



HUMAN INTERACTION WITH PUBLIC OPEN SPACES

Interactive Open Spaces With An Approach To Universal Designs

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Abstract : Once Jan Gehl the architect and urban designer stated that “The city throughout the history of mankind has been the meeting place for people. Much of the culture of mankind has happened in the public space. Public space is an important aspect of a good and well-functioning city.” A city must increase the quantity and quality of well-planned beautiful public spaces that are human in scale, sustainable, healthy, safe, and lively.

But this research is not about that, it's more towards human behaviour in those spaces. In this approach, this research aims to review theories and solutions related to it.

The research will be based on three questions:

How do human behaviour and lifestyle change with the change in their interactive spaces and surroundings? How can interactive spaces be made more feasible and beautiful through architecture? How to make those spaces effortless for the elderly and specially aided people considering various aspects.

Keywords- .

I. INTRODUCTION

As of the 21st Century, the world is profoundly changing the way of living our basic everyday activities like shopping, learning, working, praying, etc. cause of the virtual world forgetting about the real one. People enjoy and need social and sensual contact to get out of these virtual elements which are harming our bodies and the activeness in our lives.

To let people out of the virtual world we need to study certain behavioural changes as per the place or surrounding and how it triggers or relax one's mind and body. As well as needs Of these interactive spaces.

The theory which came to be known as Maslow's Hierarchy of Needs suggests that the essential factors in motivating behaviour are the physiological, biological or aesthetic needs, the need for safety, the need for love and belonging, and the need for self-actualisation, status or esteem (Lang 1991; Maslow 1943).

By drawing from Maslow's Hierarchy of Needs and considering the relationship of these factors with the built environment, it is reasonable to hypothesise that certain aspects of human behaviour are capable of being affected by the presence of the physical and ambient features of public spaces. The physical features of public spaces may include elements such as buildings, streets, landforms and other people, whereas the ambient features may include illumination, sound and temperature. The need for open and interactive spaces in cities can work as well as help with rapid urbanisation and a constant increase in the urban population.

Open spaces act as a 'green lung' for a city, a focal point that breaks up the monotony of our concrete jungle.

Indeed, public open areas, such as parks and green spaces, appear to be key built environment settings that provide opportunities for a variety of physical activity behaviours, such as recreational walking and playing sports.

A well-distributed open space can influence the quality of life in urban areas. Traditionally, architects have viewed and deployed spaces as a tool for interactions.

This view is changing. Recently, architects are beginning to embrace it as a space to be designed, rather than merely as a tool, and explore the potential stakes of architecture as a new design territory.

Example - Before the kid's play areas were allotted just to play only.

But, nowadays we can see lots of urban design elements being used to attract more people to the space through lighting, installation, etc. Also, another example would be of Panchayat being held under a tree at the centralised position of the villages can rather have an O.A.T for such meetings and festival gatherings. This paper will focus on all those design solutions as well as the core problems and failures to provide better interactive spaces for all.

II. WHAT ARE INTERACTIVE OPEN SPACES?

Interactive spaces are those that turn the user who merely occupies a space into an active participant. These are spaces that provide the user with hands-on involvement with certain aspects of the space by physically engaging them in a variety of ways.

Public spaces are an inseparable part of the urban fabric.

Such spaces function mostly as passageways from place to place, or for short-term activities. A public park, for example, where people spend relatively more time, contains a larger percentage of non-built areas, which create areas for sitting, resting, and playing. The design of these spaces will affect the types of activities that will be held in the – exposed places and will encourage public interaction, whereas enclosed spaces will enable more intimate social interactions. An open space can be used for various recreational purposes like a jogger's park, a park for kids and gardens, etc

