

Enhancing Walkability in pedestrian oriented gated communities

Case Study: Arabia's Gated Community-New Cairo City

Yasmin Talaat¹ and Marwa Emad²

Assistant Professor, Department of Architecture¹

The higher institute of engineering and technology Fifth Settlement, Egypt,
yasmintalaat@gmail.com.

Assistant Professor, Department of Architecture²

The higher institute of engineering and technology Fifth Settlement, Egypt,
Marwaelbishry@gmail.com.

ABSTRACT

In the last few years, new urbanism design for walkability has been a substantial priority of city planning, especially many negative influences appear and cities started to face a lot of problems when vehicles became prior to pedestrians.

A walkable street is a street where walking is safe and pleasant, where people are attracted to walk and where fast and extensive car traffic is not a priority. In order to identify and create a safe and desirable walking environment, the pedestrians are the most appropriate group to assess their perception, knowledge, and attitude towards the streets, thus this research's main goal is investigating whether the existing pedestrian requirements in urban areas are ready to integrate walkability. The study aimed to determine the most important requirements concerning walkability in order to convert gated communities to pedestrianization especially that Gated Communities play a significant role in Cairo.

Hence, the researchers had been choose Arabia's gated community as a case study. A description of the existing case study's features had been done then an experimental study in order to assess the problems of walkability. After that a detailed guideline had been designed for the pedestrian facilities, this paper use indicator values based on the requirements that had been illustrated in the literature review which are accessibility, safety, convenience, attractiveness, and social interactions. These requirements later rearranged and detailed into various indicators so a successful walkable community had been reached as a model that can be adapted in other urban spaces in Egypt.

Key words: pedestrianization, walkability, gated communities (GC), urban environment

1. Introduction

Walking is considered as the simplest and least costly forms of physical activity. Walking keeps people healthy; and can help in preventing diseases. Besides, it encourages social contact among people which improve both wellbeing and mental health as well [1].

Street walkability consider an evidence of the suitability of pedestrian facilities is for walking. [2] Increasing Walkability can be done when safe, comfortable, and accessible features are provided for pedestrians. A well designed construction of a walking environment can be a significant factor that encouraging walkability as they result in more attractive, convenient, healthier, and efficient streets [3] On the other hand, Pedestrianisation which can be defined as Converting a street or an area to pedestrian-only use, cannot be identified as a single technical measure as It is highly correlated with the models of how an urban environment should design. experienced changes during recent decades had been done in

order to correspond to the transformation from a function approach to a post-modern welfare society. Correspondingly the character of pedestrian paths should be ever-changing over time. [4]

2. Research Goal

The primary goal of this research is to determine the requirements concerning walkability in order to convert gated communities to pedestrianization, then determine the most important indicators that will assist in fulfilling walkability for the purpose of converting gated communities to pedestrianization

3. Research Questions:

The study highlighted the fact that walkability is the result of pedestrianisation program which means that pedestrianisation considers broad area in urban design from social to economical to find a solution to increase the quality of urban environment, this leads us to the research questions which are:

- A. How to the walkability indicators effect pedestrianization?
- B. Does walkability effected after reimagining the urban design of Arabia's GC?
- C. How can GC be converted to pedestrian oriented?

4. Literature Review

Lately, the urban environment of most of the urban spaces within cities has become displeasing for users which focus directed towards motorized transportation [5] . However the significant increasing in the number of vehicles and motorists on the Cairo's streets, pedestrians suffers from traffic congestion in the streets which prevent accommodate them and keep them safe from fast-moving vehicles.

On the other hand, sidewalks and pavements had been designed to the sides of streets to retain street balancing and prevent injuries [6]. More than that, walking and human being in term of health issues has a huge relationship between them cause people who use to walk in a regular basis almost have the greatest gain to the both physical and mental health as well. In brief, the creation of a better health condition and a healthier human being should encourage people to walk [7].

4.1. walkability:

In recent years, the term “walkability” is obtaining its popularity among professionals in the aspect of urban environment and in several research studies, but is there still confusion in its definition. In our research we choose one definition associated with the research goal which is: the description to what extent cities, neighbourhoods, routes or streets, are suitable, pleasurable and comfortable to walk in, as well as pleasant and interesting, and hence invite to walking.

This is influenced by characteristics of the built environment, activities and people. Understanding of how walkable an area is, varies with individual perceptions of a place but for our research we focus on pedestrian requirements in urban areas in order to be ready to integrate walkability [8]. The evaluation procedure of the urban environment had been affected directly by Pedestrian impression. For the purpose of identify and establish a safe and preferable walking experience, the pedestrians are the most appropriate group to determine their perception, knowledge, and attitude towards the streets [9].

4.2 Pedestrianisation

Pedestrianisation is a process of closing streets to vehicle traffic which strengthens safety and accessibility for pedestrians. Besides, it enables larger environmental, economic and social benefits for its cities. It develops public health by providing a chance of physical activity over traffic safety and active transport. Lastly, it can foster businesses in small scale and economic growth by promoting cultural exchange and tourism.

By amalgamation of pedestrianisation in context of urban spaces it leads to generate urban spaces that are inhabitable by improving quality of life for residents of urban spaces. [10] There are different types of pedestrianisation concerning the framework and aim of the design of urban spaces which are: the methods of applying one of them might be different in different contexts [11] as shown in Fig(1) :

- Full time pedestrian streets: The main objective of full-time pedestrian street is to increase and highlight the social activity and liveability of public urban spaces. For that reason, the design is based on preventing the vehicular traffic inside of the area which means that the streets will just belong to both emergency service vehicles and the pedestrians
- Part-time Pedestrian Streets It is allowed for vehicles to come streets for one specific time where there is no parking space for cars along the streets. But loading bays are obtainable.
- Traffic Calming Streets In such streets there are no limits to the access of motor vehicles but they are using different methods and techniques to slow down the speed of cars by adding various colours and road structure to let motorists know that they are in traffic calming streets.



Fig. 1: Pedestrian streets types :A-Full time pedestrian ,B-Part-time pedestrian streets, C-Traffic Calming streets[11]

4.3 Walkability and its interrelation with Pedestrianisation

Walkability which is one of the approaches of pedestrianisation develops many community and individual health benefits. For instance, the chances of increasing social interaction by increasing the number of friends within the social environment. Adding to that, as more people watch and walk down the street, that will reduce crime and increase safety.

In order to evaluate the interrelation between walkability and pedestrianisation it's essential to mention that walkability is part of strategy for pedestrianisation of the environment. Pedestrianisation strategy needs the concentration of different dimensions of urban design from social, economic, environmental and morphological dimensions. Hence, it looks like a pattern that has to be evaluated before it's applied in the context. [12] Aimed at determining what pedestrian improvements might be needed for the urban space, identifying methods for evaluating both pedestrianisation and the demand for the pedestrian becomes necessary to identify the suitable methods for that. [10]

There are various approaches for the interrelation between walkability, built environment and pedestrianisation. For example: The Institute of Transportation and Development Policy (ITDP), affirms that successful city starts with good pedestrian friendly environment which embraces factors including: Streets crossing and safety (low speed, presence of

crossing signals, tighter turns...etc).Moreover, US Green Building Rating System, Leadership in Energy and Environmental Design (LEED) has set out workable streets features in its portion, (LEED) for Neighbourhood Development (LEED-ND), as function of security, attract, comfort and health that provide the walkways to users [13].

