



## *Optimization of Public Spaces Lost in Egyptian Urban Cities: The Under Bridges as a Case Study*

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### **Abstract**

The governorates of Cairo and Giza are considered one of the largest areas of the Arab Republic of Egypt which contain large numbers of bridges that link urban areas with each other. It is one of the important traffic arteries for solving traffic jam problems as a result lack of awareness to optimize these careless areas, they have become careless urban areas, dark and very dangerous places to collect garbage and wastes, also Places crime, spread Drugs, informal parking, and finally transgresses from street vendors. The research aims to optimize these careless areas (Under the upper bridges) and make it as development model applied to all upper bridges in Egypt, by identifying Urban Public Spaces , Universal Design and studying global and local similar projects also analysing them and coming up with most important design advantages of study criteria necessary for success of projects to optimize public spaces under the upper bridges and applying them on regions studying.

**Keywords:** public spaces, urban city, under bridges



## 1. Introduction

The Arab Republic of Egypt contains about 33,000 bridges, divided between pedestrians, cars, or water bridges. Cairo and Giza contain more than 80 car bridges, and it is constantly growing day after day. As quick and alternative solutions to massive traffic congestion in Greater Cairo, bridges penetrate the urban fabric and residential areas. These areas have a high population density. These bridges create urban gaps under bridges that are not exploited. By studying the residential areas adjacent to these bridges, we find that there are no open spaces or public squares for activities. Urban spaces under bridges became dark places littered with buildings, informal car garages, dangerous places, homeless, thefts occur. From here comes the importance of research to reconsider the exploitation of lost areas unused below upper bridges. A case study at the bottom of Mariouteya Bridge, The 15th of May Bridge as case studies. Mariouteya Bridge is considered one of the important traffic hubs in Giza Governorate. As the main axis leading to the pyramids of Giza Pharaonic archaeological area. A case study of 15th of May Bridge. It is located in the most important residential, commercial and hotel neighborhoods in capital. The figures below show some examples of not exploiting spaces under the upper bridges.



**Figure 1** Unused spaces under the upper bridges



**Figure 1** Unused spaces under the upper bridges



**Figure 1** Unused spaces under the upper bridges

## **2. Methodology**

The aim of study to implement a methodology in order to: (i) Define lost space for context of urban spaces with a case study, (ii) Identify factors contributing of unused and lost spaces.

The methodology by achieving the aim of study can be represented by discussing theoretical part which focus on various performances of Universal Design Urban Public Spaces, a comparative analysis of similar global, local projects and identification of most important Positive standards and their application in Egyptian case. Current (case study) identify most important urban components (historical places - important buildings – nodes- land mark-views which affected the personality of the place, also making SWOT and the most important problems and proposals for improving population.

## **3. Urban design lost space**

The urban design of the missing spaces within the city from one of the theories and important topics within the old urban fabrics. the lost urban areas are largely cleansed in most of the untapped areas such as under the upper bridges

and next to buildings and spaces around railways roads and next to canals and rivers and next to industrial areas and next to highways which negatively affects the appearance of the city as a result of negative encroachments on these lost and untapped spaces [1].

People’s public life takes place in urban public spaces in a complex set of forms and functions. Accordingly [12], these spaces must be capable of containing diverse behavior, uses and activities such as shopping, walking, and conversation, using the facilities to entertain, relax or even passing the time as daily activities. These spaces must be able to interact with people, various daily activities, shopping and walking [9], entertainment, celebrations on occasions, daily economic activities. These open arenas should be working to attract all classes of people meeting with each other, where public places play an important role in people's daily lives on a regular basis [8].