Example -

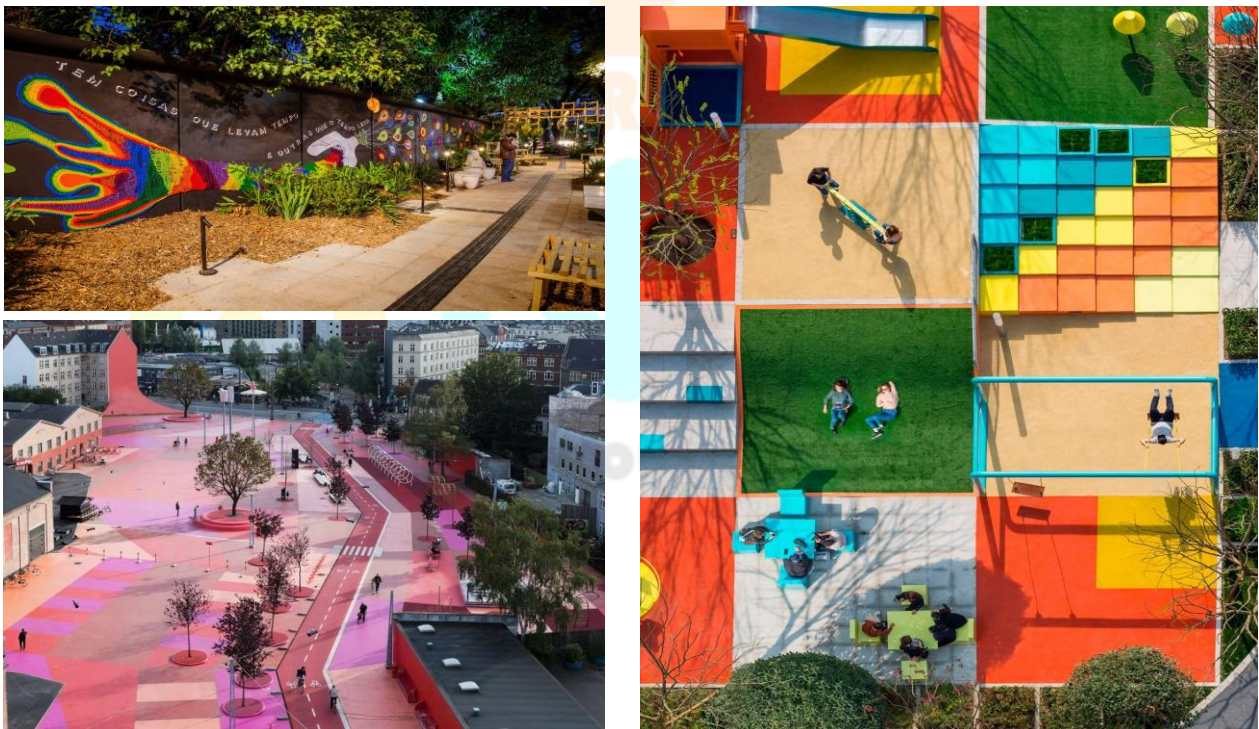
Consider public squares with a human sculpture in its centre with movable limbs, the sculpture can be manipulated by people under a set of predetermined rules, that is to say, the designer would know exactly how people would interact because there are only a few ways the limbs could move. This would be categorized as interactive, as it treats its users as 'players'.

III. USES -

There are spaces for quiet personal indulgence as well as for large-scale public events, from walkways, skating tracks, an amphitheatre with green rooms a new bridge extension, etc.

The sidewalk includes tactile signs on the pavement and maps for visually impaired persons. The walls display graffiti and artwork adding vibrancy to the street and encouraging public engagement. (Figure 1) Creates a public plaza using visual codes of colour, creating different zones for recreation including leisure, play, solitude, social gatherings, cultural nodes, marketplaces, and parking spaces.

- The design draws its inspiration from the pixels that form the smallest unit of a digital image. Likewise, the public space is conceived as a composition of several such squares/pixels each serving an independent function. The entire composition uses colours, textures, and levels to add to the dynamism of the space.



- It has been conceptualized as a space of performance creating an open-air amphitheater made from steel trusses and concrete blocks. The space in front is used for commerce while the building façade forms the backdrop or a screen for projection. This splash of bold red in the middle of the city certainly elevates the quality of this space.

- The design creates an urban toolkit with adaptive urban furniture elements, a graphic style guide, soft landscape features, play equipment and a method of distribution. The strategy makes it easy to expand the design to the rest of the street in an integrated manner. The design has transformed a former busy highway into an active liveable healthy public space.

