

Infrastructure Development and Implication of Negative Spaces in City Centers

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I - ABSTRACT

Contemporary urban land use planning is well-planned and managed program, led well-informed policies based on sustainable development principles. However, the rapid demographic and spatial transformation may prove to be difficult for cities in developing countries, where capacity is typically inadequate to cope with major urban challenges. Most of these challenges in developing countries include resource scarcity, over population, increasing poverty, slum growth, increased poverty, climate change, and safety and security concerns. But these concerns are quiet different in oil rich developing nations in Mediterranean region. This research has encompasses the development of road infrastructure particularly overpasses in developing nations and its inferences in urban fabric and social life of city. The end results of this research has sum up the overall learning from prevailing practice of utilizing the negative urban spaces in various regions and list up the possible reasons and solutions for developing negative spaces under overpasses.

Key words:

City infrastructure, city social aspect, urban land use, negative spaces under overpasses and bridges

II-INTRODUCTION

The spaces under the overpasses, bridges and any kind of urban infrastructure are regarded as perilous, negative, and overbearing. However, architects and urban designers consider that these spaces have potential to be transformed into distinguished space having visual pleasure.

The urban infrastructure such as over passes and bridges not only bring ease in accesses but also holds an important place in our collective cultural and social history, for example the London Bridge UK and Golden Gate bridge in US. These infrastructures provide fast preview to history and describe about how civilization and technology developed, therefore every infrastructure related to road particularly over passes and bridges are need to preserve and conserve. In addition to this, [6] report an unhappy social relationship aspect related to

bridges that, the people frustrated by societal norms commit suicide by jumping off the bridge. This

social aspect can also be witnessed in movies. But it is a fact that regardless of developed and underdeveloped regions or rich and poor nations, the spaces under bridges and overpasses reveals many folds of social conditions, ignorant society and government, urban poverty, homeless people and chaotic urban centers.

With the construction of highways in urban areas, empty spaces would result. The spaces along and under overpasses and bridges affect the way we experience the city. They disconnect neighborhoods, produce undesirable views, and act as physical and psychological barriers making the pedestrian experience unpleasant [8].

Contrary to this scenario, there are several examples of better utility of negative space under overpasses and bridges. According to report of [9] about Hong Kong mention that, there are 2,000 flyovers and walkways snaking their way around Hong Kong and most of them have a wealth of space underneath which could be developed . The report further reveals that, homes, shops, and workplaces could be built in these areas, going some way to solving our city's property crisis and helping to find places for the poor to temporarily live in some sort of comfort, as shown in Picture 1



Picture 1 Source: [9]

Green spaces under the overpasses and underpasses has also adopted as possible solution to utilise the spaces and to improve the cityscape. The report of [7] reveals that the program has been initiated in 2007 by Jakarta Indonesia and administration struggled to provide more open space in the densely populated capital and provided potential green areas under overpasses to manage the negative space under overpasses but remain under-utilized, as shown in Picture 2 and 3



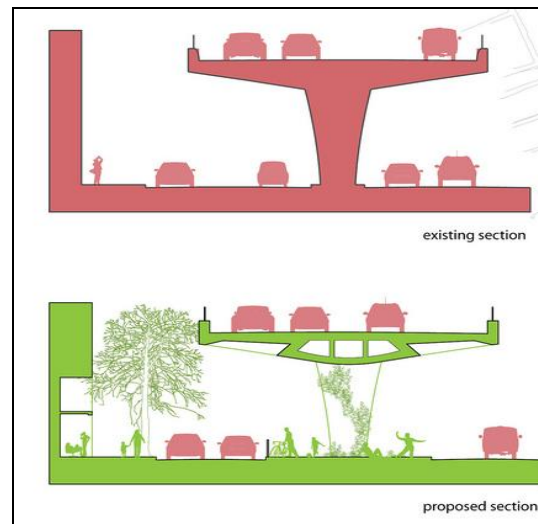
Picture 2 Source: [3]



Picture 3 Source: [3]

Research of [2] has recorded the life under JJ flyover in Mumbai India and mention that, in the mornings, informal markets spring up selling everything from *chai* (tea) to chickens, fish to fruit. Street children play games; mothers wash clothing,

cook food and sell small goods in the tiny leftover spaces of intersections and traffic medians. In the evening, food stalls set up shop and laborers gather to share food and drink, some eventually falling asleep in the vacated parking spaces. In order to address the aspiration of people living around the fly over, the study has proposed a study plan to cater the social need of thickly populated city of Mumbai. The study proposed to design the night shelters, parking, murals walls, newspaper stand, and reading space, landscape seating under the major length of JJ flyover, as shown in Picture 4 and 5.