#### 4. Universal Design

Environmentally friendly design is used by all classes of people and benefit from it as much as possible [7]. The best names that work to maintain social integrity working to provide outstanding distribution for the use of the environment. The Universal Design concept is defined as the design of space and applied equipment for most of people with any ability or age, consistent with their needs in the space. Universal Design principles. These principles are as shown in Table 1 below:

**Table 1:** seven principles of universal design  
Source: A study of Universal Design in everyday life of elderly adults [11]

<b>Principle</b>	<b>Description</b>
<b>Equitable Use</b>	The design is useful and marketable to people with diverse abilities
<b>Flexibility and Intuitive Use</b>	The design accommodates a wide range of individual preferences and abilities
<b>Simple and Intuitive Use</b>	Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills or current concentration level [5]
<b>Perceptible Information</b>	The design communicates necessary information effectively to the user, regardless of ambient condition or the user’s sensory abilities.
<b>Low physical Effort</b>	The design can be used efficiently and comfortably and with a minimum of fatigue.
<b>Size and space for approach and Use</b>	Appropriate size space is provided for approach. reach, manipulation and use regardless of user’s body size, posture or mobility.



According to Rahim and AusAid [2], there are 4 categories of design requirement which must be considered in designing accessible environment within and between buildings and in outdoor environment (Table 2).

**Table 2:** Category of design requirement in universal design  
Source: Carmona, M. (2010). Contemporary public space: Critique and classification, Part one: Critique. Journal of Urban Design

<b>Requirement</b>	<b>Component</b>
<b>Sensory</b>	Tactile warnings, guide ways and information
<b>Outdoor environment</b>	Obstructions, signage, street furniture, pathways,, pedestrian crossing, alarms [11]
<b>Horizontal areas</b>	Doors, entrances areas and lobbies, corridors, handrails and railings, bridges
<b>Vertical areas</b>	Ramps, lifts and stairs

## **5. Problems below the upper bridges in Egyptian cities**

The areas below bridges are one of biggest urban problems in most Egyptian cities, Despite frequent Their numbers and their large areas and their locations are distinguished in some cases, as they are at their best used as parking areas, At other times less badly they are used as places for the concentration of street vendors and random mattresses that fill spaces available under them, Then It extends to obstruct movement of pedestrians and cars neighboring roads, but in its worst conditions it is a repository for piles of garbage and throwing Construction waste and a stray animal shelter.

In fact, it is sometimes used as a landfill and a collection point for waste before the local bodies entrusted with their protection, cleanliness and excellent use. At night, it is a shelter for criminals and beggars, outlaws and drug users, and therefore they are either places that emit heavy pollution to urban areas due to ignition of fires, emission of harmful gases, bad odors, epidemics and insects or areas where it is missing Safety for transients, especially late at night, and therefore despite their use in achieving easy communication And rapid horizontal connection between different areas from upside However, as a result of foregoing, they act as vertical walls separating between Adjacent areas and borders at which communication between regions is separated from below, and where movement dwells and activities stop Mobility. Hence a multi-faceted loss.

First, in terms of waste of surfaces, land resources, and privileged sites represented by those large areas available in those places. Second, failure to optimize them well leads to misuse of them, and that failure to optimize them in a

planned way leads to They are used randomly [3]. Third, the lack of public services, recreational activities, public facilities and green spaces that are usually characteristic of Urban areas and neighboring population communities to those areas lends a special importance and makes an urgent need for optimization se areas provide those activities and services, especially recreational ones Despite bad condition of most of occupancies located in areas below bridges, sometimes they are Settling a number of activities that serve the surrounding urban area and provide some services necessary for uses and activities, In the adjacent urban area, in many cases these places are used when they are located in public squares to set up newsstands Magazines, books, or in establishment of stalls selling frozen goods, food and drinks, but if they are located near universities Schools, government services and these places under bridges are used to establish photocopying offices and office equipment Fast food, but if it is located near hospitals and events halls, then we find suspicions of selling flowers and gifts.

The problems in this case are: first, few cases in which these sites are optimized in this way, and second: in fact, that they are carried out separately by the owner of the project and not in a general and random manner, and not in a planned form by the local administration show figure 2. These stalls are irregular and spaced out with an uncivilized and incoherent appearance, which is not conducive to the optimal use or making the most of those sites or achieving appropriate aesthetic and civilized appearance.



