

## Study the suitability of open urban spaces in residential communities in El-Obour city

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### Abstract:

The open urban spaces network is one of the main components of the residential communities in El-Obour city, it represents the living outlet of the user community by undertaking different types of activities. The more it is possible to engage in social, sports and recreational activities in the same space, the more vital that space in the user community will be, as well as contributing to the improvement of environmental conditions, Nevertheless, we note that the open urban spaces in the city's residential communities are not suitable to accommodate the diverse needs and activities of users.

Due to the nature of urban development and the required planning methodology, there have been many trends and theories that deal with the design of open urban spaces in residential communities, This was clearly reflected in the urban design of the different communities, and many theories have emerged that define the shapes and dimensions of the spaces and the environmental and social values that created. It has become necessary when planning residential communities to take into account the existence of open urban spaces, all connected through a balanced and integrated system in terms of planning, design and coordination to reach a better level for the community of users in terms of the quality of urban life in these communities.

The paper will cover how to plan and process open urban spaces and green spaces in residential communities and ways to meet the activities of the different user group as one of the mechanisms for achieving quality of life in residential communities in El-Obour city.

**Keywords:** Open urban spaces- Residential communities - Green spaces.

### ١- Definitions and concepts:

#### ١.١ Urban spaces:

Space is a three-dimensional domain, in which things and events occur, and have a location and direction in order to perform a particular purpose or situation, while the urban space is every space between the buildings in the city and includes all the surrounding corridors, public squares, fields, water bodies, playgrounds, private and public gardens, parking and roads. Urban spaces are the most important element of urban formation in the city because of its importance in the communication of the population and the conduct of activities that cannot be carried out within the housing unit for physical and psychological comfort. [١]

#### ١.٢ Open spaces:

These are the open areas within the city that reflect human life and social integration, which are two types [٢]:

- **Open urban areas:** that are identified during the planning process of the city by following different planning methods and are within the general structure of the city (streets - squares - parks).
- **Negative spaces:** that have not been specified previously but are the spaces that surround the buildings and depend on the size and shape of the design of the buildings.

## 2 - Different classifications of open urban spaces in residential communities: [2] [4]

### 2.1 In terms of movement:

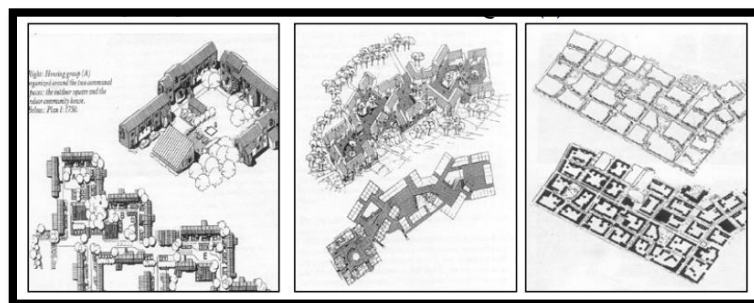
- **Static space:** a space that inspires calm and stability and is a place of gathering and emphasizes social relations between users and is represented in public and main squares and spaces between residential areas.
- **Dynamic space:** takes the linear form and inspires movement where it pulls the eye to a certain goal and is represented in commercial corridors, roads, streets and extended spaces.

### 2.2 In terms of importance:

Urban spaces can be classified according to their importance we find the main space which is the main area with the largest area and distinctive shape, which includes various and main activities and may include or branch out several secondary spaces that have less space and include activities less important than the activities of the main spaces. You find transitional spaces, which are limited spaces that achieve the function of linking and moving between different types of gradient of spaces.

### 2.3 In relation to the surrounding blocks:

- **Closed space:** It is surrounded by buildings on all sides and is organically separated from the movement paths and is supposed to gather around it a homogeneous group of residential buildings.
- **Open space:** a space that overlooks one of its ribs on the main motorized movement paths and footpaths.
- **Continuous space:** a space connected to another space or a sequenced network of spaces connected or connected to continuous footpaths but is organically separated from the motorized movement paths.



Shape 1: Closed, connected and open spaces respectively[2]

#### ¶, 4 In terms of form:

- Regular forms such as square, rectangle, triangle, oval, which are integrally similar shapes.
- Irregular forms that are integrally asymmetric.
- Composite and similar shapes.
- Complex and asymmetric shapes.
- Overlapping and related forms.