From Different parts of the world, the concept of urban and neighbourhoods' developments differ theoretically and practically which means that LEED-ND items cannot be applied worldwide [14]. Four group of neighbourhoods and uses fives indicators had been categorized by Kansas City Departments of Planning and Development and Public Works as: (Directness, Continuity, Street Crossings, Visual Interest and Amenities, and Security) and defines various level of walkability that requires each group for a specific indicator [15].

From another perspective, the measurement of pedestrian environment at city level is various from measuring the pedestrian system at the neighbourhood or Pedestrian District Level. Adding to that One of the main keys to enhance any pedestrian programs is analysing the factors that encourage people to walk. Besides, it may be possible to examine factors influencing the decision to walk by examining the relative importance of walking obstacle. [16]

In brief, in order to design a detailed guideline about the pedestrian facility that interrelation directly with pedestrianization, we used indicator values extracted from the previous data. These requirements -which are: safety, convenience, attractiveness , accessibility and social interaction- later reorganized and detailed into diverse indicators, where these descriptions of detailed indicators.

5. Case Study: Arabia gated community, New Cairo City. Pedestrian-oriented gated community

The objective of this research aimed to determine the most important requirements and indicators concerning walkability in order to convert gated communities to pedestrianization .Recently, Gated Communities play a significant role in New-Cairo city creating 40.3% of it, with a total number of 227 GC [17]. The case study located in New Cairo City-fifth settlement, at Mohamed Naguib axis .The case study is a densely populated area,

It accommodates 36 residential buildings with total of 540 apartment, a swimming pool, a restaurant three playgrounds, social club and a mosque. It was established in 1998.

The GC is surrounded with fence and gates and is fully built and occupied.(From An interview with Mr. M. Elmahdy Head of Arabia's gated community management)

The urban fabric of the study area is characterized by its structural density and absence of more spaces in-between buildings, so it is crowded with buildings permeated by a number of pathways connecting the GC. Walkability in the case study is the particular interest, since the community change plan from vehicle-oriented urban community to part-time pedestrian GC.



Figure 2 Arabia GC location , New Cairo City-Source: Adapted by Authors from [18]

The case study had been chosen due to some reasons as follows:

- GC should aim to provide better quality of life, so selecting it as a case study complying walkability and pedestrianisation as well.
- The scale of the area under study within the community is in the range of 43.36 km² and working on this scale can address the human aspect of the community better than a bigger scale.
- It accommodates various land use which help to analyse the Gc in various ways
- The selected case study is a Part-time Pedestrian GC, as There are some pedestrian streets which are allow for vehicles to come streets for one specific time. In this kind of streets there is no parking spaces for cars along the streets. But loading bays are obtainable.
- GC main purpose is to provide better quality of life, so selecting it as a case study complying walkability and mediatisation as well.

Five phases had been illustrated to achieve the research goals.

5.1 Phase 1

Description of the existing GC walkability features:

Many visits to the GC had been done on several times through July 2022 in early morning or afternoon or night to look at the walkability features of the GC different conditions.

After that A field survey and observation has also been done to record all the GC features and the actual condition of the GC.

5.2 Phase 2

Phase two is the stage of analysing the data gained in phase one to identify the problems found in the study area causing the weakness and failure in its pedestrianisation oriented, and the requirements which have a prominent role in solving these problems will be listed afterwards.

Regarding the design of the GC ,it encourages walkability as it is a Part-time Pedestrian GC ,it contains well designed path pedestrian although no added shaded items to provide a comfortable walking experience as well as there are not efficient lighting or crossing facilities or separators of pedestrian paths with motorized vehicles which led to low level of safety for the pedestrian.

On the other hand, the GC design didn't provide supporting infrastructure for groups of people with disabilities or who have physical limitations with no signs for both pedestrians or drivers. All These data and more data from the observation had been summarized in Fig 3

5,3 Phase 3:

According to our research scope and the literature as we design an approach for Enhancing Walkability in pedestrian oriented gated communities by choosing certain indicators that effect directly in pedestrianisation and use a detailed evaluation list measuring as shown below in table 1

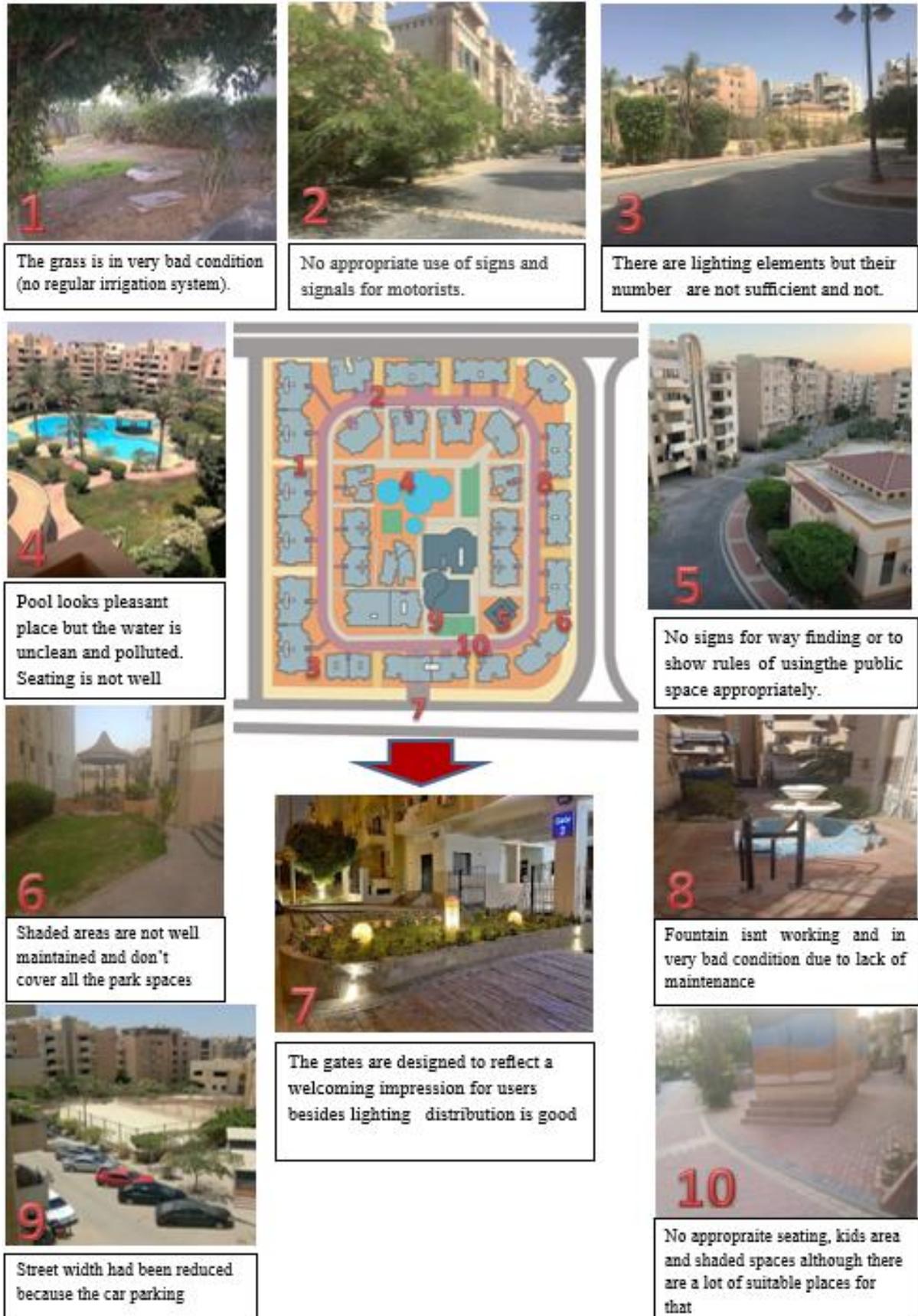


Figure3: Arabia GC location , New Cairo City-Source: Adapted by Authors from [18]