**Figure 2** The current situation below the upper bridges in Egypt

## **6. The Bentawy Project**

The Bentway is transforming a 1.75km space under Toronto’s Gardiner Expressway into a vibrant public place where visitors can experience a diverse mix of activities and programs.

The path down the road has been converted into an active place with many activities. Daily entertainment programs This void under the cooper has been used as a path for pedestrians and cyclists This route includes 7 neighborhoods This experiment is an example of how lost spaces can be reused to support a new form of public life The design team conducted a questionnaire about the needs of the population in this path As a result of the questionnaire [15],



it was found that they needed open spaces, kiosks, markets, stadiums for parties, bathrooms, places to practice sports, bicycle paths, green places, as shown in figure 3.



**Figure 3** Use the bottom of the bridge for sale product, sports, rest areas, green areas and places to enjoy residents, use stairs, seating areas, water fountains, (Prepared by the author using Google Earth)

## 7. Mariouteya Bridge Project case study in Egypt

The Mariouteya Bridge is the bridge that connects Cairo Governorate with Giza Governorate and it is considered one of the longest circular bridges that connect most of Cairo's neighbourhoods with Giza the study area, which is located between the top of the Mariouteya axis, was chosen as one of the areas that contain most important urban and architectural components. This bridge passes over the Mariouteya canal, which is one branches of the Nile River and is considered one of archaeological canals that pass by famous Pharaonic archaeological areas, and below this bridge is one of important traffic axes that reach tourist pyramids area. The area contains very important architectural components such as pyramids, the Saqqara tourist area, antiquities excavation areas, archaeological bawarat areas and new Egyptian Museum. He neglected the



area beneath bridge, which is one of the main axes for the arrival of tourists from Cairo airport.

This neglect resulted in the use of canal for non-agricultural purposes harmful to environment, such as drainage of sewage water and throwing building debris and garbage. The encroachment on both sides' road for this negligence, presence of crimes and homelessness in abundance due to lack of security, and lack of whole region, as there is no fixed police station. The presence of unregulated public parking presence of an insufficient number of bridges that are transported from one side of road to other does not allow passage a sufficient number of residents and users, and it is used in passage of motorcycles despite its design to be a bridge for pedestrian traffic only absence of safe bus stations and public transport presence of heavy garbage that is thrown on both sides of canal and on the water surface of canal The existing bridges to transfer traffic from one side to other are not designed in a safe and civilized manner befitting archaeological area At global and local level show figure 4 Unused urban spaces in the study area.

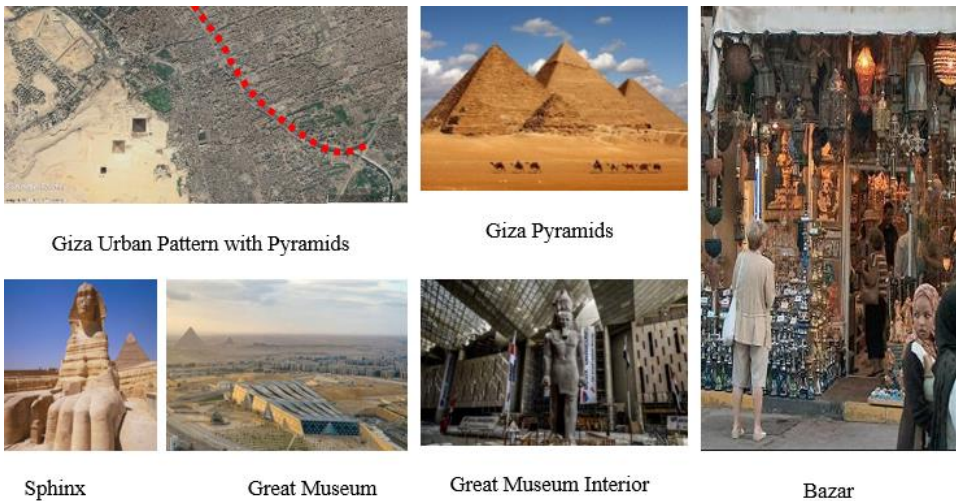


**Figure 4.** Unused urban spaces in the study area: Source: Author

Through the previous case study through theoretical study presented in research sanitary rules success of public spaces have been concluded. The study of suit from exposure Urban components (Current



situation -historical places - important buildings – nodes- land mark-views) (figure 5).



