ORIGINAL ARTICLES

An Approach towards Solving Pedestrian Problems in Modern Cairo

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ABSTRACT

This study concerns pedestrians' needs fulfillment in one of the most important Boulevards in Greater Cairo, the capital and the largest city in Egypt and the eleventh biggest city in the world. This site represents heavy vehicle and pedestrian movement along one of the biggest sidewalks in Cairo, called Boulevard of Gameat Al Dowal. The study contains information -using a descriptive analytical approach- on physical characteristics of the shopping area served by the pedestrian path along the well known boulevard. Pedestrians' patterns of using the street and needs are investigated. At the end, relying on pedestrians sidewalk problems identification, a solution was introduced in order to regenerate, revitalize and improve walking conditions in this prominent public urban space. The most significant problems found were: the unevenness of sidewalks; the inadequate provision of pedestrian crossings and poor road and pavements user behavior. An urban design alternative for future pedestrian improvement in the area of study is set according to the paper's findings, while maintaining a distinct sense of Egyptian urbanity. This shows that the town planner can use various strategies to change the traffic composition in order to achieve better environments.

Key words: Pedestrians, promenade, Boulevard, Cairo, Gameat El Dowal el Arabeya, shopping, sidewalk, quality of life and walking.

Introduction

"To create space that enhances the quality of life is architecture's greatest gift to the community it serves."

Walking enhances people's quality of life. Walking is essential for leisure, recreation, or exercise; for occupational purposes; and for basic transportation, including shopping or going to work. Walking is also considered to be one of the major activities in big cities like Paris and Cairo for both locals and tourists. A study of main attractions by tourists in Paris finds just strolling and walking a major activity:

"Visitors to Paris engage in a wide range of activities, both formal and informal. The six leading activities recorded in a 1991 survey of international leisure visitors were: going for a walk, visiting monuments, visiting gardens, visiting large museums, visiting churches and shopping. (Pearce, Douglas G., 1998).

Unsuccessful and unlivable public spaces in many cities may be a result of this lack of concern with the quality of human use and activity.

As a Metropolitan city, Cairo is a difficult city for walking; its many congested public spaces, are faced with many challenges concerning control between pedestrians and vehicle traffic.

One of the limited Boulevards in Cairo, "Gameat El Dowal El Arabiya" and its surrounding areas is faced with many problems of quality leisure and shopping livability. A community focus center and the opportunity to walk from shop to shop are common features that help create such vitality. Many of these features are dependent upon complex factors and aspects that are often overlooked such as: The physical surroundings, how people use public space, and the safety of pedestrian access.

To address this problem, researchers have examined how pedestrians use the Boulevard as an urban public space to improve it for the pedestrian. This paper continues by using the Boulevard in both sides as a case study to examine the relationships between patterns of use and the physical environment. It concludes that increased awareness of commonly overlooked items could lead to important improvements in the total pedestrian environment, thereby leading to increase this main Boulevard walk ability, livability and shopping vitality.

This paper is based on a main assumption with association between physical environment and individuals’ walking. Researchers believe that a better physical environment encourages individuals’ walking, enhances and alleviates their quality of life.

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The study aimed to: (1) identify the most severe problems and difficulties that the pedestrians face, while walking on sidewalks and crossing the majority of main streets in Cairo; and (2) suggest a set of policies and measures, intended to improve their pedestrian environment.

Objectives & Methodology:

In "Pedestrian Planning & Design", Fruin (Fruin, J., 1971) argues that there are six indices to the pedestrian environment: safety and security, convenience and comfort, continuity, system coherence, and the visual and psychological attractiveness of the environs.

The paper's main objective is to present an alternative to the existing pedestrian circulation in Gameat el Dowal Boulevard to respond to pedestrians' global human needs and expectations.

The research relies on linking walking capability in public spaces to livability and enhancement the people's quality of life in urban public spaces. Encourage walking through and along the prominent wide Boulevard in Cairo will be approached through the creation of an inviting safer pedestrian leisure environment and facilitating sidewalk connectivity.

Promoting the efficiency of commerce and shopping activity in clustered shops in a more welcoming environment could be another benefit.

One of the many outcomes of this research, is that it provides primary useful information that draws attention to commonly overlooked issues as the composition of target groups of users, including their varied social classes. This would help adding services including local fast food shops at affordable prices to respond to their needs and adding leisure attractions and environment livability.

Methodology:

Data was collected using direct observation by researchers, doing structured behavior mapping. Three viewing positions along the street were chosen as representative places to map the pedestrian activities that were noted. (Figure # 1) All locations were street-side which appeared to be high-activity areas during different times of day and during working days and week ends. Any relevant circumstances were recorded.

