

THE STUDY OF TRAFFIC CONGESTION IN BARAKE-
MAIDAN ROAD, KABUL, AFGHANISTAN

BY

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ABSTRACT

One of the most complicated and challenging issue facing Kabul is the traffic congestion. It makes the life in Kabul uncomfortable for people. In Kabul, development in the number of roads and transportation infrastructure is not enough to fulfil the rapid increase in the number of vehicles. There are many reasons behind the issue of traffic congestion in Kabul such as intersections, non-designated bus stops, illegal parking and street vendors. There were other factors that also contributed to traffic congestion in the city such as vehicle growth, population growth, not following the traffic laws, Very Important People movement (government officials), movement of people on the road and to some extent improper drainage system (during snowy and rainy seasons). All these factors lowered the road capacity, disturbed the traffic flow and led to traffic congestion. In this dissertation the study of traffic congestion (causes, effects, and preventive strategies) was done in Barake – Maidan road to find out the traffic volume, level of services and to figure out the possible solution to the issue of traffic congestion. Level of services was calculated based on the Maximum Volume/Capacity Ratio and Maximum Service Flow Rate ($P_c/l/h$). Therefore, the level of services in Barake-Maidan road based on traffic counting was B in Barake Traffic Road, Old Taimani-Saleem Karwan road and Saleem Karwan- Shaheed road and C in Traffic-Old Taimani road and Shaheed-Maidan road. The traffic counting was done in order to find out the traffic volume in peak hour and non-peak hour, then it was converted to passenger car equivalent. Also, the questionnaire survey was also done to better understand the cause and effects of traffic congestion in Kabul. Finally, recommendations are put forward to improve the road capacity and maximize the traffic flow.

خلاصة البحث

يعد الازدحام المروري من أكثر المشكلات تعقيداً وتحدياً ، والتي تواجه كابل وتجعل الحياة فيها غير مريحة للناس. إن التطور الحاضر في عدد الطرق والبنية التحتية للمواصلات في كابل غير كافٍ لتلبية الزيادة كابل مثل السرعة في عدد المركبات. هناك العديد من الأسباب وراء مشكلة الازدحام المروري في التقاطعات ومحطات الحافلات غير المخصصة ومواقف السيارات غير القانونية والباعة الجائلين. هناك عوامل أخرى تساهم أيضاً في الازدحام المروري في المدينة مثل زيادة عدد المركبات ، والنمو السكاني، وعدم اتباع قوانين المرور، وحركة ذوي الشأن والمرتبة العالية في الدولة، وحركة المشاة، وإلى حد ما نظام الصرف الصحي غير المناسب وخاصةً خلال المواسم الثلجية والممطرة. كل هذه العوامل قللت من سعة الطريق، وأدت إلى اضطراب حركة المرور و الازدحام المروري. في هذه الرسالة، يتم دراسة الازدحام المروري (الأسباب والتأثيرات والاستراتيجيات الوقائية) في طريق بركة-الميدان، لمعرفة حجم المرور ومستوى الخدمات، وإيجاد الحلول الممكنة لمشكلة الازدحام المروري. تم حساب مستوى الخدمات بناءً على الحد وعليه فإن مستوى الخدمات (Pc/l/h) الأقصى لنسبة الحجم/ السعة، ومعدل تدفق الخدمة الأقصى في طريق بركة - الميدان بناءً على إحصاء حركة المرور كان (ب) في طريق براك ، وطريق تيماني - سليم كروان القديم، وطريق سليم كروان - الشهيد، وطريق ج في حركة المرور - طريق تيماني القديم، وطريق الشهيد - ميدان. تم حساب حركة المرور من أجل معرفة حجم حركة المرور في ساعة الذروة وغير ساعة الذروة ، ثم تم تحويلها إلى ما يعادل سيارة الركاب أيضاً، تم إجراء الاستبيان أيضاً لفهم أسباب وآثار الازدحام المروري في كابل بشكل أفضل. وفي النهاية، يتم تقديم توصيات لتحسين سعة الطريق، وزيادة تدفق حركة المرور.