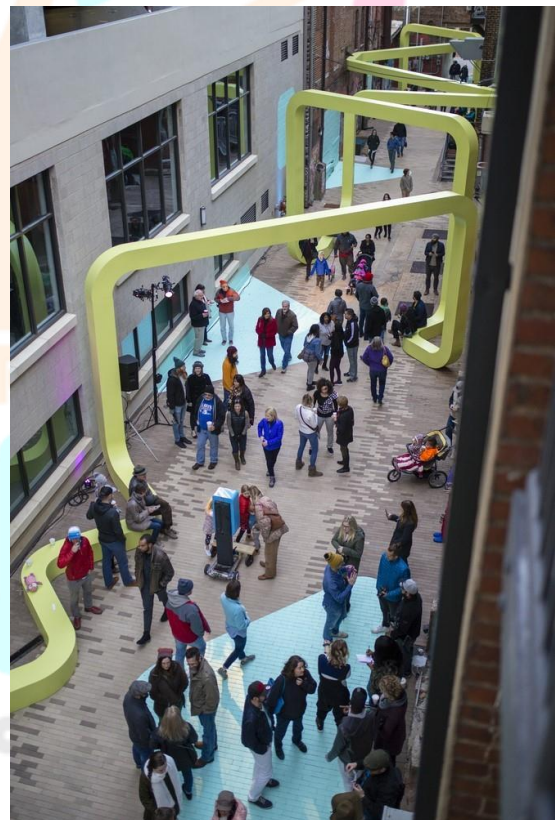
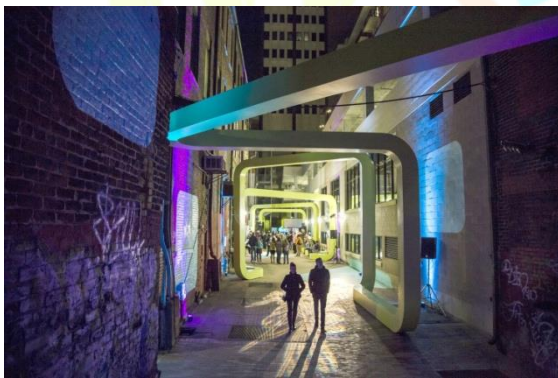


- The design creates a case for the importance of a strong interactive connection between the built and the natural. The promenade is envisaged as a space for leisure, a series of steps and ramps are created that allow one to lounge and take in the view of the sea. The design weaves in different functions such as sports facilities, various game courts, playgrounds, and relaxation areas under the palms.



- A single continuous element in design that sets in motion the anticipated appropriation of space via user perception. The continuous steel tube running horizontally and vertically, twisting, crossing its way through the length of the alley converts the linear space into multiple smaller spaces/rooms that can be used for sitting, lounging, playing, as exhibits, film screenings, etc

- The design through its vibrant use of color and minimal intervention strategy uplifts the space and lends credibility to the users by leaving room for appropriation or interpretation, an aspect most often missing in urban design interventions.



IV. PUBLIC OPEN SPACE AND HUMANS -

Public open spaces can influence physical activity in at least three ways. First, public open space can be a setting in which people engage in physical activity. Second, public open space can be a destination to which people actively travel either to be active or simply to socialise. Finally, public open space can be used as part of a route pass-through to reach another destination (e.g., passing through a greenway to reach a shop) or as part of arecreational walk or running route . Hence public open space can contribute to different types of physical activity behaviours. For example, public open space as a thoroughfare is related to active

travel, as a destination for either active travel or recreational physical activity, or public open space as a setting might be related to recreational walking or cycling, running, dog walking, formal or informal sport, or children's active play.

The choice of a particular activity form may depend on different factors, the most important of which are: age, physical abilities, gender, sex, family status (e.g. being a parent of a baby), as well as place of residence and its proximity to sports and recreation facilities. Although these factors may not be relevant to certain people or groups, they impact the way of using public spaces and sports facilities. Teenagers, for example, may do it in a completely different way and at a different time of day than families with children or elderly people.

For identifying the relationship between the forms of activities favored by users and the features of public spaces in which they are undertaken few approaches have been taken.

The first approach divides activity spaces into formal and informal ones, while the second one categorizes the different needs of their users according to their age and physical abilities.

V. FORMAL AND INFORMAL ACTIVITY SPACES -

Formal spaces -

Formal spaces include areas and facilities designed and constructed for sports or recreation, in principle dedicated to physical activity. As this study does not take into account professional sports facilities, the group of formal activity spaces includes the following areas and infrastructure: public sports fields and playgrounds, outdoor workout and fitness stations, bicycle paths, skate parks, pump tracks, parks, as well as pedestrian and tourist routes.

Their most desirable attributes are:

proximity to the place of residence, accompanying greenery, spatial connections to bicycle paths and other recreation areas, and multi-functionality – formal activity spaces should also perform a social function, serving as a meeting place for local communities and peer groups, with not only sports equipment, but also different kinds of benches, seats, and shelters from sun and rain.

What may discourage people from using these spaces is the exposure to spectators, which is the most common problem raised by the elderly and women, and the resulting lack of privacy or intimacy during exercises.

Informal spaces -

In the cities, physical activity is also undertaken in spaces not specifically dedicated to it. Two categories of informal spaces can be distinguished. Physical activities such as skateboarding, BMX riding, or parkour are undertaken in such public spaces as squares, streets, and parks, and make use of their architectural elements and parts of the buildings, e.g. balustrades, stairs, walls, ramps, benches, street lamps, or pillars. Although these activities are not always accepted, they are increasingly common and frequent.