Fig. 1: Street Places That Represent Pedestrian Activities.

The general patterns of use are explained and the adequacy of the existing facilities are described. This is followed by a description of variations of use by location and physical design. Finally, possibilities for walkability and livability improvements of the Gameat El Dowal Street scene are explored.

Less formal methods of data collection included observations while walking the sidewalks at random times. In addition, the theoretical study was provided to include the background of the area as well as details of the Streetscape plan. These exploratory studies were intended to ascertain relationships between patterns of use and the physical environment and to suggest possible improvements for the total pedestrian environment. Many photographs were captured to register the public pavements -formal and informal- user behavior.
Information is summarized and collected at the end in a table with its impact on pedestrian circulation and use of space. The paper ends up by analyzing physical reasons behind the problem of pedestrians in Cairo. It ended by linking the problem to poor pavements in relation to design and maintenance, compounded by an inadequate provision of facilities for pedestrians with poor road pavements and user informal obstacle behavior, which has significantly contributed to the pedestrian problems.

Fig. 2: Factors influencing the pedestrian environment in Egypt.

Study of Pedestrians' international needs.
- Analysing Pedestrians' patterns of use and adequacy of Facilities.
- Identify the most severe problems and difficulties that the pedestrians face, while walking on sidewalks and crossing streets in the area of study. (Whether the pedestrian needs are fulfilled in the streets of Cairo).
- Link these severe encountered problems to the physical characteristics and shortage in Cairo streets and to which extent these physical contribute and meet the global
- "(Jacobs et al, 1993) indicated that their behaviour in developing countries is often less disciplined than in developed countries".
- Specific policies and measures are stated for improving their pedestrian environment.
  To achieve the paper's main goals, researchers addressed the main problems each one separately presenting an alternative that is derived from users' demands to develop walking. measures of the built environment must be refined, and more-complete data on walking must be developed.
  The researchers relied on a detailed data on the built environment physical characteristics of Gameat el Dowal Boulevard spatially matched to detailed data on users' –especially pedestrians- behavior.
  The research gives a critical overview of the main boulevard in Cairo Gameat El Dowal, as one of the most important public spaces in Cairo studying its contemporary status especially that commercial area and its impact on pedestrians giving guidelines to what is required for an effective urban space.
  Some criticism is done for future pedestrian criteria and improvements. The visits describe its physical and uses by on either side of the road, each 4 m wide. Specific points criteria and measures are stated for improving their pedestrian environment.
In Egypt, generally speaking, there are insufficient data to analyze pedestrian physical characteristics, their needs, and impact on users behavior. Study the immediate influences of design features, physically, visually and functionally.

Based on our field study and an academic research the paper sets the methodology to decipher the street parallel to the perspective of pedestrian shoppers. There are several points of a strong identity and directly affect pedestrians from a global approach, other points as informal use of pavement (behavioral contributions) are more site-specific related approach the problem from a local perspective.

As a counterpart, there’s a flexible and buffering urban pattern constituting the area. The researchers followed and mapped these elements, their relations and constitution. The pedestrians’ needs are tabulated.

General Description of the Area:

Why this street for study?

The Gameat El Dowal boulevard combines tremendous amounts of traffic, public transit, and especial Arab tourism. This specific street was chosen for study because it is a public space highly traveled by both residents and visitors and is often considered as the representative street for contemporary modern Cairo. Almost all festivities sportive, religious and even political demonstrations take place in this area.

- This Boulevard is one of the few places in Cairo where people of various ages and classes come together as this wellknown street is surrounded by different social classes (Map Mit Okba and Boulaq near Sudan street) (Fig 3).

![Fig. 2: Different Income Rates Zones Surrounding The Area Of Study.](image-url)
- Although the sidewalks are generous along both sides and although wide planting strips and by a row of parked cars that slow down traffic, separate traffic; walking is not enjoyable in the prominent Boulevard as there are no or inadequate available facilities.
- Unfortunately, this middle to high income area is –as many parts of Cairo- deprived from affordable public places for leisure and promenades. The field of study is surrounded by many gated private clubs for walking and entertaining. (see fig.) Clubs of Zamalek, Tersana & Shooting with very expensive memberships constitute together about 15% of Mohandessin district. Only members in these clubs can enjoy walking. At the same time, ironically this high income area is surrounded by poor deprived and congested neighborhoods as Mit okba and Boulaq. (Fig 4).