ABSTRACT IN BAHASA MALAYSIA

Salah satu masalah yang paling rumit dan mencabar yang dihadapi Kabul adalah kesesakan lalu lintas. Ini menjadikan kehidupan yang tidak selesa bagi penduduk di Kabul. Di Kabul, pembinaan jalan yang banyak dan infrastruktur pengangkutan tidak mencukupi untuk memenuhi jumlah kenderaan yang meningkat dengan pantas. Terdapat banyak sebab di sebalik isu kesesakan lalu lintas di Kabul seperti persimpangan, perhentian bas yang tidak terancang, tempat letak kenderaan haram dan peniaga jalanan. Selain itu, terdapat faktor-faktor lain yang turut menyumbang kepada kesesakan lalu lintas di bandar seperti penggunaan kenderaan yang meningkat, pertumbuhan penduduk, penduduk yang tidak mengikut undang-undang lalu lintas, pergerakan Pegawai Kerajaan (VIP), pergerakan orang di jalan raya dan sampai ke tahap tertentu sistem saliran yang tidak diselenggara (semasa musim salji dan hujan). Semua faktor ini memburukkan kapasiti jalan, mengganggu aliran lalu lintas dan menyebabkan kesesakan lalu lintas. Dalam disertasi ini, kajian kesesakan lalu lintas (penyebab, kesan, dan strategi pencegahan) dilakukan di jalan Barake - Maidan untuk mengetahui jumlah lalu lintas, tahap perkhidmatan dan untuk mengetahui kemungkinan solusi untuk masalah kesesakan lalu lintas. Tahap perkhidmatan dikira berdasarkan Nisbah Volume / Kapasiti Maksimum dan Kadar Aliran Perkhidmatan Maksimum ($P_c / l / h$). Oleh itu, tahap perkhidmatan di jalan Barake-Maidan berdasarkan pengiraan lalu lintas adalah B di Jalan Trafik Barake, jalan lama Taimani-Saleem Karwan dan jalan Saleem Karwan dan C di jalan Laluan-Old Taimani dan jalan Shaheed-Maidan. Penghitungan lalu lintas dilakukan untuk mengetahui jumlah lalu lintas pada waktu puncak dan bukan waktu puncak, lalu ditukar menjadi setara dengan kereta penumpang. Selain itu, tinjauan soal selidik juga dilakukan untuk lebih memahami sebab dan kesan kesesakan lalu lintas di Kabul. Akhirnya, cadangan dikemukakan untuk meningkatkan kapasiti jalan raya dan memaksimumkan aliran lalu lintas.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Urban and Regional Planning.