#### ¶, 5 In terms of composition:

- **Linear spaces:** in its various straight, curved and zigzag forms, whose shapes are linked to their axes, and the way they are connected, determines their basic function.
- **Bundled spaces:** Their forms are also related to their axes and the way they are connected, but this does not determine their basic function, which is mainly related to the overlap and interaction of human activities in the space, and therefore this type of spaces is largely related to users to give people a greater opportunity for people to interact and meet in groups and engage in joint activities, where this type of spaces collected is the content of people and activities.

#### ¶, 6 In terms of proportions and dimensions:

- **Human spaces:** in which ratios, dimensions and angles are comfortable for humans, for example, if the dimensions of the void are  $1 \cdot * 1^2$  meters, the relationship between man and space is close and the perception of detail is complete and comprehensive.
- **The space of the corridor:** it is the longitudinal fur that is defined by the side and gives the sense of axial orientation and not a condition to be straight and the width of the space is less than a quarter of the height of the sides of the void.
- **Deep spaces:** in which the heights of buildings around the void increase in a way that gives a suffocating feeling to the human as if in a well, where the viewing angles exceed  $40$  degrees.
- **Imperceptible spaces (shallow):** these spaces that have been separated by the walls and their heights decreased in a way that lowers the viewing angles of the ends of the buildings to  $1^{\wedge}$  degrees and loses the sensation of their composition.

#### ¶, 7 In terms of closure and openness:

Urban spaces in terms of closure are divided into three types:

- **Closed space:** a specific space, given a sense of protection and security, which can be clearly perceived by the human being, and the closed space in several forms as follows:
  - ❖ Closed space on all sides / open space on opposite sides.
  - ❖ A vacuum with four opposite entries/open space of sides.
  - ❖ Closed-corner space/open-pillar editing space.

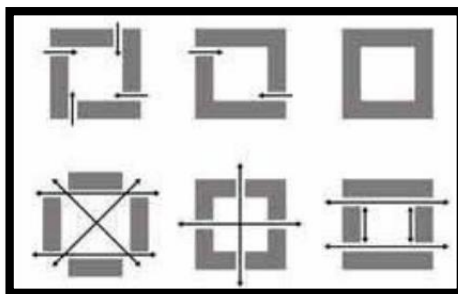


Figure 1: Different cases of closed vacuum [1]

- **Semi-closed space:** a space that is automatically formed as a result of the presence of some assembled buildings, a medium between the closed and open space in terms of visual continuity, and consists of through the relationship between buildings and natural elements.
- **Open space:** a space in which the distances between its parameters are so far away that it does not lead to a feeling of closure and is difficult for man to perceive in nature.

## 2. Planning criteria for open urban spaces: [2]

### 2.1 Spaces at the neighborhood level:

#### ❖ Quantitative requirements:

- The surrounding open area should not be more than 400 meters away from any dwelling or less than an acre.
- The area allocated to the park in the residential neighborhood must be proportional to the density of the population it serves, providing a garden for each of 3,000 to 6,000 people, and an average area of 0.8 to 1.7 m<sup>2</sup> per person.

#### ❖ Technical requirements:

- It should be easy to walk to all nearby occupants.
- It should be abundant in green areas with seasonal trees to provide light and winter sun, with the selection of plant species that do not require constant attention, and provide children's playgrounds with tools for play and enough seats. It also requires the availability of necessary facilities and services such as toilets, simple cafeterias and garbage bins. The park is preferably open to buildings overlooking it for security reasons.
- Open areas in residential neighborhoods should include enough areas for group sports, with at least one stadium available for every 3,000 inhabitants, similar to a playing area for football, handball and other group games.
- Open areas in the neighborhood must include enough spaces for children's games of at least 100 m<sup>2</sup>.
- The proportion of green areas must not be less than half of the open areas in residential neighborhoods.
- The built-up areas of the local open area should not exceed 20% of the total.

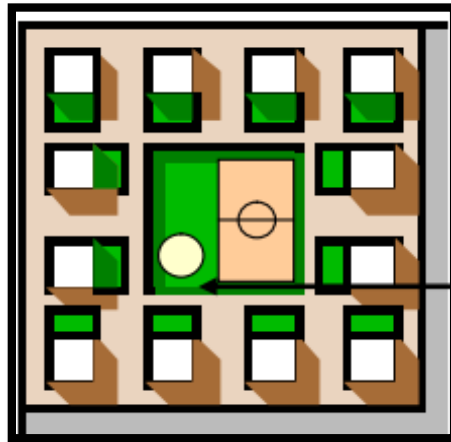


Figure 3: Neighboring open areas [4]

### 3.2 Spaces at the residential group level:

#### ❖ Quantitative requirements:

- These areas serve residential groups with a population of 900 to 1,200 and a per capita income of between 0.8 and 3 m<sup>2</sup>.
- Each residential group has its own area, and is within a service range of no more than 200 m.