Table 1 walkability requirements ,description and indicators

Req.	description	indicators
safety	Protected from motor vehicles	There is a pavement for a pedestrian walkway
		There are boundaries/separators of pedestrian paths with motorized vehicles
		Conflict-free between pedestrians and other modes of transportation
	Availability of crossing facilities	Availability of crossing facilities such as Zebra crossing, raised crossing....etc
	Safety of crossing street	Availability of traffic lights and traffic signs
		The view is not blocked when crossing the road.
	Protected against crime	There are lightings along the pedestrian walkway
	traffic calming to slow down vehicle speeds	Narrowing corner radii reduce vehicle turning speeds as well as pedestrian crossing distances
		Availability of Buildings at the right-of-way
Gateway treatments alert drivers that they are entering a slower area. This treatment may include signage, entry portals, speed tables, raised crossings, and curb extensions		
Design of signs		appropriate use of signs and signals for both pedestrians and motorists,
N. of Upper-Level Windows	influencing the level of security by increasing street vitality	
Convenience	supporting infrastructure for disabilities	Ramp availability
		Guiding block accessibility
	The surface of the pedestrian path is comfortable	flat with no bumps or holes to avoid injury
		The surface of the pedestrian path the slope should be as small as possible
		not slippery or greasy surface to avoid slipping when raining
Provide facilities for pedestrian comfortable	Availability of benches for breaks, food/beverage kiosks	
	Availability of protection from bad weather, i.e., canopy, shading	
Attractiveness	Related to pedestrian infrastructure	Attractive pedestrian walkway design
		The pedestrian walkway design is following the surrounding environment
	Regarding the surrounding environment	The existence of street furniture as a complement such as traffic barriers, post boxes, traffic signs, public sculptures..etc
		Cleanliness of pedestrian infrastructure such as sidewalks, trails, crosswalks, and intersection designs.
	Landscaping elements such as bushes, grass,trees..etc	
Accessibility	availability of pedestrian paths	Pedestrian walkways provide the closest route.
		Pedestrian walkways connected without interruption
	Connecting different elements	Pedestrian walkways connect between buildings, transit areas, public transportation, parking, and green space
	Signages are easy to see.	Signages located in a strategic place, so it is easily visible.
Social Interaction	allowing a series of public interactions	The pedestrian walkway environment supports community social activities.
	design of public spaces that support social activities	The open spaces designed as an attraction space with elements such as: playing areas, variety of plants..etc

5.4 Phase 4:

A paper questionnaire regarding users' needs and preferences for achieving walkability was conducted which aimed to get clear information to evaluate the real condition of the Part-time Pedestrian community, its advantages and disadvantages. Also, One to one

interview with unstructured questions has been conducted. The answers were collected from 150 respondents with various ages, genders, purpose of visit, education level, and summarized with percentages. Answers regarding Arabia’s GC preferences for encouraging walkability has been classified under the 5 main factors (discussed in the literature review). The questionnaire was composed of three categories of questions: Demographic character, walkability requirements satisfaction, and walkability requirements indicators satisfaction by 40 questions: section one consists of 5 questions shows the respondent’s profile. Then 35 questions using 5-point Likert Scale offers five different options for the respondents to choose level of satisfaction of each indicator as followed: very dissatisfied, dissatisfied, Neutral ,satisfied, Very satisfied

✓ Category 1: Demographic character:

Respondents interviewed in the questionnaire had expressed reasonably even gender distribution (52 male and 48 female respondents).the percentage of respondents regarding age was highest in the 40-49 years as 55% ,while the lowest was for over 50 years with 8% .

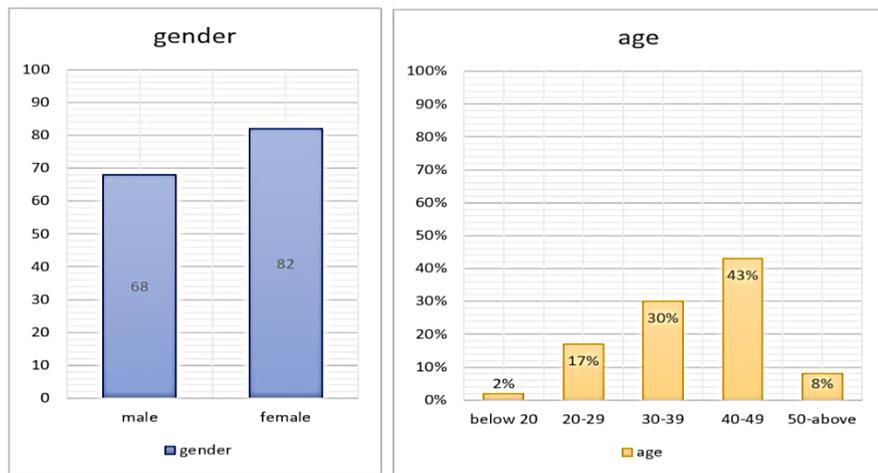


Fig4: Age and gender from questionnaire responses

The Purpose of visiting shows 55% for residents and 35% for tenants and all the other purposes percentage were less than 6% .Besides,90% of respondents claimed that they visited the case study daily, while the lowest average was for 1-2 days per week visitors and 1 day per month as well as shown in Fig 4 & Fig 5

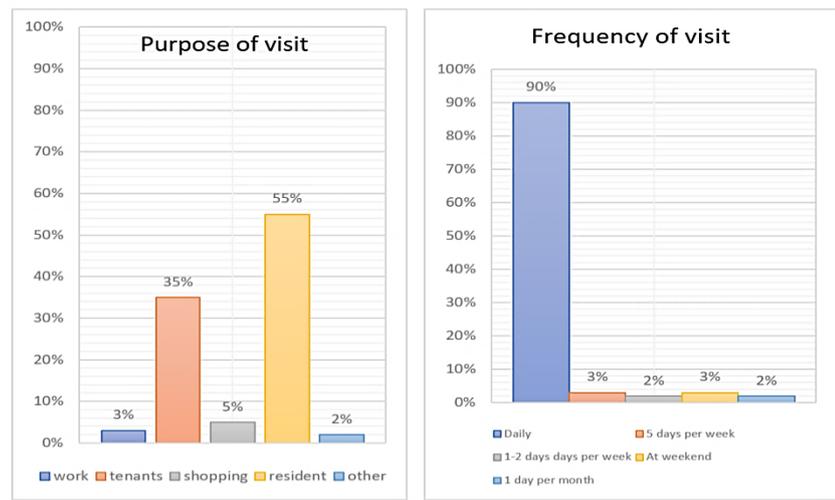


Fig 5: Purpose and frequency of visit from questionnaire responses

✓ Category 2: walkability requirements degree of satisfaction:

In terms of this category, the results of the survey were collected and summarized in the form of tables. the respondents answered the questions as shown in Table 2

Requirements	very dissatisfied		dissatisfied		Neutral		satisfied		Very satisfied		Total responses	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
safety	120	80	25	16	5	3	-	-	-	-	150	100
Convenience	65	43	50	32	20	13	8	5	7	4	150	100
Attractiveness	55	36	40	26	22	15	17	12	16	10	150	100
Accessibility	20	14	28	19	30	20	36	24	36	24	150	100
Social Interaction	30	20	18	12	15	10	52	34	35	23	150	100

The preponderance of participants (80%) confirmed that they are not satisfied with safety requirements ,while Social Interaction considered as the most satisfying factor (12%).