**Figure 5;** Urban Components that affects the study. Source: Google.com

SWOT based on the basic needs for the success of the missing urban spaces under bridge, physical ingredients Determining urban elements and basic components that help continuity and success of lost space and benefit from them as basic criteria Determine negative effects in area.

### Strengths

- There is a large area between (columns) - and it can be used for many different activities
- The main street width below the bridge allows the process of development.
- A green area at the end of the bath.
- Giza Pyramids near the bath
- Bazaars to sell souvenirs to tourists.
- Width of the main road lane allows the buses to park safely and comfortably.
- Near the new Egyptian Museum.

### Weaknesses

- The positions of the cars are disorganized and random.
- There is Garbage and construction waste along bath.
- There in not green areas.
- There in not enough u turn in the bath

- There is not police station in the bath
- There are no restaurants that are suitable for the tourist area
- There is not information centre for tourists
- There are not informative signs for tourists, public bathrooms, formal bus stations, formal parking.

### **Opportunities**

- The area below the Mariouteya axis is sufficient to use it in various activities.
- It is considered one of the main roads
- Tourists arrive in the Giza Pyramids and the new Egyptian Museum.
- Possibility Backfill The canal and turn it on a service path.
- Width of street width from both directions with the possibility of making parking.
- Bridge height above street level allows activities to be carried out at heights.

### **Threats**

- The area is not safe, especially at night.
- There are no activities below the bridge
- There are no pedestrians passing
- along the path except for specific points and they are used only for pedestrians crossing the other side of the road

## **8. 15<sup>th</sup> of May Bridge (Zamalek Island) Case Study**

The May 15 Bridge is an important and major traffic hub in the Egyptian capital Connecting Cairo Governorate with Giza Governorate It passes through many famous and important neighborhoods in Egypt, The chosen area of study is the beginning of the intersection of the 15th of May Bridge with Zamalek Island until the end of the path at the Marriott Hotel, The study area is one of the famous and rich district, Contains a group of world famous hotels and foreign embassies , (Al-Ahly - Al Jazeera) famous clubs, Many educational buildings like Fine Arts College, Music Education College, College of Art Education, Egyptian opera, Cairo Tower, National Telecommunication Institute, Theaters, Cinema, Churches like All Saints Cathedral Church, Aquarium. Restaurants and cafeterias, show figure6, below the bridge was tapped at the moment use a car park without government supervision. The presence of a large berth that runs along the path Not to be used in front of the shops, The usage of bridge columns in advertising boards only, the absence of service elements for the path Not to use the path by visitors despite the presence of a large number of colleges, public parks and places of picnic The absence of public open green areas.



**Figure 6.** Urban Components. Source: Author

### **Strengths**

- The area of study is an excellent location within the Egyptian capital.
- The location of the area of study in the most famous indigo island in the Nile River.
- The area of study contains many important urban components through its wonderful **planning**.
- The area of study contains important buildings in the capital.
- The multiplicity of activities in the area due to the presence of many embassies and important educational buildings.
- The area of study contains social places, such as sports clubs, a fish park, and the Al-Sawy Culture Wheel

### **Weaknesses**

- The road is very small.

- The distance between columns is very small.
- The Bridge height is too low which prevent doing activities that require heights.
- Optimization of Bottom Bridge in parking.
- The crowd is in traffic at many times today.

### Opportunities

- There is a space that can be used between all columns of the bridge.
- University & educational levels those who frequent the area are permitted to use the spaces for artistic and cultural activities.
- Students of the Faculty of Fine Arts contribute beautify the bridge.
- The various activities frequented by many users lead to present many doing activities effective path.