**Fig. 4:** Private Clubs and Private Bordered Green Areas.

**Case Study: Street Network & Walking Pathway Analysis of Gameat El Dowal street:**

Game‘et el Dowal is considered as a main boulevard and the largest street in el Mohandessin, a high to middle income district in Cairo.

Along the **Gameat El Dowal**, the highest income classes are located. Those are the most favorite place and the luxurious shops in mohandessin and also attraction-point for Arab tourism. This street's name represents the ideology of the Arab nationalism, it means literally translated: League of Arab States street, several streets surrounding it are named after different Arab countries as Sudan, Syria or Iraq. These names give a special identity to the area, could be probably one of the reasons why Arab tourists feel attracted to this area.

This Boulevard is lined with five to twelve-story buildings that accommodate many residential, commercial and administrative uses. There are also diplomatic and institutional buildings. The 650 meters block face has a continuous sidewalk on each side of the street with a single non-marked pedestrian cross walk. The roadway has four lanes for traffic (two in each direction) with one lane on each side devoted to parking, loading/unloading, and only one bus stop. The whole space is linear in nature. Besides this main street issue of study, there are two secondary routes, "Syria" and "Wady El Nil" street, both of which only have two lanes through this area. Because of the restricted capacity on these secondary streets, Gameat El Dowal bears the burden of the north-south traffic. To the North there is one other Boulevard called "Ahmed Orabi".

**Shopping Area:**

Gameat el Dowal is often referred to as "Champs Elysees of Cairo". Its International brand stores and occidental leisure service are a main attraction for Arab tourism. The shopping area contains many clothing
shops, silver and gold Shops, International and local Cafés. The cafeterias don't make use of the pavement as a sitting extension due to noise coming from street, some poor artificial planting was placed instead in front of the shops' windows. The shops are rent through renewable contracts from the Zamalek club which is in a present (year 2011) critical monetary position and needs marketing promoting.

Generally speaking, the streets in Mohandessin can be categorized in five different groups:

The **main boulevards** are the biggest ones, the **transit corridor**, crossing the area leading travelers to the new settlement of 6th of October, the **radial streets** structure embracing the **mesh streets**, usually smaller and surrounded by trees and the **alley ways** mostly located in the unplanned settlements tightly narrowed through the dense building typologies. (fig 5).

![Fig. 5: Mohandessin Streets Group Categorization.](image)

**Problems Encountered by Pedestrians in Cairo: General**

Egypt –as many Developing countries- suffers from an increasing uncontrolled growth and uneven distribution of population. Cairo is a difficult city for walking; first impressions of its visitors are its careening buses and crammed sidewalks that sometimes do not even exist at all. In highly congested cities like Cairo, walking is a problem.

Pedestrians in Cairo have poor walking environments even where sidewalks exist. Rights-of-way account for slightly more than a tenth of the land area, and most of space is devoted to roadways. Most of the public pedestrian network is along arterial roadways. Because there are no parking lots in Cairo's streets, more of the right of way is devoted to parking and moving vehicles.

Where sidewalks exist they abut roadways without any buffer between pedestrians and moving traffic. Where landscaping exists, it is usually located between roadways, not between sidewalks and roadways. Sometimes fences designed to protect planting from roadways trap pedestrians with traffic, creating walking environments that feel exposed to moving noisy traffic and are devoid of visual interest. In many places, fences separating roadways have been repeatedly broken down by pedestrians seeking short cuts.

Thus, it is not surprising that road traffic injuries RTI constitute 45% of injury mortality in Egypt; 75% of these injuries are pedestrians related (Hisham F., 2006). Traditionally, research on RTI has focused on the traffic environment and the vehicles. (Trond N, Torbjorn R., 2009) However, little attention has been given to road risky behaviors and perceptions of road safety by pedestrians as risk factors associated with high pedestrian injury rates.

Another study (Tuma, Elias H., 1988) mentions that major public utilities and services –including abused roads, and **sidewalks**- are damaged and destructed over and above normal depreciation. This has its impact on employees going to work:

*"One study of government employees in Egypt estimates that 37% of the employees are late to work."*
Most of the physically handicapped need a crutch or stick to assist their movement, and most of the visually impaired need to be accompanied by other people while traveling.

**The most significant problems can be summarized in:**

(1) The unevenness of sidewalks; and (2) The inadequate provision of pedestrian crossings.

Some specific policies and measures should be stated by many researches in further studies for improving the pedestrian environment in Cairo.