✓ Category 3: walkability indicators satisfaction:

1st requirement: Safety

Perceived road safety impacts walking and cycling levels in the community, particularly The presence of appropriate well-designed walking and crossing facilities can encourage pedestrians to walk. Cross traffic intersections needed mostly in order to control and reduce pedestrian crashes include the need to. Designing Wider lanes and higher speed limits have a significant interact with higher accident rates and a reduced sense of safety. [19]

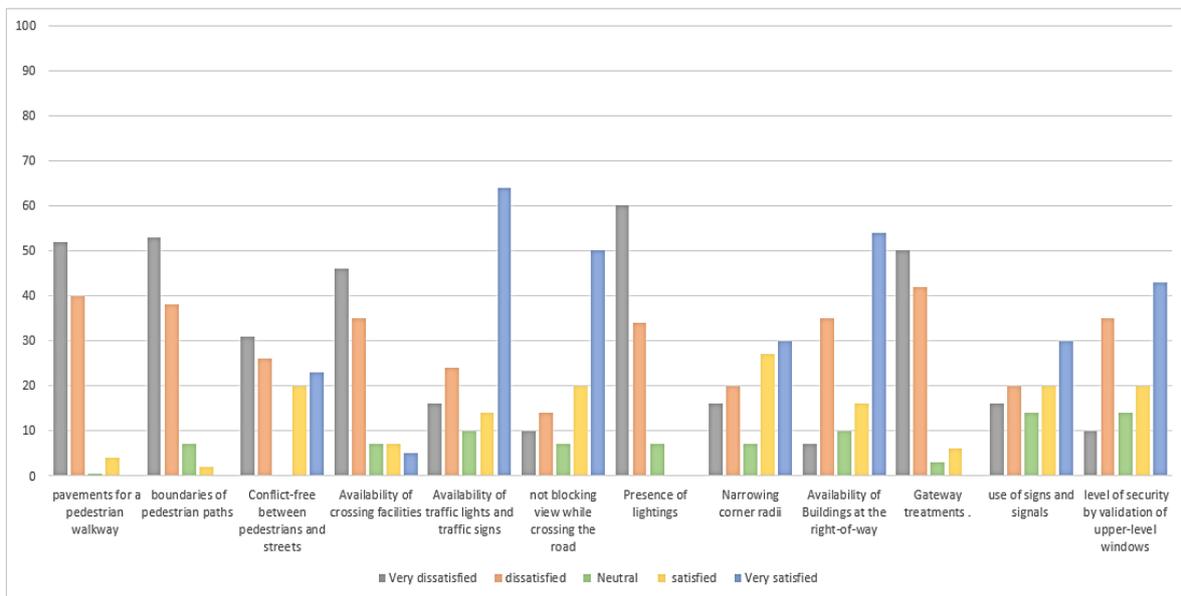


Fig 6: walkability satisfaction indicators: 1st requirement: Safety

As shown in Fig 6, the data was collected, showing the degree of dissatisfaction of each applying sufficient light almost 88% which is the higher degree.

From the observation stage. it was clear that the lighting distribution isn't sufficient to make people feel safe so it decreases walkability. On the other hand, the percentage of the

dissatisfaction of availability of crossing facilities had the lowest degree because most of the Arabia’s GC streets is just 2 lanes street so the respondents think that it is no as important as the other requirements.

2nd requirement: Convenience:

The state of the pedestrian path indicates the existence and quality of the access road. Not just does the pathway exist, but also how it is and how it works.

Besides, the existence of obstructions, path width, the cleanliness and maintenance and the conditions of the surface that could affect the walking and so on that could make the pedestrians circumstances more attractive and the supporting for disabilities or wheel chaired people (for examples: tracks for the blind, wheel chair accessibility) [20] as shown in fig 7

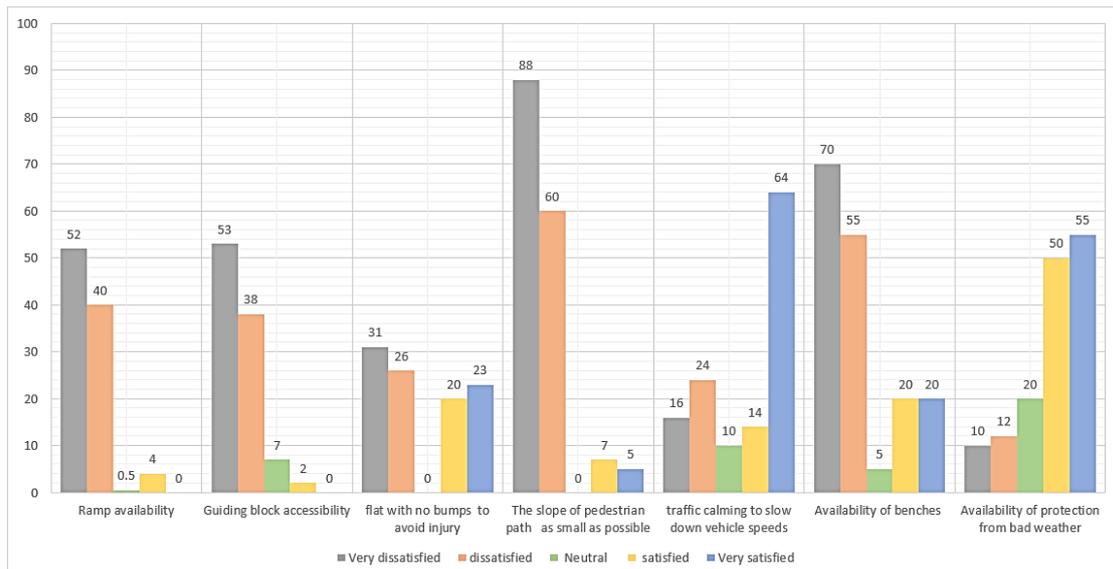


Fig 7: walkability indicators satisfaction: 2nd requirement: Convenience

From Fig 8, the data gathered showing the degree of satisfaction of each requirement. It is seen that the percentage of the satisfaction of indicator of providing facilities for helping pedestrian being comfortable was 68% which is the higher degree, this percentage due to lack of any benches ,shading areas, garbage binetc While, the percentage of the satisfaction of supporting infrastructure for disabilities had the lowest degree.

