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CAIRO UNIVERSITY

FACULTY OF URBAN AND REGIONAL PLANNING

URBAN DESIGN DEPARTEMENT

**‘WALKABLE CITY’**

**Assessing Walkability of Major Urban Thoroughfares of Cairo**

*- Pedestrian quality needs system approach -*

By

FEKRIA SALAH EL-BIALY

A thesis submitted in partial fulfillment of the  
requirements for the degree of M.Sc. In  
URBAN DESIGN

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Supervised by:

**Dr. Abbas EL-Zafarany**

Professor of Architecture & environmental  
Planning  
Cairo University

**Dr. Aboulfetouh Shalaby**

Associate Professor of Urban & Regional  
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**Arch. FEKRIA SALAH EL-BIALY**

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Committee in charge:

Prof. Maher Estino  
Prof. Hisham Gabr  
Prof. Abbas Al zafarany  
Prof. Aboulfetouh Shalaby

## STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted for a degree or diploma at any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Faculty of urban and regional planning

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**Fekria Salah El-Bialy**

And has found that it is complete and satisfactory in all respects, and that all revisions required by the final examining committee have been made.

Committee Members:

**Dr. Maher Estino**

Professor of urban & landscape design,  
Cairo University

**Dr. Hisham Gabr**

Professor of Architecture,  
Cairo University

**Dr. Abbas Al Zafarrany**

Professor of Architecture & environmental Planning,  
Cairo University

**Dr. Aboulfetouh Shalaby**

Associate Professor of Urban & Regional Planning,  
Cairo University

## DEDICATION

*I have always looked up to you, and I continue to be awed by your talents as you raise our family. You have contributed irreversibly to the person I have become. Mom and Dad, I cannot thank you enough.*

*...This is for you, I love you.*

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## SUMMARY OF THE RESEARCH

The presented research deliberates the model of the 'Walkable city'; particularly assessing walkability of major urban thoroughfares of Cairo. Four main segments of study procedures are used to configure this research: 1) A theoretical framework based on literature review, 2) Methodology for answering the research questions, 3) Field and pedestrian surveys for gathering information, 4) Discussion and conclusion due to study findings.

The theoretical framework involves two chapters; 1) Chapter **one**; Understanding walkability, It presents the concept of 'walkability' examined in various contexts from multiple perspectives and levels, and discusses its importance as a paradigm shift for urban development. The pedestrian quality needs approach as a framework for addressing walkability is described. And an investigation of what constitutes a walkable community and what factors influence walkability within various settings. Dimension of measuring walkability, techniques and tools are discussed; however, this research entails 'street-level' scope and precisely studying micro scale features affecting walkability along local urban thoroughfares using a developed audit tool for local application. Also, a number of global practices presented to provide practical achievements; where Specific Case studies were selected and described in details. 2) Chapter **Two**; Challenges and opportunities, In this chapter two dimensions for recognizing future prospects for walkability in local community are discussed. First, 'Challenges'; represent in current policy, design, or environmental obstacles; and 'Opportunities' for overcoming such impediments. These two scopes are presented in order to formulate a framework for possible interventions, and practical actions, towards improvement of walkability in the Egyptian context.

In chapter **three**; Methodology of the research describes the followed strategy for answering three main questions: 1) How walkable are the thoroughfares of Cairo? 2) What is the pedestrian level of services provided along thoroughfares of Cairo? And 3) How local pedestrians Perceive the walking environment of thoroughfares of Cairo? An environmental auditing methodology is followed; using a developed walkability assessment form that is applicable to the local context. This form covers a number of physical attributes and variables - to be assessed - which influence the quality of the walking environment. On the other hand, A Community street review, and a random sample interviews have been prepared for capturing perceptions of actual users of the thoroughfares.

Chapter **Four**; Assessing walkability in Abbas Al-Akkad thoroughfare, presents the assessment of walkability through two main areas of analysis; First, the analysis of the Physical conditions of the thoroughfare. Second; the analysis of local pedestrian's perception towards the walking environment. The scope has been analyzing street scale (micro level) walkability by investigating; pedestrian infrastructure, level of services, common trade-offs and areas of improvements. It includes field observations, Pedestrian questionnaire, street review forms, and photo documentation. Discussion for the main findings argues the contrast between theoretical framework of walkability, and its application within the local context.

Finally, Chapter **Five**; Conclusion of the research based on theoretical and empirical studies is presented. It illustrates the current strengths, weaknesses, and opportunities related to walkability of local thoroughfares of Cairo. As well as, the reflection of it on international discourse. Following, a number of recommendations and suggestions for future research are proposed.





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*“For routine physical activity, no element of the urban environment is more important than streets; this is where active travel to work, shop, eat out, and engage in other daily activities takes place, and where walking mostly occurs”. EWING 2005*

## ABSTRACT

The pedestrian environment is a critical element of the urban experience. How it is being structured, and how this can influence 'Walkability'; "the extent to which built environment is pedestrian friendly", is an area of increasing interest within the planning, transportation, environmental, and public health fields.