The second category includes spaces that have been adapted for sport in an informal and bottom-up way, for example as a DIY (Do It Yourself) project. The main feature of this kind of infrastructure is its grassroots character and location in previously degraded areas. Its users return the space to the city, developing and adapting it to their needs.

The quality of public space – its architecture, equipment, and design, as well as its level of accessibility and openness to the different needs of the residents – has a direct impact on the number of its users and on the quality of life in the city. Therefore, its features can have an effect on the residents' activation.

VI. DIVISION OF SPACES ACCORDING TO THE AGE AND PHYSICAL ABILITIES OF THEIR USER

First, it has to be stressed that the most actual trend in sports facilities design is to ensure their integrating and inclusive character, with no age or physical ability segregation.

Children and families -

The meeting places for families and children should constitute the spatial heart of a local community, where all its members can spend their time. It should be a space where children challenge their physical and mental capabilities, creating different forms of free play. Through games and their social, physical, and creative character, children also learn about the community they belong to. Another trend in the design of multifunctional, family playgrounds is to use natural materials like stones, wood, water, and plants, to teach the importance of having contact with the natural environment.

Teenagers and youth -

This age group is characterised by a rejection of the children's world and negation of the adult's world, which finds its expression in undertaking alternative street activities:

skateboarding, inline skating, scooter and BMX riding, streetball, parkour, etc. Teenagers search for places to undertake their activities and find them even in the areas of urban space not designated for sport. In fact, they are the largest group of users of the already discussed informal and DIY sports infrastructure.

They play their own music and bring sports equipment and lighting which allows them to use the space even at night. They use movable elements to arrange the place in different ways.

They like to decorate the walls, benches, pavements, and ramps with graffiti and resent being told how their space should look like. It is very important to take into account these specific needs in the planning and design process of formal spaces as well, by allowing young people to arrange them according to their expectations.

Adults -

The most common public facilities for adults are sports fields, parks, outdoor gyms, and workout stations, as well as paths for biking, walking, jogging, or Nordic walking. Inconveniences, already described when discussing formal spaces, include lack of shelters, lighting, and greenery, and too much exposure to other users.

Women in particular report the need for intimacy in exercise areas. What most adults need, however, is motivation, company for joint exercises, a local leader, and organised activities close to home – which are issues of a more organisational nature, not connected with the spatial aspects of physical activity. Trees and the surrounding silence create favourable conditions for sleeping and playing children, while their mothers exercise together and take turns looking after them

Seniors (70+) -

Physical activity for people advanced in years has a great impact on their physical, mental, and intellectual condition, and the ability to conduct an independent life for as long as possible. Among the most recommended activities, we can list balance exercises that prevent falls, coordination exercises that help to perform all kinds of domestic and other activities, as well as muscle strengthening exercises that make it possible for the elderly to overcome terrain difficulties and stairs and to perform heavy housework.

Apart from strictly physical exercises, recreation and relaxation is of great significance: the possibility of walking, jogging, cycling in green areas, observing people, and taking part in community life. That is why safe, green links between the pace of residence and other urban areas, such as the community centre, recreational and sports areas, or cultural centre, are necessary. Design for the elderly should realize all principles of the universal design of public spaces, making them accessible, friendly, and safe for both young and old ones, for people in wheelchairs, the blind or deaf, and others physically disabled.

VII. UNIVERSAL DESIGN CONCEPT

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. In other words, the main aim of Universal Design is not to make people fit to space but to make the space fit to people.

The Universal Design concept promotes a shift to more emphasis on user-centred design by following a holistic approach and aims to accommodate the needs of people with disabilities, including the changes that people experience in the course of Life.

Disability (specially-abled people) -

A disabled person is someone who is disabled due to organ failure and has difficulty in performing his or her daily routine activities, as well as those suffering from congenital malformations or mental retardation, diseases and injuries. Thus, disability includes various physical and mental impairments that can hamper or reduce a person's ability to carry out his daily activities.

Disabled people encounter many problems, and these vary according to the types of disability they have, in urban spaces and their social surroundings. In the case of disabled pedestrians, movement barriers relate to their physical-movement characteristics and the lack of both infrastructure and facilities in urban areas.

