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**A critical study of Responsive Design elements in the context of the college road Mandian in Abbottabad, Pakistan**

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**ABSTRACT**

*Within the urban fabric of a city, vibrant open spaces are essential for carrying out daily living activities. These open spaces become even more important in areas that are in the process of becoming more urbanized. These are commonly referred to as urban villages. The study's primary objectives include a qualitative assessment of a very busy, vibrant, and active college road in Abbottabad's Mandian neighborhood. For conducting qualitative research and soliciting proposals for improving everyday routine transactions, the case study technique was used. The findings of this study imply that urban areas include a variety of activities that play an important part in the resident population's life cycle. For a long time, these activities have been a part of the locals' lives. The findings imply that urban design features have an important role in carrying out these activities. They also have an interesting relationship. In the context of Pakistani cities, especially those in transition, these highlighted urban design elements can be used to revitalize a range of urban open spaces.*

**Keywords:** Active Frontage, urban public spaces, Streets, socio-spatial street edges, new urban trends.

**To cite this article:** Ali, A, I & Shah, A, M, W (2022). A critical study of Responsive Design elements in the context of the college road Mandian in Abbottabad, Pakistan. Competitive Social Science Research Journal (CSSRJ), 3(2), 340-353

**INTRODUCTION**

The most significant aspect of a community is the public area, which is where all the daily activities take place (Abdul et al., 2015). These public places are frequently referred to as the social nuclei of a city. Open spaces can be seen in previous traditional civilizations, where they were used as a stage for human activities to take place. The examples are from the Greek agora and the forums of the Roman era. The more alive these spaces are, the more important they are (Ali, Iftikhar; Shah, 2021). Historically, these urban spaces were used for human transit, socio-cultural, and sporting activities, but now they are dominated by automobiles. However, sociologists, geographers, and political and social activists are increasingly studying these open spaces to understand the historical role and

character they played. In recent years, urban open spaces have become very critical to maintaining the physical and mental health of the residents of an area (Firjatullah & Kurniawan, n.d.; Zhao et al., 2019)

Urban open spaces include the streets or localized roads as an important space typology. These aren't only places for people and vehicles to commute; they're also an exhibition of the area's urban public culture. It's the result of communal requirements and aspirations combined with climate factors. The pieces on display in these locations, whether in the home or commercial settings, are the result of their evolution over time. If we go through any area's most dynamic places with a critical mind, we can gain a deeper grasp of it (Huang et al., 2020).

### **Aims & significance**

Urban development, which attempts to produce a welcoming and green environment as well as opportunities for the local population, tourists, and stakeholders, places great importance on urban spaces. The importance of space creates favorable impacts on urban centers to draw people there to live, work, walk, and enjoy the space environment within the core of the urban living zone. Focusing on the streets, frontages, and minor spaces are essential components that must be recognized and improved for the space to feel alive inside the city and to create a better environment and activities for the residents (Armato, 2017).

### **Methodology**

We have selected two attributes of Character and connectedness for the site observations. The character of any area is the product of the culture, its scales, climatology, and environmental constraints. While the connection is the mixture of spatial and visual elements interwoven with the socio-cultural norms and traditions. The character of the specific area is the representation of the context which in turn maintains the placeness while the connection is the agent of retaining that specific identity (Bishop et al., 2017).

The methodology for the study of urban spaces is adopted through the daily use of college roads to observe and identify the spaces on the roads that need to redesign the spaces. Personally, visiting different times and observing the activities to analyze them and compare them with the uses and design of spaces as discussed in the literature review. The study of the college road was focused, take pictures and user activities were observed during the day and night to take into consideration the practical adaptation of space to redesign and reshape it with recommendations and conclusion.

### **Abbottabad:**

Abbottabad is a popular tourist destination and the capital of District Abbottabad in Pakistan's Khyber Pakhtunkhwa province. It was a city founded and named after Major James Abbottabad in January 1853 (*Abbottabad.Pdf*, n.d.) Abbottabad has a humid and subtropical climate. It has hotter months in June and July, with mild to warm temperatures in autumn and spring, and cool to mild temperatures in winter. Summer temperatures reach 38 degrees Celsius, while winter temperatures plunge to -5 degrees Celsius.

Abbottabad is well-known for its colonial-era heritage structures. It serves as a gateway to all tourist locations in the northern regions of Khyber Pakhtunkhwa, Gilgit Baltistan, and Kashmir. The main artery for accessing Abbottabad and the surrounding districts is the historical Silk Route known as the Karakoram Highway, which runs from Hasanabdal to the Khunjerab Pass. It's appealing throughout the voyage from the beginning to the end.