**Problems Encountered by Pedestrians in Boulevard of Gameat el Dowal:**

- The researchers took the commercial area of club Zamalek adjacent to one of the most prominent boulevards in Cairo Gameat el Dowal as a case study. (Fig 6).

**Fig. 6: Area Of Study.**

- The planning of this main Boulevard of Gameat el Dowal, the case study devotes less than a quarter (measure sidewalk and roadway) of the land to public rights-of-way, and more than half that space is devoted to roadways, not sidewalks and landscaping.

- As the internal green aisle dividing Gameat el Dowal Boulevard is now used as a public garden with a recreational urban ambiance as it is furnished by seats and wooden shaded kiosks. This area has a power of attraction for poor classes from nearby squatter neighborhoods. It becomes a crowded recreational area especially during religious and local feasts. Some sellers trade in the garden refreshments, balloon, rubbers, cottons, candies. It is said by the Bourgeoisie residents that the popular frequentation has disfigured this green area by throwing plastic bags –as there not enough rubbish collectors- They may use the limited space
surrounded by cars and buses from both sides in sitting, picnicking, and even playing football. This uncontrolled behavior could be very risky especially for adolescents and young children.
- Crossing from a side to another in the street is also extremely dangerous as there are no pedestrian bridges or tunnels. So shops located at the gates of Zamalek club are unreachable from the other side of the street and the sidewalk facilities are not serviced by any pedestrian facilities. The pavement is in a disastrous and pitiful status (Pic 1 & 2).

**PEDESTRIANS’ NEEDS** (Fruin, J., 1971) & **HUMAN DESIRES IN PUBLIC SPACES**
(Mathes, E., 1981)

**CURRENT SITUATION**
IN THE PUBLIC SPACE
OF GAMEAT EL
DOWAL BOULEVARD
& SIDEWALKS

**PHOTOGRAPHY & SHOTS**

**SUGGESTIONS FOR**
REGENERATION &
REVITALIZATION OF
SPACE FOR
PEDESTRIANS

1- SAFETY & SECURITY

- Road safety through surveillance and belonging by individuals and institutions.
- Proper layout and urban design permeability.
- Accessibility for different users and connectivity through adequate provision of pedestrians' road crossings through tunnels or bridges.
- Walkways' finishing should be according to international restrictions with non-slip materials.

- There is inadequate provision of pedestrian crossings so crossing this Boulevard from a side to the other is extremely dangerous.
- Slipping walkway.
- There are no ramps for people with limited mobility.
- Area for leisure, picnicking and playing is dangerously located in between two streets.
- After dark; the street is not well-lit.

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**Pic # 1** No Pedestrian Crossing Facilities For Wide Street.

**Pic # 2** Side Walk pavement disastrous and pitiful status
<table>
<thead>
<tr>
<th>2- PROTECTION FROM NOISE &amp; POLLUTION</th>
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<tr>
<td>- The area equipped with benches and kiosks reserved for public sitting is ironically situated in the middle of two streets exposing people to all sorts of pollutants, dust and street noise.</td>
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<tr>
<td>- Pollution and noise minimization by greenery and trees to buffer between pedestrians walking and vehicles.</td>
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<th>3- IDENTITY &amp; BELONGING</th>
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<td>- The main walkway is in a disastrous and pitiful status.</td>
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<tr>
<td>- The whole urban space is characterless and without any identity.</td>
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<tr>
<td>- Identity and sense of place through good spatial composition of urban space.</td>
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<tr>
<td>- Use of instruments and elements of urban composition including: shaping suitable public urban spaces.</td>
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<th>4- VISUAL AESTHETIC ATTRACTIVENESS OF THE ENVIRONS</th>
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<td>- Light is very primitive.</td>
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<tr>
<td>- Pavement is damaged and not maintained.</td>
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<tr>
<td>- Some benches are broken and never replaced.</td>
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<tr>
<td>- Plastic bags are thrown as there are no rubbish collectors.</td>
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<tr>
<td>- Create and enhance cultural and recreational opportunities, creativity and richness (suitable atmosphere created by specific type of architecture, type of urban details including furniture, illumination, etc.)</td>
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<tr>
<td>- Visual quality townscape and landscape.</td>
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### 5- CONTINUITY, SYSTEM COHERENCE & OWNERSHIP OF SPACE

- Walking is interrupted by newspapers and sellers, pedestrians feel that they do not own the place.
- Some beggars –especially less disciplined- spoil the feeling of continuity as they ask for money.