The suggestions to make the street accessible, safe and comfortable for people with disability are outlined below:

1. Quality of walkways: Improve the quality of sidewalk and roadway paving by using pavement which is resistant to changing climate such as rain, snow and hot summer weather. Good quality paving would make sidewalk surface more resistant to cracks and potholes, allowing for freer and smoother movement by the disabled.
2. Obstruction on walkways: Clear the sidewalk of any physical barriers that would impede the movement of the disabled. The use of tactile paving can also improve the safety of the blinds in using the sidewalk.
3. Quality of zebra crossing: Improve the quality of zebra crossing by using tactile paving. Zebra crossing must also be clear of obstacles and street islands.
4. Traffic light: Install an audible alarm and timer to provide safer crossing to the disabled. Timer length must consider the movement speed of the disabled to cross the street.
5. Street sign: Install signage with Braille script and also with suitable dimension to allow the disabled to easily find their way in the area.

Animal-Aided Design' (AAD) -

Animal-Aided Design' (AAD) is a methodology for the design of urban open spaces, to integrate conservation into open space planning. The basic idea of AAD is to include the presence of animals in the planning process, such that they are an integral part of the design.

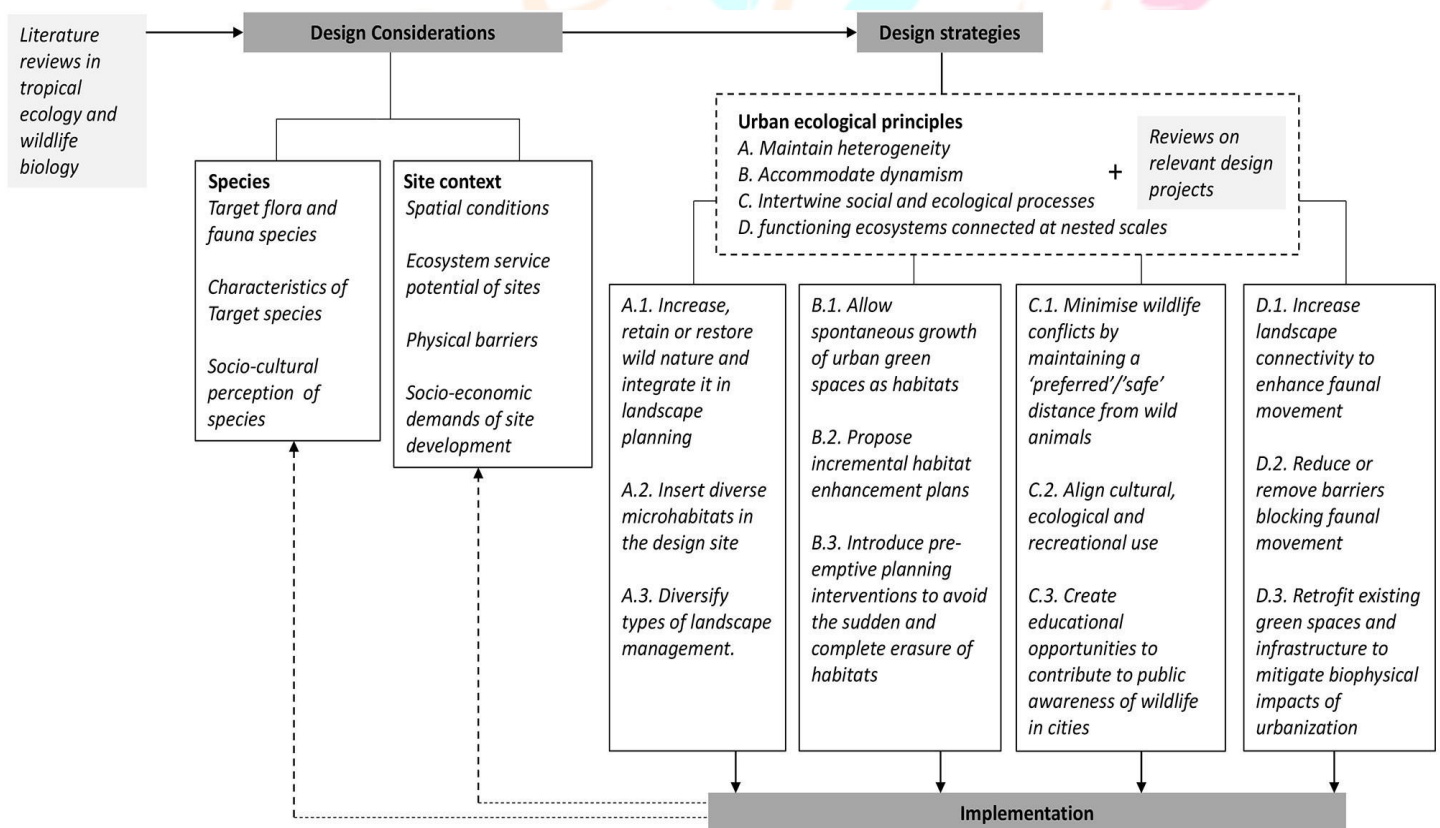
For AAD, the desired species are chosen at the beginning of a project. The requirements of the target species not only set boundary conditions for the design but also serve as an inspiration for the design itself. The aim of AAD is to establish a stable