Picture 4

Source: [2]



Picture 5 Source: [2]

The account of above suggests that the predicament of negative space under the elevated over passes and bridges need to take as an opportunity to work with the spaces results form urban development. These spaces are required to be investigate visually and exploring the

possibility of incorporating them into the surrounding communities through a comprehensive design that maximizes the functionality of the space and to minimize its negative impact. Parallel to this it is also important to improve the safety and the aesthetic qualities of the space under and its periphery. The spaces under over passes and bridges shown in picture 1, 2, 3, 4 and 5 exhibits the negative characters associated with the development of an elevated road network voyaging through an urban area. However, these spaces remain a highly desirable destination for over crowding, encroachment, and unsafe activities in highly populated regions. Various examples discussed above identified the a variety of aspect of inferences of overpasses and provided number of solutions such as parking facilities, light fixtures, sidewalks, landscaping, and landscape seating etc.

III- INFRASTRUCTURE DEVELOPMENT AND URBAN CENTERS

There is misconception that only in developing and populated nations the neglected negative spaces under overpasses function as a place ranges from chatting place to living and business to crime hubs. This phenomenon is not restricted to only developing nations but in fact it is also stretching its limits in first world also, the study of [5] reveals that, before the development of the skateboarding facility under the Burnside Bridge (Portland, Oregon, US) , drug dealers, prostitution, and dumping were common activities under the bridge. Despite these conditions some skateboarding activity took place in this area.

The study of [4] analyse the under space of below interstate-10 (Perkins Road ,Hollydale Avenue Baton Rouge, Louisiana US) and mention that, the overpass are generally aesthetically poor and obscure often producing an unpleasant sensation. These spaces can also be perceived as unsafe. These conditions are the result of a poor maintenance, bad illumination, and lack of visibility from nearby streets into the spaces below the highway overpass as shown in Picture 6.



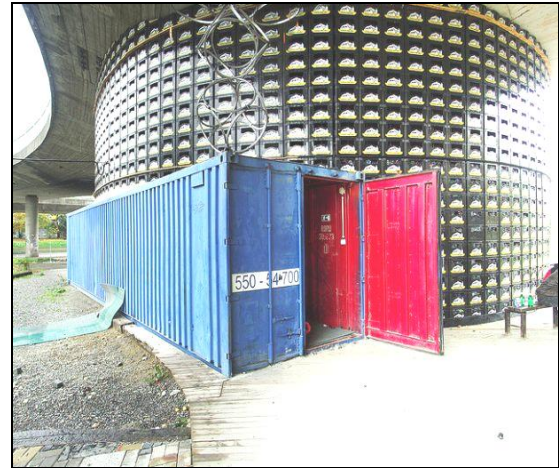
Picture 6 Source: [4]

Moreover the report of [1] has worked out the some well designed international project focusing on under spaces of over passes and bridges. These projects ranges from shift over market place to cultural display, passive landscape seating to active play and restaurants to housing. The important features of these projects are assembled as under:

Table: 1 Source: Improved from [1]

	Project	Features
1	Underpass Park, Toronto, Canada	As shown in Picture 7, illustrating the existing and proposed 3-d shots for 2.5-acre Toronto. The park is planned under the surrounding negative spaces of two freeway overpasses in downtown near Don River. The existing dilapidated site will be re-generated as an active and appealing public space, with landscaping, activity and places for edibles.
2	Burnside Skate Park, Portland, US	The concern authorities have understood the need and aspiration of neighborhood and transformed the under space of free way into skate park, named as Burnside Skate park, shown in Picture 8.
3	Under the Freeway Flea Market, Wallace, ID, US	The unique type of flea market place has been allowed to establish in small town of Wallace, Idaho US (population 784). The market under the bridge allows the 80 vendors (shopkeepers) to make business of antiques, firearms, and "everything from A to Z" as shown in Picture 9
4	Stanica Cultural Centre, Zilina, Slovakia	The place for cultural display and recreation was established in form of auditorium and theater under the negative space of a

