.8 Inventory of traffic at the entrance to Abu Dhabi	63

3.9 Comparisons	72
3.10 <i>Types of highway</i> in both countries	78
3.11 Most important factors causing the incidents	84
Chapter Four ANALYSIS AND DISCUSSION	88
4.1 Analysis and discussion	89
4.2 Methods of treatment used in the Sudan and the United Arab Emirates	92
4.3 Procedures to handle incidents Proposal	95
4.4 Proposal Processing program Black Sites	98
Chapter Five CONCLUSION AND RECOMMENDATIONS	85
5.1 Conclusion	100
5.2 Recommendations	101
5.3 Proposed future research	101
<i>Reference</i>	102
APPENDEX A: PHOTO FROM SUDAN ROAD	104
APPENDEX B: PHOTO FROM UNITED AREB EMIRATE ROAD	110
APPENDEXC: Some Official Work Paper	116

LIST OF TABLES	Page No
Minimum stopping sight distances or rural and urban local roads and street will adhere to the value in Table 3.1	32
Corner sight distance for rural and urban local roads and streets will meet the minimum requirement of table 3.2	33
Minimum Width of Lanes And Shoulder for Rural Local Roads table 3.3	33
Minimum Clear Zone Distances (in feet from edge of traveled lane) for Rural	34

principal Arterials table3.4	
Table 3.5 Maximum Grade for Rural Local Roads	35
Table 3.8 show the traffic account in Alengaze bridge	40
Table3.9 show the percentage of Traffic Movement for all side	41
Table 3.10 show the number and details of accident in all road in Khartoum State	42
Table 3.11 show the distribution of the way in the interchange	48
Table3.12 show the number for accident in the Sudan from 2002-2009	49
Table3.13 show the Public transport vehicles involved in the incidents of death	50
Table 3.14 show the Public transport vehicles involved in incidents of serious harm	51
Table 3.15 the Public transport vehicles involved in incidents of harm from simple	52
Table 3.16show the Comparison of annual license types for the years 2002 -2003 -2004	53
Table3.17 Decision Sight Distance in Khartoum	54
Table3.18 Decision Sight Distance in Abu Dhabi	55
Table3.19 Maximum Super elevation Rates	56
Table3.20 Standards For Curves Radius	57
Table3.20 Maximum Super elevation Rates	52
Table 3.21 SHOULDER WIDTH STANDARDS	58
Table 3.22TRAFFIC COUNTS FOR Entrance of Abu Dhabi DECEMBER 2008	63
Table 3.23 classification of car in the entrance of Abu Dhabi	63
Table 3.25 NO OF ACCIDENT IN AIRPORT ROAD 2007	64
Table 3.26 NO of accident in Abu Dhabi- Alain 2007	66
Table3.27 the main cause of accident	69
Table 3.29 show the number of license from2005-2008	72
Table3.29 show the Summary of Survey shows the amount of road traffic safety in Sudan and U.A. E Participants were divided into age groups	73
Table 3.30 Comparison between the Khartoum and Abu Dhabi roads in the terms of infrastructure	76
Table 3.31 show the number of accident in tow State	77

Table 3.32 show the type of location and percentage of accident in tow State	80
<i>most important factors causing the incidents Table 3.33</i>	84
Table 4.1 Data required for accident and safety measure in rear end and collision in the signal intersection	95
Table 4.2 Measurements reverse the lack of public safety degree crashed tended to	96
Table4.4 show Rear end collisions in the non-signal intersection	97

LIST OF FIGURE	Page No
Figure 2 -1 Foundation Design Process	20
Figure 3.1 show the percentage of movement in all side	42
Figure3.1 show the percentage of hurt people from 2002-2009	50

Figure3.2 show the number of accident in Khartoum from2002-2009	50
Figure3.3 show Public transport vehicles involved in the incidents of death	51
Figure 3.4 show Public transport vehicles involved in incidents of Serious harm	52
Public transport vehicles involved in incidents of harm from simple Figure 3.5	53
Comparison of annual license types for the years 2002 -2003 m -2004 m Figure 3.6	54
Figure 3.7 show traffic account in Abu Dhabi	64
Figure 3.8 show the increasing of accident in Khartoum and Abu Dhabi	78
Figure 3.9 show the location and Percentage of Accident in tow Countries	81