#### ❖ Technical requirements:

- A children's playground with simple, attractive and safe playing equipment, with seating areas overlooking it, open running space, shaded spaces and garbage bins, must be available.
- A suitable location for the park must be selected so that it can be accessed from all residential areas, preferably in an intermediate location in the residential group.

### 4- Classification of activities in urban spaces:

The urban spaces in residential areas are generally aimed at external population activities that take place outside the housing unit. Activities within the urban spaces can be categorized into three types, which are **necessary activities** such as going to school, working, shopping, waiting for cars, waiting for the bus, **optional activities** including hiking in the area, standing and enjoying the scenery and meditation, sitting and relaxing, children's toys, as well as **social activities** that consist of mutual activities such as acquaintance, conversations, interaction of children from toys, exercises, etc. [5]

### 5- The objectives of establishing open urban spaces in residential communities:

The urban designer aims to meet the living, psychological and spiritual needs of the human being and depends in his design of urban spaces to study the needs of different segments of society. Residential spaces must achieve a sense of security, difference and uniqueness, as well as a sense of belonging to a group within the space, as well as the inclusion of blanks from private to public allows a sense of unity with the group and belonging to it through a single urban vacuum, while the natural needs of the human can be translated into the space through the environmental and health conditions provided by the urban spaces in terms of ventilation, clean environment and

green spaces [۳]. Safety and security, health services, pollution, cost of accommodation, occupancy, visual aesthetic values, educational services, employment opportunities and income levels, local climate, sports services, distance to work, parking, a place to play for children, a place to wait for cars, and therefore the urban spaces in residential groups contribute to achieving a high level of awareness of the sense of quality of life [۴] [۵].

#### ۶.۱ Planning objectives for open urban spaces in residential communities:

Through the different directions of the design of the urban spaces, the objectives of these spaces can be limited to the following [۳]:

- **Visual objectives:** achieve a suitable visual image.
- **Environmental objectives:** reducing pollution through green areas and improving climatic conditions through environmental treatments of the space ratios achieved for air movement and required shadows.
- **Social and psychological goals:** providing picnic areas and places to sit and meet and provide places for children to play and play sports, as well as providing a sense of security by keeping away from risks and accidents by separating motorized movement from pedestrians, avoiding closed spaces and providing appropriate management.
- **Economic objectives:** economics of the use of resources and elements of site coordination to achieve the economic popularity of residential units overlooking the urban spaces as well as linking the spaces with traffic paths related to economic activities in the region.

#### ۶- The design foundations of open urban spaces in residential communities:

There are some considerations that need to be taken into account when designing open areas and green areas in residential communities to achieve the required goals of these areas at all levels. These considerations are: [۶] [۷]

- **Axes:** The open area must be designed according to the nature of the paths within it from the main and secondary axes and the relationship to the nature of the entrances and their gradients from the main to the secondary and each axis must have a beginning and an end.
- **Scale:** The scale of the elements must be proportional to the spatial space and reflect the nature of the activity and behavioral patterns of users.
- **Unity and consistency:** Location format must reflect unity and coherence through the intended repetition of formatting elements.
- **Proportionality:** All parts and components of the open area must be matched and balanced with each other, taking into account the proportions, types and characteristics of plants and their afforestation in order to conform to the nature and design of the origin and design.
- **Repetition and variation:** it is better to follow the repetition in some components of the open area so that the sequence is achieved without interruption to connect its parts, and find a regular rhythm by planting some trees on the road, or a group of plants repeated by the same system.

- **Colors and degree of compatibility:** When designing the open area you must carefully study the colors of each of the plants and the elements of the design of different sites in order to suit each other and perform the required goals of the design.
- **Lighting and shade:** Light and shade are two important elements in the coordination of open urban spaces, as the color, shape and strength of the element is influenced by its location in terms of shade or intensity of light.