Creating good Pedestrian environment requires understanding of the characteristics of walking activity, the built environment adjoining pedestrians, as well as their needs, abilities, and opportunities for walking. Only if we understand these 'system' properties are we able to create appropriate institutional and design frameworks, develop good policies, build and maintain adequate facilities for more walkable environment. Hence, acquire *the pedestrian quality*.

In his book *Great Streets*, Allan B. Jacobs, explains the importance of pedestrian facilities (Jacobs 1993), and how 'Complete streets' approach conducts "Walkability". However, Evaluation of the factors that influence this marker requires further extension than just the physical boundaries of the street geometry. This study explores how walkable our thoroughfares are, how they sustain pedestrian needs and level of services, and what key interventions are required to reach *the pedestrian quality*.

A comprehensive approach for walkability along urban street corridors; based on a broad literature and best-practice review and combination of its conceptual and applicable aspects, is to be demonstrated on two different, but compatible environmental scales: macro and micro.

## KEY WORDS

Walkability- active transport- Walking behavior- pedestrian- pedestrian level of services- pedestrianism- new urbanism- smart growth- Walkability audit tool- walkability index- walkable communities- accessibility- traditional neighborhood design- complete streets- community street review- physical activity.

## ACRONYMS

AQ	Area Quality Assessment
CSR	Community street review
CSS	Context sensitive solution
CS	Complete street
PLOS	Pedestrian level of service
GWI	Global walkability index
HCM	Highway capacity manual
IN	Inventories Of Environment
LD	Estimating Latent Demand
NEWS	Neighborhood Environment Walkability Scale
NOA	Needs, Opportunities, and abilities model
PEQI	Pedestrian environmental quality audit tool
PEDS	Pedestrian Environmental data scan
POD	Pedestrian environment development
PPM	Pedestrian performance measure
RQ	Route Quality Assessment Tools
SPACES	Systematic pedestrian and cycling environment scan

## LIST OF TERMS

<b>Audit</b>	An instrument used by an observer to rate or score the physical environment
<b>Built Environment</b>	Refers to the presence and interaction of attributes related to land use, urban design, and the transport system
<b>5C's layout</b>	Five criterion of walkable communities; Connected, conspicuous, convenient, comfortable, and convivial.
<b>Context zones</b>	A classification of urban contexts into discrete types, ranging from lower to higher density and intensity of development.
<b>Crosswalk</b>	A facility that is marked off on a road to indicate where pedestrians should cross, generally at an intersection
<b>Convivial</b>	The extent to which walking is a pleasant activity, In terms of interaction with people, the built and natural environment, and other road users
<b>Conspicuous</b>	The extent to which pedestrian routes and public spaces feel safe and inviting for pedestrians
<b>Convenient</b>	The extent to which the walking mode able to compete with other modes of transport in terms of efficiency (in time, money, and space)
<b>Environmental quality</b>	an environment of high quality conveys a sense of well-being and satisfaction to its population through characteristics that may be physical, social or symbolic
<b>Land use mix</b>	The degree of variety of different land uses within close proximity to one another or located within the respondent's neighborhood
<b>New urbanism</b>	An approach to development and redevelopment championed by a group of architects, planners, and urban designers that has similar goals to Smart Growth. Towns and cities developed before widespread use of the automobile are seen as having multiple environmental, social, and health benefits when compared to the sprawling, suburban developments that have dominated land use decisions in the United States since the 1940s (see <a href="http://www.cnu.org">http://www.cnu.org</a> ).
<b>Perceived environment</b>	Self-reported characteristics of the physical environment that reflect the study participants cognized representation or perceptions of the actual environment

A person traveling on foot, standing or in a wheelchair.

**Pedestrian**

- adj.* 1. Of, relating to, or made for pedestrians: a pedestrian bridge.
2. Going or performed on foot: a pedestrian journey.
  3. Undistinguished; ordinary: pedestrian prose.

**Pedestrian level of service**

A technical term for a very basic, simple concept: how supportive of pedestrian travel is the infrastructure in a given area and how well do other modes of travel interact with pedestrian travel?

**Reviewing**

A technique whereby a whole environment or environment specific element is assessed against performance criteria specific to the problem being considered.

**Smart growth**

An approach to neighborhood development that considers impacts on environmental quality, social interactions, population diversity, and transportation choices. Smart Growth is often contrasted with suburban sprawl that assumes automobile dependence. Smart Growth advocates promote development that is higher in density, built around public transit, contains a mixture of residential and commercial uses, and provides housing for a range of income levels. Smart Growth is the efficient usage of transportation infrastructure (e.g., roads and railways) and therefore encourages growth to be located in areas served by existing transportation investments (see <http://www.epa.gov/livability>).

**Walkability**

The degree of pedestrian friendliness of a neighborhood based on objective criteria such as population density, land use mix, and connectivity

**Walkable**

Capable of being traveled, crossed, or covered by walking: a walkable road; a walkable distance.

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