population at the project site or contribute to the population growth of species with larger habitats. AAD thus allows a combination of good urban design with species Conservation. In order to create green infrastructure, biodiversity needs to be mainstreamed into current planning strategies, in order to end solutions that be- net both humans and other species at the same development site. In cities, this is particularly true for those species that can share their habitat with humans, rather than those that live in remnants of their original habitats that were there before the city was built, which is very disturbance-prone and that tolerate little contact with humans.

Implementing human–wildlife interactions systematically in planning and design is not yet common practice, as decision-makers are confronted with several major challenges. First, land scarcity is a major concern for many modern and compact cities (Richter and Behnisch 2019). Cities prioritise anthropocentric developments and regard wildlife as belonging to, and necessarily conserved in dedicated nature reserve areas. Second, design considerations are typically limited within the project site scale while biodiversity planning and design go beyond site scale, and must consider the large scale of connectivity across a city. Third, wildlife in urban environments can evoke mixed feedback, with some residents perceiving animals (e.g. long-tailed macaques *Macaca fascicularis* and wild boars *Sus scrofa*) as a public nuisance. Furthermore, the public may fear being close to wild animals, and public acceptance of the presence of wild animals may remain blocked by certain socio-cultural barriers

Design strategies to enhance human and wildlife interactions -

Based on the preceding discussion of species and site considerations, we propose 12 actionable and contextualised design strategies to enhance interactions between urban dwellers and wildlife and contribute to habitat enhancement in the city. We group these strategies into four essential urban ecological principles: maintain heterogeneity, accommodate dynamism, interweave social and ecological processes and recognise urban landscapes as functioning ecosystems at nested scales.



Research Through Innovation

A flowchart representing an iterative process of design approaches to develop human– wildlife interactions. The process can be divided into two steps: species/site context considerations based on the relevant literature; 12 design strategies categorized by 4 urban ecological principles and exemplified in design projects.

The key to wildlife-inclusive cities goes beyond simply designing spaces for animals to thrive. Success also depends on public acceptance of wildlife in the urban context. Thus, the social perspectives of human–wildlife interactions require more study. We hope our suggestions will boost design and planning efforts in that direction, strengthening links between wildlife and urban dwellers and having a positive impact on the pursuit of conservation beyond cities and towards a bio-diverse planet.

VIII. PUBLIC INTERACTION IN PUBLIC SPACE

Public interaction is hard to understand and when it comes to interacting in public spaces there are different things to keep in mind, such as what type of social situation the person is in, where space is and many different characteristics. The interaction the people do in public space should be designed in a way that it does not make them feel uncomfortable.

The importance of to have knowledge over social filters, such as comfort zone and privacy that are needed in order to figure out the condition of the interactive system in the public space will fit and work accordingly and fit successfully in the environment. Most activities done in public space are not through social interaction but implicit interactions with yourself. An example of that could be when walking and a person is implicitly interacting with their phone, and since you are not aware of the social surroundings you are not able to socially interact and leading to not trying to interact with others. This will try to be debunked through different methods and design possibilities as well as reflect over the participants' insights. Such as the social characteristics of adding social layers to a place, and this contributes to defining the place and giving it an identity. The kind of activities that happen in the place and what kind of interaction are implemented will influence the condition of the interactive space. Further, the amount of people in this space and the frequency of their visits determines how the interaction adds characteristics and feels more inviting for the people to discover its purpose, which leads to the encouragement of social interaction in public space. People are drawn to spaces that offer interest, stimulation, comfort and amenity. These aspects can positively change the reputation and overcome the psychological barriers experienced by some users within the public space. This is an important factor to encourage public interactions in public space, since it requires the person to feel comfortable and not to be outside their comfort zone to engage in it, as previously mentioned in the thesis Swedes are always evaluating their situation and thinking about what they did wrong and do not want to make a fool of themselves. Being outside your own comfort zone can mean a lot of different things, such as anxiety, panic, fear and excitement. These feelings and emotions are related to it being unknown experiences which often occur when navigating in public spaces. Behaviours such as jumping or being silly in public spaces could drag people out of their comfort zones which is the opposite intent of the planned prototype. Motivating and encouraging people to interact outside of their comfort zone is a goal trying to be achieved through this thesis, as well as encourage people that it is okay to step out of their own comfort zone