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<th>- Kiosks with displays and booths for newspapers and sellers with legalized acceptance of local authorities.</th>
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### 6- CONVENIENCE & COMFORT

- There are no pedestrians' basic facilities in the walkway near clustered shops including shading devices and garbage collectors.
- Only existing benches are not placed at the appropriate location.
- Lacking Parking areas, Public Toilets and there is one damaged telephone booth.

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<th>- Improvements and adequate utilities (systems) and public services (localization)</th>
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### 7- COGNITIVE & WAY FINDING & SENSE OF PLACE

- The sidewalk is lacking any signs.

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<th>- Ornate street lamps, and interesting sidewalk patterns with sitting central area should help create a sense of space with a character. -Affordability of street signs.</th>
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**The Existing Situation:**

![Image of the existing situation]
Suggested Solution:
Benefits of Suggested Solution:

This alternative responds to the street's social atmosphere, the researchers would expect most people using the sidewalk in front of shops, to be in groups. As a whole, however, there could be couple shoppers.

It reduces the exposure to dust, street noise and pollution through the buffer area including tree planters and parking, is an asset for separating auto from pedestrian traffic.

There shouldn't be a problem when pedestrians need to cross the street, as there should be many crossings for pedestrians to safely go to the other side especially in front of the Hotel.

It contains attractive light posts and benches and flooring patterns.

The sidewalk width being more than 5 meters, allows pedestrians much space for fear of creating vacuums according to Whyte (101) who endorses this standard.

According to the estimation of the flow rate of between three to five people per minute per foot of walkway width as a good density range.

Placing different informal sellers in separated shaded booths along the widened sidewalk in an appealing attractive way, allows the pedestrians a freely flowing passage even at the crowding busiest time.

Conclusion & Recommendations:

While this paper describes findings that are specific to Gameat El Dowal street, the information gathered and methodology used could be applied to any street scene setting. Data on people's use of the built environment with its lacking facilities can also be applied to many different street scenes. In a similar vein, further examining some of the factors that lead to increased vibrancy in one area could be used to enliven a different area.

Not only does there seem to be adequate sidewalk width for the fulfillment of pedestrians' needs. This sidewalk –especially when located near a cluster of shops- should be welcoming people for walking and encouraging shopping in a live promenade atmosphere. Pedestrians should have a considerable buffer to shield them from traffic.

Considering the social classes, as there are low, medium and high classes, shops with different categories should respond to different classes' needs as there should be local take away restaurants selling fast Egyptian food beside the International Brands.

A restoration project should help the boulevard regain some of its charm as a promenade. New street furniture should be added, cars diverted to side roads, the sidewalk widened and improved, bollards installed, parking problems appeased by an underground garage, and the street's general appearance improved with granite paving and double rows of trees. The street retaining its feeling of luxury and the tree-shaded sidewalks should offer promenades that could be a source of pride to the whole Nation.

- Car parking should be banned on illegal to stop but there should be underground parking available paid per hour to increase the pedestrian area.
- Extra-widening of available sidewalk in order to provide adequate space for cafes and vending. Parking area should be at the back plot (beside the bridge)
- A consistent street tree coverage may turn the street into a great more welcoming open space. The Continuity of trees instead of poor landscape at the pavement level with direct and indirect sources of lighting scales down the expanse of the sidewalk add livability. The alley of trees along the curb provides pedestrians with a buffer from the automobile traffic.
- As there are no outdoor sitting areas –even in front of cafes inspite of the mild sunny warm weather- there should be few benches with many outdoor restaurants and cafes having chairs facing the sidewalk. Outdoor seating should be as well enhanced by plantings, coverings, shade and color.
- Sidewalk amenities –as there are none now- should include colorful banners, cast-iron kiosks with displays, ornate street lamps, and interesting sidewalk patterns.
- As poor road user behavior will have contributed to the pedestrian accident problem. Required pavement width shall be unobstructed by street vendors.
- Most people should walk on the sunny side, where should be more cafes, theaters, chain stores and boutiques. Fewer can stroll on the other side, where there is less sun and more banks and luxury internal restaurants.
- Activity should not decline after dark; the street should be well-lit taking on a new ambiance of nightlife.

References


Hisham, F., 2006. Injury statistics and control program in Egypt. Egypt, Cairo: Faculty of Medicine, Suez Canal University.


Koning, Anouk de "Global dreams: class, gender, and public space in cosmopolitan Cairo"


Saelens, E. Brian and Al "Environmental Correlates of Walking & Cycling: Findings from the Transportation, Urban Design & Planning Literatures"

Sl, Handy and Al "How the built environment affects physical activity: views from urban planning." School of Architecture, University of Texas at Austin, USA.