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Supervisor

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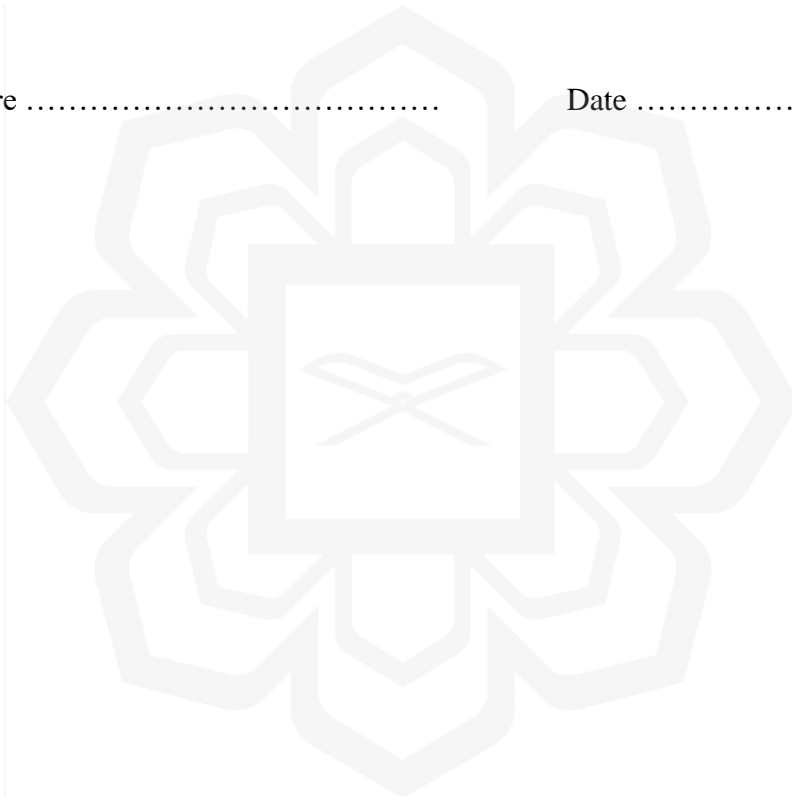
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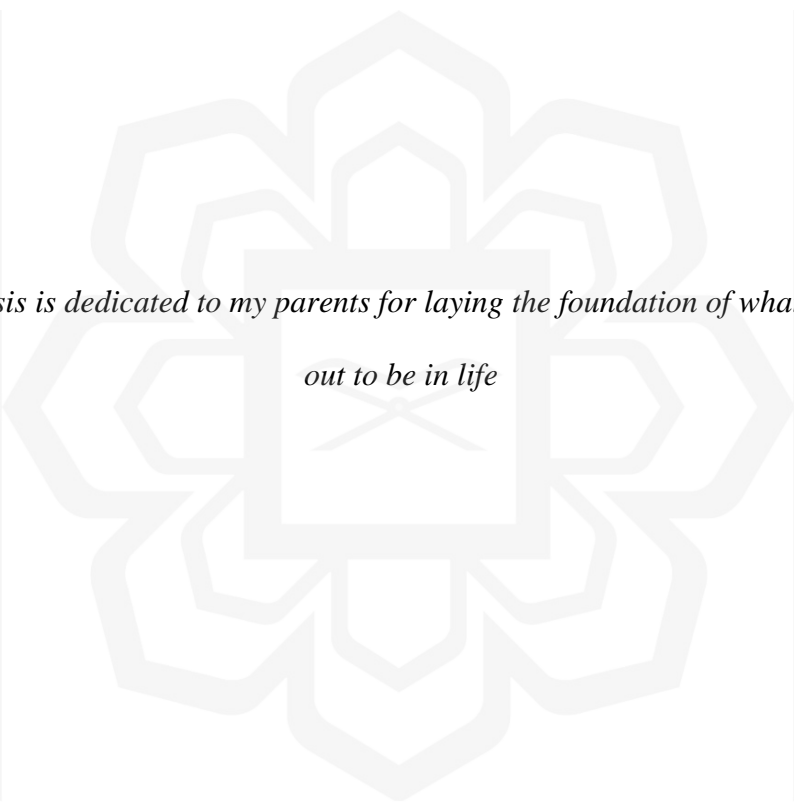
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*This thesis is dedicated to my parents for laying the foundation of what I turned
out to be in life*

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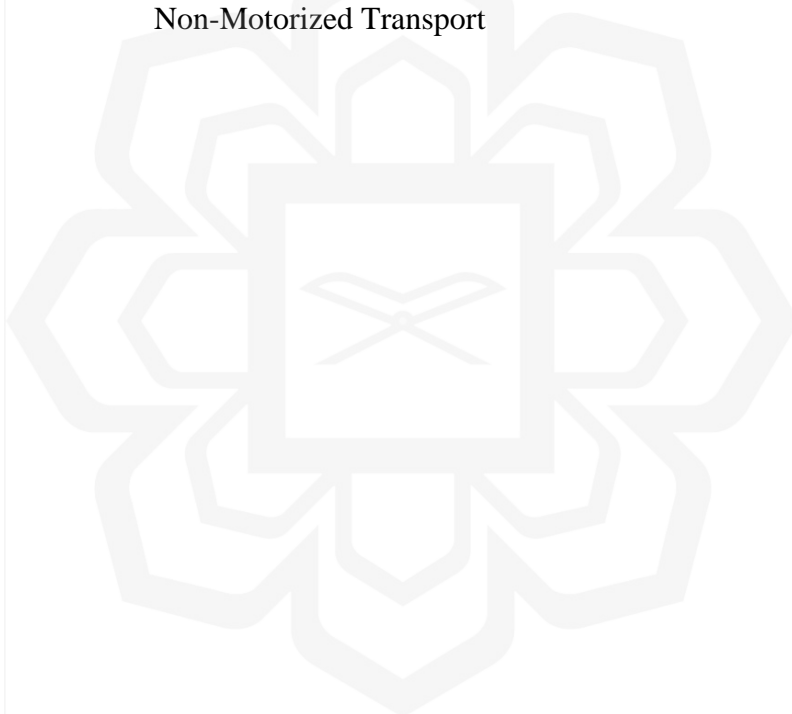
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LIST OF ABBREVIATIONS