### Threats

- The area is not safe, especially at night.
- There are no activities below the bridge
- There are no pedestrians passing along the path except for specific points and they are used only for pedestrians crossing the other side of the road.

## 9. Results and Discussion

Based on the previous analytical study of the field of study, knowing the urban components in the study area, studying their impact on the urban environment, determining the users of the place, knowing the urban identity, and studying the most important basic needs that work to exploit the untapped spaces. A new design has been proposed for car parking, gas station, bazaar, police station, toilet, restaurants and cafes, commercial market, playgrounds, bookshops, and a lounge clothes shop, show figure 7.



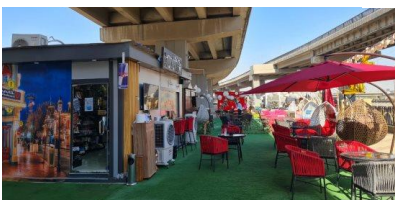
Stores



Smart Parking



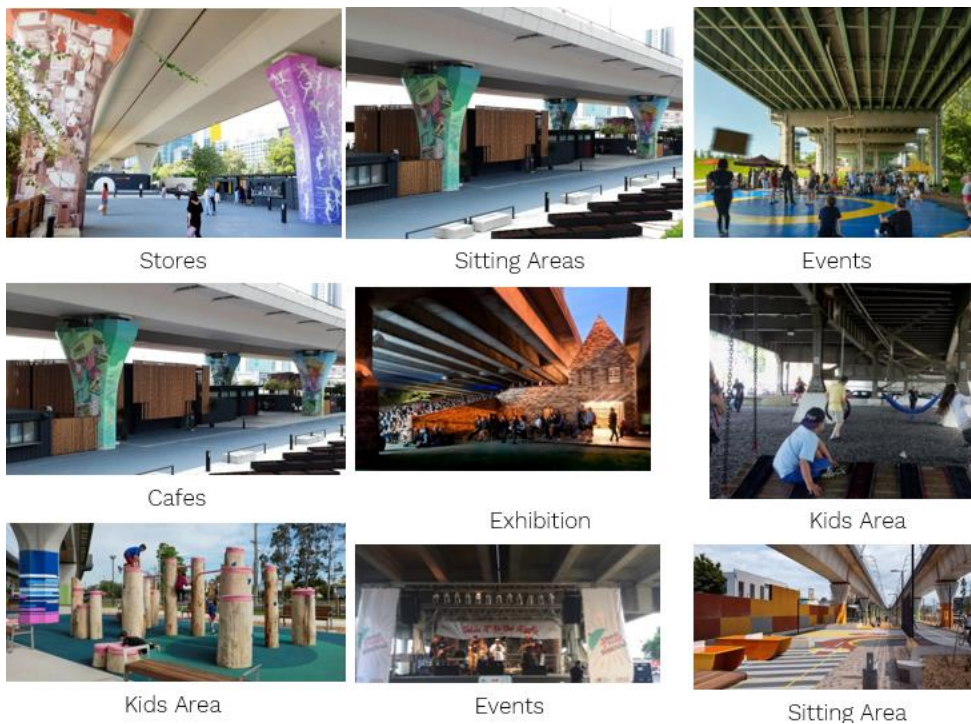
Sitting Areas





**Figure 7.** Suggested activities under the Mariouteya Bridge). Source :Author

After studying the down of the bridge of 15th of May (Zamalek Island) And knowing the negative impacts on open spaces under bridge, it was new design work to cover users' needs of following was done, Parking at the beginning and end of path, green areas along of path [3], Places designated of practicing painting and arts for college students, Open theater Public, libraries, Snacks selling places, Seating places show figure8, Proposal of redesign under the 15th of May.