		freeway in Stanica, Slovakia's. the structured is sustainable and modular made from plastic beer crates and hay bales, its good example for community participation, shown in Picture 10
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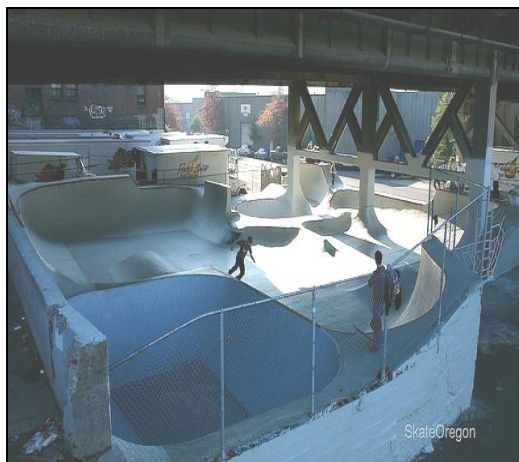
Picture 9 Source: [1]



Picture 7 Source: [1]



Picture 10 Source: [1]



Picture 8 Source: [1]

Malaysian experience of utilizing the negative space is quite unique, at several locations along the LRT route (Overhead city commuter Train) the authorities have used the long walls of LRT infrastructure as impressive mural walls and at certain locations under spaces is used as parking space, as shown in Pictures 11 and 12. However still there is a niche to rethink about revitalizing the spaces under infrastructures. The negative spaces under the LRT route could be further developed as per inspiration of people and aesthetics. For example, the Malaysia has very good setup and culture of night markets (Passar Malam) and certain viable locations of under passes could be used for hosting such markets.



Picture 11: Source: [3]



Picture 12 Source: [3]

IV- IMPLICATIONS OF NEGATIVE SPACES

This section of research has reviewed the examples of regions those are highly populated and governments have insufficient funds for improving the space under the overpass. However, with help of the pictorial appraisal in following paragraphs this research has explained that how other social groups and non-governmental organisations are taking initiatives to work out the best possible use of available space under the overpasses.

(IV-A) Makeshift School under Overpass

As shown in Pictures 13 and 14, two teachers are busy with formal lectures using part of retaining wall of bridge ramp as writing board and students are sitting on raw bricks, busy with taking notes under the bridge. The surfaces and surrounding of site is not even leveled and its environment is far away from required environment of school learning. This picture conveys three parallel messages, first that courageous and dedicated people find the opportunity in problems and secondly depict the

lethargy of government that does not want to help these people to ensure some extent of environment required for school. Third, those spaces under overpasses and bridges could be used for much better utilisation i.e. establishing schools for street and homeless kids.



Picture 13 Source: [3]



Picture 14 Source: [3]

(IV-B) Dumping Yard under Overpasses

The view shown in Picture 15 is most provoking and sullied image of reluctant city managers and authorities. The space under overpass is acting as dumping yard for household trash and leftovers. The neighborhood is prone to this filth and rotten trash and it's after affects. In this scenario the question could be raised that, if diseases, unhygienic conditions and unpleasant view is the price of development people have to pay than please don't go for development. In certain developing countries, the authorities' and municipal corporations are not willing or capable enough to manage and maintain structures of flyovers, overpasses in urban centers.



Picture 15 Source: [3]

(IV-C) Unplanned Structure

Reviewing the case in 3.1.2 perhaps suggest that if spaces under overpasses remain unattended by concern authorities, subsequently these spaces are encroached by powerful nexus of social groups for purpose of self-styled social welfare to business spots, as shown in Picture 16. Such a unplanned growth eventually start disturbing the urban fabric through traffic congestion and unplanned parking, thus establish an example for other groups to follow the similar practice in their respective areas.