Groups of different ages tended to avoid contact, often by occupying different sections of the same space. There has been an issue for generations that different age groups tend to avoid to public interact with each other and use the public space as an area to hang out on but only with comfortable people. The persistence and influence of reputation is an important aspect of a place's identity. Public interactions are not only between the people that interact but as well as the space they are in, which leads to it becoming more engaging and encouraging when the people are in a space they know about and are aware of their surroundings. This will be presented in the design process throughout the interviews, observations and user testing. Not only could it attract more people to interact, but it could turn the spare into something significant to the environment and to the people using it.



IX. PUBLIC OPEN SPACE AND FIXATION

Various recreation grounds and open spaces present unique and wonderful qualities. These places enable the residents to find more neighbors and develop communications.

Public open spaces as a place for important social events

Making an opportunity for some great social events to establish is one of the advantages of qualified public open spaces. Festivals, seminars, national and traditional events can affect the urban environment if they are managed appropriately. In addition, these events prepare public spaces which are hardly indelible. In the other words makes the city indelible and unique on its own.

Urban space is not only divided to public and private but it can be differentiated by social, economic and cultural patterns

Hereupon mobilizing and developing the urban open spaces has become an important factor in sustainable development which has a main role in environment qualification and protection of natural and historical values in cities. From this perspective, ancient urban spaces and restoring the human and social qualities and innovate various kinds of new collective and public spaces

is a subject require continual comprehensive cooperation. Functions and dimensions of public open spaces In texts, wide range of public open spaces functions and dimensions includes chances for gathering in grass roots, political role in free associations in a democracy, traditional and cultural festivals, ceremonies which private and gregarious identities can be grown, public and individual access to private space, are mentioned .

From a descriptive perspective, public spaces are multipurpose and accessible areas distinct from family and individual territory . Different dimensions of urban open spaces are shown in the following scheme:

-Sociability: One of the most important dimensions of public spaces is to create opportunities needed for social interactions. Interaction with other people of the society leads to creating a stronger relationship with the place and society. This factor can be measured by determining the level of different social group's presence, formation of social societies and living in different hours of day and night

-Activity and usage: social events, different activities and usages inside the space and their potential to attract individuals and different groups are the most important factors in public spaces dynamics and their activity in various hours and seasons. The evaluation criterion for this dimension is the level and number of people's reference to such places and participation in various activities .

X. OPEN SPACE INFRASTRUCTURE

Different types of open spaces are considered including parks characterised by a larger proportion of their overall area occupied by soft, porous surfaces, planted areas and water. Different scales with different functions are considered. In this category, we can distinguish variations related to urban development processes and location including historic parks and large central parks. A third category is the linear parks occupying a long and thin area going sometimes beyond the urban centres and acting as a connector with the urban fringes and often related to a river or disused railway lines .The link between different parks is often retrospectively driven by the contemporary concerns in creating coherent and continuous open space networks requirement to respond to the sustainable living agenda playing a major role in ensuring biodiversity and urban cooling