3rd requirement: Attractiveness A well-designed soft scape is playing A significant role of the built environment is outdoor greenness. Not only is it visually appealing., vegetation and trees lower temperatures, spread shadows, and improve air quality. [21]

As shown in Fig 8 regarding attractiveness, it had been shown that both of the requirements had almost the same degree of satisfaction which are: attractiveness related to the surrounding environment and regarding infrastructure as the GC due to lack of existence of street furniture as a complement such as traffic barriers, post boxes, traffic signs, public sculptures...etc moreover soft landscape need maintenance

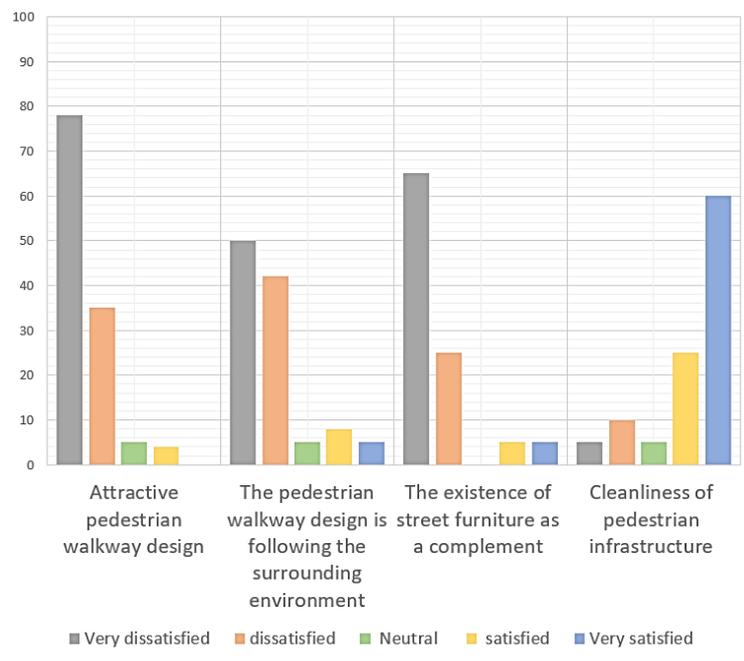


Fig 8: walkability indicators satisfaction: 3rd requirement: Attractiveness

4th requirement: Accessibility:

Multiple intersections between connectivity and various public services and equipment has to be provided by the built environment The ability to walk constantly to the destination is the most important dimension of the possibility of walking and determine the possibility of walking trip. Consequently, to promote walking and physical activity, the built environment must provide relaxing paths for pedestrians., vehicle speed limits, well-designed road crossings, and suitable lighting. Footpaths should not be too long, and paths to destinations should be reasonably direct. One feature of connectivity is the density of intersections in a specific area, which makes navigation and accessibility much more direct and navigable due to smaller blocks. [22]

As appears from Fig 9 concerning Accessibility, It has been demonstrated that the factor regarding signages rated as the most dissatisfied factor ,while Pedestrian walkways connect between buildings, transit areas, public transportation, parking, and green space has the most satisfied rate.

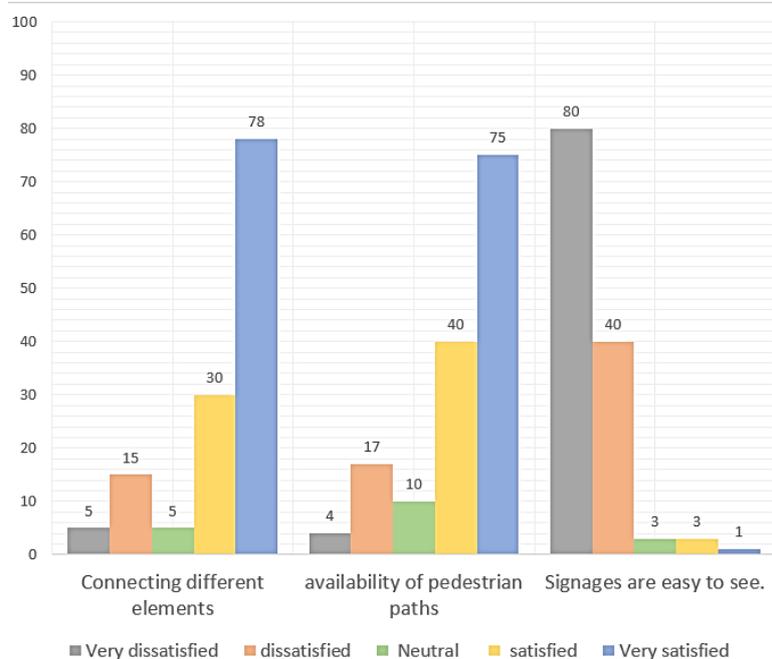


Fig 9: walkability indicators satisfaction: 4th requirement: Accessibility

5th requirement: Social Interaction

Walkability makes neighbourhoods encourage higher frequent and longer interactions between members of a society and make them more sociable, enabling for better connection. At the same time, an obviously negative correlation between walkability and sociability can be a result of socioeconomic, and ethnic contexts, considerably exceeds the positive influence of the physical environment on social relations. [23]

It's obvious that the user's needs public spaces in order to encourage social interaction, on the other hand, a high rate of satisfaction had been noticed for allowing public interaction due to the GC design which contains social club/

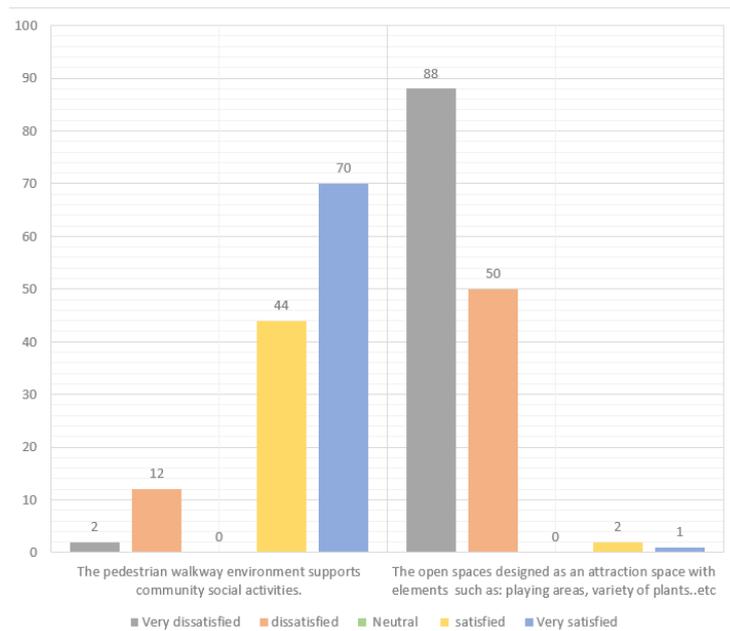


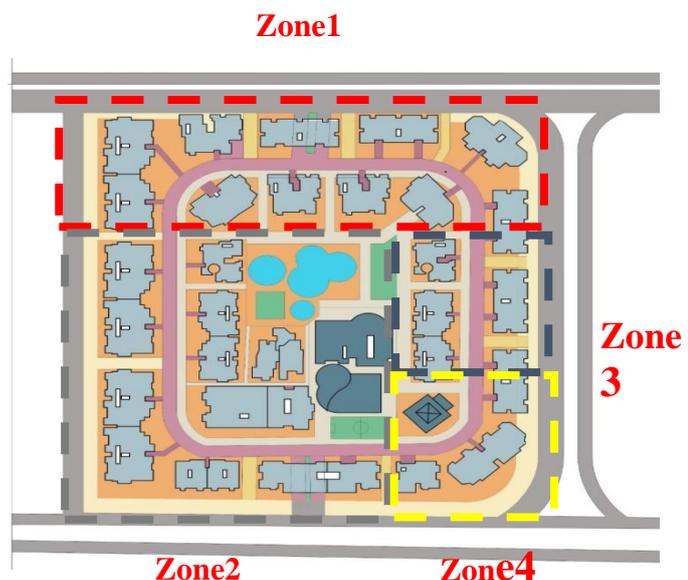
Fig 10: walkability indicators satisfaction: 5th requirement: Accessibility

