THE EFFECT OF TRAFFIC COMPOSITION ON EGYPTIAN ROAD SAFETY

A Thesis

Submitted to the Faculty of Engineering - Ain Shams University

in Partial Fulfillment

of the Requirements for the Degree of

Master of Science

in

Civil Engineering

Public Works

Road and Traffic Engineering

Prepared by

Eng. AMIRA FARID MOHAMMED FODA

B.Sc. in Civil Engineering, June 2008

Faculty of Engineering - Ain Shams University

Supervisors

Prof. Dr. Hassan Abd El-Zaher Hassan Mahdy
Professor of Highway Engineering
Faculty of Engineering, Ain Shams University, Cairo, Egypt

Prof. Dr. Khaled Anwar Kandil
Professor of Highway Engineering
Faculty of Engineering, Ain Shams University, Cairo, Egypt

Dr. Hamdy El-Sayed Ibrahim
Assistant Professor of Highway Engineering
Faculty of Engineering, Ain Shams University, Cairo, Egypt

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Thesis Approval

Examiners Committee	**Signature**

Prof. Dr. Issa Abd- Allah Sarhan
Tenured Professor of Highway and Traffic Engineering.
Faculty of Engineering, Ain Shams University

Prof. Dr. Abd- Allah Hassan Wahdan
Professor of Transportation Planning and Traffic Engineering.
Dean of Faculty of Engineering, El-Azhar University

Prof. Dr. Hassan Abd El-Zaher Hassan Mahdy
Professor of Highway Engineering.
Faculty of Engineering, Ain Shams University

Date : …… / …… / 2013

Faculty of Engineering

Public Works Department

Curriculum vitae

Name:	Amira Farid Mohammed Foda
Date of Birth:	30/07/1985
Place of Birth:	Cairo, Egypt
Nationality:	Egyptian
University Degree:	B.Sc. in Civil Engineering, June 2008, Faculty of Engineering, Ain Shams University
Current Job:	Transportation Technical Office Group Leader at Madinaty Project, Alexandria Construction Company, Talaat Mostafa Group.

STATEMENT

This thesis is submitted to Ain Shams University, Faculty of Engineering for the degree of Master of Science in Civil Engineering.

The work included in this thesis was carried out by the author in the department of Public Works, faculty of Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

Date: …… / …… / 2013

Signature: ……..

Name: Amira Farid Mohammed Foda

DEDICATION

First of all, my full thanks and gratefulness to ALLAH for his continuous blessings, great help, guidance, and support since the start of my life until now, and I pray to him to continue his infinite great generosity until the end of my life.

I have spent years from my life working hard to accomplish this thesis in honorable scientific level as much as possible, and now I wish to dedicate it with my deepest gratefulness to my mother, whom encouraged, helped, and supported me along my life with her continuous love, patience, and optimism.

I wish to dedicate it also to my father`s soul with my deepest gratitude and I hope that I have become as he wished.

Finally, I would like to dedicate it to my sister and my brothers with my special thanks and gratitude for their love, encouragement, and valuable help.

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ABSTRACT

In recent years, the annual rising number of traffic accidents is becoming a major problem in Egypt. It makes the situation of road traffic safety more and more severe. So, Egypt is in a great need to find how to control this severe situation and finding the appropriate countermeasures to be taken to improve road traffic safety by preventing or at least by reducing road traffic accidents.

Road traffic accidents result from the disorder of the complex dynamic road traffic system, which consists of people, vehicles, roads and environmental conditions. This study introduces traffic accidents prediction model with respect to vehicles factor, without considering the other three factors of people, roads and environmental conditions.

After collecting traffic data from Traffic Police Department, Ministry of Interior in Egypt, this study carries out quantitative statistical analysis of these data and finally, explores a linear regression between the number of road traffic accidents and the road traffic composition, and another linear regression between the number of road traffic accidents and the accidents vehicles types.

The collected traffic data represents the situation of traffic accidents and traffic composition in Egypt during the period from 2006 to 2010. Quantitative statistical analysis is carried out for finding the correlation between the number of road traffic accidents and the number of licensed vehicles of different types (passenger cars, trucks, buses, motorcycles, etc.). After finding this correlation, some types of vehicles which have a significant correlation with the number of road traffic accidents are chosen for building the linear regression model between the number of road traffic accidents and the traffic composition. Data processing is mostly done by Excel and SPSS.

As a case study, quantitative statistical analysis is carried out for the collected traffic data of Cairo – Suez Highway and Cairo – Alex Desert Highway in Egypt which represents the number of road traffic accidents, the accidents vehicles types, the number of fatalities, and the number of injuries during the period from 2010 to 2011.

The quantitative statistical analysis found the correlation between the number of road traffic accidents and the accidents vehicles types (passenger cars, trucks, buses, motorcycles, etc.). After finding this correlation, some types of accidents vehicles which have a significant correlation with the number of road traffic accidents are chosen for building the linear regression model between the number of road traffic accidents and the accidents vehicles types.

With the same sequence, the quantitative statistical analysis found the correlation between the number of each of fatalities and injuries and the accidents vehicles types (passenger cars, trucks, buses, motorcycles, etc.). After finding this correlation, some types of accidents vehicles which have a significant correlation with the number of each of fatalities and injuries are chosen for building the linear regression model between the number each of fatalities and injuries and the accidents vehicles types. Data processing is mostly done by Excel and SPSS.

According to the found linear regression between the number of road traffic accidents and the traffic composition fro Egyptian roads, the found linear regression between the number of road traffic accidents and the accidents vehicles types, and the found linear regression between the number of each of fatalities and injuries and the accidents vehicles types Cairo – Suez Highway and Cairo – Alex Desert Highway in Egypt, this study will give some advice to the relative administration authorities, which can help for the improvement of the situation of road traffic safety in Egypt.

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