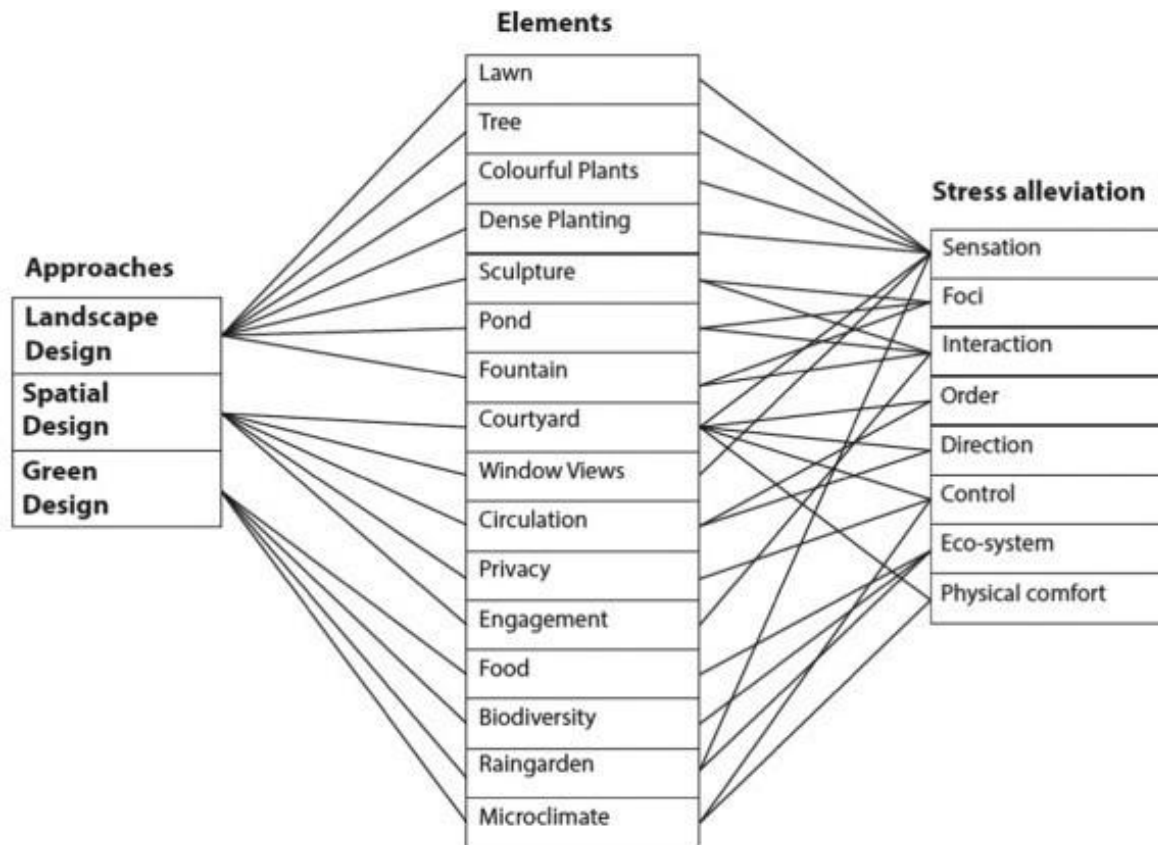
Parks also constitute a significant public amenity for urban dwellers and therefore should cater for a wide range of needs and activities. The size and location of parks, their isolation, proximity and/or continuity are criteria, which influence their potential impact on the quality of life in the urban environment .

XI. THE BENEFITS OF PUBLIC SPACES IN THE POOREST PARTS OF THE WORLD



XII. PUBLIC SPACE AS AN INSTRUMENT OF URBAN TRANSFORMATION

We have seen an increase in demand from client cities to enhance urban spaces as a part of their urban projects. Some of these requests have been included as a part of several operations across South Asian countries, and incorporated in recent World Bank projects in cities including Colombo, Kandy and Galle in Sri Lanka as well as Chennai in India. Fortunately, there are notable examples of success from South Asia and beyond. Despite the numerous successful examples, the need for public spaces has not been given the attention that it deserves, in terms of policy and action in developing countries. Cities must recognize the role that quality public spaces can play in meeting the challenges of our rapidly urbanizing world.



XIII. CONCLUSION

The results of the study can help to integrate urban design and conservation efforts in the development of historical cities. Additionally, the results can serve as an example of urban design studies to further reveal the character of a historical city.

Safety barriers and guardrails should not interrupt visual perception. Informative urban elements and seating units should be made available, and a variety of urban actions should be sufficiently planned for the area. The historical texture should be evaluated as a whole along with its artificial (existing modern and historical texture) and natural elements.

Throughout the evolution of historical cities, public spaces should be arranged in consideration of all aspects and context, including the periphery of historical environments. Greenery and sustainability should be considered a part of the process of public space design. The variety of urban functions and the types of spatial relations with respect to the historical texture can be enhanced through the active promotion of public life. This study examined the contribution of public space to the perception of historical texture, its powerful presentation, and the interaction between public space and historical texture.

With the progress of society and economic development, people's material and spiritual level has been improved, and the proportion of commercial public space in urban construction is also increasing. People are no longer satisfied with the original spatial functional characteristics, and need to introduce solutions to improve the current situation.

Introduce interactive design into commercial public space, optimize the space environment, meet the current social needs, and integrate the concept of environmental art into user space. The interactive design method proposed in this paper has certain popularization value and guiding significance for the current methods of designing and improving the spatial characteristics of urban commercial public space. It explores the new commercial development direction in the future, realizes the artistic and intelligent space environment of the commercial public entrance space in the human-computer interaction system, and fully reflects the artistic vitality and great artistic charm of the space environment.

XIV. ACKNOWLEDGEMENTS

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