It is also known as the city of schools. Due to the presence of standard educational facilities, there is a diversity of residents. From elementary school to graduate school, almost every stage of education is covered. Schools, colleges, universities, professional medical and engineering universities, and the Pakistan military academy are among the facilities. As a result, the culture in Abbottabad is diversified in terms of nature, languages, and age groups, with the young dominating the rest of the groups.

Sports, recreational, and religious facilities are also available, including grounds for Cricket, Hockey, Squash, and Football, as well as video games, e-gaming businesses, horse riding facilities, an auditorium, a public library, and recreational community parks. Masjids, churches, Gurdwaras, and Arya Samaj Mandirs are examples of religious structures.

### Case Study of Old College Road

College road is one of the busy roads which connect with the main “Shahrahi – Rehsham/ silk route” also called Karakoram Highway (Figure # 01 Google image) with a total length of Approx. 600 meter having the main business hubs shops, stores, restaurants, flats, banks, and all small business activities i.e. Koka shop (traditional name), mochi shop (shoe makers), take away foods, vegetable shops, ice cream spots, tea spots and shopping areas which is one of attractive and more flux areas of the communities and students i.e. many schools, colleges, and University Campus and linkage to the villages and towns of the City boundaries. The overall environment the road is very attractive and pleasant having natural attractions and populated area and can become a more attractive urban center for people using urban principles for urban renewal and sustainable development.

College road is a great example of an urban neighborhood in Abbottabad. The college road meets all the criteria for this successful urban development definition when measured against the indicators outlined by (John, 1998). These indicators include activities (walking, shopping, mixed-use, attraction, and diversity in transactions), form (scale, intensity, landmarks, spatial systems), and image (information, cognition, sensory experiences, and perceptions). The prominent design features of the college road include:

- **Mixed-Used buildings:**
- Mixed-use developments are multifaceted ideas. The community design will consider functional, social, and cultural factors. The urban experience, which is the result of a range of functions, diversity of activities, architectural features, facilities, open and functional spaces, as well as a variety of user groups, is the next crucial factor. In response to user needs, the public realm and venues are changing to meet those needs (Rowley, 1996). It is characterized by the mix-used development on the college road. The presence of a variety of shops and their nature adds to the vitality of the activities.
- **Contemporary Materials:** The use of contemporary materials in buildings with some traditional signboards/billboards is evident in the frontage of the buildings as well as the public space domain.



Figure # 01, College Road Mandian, Abbottabad, Google Earth Image.

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- **Multiple anchor buildings:**

According to a study (Carmona, 2014), the way a space is used might influence how it feels to be in it. Daily activities, human attachment to space, varied commercial facilities offered, and adaptability with appropriation to environmental, social, and commercial needs over time are just a few examples of how the place can be described. Overall, the whole college road is dependent on the various educational nuclei, including Government Jhangi School, Government Polytechnic Institute, University of Engineering and Technology, Peshawar Abbottabad-Campus, Government Post-Graduate colleges for Women, and Government Post-Graduate College No. 2, and several private schools and colleges of higher repute. So, the whole college road is full of activities generating buildings (Fig. 01).

- **Presence of a Major Circulation Axis:** The whole college road can be seen as a major circulation axis spine along which there is a present variety of anchorage institutional buildings, residential houses, commercial buildings, and public activities are surrounded by these buildings. (Fig.01)
- **Development Type:** The overall development of the main college road Mandian, is housing the multilayers of activities. The development is not uniform. It includes the single-unit dwelling, multiunit housing units apartments, and Residential quarters. The population of the area specifically under study is a multi-ethnic and diverse population.
- **Central Public and Open spaces:** As the college road is having various educational institutions, the overall open public spaces are provided within each educational institution. For the residential areas, the open spaces are not specific to their needs. The non-formal urban open spaces in the form of the wider streets, within the commercial community spaces provided for access to individual shops, linking streets to the main circulation spine is used as the public open spaces. These spaces are enriched with the context-specific character of the socially and commercially connected activities and users.

### **Permeability:**

The term permeability is one of many properties that can be assigned, observed, and utilized to study any urban area, according to urban design literature. It is referred to as a powerful instrument for determining human comfort. According to Wikipedia, it is the degree to which an urban form allows or forbids pedestrian and vehicular mobility in diverse directions within a setting. In general, it is a positive characteristic of a city. Permeability in front of any development means the visibility of the activities taking place inside the spaces from the main commuting axis (Mehta & Bosson, 2010).

The college road Mandian, a case in point, has permeability as a key attribute that contributes to the preservation of its distinct character and connectivity to users. It is clear from the detailed observations and data presented in table 01 above. Permeability can be found in a wide range of activity enforcers, such as spatial, physical, social, economic, and environmental aspects. They are summarized as follows.

