



Evaluation and Improvement of Multi-Lane Arterial Highway in Iraq

By:

Ahmed Hadi Mahmood

Supervisor:

Prof. Dr. Basim K. Jrew

**This Thesis was submitted in Partial Fulfillment of the
Requirement for the Master's Degree of Engineering Project
Management (E.P.M)**

**Faculty of Engineering
Isra University**

May, 2018

Isra University

Authorization Form

I, Ahmed Hadi Mahmood, authorize the Isra University to supply copies of my thesis to libraries, establishment or individuals on request, according to the Isra University regulations.

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DEDICATION

*This work is dedicated to my parents Eng. Hadi M. Abraham, Sabeeha K,
Joud and Shaema M. Naif.*

*All I have and will accomplish in my life would be impossible without their
love and sacrifices.*

*Also, this work is dedicated to my brothers and sisters who have been a great
source of motivation and inspiration.*

*Finally, this work is dedicated to my beloved wife Zahra M. Qaes who have
been a great source of motivation and inspiration.*

ACKNOWLEDGEMENT

I would like to give my sincere thanks and appreciate to my supervisor Professor Dr. Basim K. Jrew for his great and continuous encouragement, catalytic guidance, unfailing support and patience. He has been available at all times, giving direction and support to ensure the success of this work, I wouldn't have done it without him.

I would like to thank Eng. Hussein Abdul Kareem, Eng. Ali Abdul Rahman, Eng. Mustafa Ahmed Musa and Eng. Omar Khameas for providing me all necessary information that was helpful in accomplishing this work.

At the end of my thesis, I would like to thank all those people who make this thesis possible.

Abstract

EVALUATION AND IMPROVEMENT OF MULTI-LANE ARTERIAL HIGHWAY IN IRAQ

By: Ahmed Hadi Mahmood
Supervisor: Prof. Dr. Basim K. Jrew

Transportation industry is basically a service sector component. It is of great importance to traffic engineers and planners to understand and evaluate the quality of service provided by transport facilities. Highway Capacity Manual (HCM), with all its revisions since 1950, is the pioneer document in this area. It quantifies the concept of capacity for a transport facility and lays the foundations for estimating the level of service (LOS) being provided by that facility to its users.

This thesis is an engineering project management study. It is about evaluation and improving multi-lane highways in Iraq. The research study was conducted on one main multi-lane highway in Baghdad, including: Al- Dora intersection to Al- Rashid interchanges, where this highway is considered as a major highway with high volume traffic in Iraq.

Highway Capacity Software (HCS 2010) program software was used to evaluate and improve the level of service and traffic conditions for the highway for existing conditions (year of the study-2018), short-term conditions (2023) and mid-term conditions (2028). Evaluation shows that all segments are operating at LOS E or LOS F for existing conditions, short-term conditions and mid-term conditions.

The segments that operated at LOS E or LOS F for existing, short-term and mid-term conditions improvements are suggested by modifying the geometric and traffic conditions and changing the highway to a freeway facility; in order to operate at better LOS. Management flow diagrams were prepared for decision makers to be a guide for future planning programs.

Keywords: Highway Capacity, Highway capacity manual (HCM 2010), Multi-lane Highway, Expressway (Basic freeway facilities) in Iraq, Level of Service (LOS), Highway Capacity Software (HCS, 2010).

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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
LOS	Level Of Service
PHF	Peak Hour Factor
PHV	Peak Hour Volume
TRB	Transportation Research Board
PCE	Passenger Car Equivalent
EPM	Engineering Project Management
NB	North Bound
SB	South Bound
FFS	Free Flow Speed
ATM	Active Traffic Management
HV	Heavy Vehicles
ASTM	American Society for Testing and Materials
PCU	Passenger Car Unit
Mc Trans	Microcomputers in Transportation
FHWA	Federal Highway Administration
NCHRP	National Cooperative Highway Research Program
AWSC	All-Way Stop-Controlled
TWLTL	Two Way Left Turn Lane
RV	Recreational Vehicles
TWSC	Two-Way Stop-Controlled

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