5.5 Phase 5: Suggestion for a development program

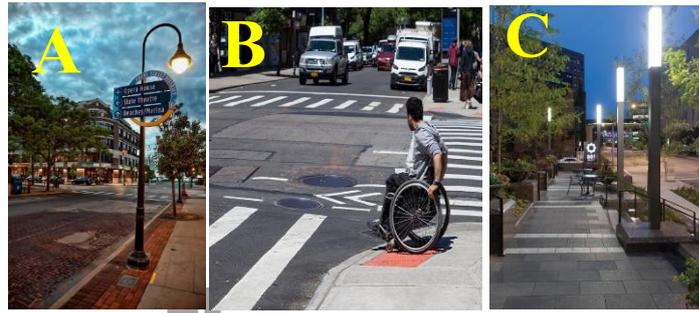
From the previous phases we had been choose some of the indicators which ranked as the most important one in order to reach the research's goal.

By analysing the layout components, we divided the layout in to four zones even they are not the same area, but selecting them cause they the most important indicator which need improvement.

Fig 11::Dividing the layout to four zones - Source: Author adapted form [18]



Every zone consists of different three problems extracted from all the five requirements:



A-Signage shouldn't be installed within foot path but only at the edge of it

B-Ramps should have a slip-resistant surface and should not allow water accumulation

C- Street Lighting to produce quick, accurate and comfortable visibility at night.

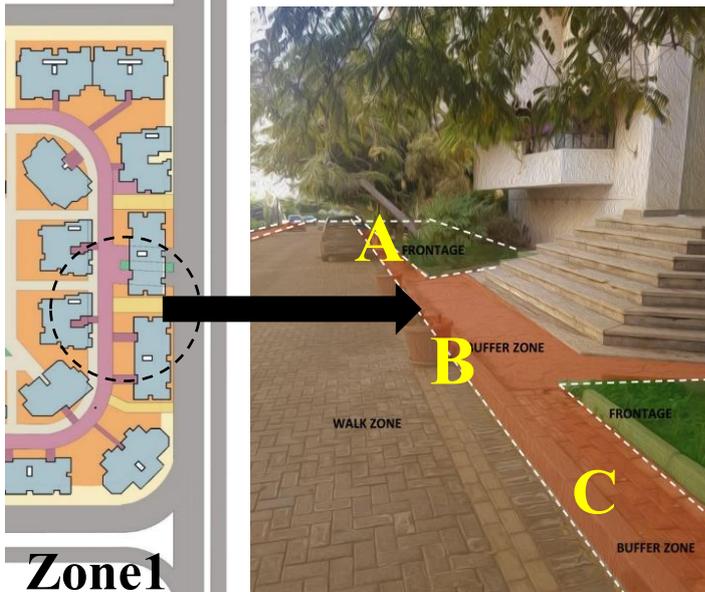


Fig 12::Zone 1 analysis: problems and suggestions



A-Signage shouldn't be installed within foot path but only at the edge of it

B-Ramps should have a slip-resistant surface and should not allow water accumulation

C- Street Lighting to produce quick, accurate and comfortable visibility at night.



Fig 13::Zone 2 analysis: problems and suggestions.



A-Using pedestrian crossing art as traffic calming measures that allow the people to cross the road it can be designed in different colours and shapes
 B-Air condition cover reinforce facades aesthetic image and this cover can be used in electric boxes too
 C- Garbage bins at right places and at frequent intervals help to keep the streets clean.

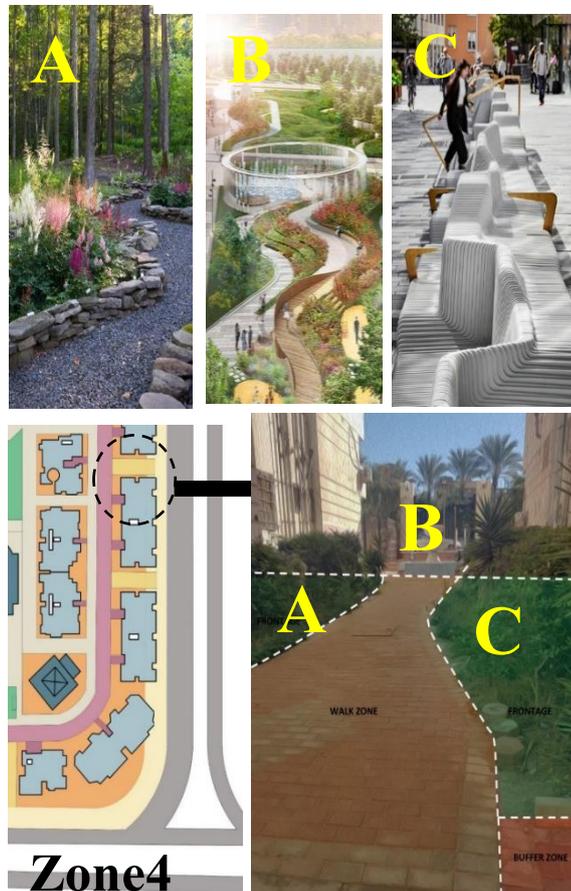
Fig 14::Zone 3 analysis: problems and suggestions

A-Colourful soft scape with various path's pedestrian can bring life and excitement to the area

B-It had been proven that the movement of natural water releases Negative Ions that aid the body and mind in healing besides it is considered to be a lightning rod

C- Complementary street furniture such as benches can enhance green spaces and encourage people to engage with the environment

Fig 15::Zone 3 analysis: problems and suggestions.