Picture 16 Source: [3]

(IV-D) Unforeseen Conditions

Corruption and malevolent planning is benchmark of developing nations, the Picture 17 is evident for this aspect. The bridge has been collapsed shortly after operation, its good to know that no functional space was planned officially under this overpass. Unlike other parts of world, in developing metropolitans, perhaps the concern officials are not very sure about stability of such structures and foresee that living under such space is not wise decision. Therefore, they do not take initiatives to transform the negative

space under overpass into functional space with certain aesthetic value.



Picture 17 Source: [3]

V- ANALYSIS

This study has appraised that, modifying the negative spaces into a sharing hub can perform a significant role in the development of a rational and functional design scheme between different elements within the spaces under elevated overpasses.

In certain cases the overpasses and bridges established in commercial areas along the busy high-speed roads restricts for further development and portray as the restraints to applying the design proposals. However, function and design are two important issues addressed in these discussed case studies and have been identified as missing principal elements within these random and disturbed case studies.

The examples discussed earlier evaluated the existing and proposed elements in relation to the commercial and residential land uses that constituent the under spaces of overpasses and its periphery. However organizing these elements such as landscaping, mountain bike track, tea spot, landscape seating, night shelters, city fresco, etc. within the spaces below over passes and bridges, provided the opportunity of developing new commercial areas, bringing together scattered parking, and creating new connections between the commercial areas and adjacent neighborhoods. These small and corrective design initiatives takes advantage of the vital position of the spaces below the overpasses, within that space an exclusive quality of the site supports the concept of developing the negative space into a small urban hub were

people will arrive and recreate themselves in passive and active manner.

VI- CONCLUSION

The finding the revitalization of negative spaces under the infrastructure is not only an issue related to urban design but it is more concerned with socioeconomic and sociopolitical conditions. In certain cases the study has identified that, it is not possible to hand pick and standardized some solutions for revitalizing the underpass. The revitalizing these negative spaces envelopes the in depth study of economic, population, and cultural issues of particular regions and site under consideration.

However, the revitalization these spaces under the overpasses and bridges passing near urban neighborhood could be drastically changed to any functional and aesthetically designed place through careful interventions and facilities. This research believes that negative spaces under overpasses and bridges could be completely transformed into viable and social interactive places and these lean and negative spaces could host shared need, present aspiration as per climatic conditions seasonal and social norms.

These multifaceted spaces under the overpass and bridges consist of numerous structural characteristics for examples columns, long beams, oblong spaces, short and narrow heights, these features are confusing and create negation in urban fabric. But in some cases the rigid construction of the buildings along these spaces gives outward appearance to these spaces along the street in a pleasing manner. However, these spaces and its form do not carry all the essentials meaning and definitions to transform it in any type of functional space. But understanding of the aspiration of neighborhood and transport pattern paves the way for better revitalizing of such a space. Whereas there are some locations where the continuity of these under spaces vanishes and under spaces could not be revitalized as total functional space.

This research has established that, after careful design consideration and social brainstorming following activities and functions can be designed under the spaces of over passes and bridges.

1. Facilities for pedestrians
2. Provide safety and educational activities for pedestrians
3. Landscaping and other scenic beautification
4. Limited sports activity
5. Advertisement and Hoarding
6. Refreshing spots (beverages and news paper stall) and
7. City Mural

This research has also established that the non-development of underpasses could result from following issues

1. Lack of motivation by city governments and /social groups to improve these spaces
2. Non involvement of urban designer/architect during infrastructure design and development process
3. Power full nexus of land mafia
4. Less or No financial recourse to up keep the space
5. Dubious city governments
6. Territorial advancement of various social groups
7. Encroachment
8. Corruption among officials
9. Self styled social work

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Author's Profile



Dr. Afaq Hyder Chohan is a professional architect and registered member of Pakistan Council of Architects and Town Planners (PCATP) and associate member of Institute Architect Pakistan (IAP). Author becomes the lifetime member of PCAT in 2011. He joined RAIC, Canada and CIAT, UK as an associate member. Author's first degree is in architecture from Pakistan, master in Building Science and PhD in Architecture from Malaysia. Author is also engaged in professional teaching (architecture) and has experience of more than 16 years of university teaching in Pakistan, Malaysia, and UAE. Author has produced more than 14 research papers in international research journals of repute. His key research areas are sustainable architecture and planning, housing quality, affordable housing design, and policy, design audit, design quality indicators and urban regeneration.