بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Cairo University
Faculty of Regional and Urban Planning

INTEGRATION OF GEOINFORMATICS TECHNOLOGIES AND ECONOMETRICS APPROACHES FOR ENVIRONMENTAL IMPACT ASSESSMENT: TRAFFIC NOISE

by

TAREK ZAKI AHMED ABOU EL SEOUD

A dissertation submitted in partial fulfillment of the
Requirements for the degree of

DOCTOR OF PHILOSOPHY
IN
REGIONAL AND URBAN PLANNING

Supervision Committee

Prof. James Strathman
Professor of Urban Studies & planning - Portland State University, USA

Prof AbdAlla El-Erian
Professor of Urban Design
Faculty of Regional & Urban Planning – Cairo University

Prof. MohamedReda Haggag
Assoc.Prof of Basic Sciences
Faculty of Regional & Urban Planning – Cairo University

2005

Cairo University
Faculty of Regional and Urban Planning

INTEGRATION OF GEOINFORMATICS TECHNOLOGIES AND ECONOMETRICS APPROACHES FOR ENVIRONMENTAL IMPACT ASSESSMENT: TRAFFIC NOISE

A dissertation submitted by Tarek Zaki Ahmed Abou El Seoud
in partial fulfillment of the Requirements for the degree of
DOCTOR OF PHILOSOPHY IN
REGIONAL AND URBAN PLANNING

Examination Committee

Prof. Nadia Saber El Boghdady
Professor of Architecture and planning
Faculty of Engineering
Alexandria University

Prof Maher Moheb Estino
Professor of Urban Design and Dean
Faculty of Regional & Urban Planning
Cairo University

Prof. James Strathman
Professor of Urban Studies & planning
School of Urban planning
Portland State University, USA

Prof AbdAlla El-Erian
Professor of Urban Design
Faculty of Regional & Urban Planning
Cairo University

Prof. MohamedReda Haggag
Assoc.Prof of Basic Sciences
Faculty of Regional & Urban Planning
Cairo University

ABSTRACT

An abstract of the dissertation of Tarek Abou El Seoud for the Doctor of Philosophy in Regional and Urban Planning presented March 2005.

Title: Integration of Geoinformatics Technologies and Econometrics Approaches for Environmental Impact Assessment: Traffic Noise

This dissertation deals with the prediction/valuation phase of environmental impact assessment (EIA). The research develops a predictive approach to examine traffic noise in the Portland metropolitan area by the integration of geoinformatics technologies: geographic information systems (GIS), global positioning systems (GPS), and intelligent transportation systems (ITS). These technologies serve as a tool to process the input data and to analyze the spatial characteristics of the results. The main prediction calculations are carried out in the traffic noise model developed by the U.S. Federal Highway Administration (FHWA TNM). The solution described here integrates the whole process into one compatible efficient framework. At the same time, using the advantages of geostatistical tools of GIS and GPS technology, the research develops a calibration model for the application of the FHWA TNM to the Greater Cairo area using traffic noise field measurements.

The research also introduces and illustrates econometrics approaches for traffic noise economic valuation, among which are hedonic pricing and contingent

valuation which the study applied to the monetary valuation of traffic noise in Portland and Greater Cairo. The research develops a hedonic model for the property values of the free market in the Portland metropolitan area. The research also develops a contingent survey and a logit model for the prediction of willingness to pay to reduce traffic noise in the Greater Cairo area.

These econometrics approaches combined with geoinformatics technologies allow us to better understand and forecast how changes in traffic noise levels influence human behavior in both Portland and Greater Cairo. The research addresses some of the more serious shortcomings in past research on the prediction/valuation phase of traffic noise EIA and in general in the economic analysis of natural resource management, environmental management, and environmental policy analysis.

Dedicated to the souls of
my father and my mother

ACKNOWLEDGEMENTS

This work was carried out from 2000-2004 at the Faculty of Regional and Urban Planning (FRUP), Cairo University and the College of Urban and Public Affairs (CUPA), Portland State University (PSU), USA. The research was financially supported by the Egyptian government.

I am deeply grateful to my American supervisor Professor James Strathman, director of the Center for Urban Studies at PSU, who provided excellent conditions, candid support, and encouragement during my 2 years of work in Portland from 2003-2004.

I owe my warmest thanks to my Egyptian supervisors Professor Abdalla El-Erian and Professor Reda Haggag for their valuable advice and criticism and for introducing me to scientific research.

I would also like to acknowledge with much appreciation Victoria Gilbert, the budget and personnel manager of CUPA, for her support and handling all my financial and administrative issues. My sincere thanks are due to Hilary Russell, the editor of the Journal of the American Planning Association (JAPA), for her detailed review and excellent advice during the preparation of this thesis.

During these years, the support of Professor Rob Bertini and the ITS lab at PSU have been extremely valuable. I give my special thanks to the Academic Research Computing (ARC), especially to William Garrick, the ARC manager, for his support and for all my colleagues in the ARC and ITS lab.

I cannot leave Portland without mentioning Dr. Tom Kimpel, Ahmed El-Geneidy, Mahmoud El-Gohary, Rania Wasfy, Jaturapat Bhiromkaew, Arlene Brockel, Tracy Braden, and Denise Duncan. Without your support and friendship, I would not have been able to simultaneously explore Portland and myself.

Finally I wish to express my loving thanks to my family--my wife and my three super kids Logy, Marwan, and Mazen--for their support and encouragement.

Portland, March 2005 Tarek Abou El Seoud

TABLE OF CONTENTS

TITLE PAGE