## ٧- Methodology

### ٧-١ Case study:

El Obour city is one of the second generation of new cities in Egypt and is a tourist attraction for residents and industrial to get out of the narrow valley and reconstruct the desert, the city of Transit is located in the province of Qalyubia from kilometer ٩ to kilometer ١٥ and deep ٧ km to the right of Cairo-Balbis road Desert and bordered to the west by Cairo-Balbis road from kilometer ٤ kilometers south to kilometer ١٦ meters north Bordered to the south by the Cairo-Ismailia road at ٢٦ km, it is planned at the highest level to accommodate ٦٤١,٠٠٠ people on an area of ١٦,٢ thousand acres and a total population of ٣٠٣,٠٠٠ with a population of ١٧ individuals/acres, and ١٦,٤ thousand acres of agricultural associations have been added along the Ismaili Egypt Desert Road. [١٠]

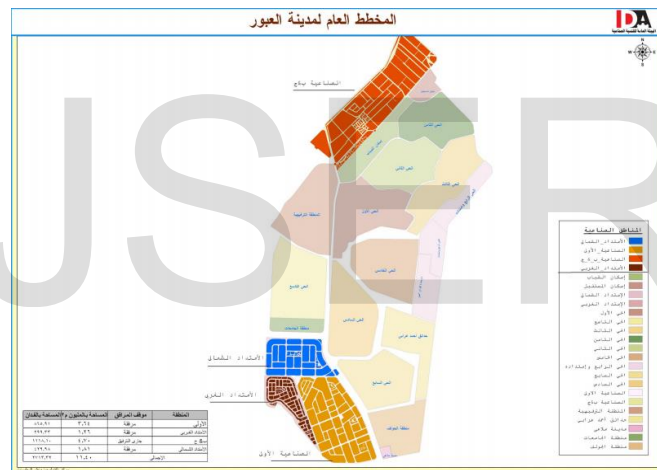


Figure ٤: The master plan of El Obour City[١٠]

### ٧-٢ Data collection and analysis:

#### ٧,٢,١ The basis of the analysis of open urban spaces and green areas in the residential neighborhoods of The Transit City:

The open areas and green areas located in the residential neighborhoods of The Transit city were analyzed by visiting the site and studying the different spaces on the ground and by maps in terms of:

- **First:** quantitative and technical requirements.
- **Second:** Classification of the types of blanks in terms of:
  - ❖ Ratios: intimate spaces - corridor space - deep space.
  - ❖ Shape: Simple shapes - similar shapes - overlapping and connected shapes.
  - ❖ Closure: Open- closed- semi-closed.
  - ❖ Gradient: Main vacuum - secondary - transitional.
  - ❖ Movement: Static- dynamic.
- **Third:** connecting with footpaths.
- **Fourth:** Activity (including auxiliary brushes for the performance of activity)



- **Fifth:** Green areas.

## 4.3 RESULTS AND DISCUSSION

### Results of the analytical study of open urban spaces and green areas in residential neighborhoods in The Transit City:

#### ❖ **First: quantitative and technical requirements:**

Most of the spaces meet the quantitative requirements, both at the level of the residential group and adjacent, in the neighborhoods of the city of Transit, except for the first neighborhood, which lacks the presence of open urban spaces or green areas as shown in the following figure (°), but all lack the technical requirements to mediate the neighborhood or the residential group and access to it at the city level.



Figure °: The presence of open urban spaces and green areas in the 4th district and the lack of presence in the first district[11]

#### ❖ **Second: Classification of types of spaces:**

##### • **Ratios:**

There are many percentages of spaces of the city according to the layout of each neighborhood, some neighborhoods have the space between the buildings empty the corridor such as the neighborhoods of the first and eighth neighborhoods as well as the widening spaces such as the spaces located in the neighborhoods of the sixth and seventh neighborhoods as there are some intimate spaces such as the neighborhoods of the youth housing area and there are no deep spaces in the city.

##### • **Shape:**

Most of the spaces are simple shapes such as square and rectangle, as in the vicinity of the 4th district, the youth housing area, and others are similar forms, such as those of the sixth district, and there are overlapping shapes in the golf area.

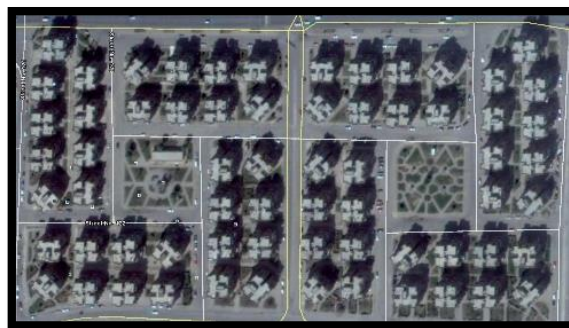


Figure 7: Forms of emptiness in the youth housing area[11]



- **Closing:**

Most of the city's spaces are closed or semi-closed of all kinds and there are no open spaces in the city.