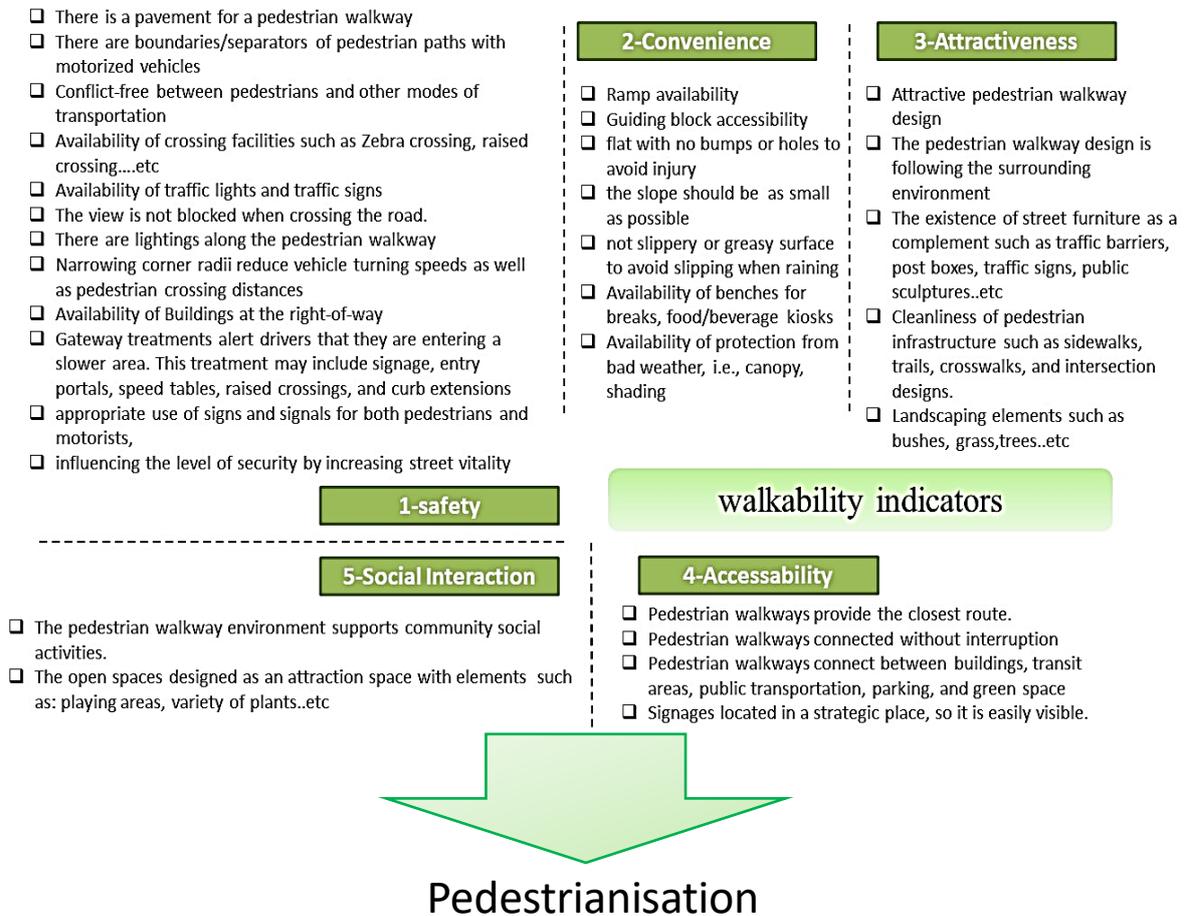


Fig 16: The purposed approach for Enhancing Walkability in pedestrian oriented gated communities

By choosing part-time pedestrian Gated community, we applied these indicators in order to measure the most important indicators for enhancing walkability which are: Adding boundaries/ separators of pedestrian paths with motorized vehicles ,design a conflict-free between pedestrians and other mode of transportation such as motorcycles and vehicles.

Availability of crossing facilities should be applied besides applying traffic lights and signs.

On the other hand, narrowing corner radii can reduce vehicle turning speeds as well as pedestrian crossing distance. The case study needs Gateway treatments which alert drivers that they are entering a slower area. This treatment may include signage, entry portals, speed tables, raised crossings, and curb extensions.

Moreover, not all the requirements and its element’s description had the same level of importance ,so from the study stages we determined it along every requirement as shown in Fig 17

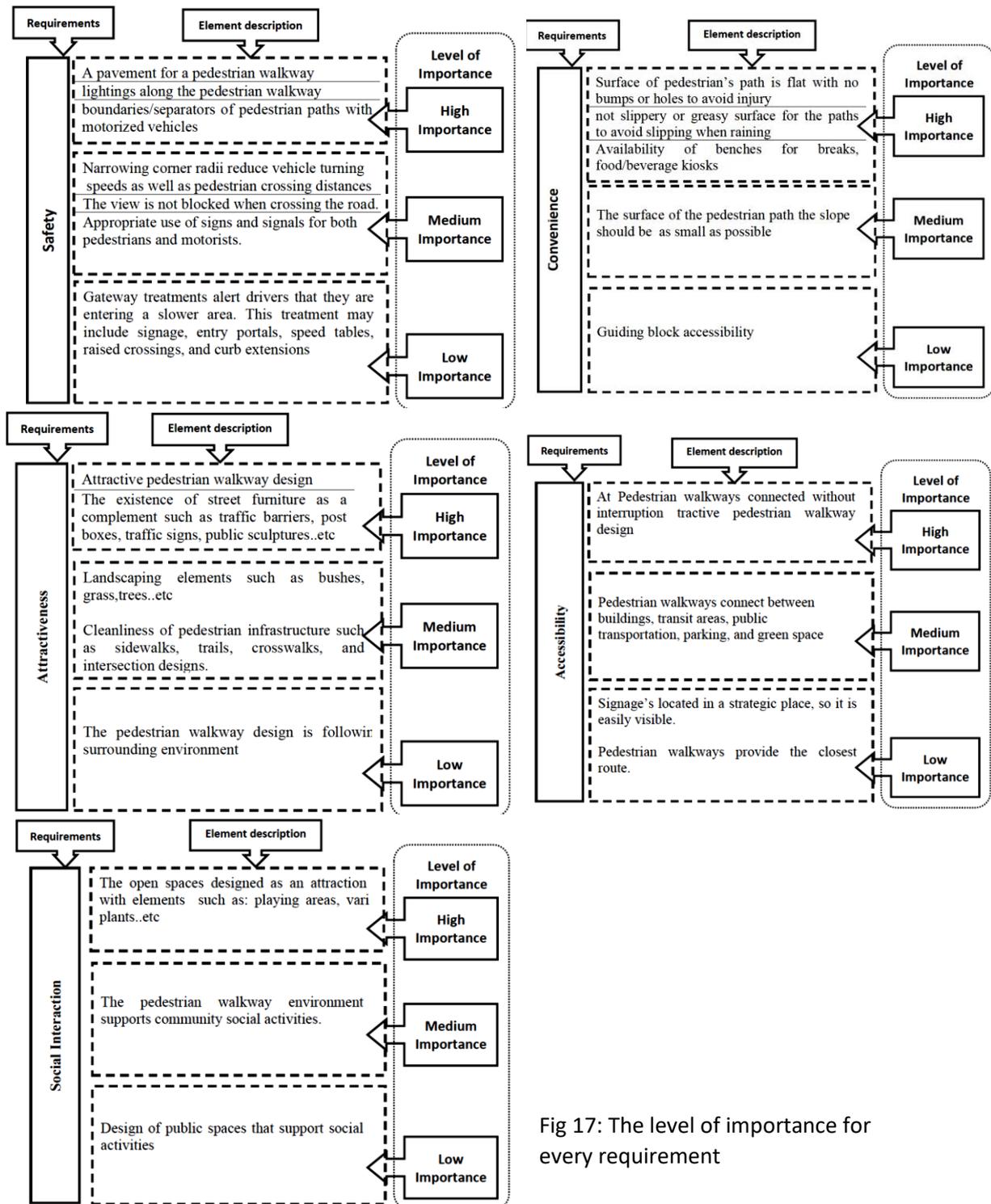


Fig 17: The level of importance for every requirement

At the end, the main purpose of analysing the walkability indicators is to understand how walkability can expand our knowledge on how to measure and assess sustainability in the built environment. In other words, creating more liveable pedestrian environments.