### **Permeability in Spaces:**

- Permeability is the key element in any urban area, defining the responsiveness in the layout. It is the choices that are offered to the users to adopt (Pancholi et al., 2015).
- All the activities on the college road have been observed to be exclusively mixed-use. Functionalities include residential, commercial, playing, dining, and traditional street vendors.
- The presence of interconnected functional spaces and public spaces characterizes urban form.

- The commercial spaces lining the overall college road have transparent frontages. All the activities inside are visible from the outside, and it attracts visitors by displaying its merchandise and various specialties in the case of edibles. The entrances are shaded following the local climatic conditions.

### **Permeability in Social Context**

People are always of the view that public spaces should be more celebrated. Presently, it's a multidisciplinary interest for urban planners, sociologists, geographers, and any other related disciplines. Users always have expressed their selves socially in public spaces (Bishop et al., 2017). In the following ways, the social responsiveness of the college road in the case under discussion is imminent.

- Because of the existence of major market areas, the area is originally known as Mandian. As a result, retail areas are currently delivering the same contextual responses and have two to three-story U-shaped open marketplaces. As a result, the nature of the open plan marketplaces remains, and the locality is not unfamiliar to perceive as a place.
- The merchandise on exhibit on College Road is a direct response to local social contexts, demands, and requirements, including signboards, wall chalking, and architectural décor that reflects local social ideals.
- The residents of College Road are cared for in a very efficient manner.
- All the residential flats are provided in the form of hostels, single beds, multiple flats, double-story individual housing units, and one housing unit with double-story residential units.
- While commercial activities are mostly located on the ground floor, they are well connected both physically and visually to users, customers, and passers-by.
- Families choose to live in individual dwelling units or integrated dwellings divided into ground and first-floor portions with separate entrances, as witnessed across the area. Individual apartments, flats, mixed rooms, and hostels on the first floors of commercial stores and marketplaces are preferred by bachelors.
- **Permeability in Economy:**
- The generation of value, a rise in economic activity, and cost savings are considered indicators of a space's economic viability (Larco, 2016). If we observe the college road, Mandian Abbottabad we found that.
- In a larger sense, all the property on College Road is privately held, except for the publicly owned anchor buildings. Its overall economic characteristics are primarily private, with a mix of government-owned institutional buildings.
- Affordability of the college road is very specifically related to the users of it. Although the residents of are different in terms of socio-cultural background, they represent the lower-middle class of society economically. Locally manufactured grocery stores, wholesale products, local eateries, beauty salons, and pharmacy shops are among the business activities. Mobile fruit and vegetable stands, ice cream cabins, traditional cuisine huts, and seasonal fruit juice stores are all available. The neighborhood resembles a microcosm of a traditional city because it lacks national competitive apparel and shoe companies, multinational and national restaurant chains, drive-through takeaways, and other major businesses.

- **Environmental permeability:**
- Because Abbottabad is a tourist destination with cold weather and frequent rains, the architectural components of the college road have been adapted in a variety of ways. All the shops and buildings have shades, allowing customers to take shelter from the rain. In the winter, the user can also enjoy bright days while shopping in transparent shops during the day. In the winter, the elderly use these shades to sit in the sun.
- Sloped roofs are found in older buildings, but flat roofs are prevalent in new construction.
- The trees are preserved in public buildings, and some private property owners are also aware of doing so. However, most private commercial landowners do not blend the trees.

**Table # 01:** Observations of the “*Character*” and “*Connectivity*” of the College Road

Attributes	Attributes observed	Description
Character	Context Integration	<ul style="list-style-type: none"> <li>▪ Because educational institutes are the key anchors, the main features and amenities developed over time are generally function specific to the user's Fig.</li> <li>▪ Most of the commercial spaces are labeled "For Students" Fig.</li> <li>▪ Whole-sale household products businesses are available to assist residential communities Fig.</li> <li>▪ By addressing their needs, backgrounds, and requirements, all users have been accommodated within the context Fig.</li> </ul>
	User Orientation	<ul style="list-style-type: none"> <li>▪ Buildings' human scale plays an important part in determining their visual character. Buildings can reach a maximum height of four floors. While most of the structures have two to three stories each Fig.</li> <li>▪ The windows facing the college road, as well as sitting near the different dynamic front borders of Koka shops, juice bars, local restaurants, and fruits and vegetable shops, make it a lively open place Fig.</li> </ul>
	Nature Integration	<ul style="list-style-type: none"> <li>▪ The trees are integrated into the anchored buildings and along the college road's key axis lines Fig.</li> </ul>
Connectivity	Spatial Connectivity	<ul style="list-style-type: none"> <li>▪ All the buildings are well connected through a variety of major axes, streets, and tiny walkways Fig.</li> </ul>
	Physical Connectivity	<ul style="list-style-type: none"> <li>▪ Pedestrian flows are dominant, and there are no clearly defined walkways.</li> </ul>