- **Gradient:**

There is no inclusion in the spaces at the level of each neighborhood as most of them are planned as a negative result of the planning of buildings or residential villas, generating the spaces and their sizes how i agree without a specific planned plan for them.

- **Movement:**

Most of the spaces are static, except for the spaces of the corridors that inspire movement in their linear direction.

- ❖ **Third: Connecting with footpaths:**

The spaces are connected to the main footpaths in the neighborhood, which are represented only in the corridors between the entrances of the units and the parking spaces without clear and deliberate planning as in the neighborhoods of the eighth district, and without distinguishing between the different segments of the population and the needs of each segment.

- ❖ **Fourth: Activity:**

There is no identification of any particular activity within the spaces as there is no type of brushes such as seats for the seating activity, except from the presence of some pergolas, where the spaces were planned and designed as a green space only used to pass from one place to another, and therefore most of the spaces allow only the activities of the poor and dependent on traffic, and are carried out by optional and social activities on a narrow field and thus do not allow the spaces for the group of users for different activities in most of them, whether for counting the availability of seats for the activities of the activities Social except in the areas of youth housing and future housing or for children

n to play with their own spaces available some games except in the youth housing area, or open spaces for the practice of various sports activities such as the availability of playgrounds except in the youth housing area.



Figure 1: Playground and children's play area in the youth housing area in the urban spaces of the future housing area[11]

- ❖ **Fifth: Green areas:**

There are a lot of green areas between residential groups with a floor of natural plantlets and some trees, palms and shrubs, but it is noticeable that despite the multiplicity and abundance of green areas, they are almost designed as a natural view of eye comfort, not for functional use, where most of the spaces lack shaded trees either for the purpose of sitting under them or to shade the footpaths, or trees that act as barriers to wind and dust especially in open spaces or for use as distinctive signs or entrances, or to distinguish between the type of user next to where the different Distinguishes each neighborhood from the other.

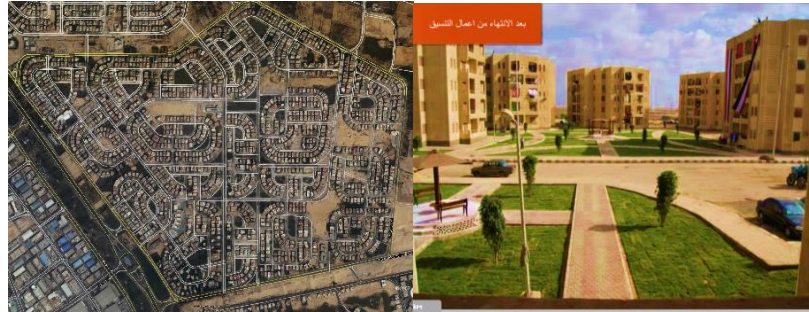


Figure 1: Green areas in the 5th district and not using trees to shade the footpaths in the urban spaces of the future housing area [11]

### 1- Results and Discussion:

- The urban spaces in residential areas have a strong role in strengthening social ties and the homogeneity of the population, which achieves the needs of the population to feel the excellence and sense of belonging to the surrounding community and shared with it in the ownership of the place.
- The current clarification shows the inappropriateness of the open urban spaces in El Obour city to practice the various activities of the group of users.
- Non-compliance with quantitative and technical requirements when designing urban spaces in residential neighborhoods in El Obour city.
- Most of the urban spaces and green areas in El Obour city lack employment use as it has been designed only as a natural view for the comfort of the eye.
- It should be paid more attention to the design of open spaces in residential communities to study the behaviors and needs of the population from actual reality rather than the application of theories and standards only.
- Taking into account the responsiveness to the implementation of the standards and design requirements of the residential communities to achieve social interaction by identifying the areas and requirements of the green and open spaces and not limiting them to the existence of the city's club.
- The need for integration between the parties of the urban development of residential communities of urban designers and specialists in the social and psychological field in order to suit the product with the needs, behavior and culture of the population.
- Work on the existence of the basic plans for residential communities and green and open spaces with the privacy to be achieved within residential neighborhoods and in accordance with the contemporary requirements of the community.

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