7. Recommendations:

The study's output shall be useful for both urban designer and architectures as well in order to determine the problems facing walkability. To improve walkability and pedestrianisation local governments, sometimes with funding and technical support of

regional or state/provincial transportation agencies must work together. It usually begins with Nonmotorized Planning to identify problems and prioritize projects which mean turning to full or part time pedestrian oriented or at least traffic calming streets.

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Abstract 1:

Questionnaire:

Measuring the level of satisfaction of walkability requirements and indicators in order to enhance Arabia Gated community -New Cairo City as a Part-time Pedestrian Gated community

Walkability simply defined as: “a measure of how friendly an area is to walking”. There are many requirements and indicators concerning walkability which are important to improve it in order to convert gated communities to pedestrianization which effect environmentally, socially and economically on urban spaces .

We Highly appreciate your participation in the survey to help us in measuring the level of satisfaction of walkability requirement and indicators in Arabia Gated community

Section 1:Demographic character:

1.1 What is your name? (optional)

1.2 What is your gender?

- Male Female

1.3 What is your age?

- Below 20 20-29 30-39 40-49 Above 50

1.4 What is the purpose of visiting Arabia Gated community?

- Work tenants shopping resident other

1.5 How often do you visit Arabia Gated community?

- Daily 5 days per week 1-2 days per week At Weekend 1 day per month

Section 2: walkability indicators satisfaction:

Regarding safety requirements in the case study:

2 Rate your satisfaction about:

2.1 Existence of pavements for a pedestrian walkway

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.2 Availability for boundaries/separators of pedestrian paths with motorized vehicles

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.3 Conflict-free between pedestrians and other modes of transportation

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.4 Availability of crossing facilities such as: Zebra crossing, raised crossing....etc.

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.5 Availability of traffic lights and traffic signs

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.6 The view is not blocked when crossing the road.

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.7 Presence of lightings along the pedestrian walkway

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.8 Narrowing corner radii in order to reduce vehicle turning speeds as well as pedestrian crossing distances

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.9 Availability of Buildings at the right-of-way with articulated facades indicate that a street is in an urban environment, not a highway.

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.10 Gateway treatments which alert drivers that they are entering a slower area. This treatment may include signage, entry portals, speed tables, raised crossings, and curb extensions

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.11 appropriate use of signs and signals for both pedestrians and motorists

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.12 influencing the level of security by validation of upper-level windows which increase street vitality

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

Regarding Convenience requirements in the case study:

2.13 Ramp availability for people with disabilities or who have physical limitations

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.14 Provide supporting infrastructure for Guiding block accessibility

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.15 The surface of the pedestrian paths is flat with no bumps or holes to avoid injury

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.16 Designing of the slope in pedestrian path should be as small as possible

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.17 Avoid slipping when raining by not using slippery or greasy surface

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.18 Provide facilities to comfort people such as benches for breaks, food/beverage kiosks ...etc

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.19 protection from bad weather for example: canopy, shadingetc

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

Regarding Attractiveness requirements in the case study:

2.20 Attractive pedestrian walkway design

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.21 The pedestrian walkway design is following the surrounding environment

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.22 The existence of street furniture as a complement such as traffic barriers, post boxes, traffic signs, public sculptures, waste receptacles....etc

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.23 The Cleanliness of pedestrian infrastructure such as sidewalks, trails, crosswalks, and intersection designs.

Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.24 Landscaping elements such as bushes, grass, trees, palms.. etc
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

Regarding Accessibility requirements in the case study:

2.25 Pedestrian walkways provide the closest route.
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.26 Pedestrian walkways connected without interruption
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.27 Pedestrian walkways connect between buildings, transit areas, public transportation, parking, and green space
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.28 Signages located in a strategic place, so it is easily visible.
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

Regarding Social Interaction requirements in the case study:

2.29 The pedestrian walkway environment supports community social activities.
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

2.30 The open spaces designed as an attraction space with elements such as: playing areas, variety of plants, seats that facilitate interaction and water element
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

Section 3: walkability requirements satisfaction

3.1 How do you rate safety satisfaction Arabia’s gated community?
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

3.2 How do you rate Convenience satisfaction in Arabia’s gated community?
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

3.3 How do you rate Attractiveness satisfaction in Arabia’s gated community?
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

3.4 How do you rate Accessibility satisfaction in Arabia’s gated community?
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

3.5 How do you rate Social Interaction satisfaction in Arabia’s gated community?
 Very satisfied satisfied Neutral dissatisfied Very dissatisfied

تعزيز القابلية للسير في التجمعات العمرانية المغلقة الموجهة للمشاة دراسة حالة: حي عربية مدينة القاهرة الجديدة

الملخص:

أصبحت القابلية للسير في التصميم العمراني الحديث واحده من أهم عناصر تخطيط المدن في السنوات الاخيره، وخاصة عند ظهور العديد من التأثيرات السلبية الناتجة من إعطاء الاولويه لحركة المركبات الآليه مقارنة بالسير. ويعرف شارع المشاه او الشارع المعد للسير بأنه الشارع الذي يوفر للماره بيئة آمنة وممتعة مما يشجعهم علي السير بالاضافة لكونه يحد من الكثافة المروريه المرتفعه مما يقلل من اهميتها مقارنة بالسير . ويعتبر المشاة من أكثر الاطراف ملائمة لاختيار المعايير المطلوبه عن طريق لتقييم إدراكهم ومعرفتهم وانطباعهم تجاه مسارات الحركة نظرا لكونهم المستخدم الاساسي للمسارات.

لذا تهدف الورقة البحثية الي التحقق من مدي ملائمة الشوارع لتحويلها الي شوارع للمشاه مع تحديد أهم المتطلبات المتعلقة بإمكانية السير من خلال تحويل التجمعات العمرانية المغلقة إلى فراغ عمراني ملائمة مشاة، نظرا لكونها تلعب دورا هاما في التنمية العمرانيه لمدينه القاهرة. ومن ثم تم اختيار حي عربيه كدراسة حالة حيث أنه يعد من التجمعات العمرانية المغلقة حيث تم عمل رصد وتحليل للوضع الحالي لتقييم مشاكل قابلية السير، وتعتمد الدراسة البحثية علي تحليل المتطلبات التي تم توضيحها في الورقة البحثية وهي إمكانية الوصول والسلامة والراحة وقوة الجذب والتفاعلات الاجتماعية، وعليه تمت إعادة ترتيب هذه المتطلبات في وقت لاحق وتفصيلها في مؤشرات مختلفة بحيث تم الوصول إلى تجمع عمراني قابل للسير كنموذج يمكن تطبيقه في الفراغات العمرانية في مصر. الكلمات المفتاحية: قابلية السير، المخصص للمشاة ، التجمعات العمرانية المغلقة، التنمية العمرانية .