MUTCR	Managing Urban Traffic Congestion Report
ITF	International Transport Forum
WHO	World Health Organization
CNN	Cable News Network
SW	Salaam Watandar
VTPI	Victoria Transport Policy Institute
UNWPP	United Nation World Population Prospects
MEN	Ministry of Economy of Netherlands
IRIN	Integrated Regional Information Networks
UDA	Urban Development Authority
CMRSP	Colombo Metropolitan Regional Structure Plan
CMR	Colombo Metropolitan Region
NMT	Non-Motorized Transport



CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This thesis focuses on the traffic congestion in Barake - Maidan road, Kabul, since it is one of the major issues faced by Kabul's residents. Road congestion happens when the road system cannot accommodate the traffic volume at the reasonable speed. Traffic congestion affects the social well-being, reduces growth in the economy and deteriorates the environment.

Within this chapter (theoretical and conceptual) research framework is introduced for the general understanding of the research. This covered the introduction of the thesis and the needs for the study. The chapter will then describe the research goals and objectives, as well as the methodology used for this study. In this chapter the scope and limitation of the research is defined to ensure a comprehensive research direction based on a clearly defined research methodology.

1.2 BACKGROUND

Traffic congestion is a common transportation-related phenomenon, especially in the cities. Road congestion typically happens as demand exceeds the road 's capacity or the intersection. Road congestion would frustrate travelers and get them into rage on the streets. According to Managing Urban Traffic Congestion Report (MUTCR) (2007), traffic congestion refers to any physical phenomena that are connected to circumstances or behaviors that impede vehicles from passing. Traffic jams also refers to inability to travel (Immobility) (International Transport Forum,

2007). Traffic congestion usually occurs where the road network would be unable to accommodate traffic volumes at a reasonable speed and where there is dispute between the various modes of transport like cars, trucks, buses and minivans (Sadaat & Lukumwena, 2018).

Bruton (1982) stated that road congestion generates inconvenience and psychological issues (anger, anxiety and mental trauma) which may clash with the driver's attention on the road and causes incidents. To summarize, road congestion is a global problem that not just impacts the flow of vehicles and persons but also severely impacts air quality and social well-being.

1.3 PROBLEM STATEMENTS

1.3.1 Huge Number of Vehicles in Kabul Has Led to Higher Transportation Cost and Time

Along with quick urbanization and huge population growth after the 2001 United States (US) occupation of Afghanistan, Kabul's level of traffic has increased substantially (Rasmussen, 2017). Therefore, this has made a massive environmental, economic, and social issues for both the residents and the government. The huge volume of traffic and weak traffic control has resulted in higher transportation expenses and time; this is due to the fact that vehicles use much of its gas to accelerate or deaccelerate when caught in traffic jams as well as the precious amount of time wasted on the street when trapped in traffic congestion. Traffic congestion has therefore generated an economic and environmental issues for the citizens of Kabul, and also for the government (Rasmussen, 2017).

1.3.2 Huge Number of Vehicles in Kabul Resulted in Air Pollution

Air pollution is the mixture of solid gases particle in atmosphere (World Health Organization, 2000). This combination contains vehicle emission, factory chemicals and dust. A huge component of air pollution is gas (Carbon dioxide, Carbon monoxide, Radon, etc.) (World Health Organization, 2000). It produced by combustion of fossil fuels, coal, and petroleum used in vehicle and production of energy. Vehicles such as cars, buses, planes, trucks, and so on are among the major sources of air pollution. Air pollution causes health effects such as cardiovascular diseases respiratory diseases, and even death (World Health Organization, 2000).