**Figure 8.** Proposal activities under 15th of May). Source :Author

## 10. Conclusion

- Neglected areas below the bridges are the vital outlet for residents nearby areas.
- The proposed design helped to create job opportunities, which has a positive impact on economic development

- People should not encroach on public spaces as a result of the new design.
- The presence of control by the competent authorities in the country by preventing the dumping of garbage, which prevented the spread of epidemics and reduced the spread of crime.
- The proposed design led to raise the efficiency of the tourist area in preparation for reaching the pyramids area / to the fluidity of traffic.
- The proposed design contributed to create a spirit of community participation and cultural development, and create open urban areas with a positive impact on the residents of the region.

## References

- [1] Ashnaiy T, Mostafazadeh M (2014) The Applying of The Urban Lost Spaces In Old Yazd By Using The Concept of Leisure Time, *J Art Arch Stud.* 3(2): 87-94.
- [2] AusAid (2013). Accessibility design guide: Universal design principles for Australia's aid program, Registration Number 13. Retrieved from,
- [3] Azhar, J., & Gjerde, M. (2016). Re-thinking the role of urban in-between spaces. In J. Zuo, L. Daniel, & V. Soebarto (Eds.), *Fifty years later: Revisiting the role of architectural science in design and practice: 50th International Conference of the Architectural Science Association 2016* (pp. 279–288). Adelaide: The Architectural Science Association and the University of Adelaide
- [4] Carmona, M. (2010). Contemporary public space: Critique and classification, Part one: Critique. *Journal of Urban Design*, 15(1), 123-148
- [5] Elnaz Esfandfard, Mohammad Hussaini Wahab & Rohayah Che Amat (2018), Universal Design in Urban Public Spaces for People with Disability. Case Study of Tehran, Iran, *PLANNING MALAYSIA: Journal of the Malaysian Institute of Planners VOLUME 16 ISSUE 1*, Page 173 – 182.
- [6] Eslami, L., & Mahmoudi, M. M. (2016). Universal Design and Social Sustainability in the City: The Case Study of Tehran Iran. *Studies in health technology and informatics*, 229, 263-273.
- [7] Fakuhi N (2006) *Urban Anthropology*, third edition, Tehran: Ney Press.
- [8] Jalaladdini, S., & Oktay, D. (2012). Urban public spaces and vitality: A socio-spatial analysis in the streets of Cypriot towns. *Procedia - Social and Behavioral Sciences*, 35, 664-674.
- [9] Krier, R., Ibelings, H., Meuser, P., & Bodenschatz, H. (2006). *Town spaces: Contemporary interpretations in traditional urbanism: Krier-Kohl-Architects.* Basel: Birkhauser.
- [10] Mehta, V. (2013). Evaluating public spaces. *Journal of Urban design*, 19(1), 53-88.
- [11] Mustaqim, M. M. (2015). A study of Universal Design in everyday life of elderly adults. *Procardia Computer Science*, 67, 57-66



- [12] Nurul Shakila Khalid, Sabirah Hilal, Na'asah Nasrudin, & Marlyana Azzyati Marzukhi(2018). Lost Space in Urban Core Areas of Kuala Lumpur in Relations to Physical Urban Environment, *PLANNING MALAYSIA: Journal of the Malaysian Institute of Planners* VOLUME 16 ISSUE 3 (2018) Page 156 – 17.
- [13] Pour jaafari M (2009) Principles rehabilitation and renewal the historic fabric of cities, First edition, Tehran: Payam Press.
- [14] Rujak C (2009) Theory of the Leisure: principles and experiences, Translated by MokhberA, First edition, Tehran: Shahr Press.
- [15] Seçil ŞATIR, Elif KORKMAZ(2005)Urban open space with examples & the classification of urban furniture *ITU A|Z* VOL: 2, NO: 1/2, 130-141, 2005-1/2
- [16] Tavassoli M, Bonyadi N (2007) Design of urban space: urban spaces and their position in life and the image of the city, Second edition, Tehran: Shahidi Press.
- [17] Trancik R (1986) Finding Lost Space; Theories of Urban Design, New York, John Wiley & Sons Press
- [18] Türk, Y. A. (2014). Planning–Design Training and Universal Design *Procedia-Social and Behavioral Sciences*, 141, 1019-102