According to Sadaat and Lukumwena (2018), the Ministry of Health in 2009 carried out a survey, the survey result showed that the blood test of 80 percent of 200 Kabul citizens contained lead. Among neighboring capitals, Kabul has the most polluted air and one of the worst in the region. According to Rahman and Nsenda (2018), Cable News Network (CNN) carried out an investigation report on five worst cities for air pollution, the report included a statistic showing that Kabul is the world's third worst city in the world for air pollution.

1.3.3 The Huge Volume of Traffic in Kabul Has Generated Noise Pollution

Pollution is the product of modern lifestyle. The annoying sounds of vehicles, power-generators, machines of the factories, and even the noise created by people on the street, are all part of the noise pollution (Salam Watandar, 2018). In Kabul noise pollution mainly come from the loud sound of music in public transport, shops and restaurants, the loud horns of all types of vehicles and the loud shouting of street vendors (Salam Watandar, 2018).

One of the most serious and pervasive sort of noise pollution in Kabul comes from vehicles. Traffic noise in Kabul seems to have become a major problem because of inadequate urban planning in the past, and quick motorization, rapid population growth and urbanization. According to Salam Watandar 2018, traffic volume increased noise pollution beyond the expectations of Kabul 's early city planners. Noise pollution is one of the major environmental contaminants that citizens of Kabul face in everyday life.

1.4 RESEARCH QUESTIONS

Below are the questions that were addressed.

- i. What is the congestion level in Barake – Maidan road?
- ii. What are the factors reducing traffic flow in Barake-Maidan road?
- iii. How to lower traffic congestion in Barake- Maidan road?

1.5 GOAL

The goal of this thesis is to find out the traffic volume, level of services and causes of traffic congestion in Barake - Maidan road.

1.6 OBJECTIVES

Below are the main objectives of this thesis:

- i. To determine the volume of traffic in Barake – Maidan road.
- ii. To assess the level of services in Barake – Maidan road.
- iii. To propose solutions to decrease the congestion level in Barake – Maidan road.

1.7 SCOPE OF STUDY

In order to accomplish the goals and objective, several scopes of study need to be covered. This work will extensively concentrate on the traffic volume and level of congestion in Barake – Maidan road to propose a reasonable solution to alleviate the traffic congestion issue in Barake – Maidan road.

1.8 SIGNIFICANCE OF STUDY

1.8.1 Significance Towards Department of Traffic in Kabul Municipality

The results of this paper are useful to either the government and agencies which are involved in road in building and developing the road infrastructure. The results of this study can also help the Kabul municipality to properly design and construct the road networks. It would further enable them to develop rules and regulations both for eliminating traffic congestion and improving road services.

1.8.2 Significance Toward society

This work would raise community understanding of factors leading to traffic congestion so that they might take action to minimize the issue. Moreover, this would also raise public understanding of the environmental and economic effects of traffic congestion. In terms of economy, road infrastructure boost both the economy of the specific areas and the country. To sum up, Barake – Maidan road will make the living quality better at its proximity with improved capacity, better traffic flow and infrastructure.

1.9 PROCEDURE AND STRUCTURE OF RESEARCH

This thesis is organized into five chapters and the procedure was carried out according to the structure and stipulated timetable. This segment highlights the research's structure. Thus, the framework is mentioned below with a brief description concerning the research.

1.9.1 Chapter 1: Introduction

The introduction of this research project is described in the first chapter. The problem statements which outlined the need for the study are stated in this section too. Research questions were subsequently formulated based on the question raised by the problem statement. Goal and objective were designed to direct the author in carrying out the work. Within this section, the scope of study is explained to direct the reader to the aspects covered in this work.

1.9.2 Chapter 2: Literature Review

Chapter two focuses on literature reviews that is the theoretical section of the thesis. Different perspectives from experts were analyzed at this stage. In addition, definitions and terminology related to the issue were explained too.

1.9.3 Chapter 3: Research Methodology

A discussion on the research methodology of the study is presented in this chapter, the subjects, research tools, technique of sampling, Data Collection procedure and statistical treatment which would be used for precise data interpretation and analysis.