Visual Connectivity	<ul style="list-style-type: none"> <li>Surprisingly, most of the buildings lining the college road on the ground floor are at the same level as the road, removing any physical or visual barriers to attract and facilitate users while also allowing shop owners to display all of their merchandise for potential customers to see as they cross the college road.</li> </ul>
Socio- Cultural Connectivity	<ul style="list-style-type: none"> <li>Visually all the buildings are having “an eye” on the main axis road. Both on the ground floor level and higher floors Fig.</li> <li>Users inside the buildings (whether on the ground floor commercial floors or the first or second-story residential floors) are socially connected to the public spaces and act as observers of the continuous socio-cultural-economic activities on college road at various times of the day and night Fig.</li> </ul>
Architectural Character	<ul style="list-style-type: none"> <li>Due to excessive precipitation, the buildings lining the college road have typical sloping roofs, and all ground floor commercial storefronts are supplied with setbacks from the main road with shades to protect users from environmental challenges in case of heavy rain Fig.</li> </ul>

**Critical Appraisal of the College Road:**

The study of different spots was analyzed by taking actual images on the site to identify the original situations of the spaces i.e., frontage, streets, roads, all the amenities, etc. during the survey of the site personally. The situation on the old college road was identified and marked for the proposed recommendation and to analyze it with details that how we can improve the urban spaces for more economic opportunity, land value, and friendly environment and to overcome the challenges that need to redesign it to make a sustainable environment on the old college road.

The word Revitalization is a key to finding the issue what is the decay that needs renewal and redesigning within the city center. Urban renewal is a key to making the space sustainable by focusing on the environment, social, economic, and technology challenges. (Figure # 02)



Figure # 02: College Road East View



*Figure # 3 & 4: Different Views of College Road*

The images of College Road, give a very attractive look i.e., natural views, trees, and water. But due to lack of maintenance of drainage system, electric wire, and poles, faced material, boards on walls, and waste of water on the road are all the opportunities that need to redesign. The existing monument is a guidance point to give safe flow to traffic. The staircase outside the building with the use of billboards of red different colors and no parking area in front of the Campus gate on the road is a critical problem for the visitors and community. The heavy water tank a concrete structure gives a very dangerous look to the students and community to get pleasure in this environment.



## Urban Open Spaces



*Figure # 5 & 6: Urban Open Spaces on College Road*

Urban open spaces are the key spots that become the center of opportunity i.e., to attract the visitors' i.e., for small shops or restaurants as well as daily requirements shops in the urban streets. These neglected and unplanned spaces can be mobilized by using the urban development policy that how to develop a space for the different purposes as discussed in the part of literature through an example of different images in the modern urban development center. The use of color, plantation, and spots of electric poles are needed to study in this type of case to improve the urban area.

## Building Façade and Visual height



*Figure # 7 & 8: Building façade and visual height*

Every city has bylaws and roles to be followed for the building aesthetic and skyline. The height of the building on the old college road varies from each other which create a disturbance in the skyline of the city and visually the heavy weight of the building and materials is an important part of the urban development to consider the environmental factors of the city and culture worth in the design of a building in an urban center. The overall approach is better but not sustainable in this case which needs to be adopted to make a center sustainable and alive in a city.

## Small business hubs



*Figure # 9 & 10: Small business hubs*

Small business hubs were searched in this case study to find the number of people that are working on college roads i.e., small fruit stalls, vegetables, garments, sports, toys, drinks, easy-loads (microfinance retailers), fast food, and many small businesses were identified but in very weak and non-livable condition i.e. is harmful to the health, environment and city look. To make a sense of place is essential to shape it. It's a sign of a city to be recognized. These spaces are looking very rear in significance but the actual identity of the culture in an urban center can play a vital role in its development (Ali & Shah, 2021).

Consider the important factor while designing the social urban space include the level of construction and presence of other amenities within the streets including the street furniture and fixtures such as the benches, relaxing points, street lights, maintenance, effective drainage and sewerage system, efficient side-walks, and car parking areas need according to the social and cultural context, the economic opportunity can be created through the use of proper spaces according to the purposes, but the location and user analysis are important keys to be utilized to pinpoint the spaces i.e. for entertainment, for eating, for family, for gathering, for business and for cultural activities, etc. in the new urban development centers these principles were adopted for creating the sustainable spaces i.e. environmentally, socially, economically and technologically to get more facilitation and protect the urban areas from further decay. If we are not considering these challenges as discussed in the case study, then it will make more chances decay a city.

### **Discussion, Analysis, and Recommendations:**

The streets play a significant role in the characteristics, as different researchers have noted. It depicts the area's popular culture. College road has all the characteristics that make up successful streets, including landmarks, amenities, lively edges, identity and image, a variety of user groups, a mix of pedestrian and vehicular access points, mixed-use and activity types, and safe neighborhoods (Uses, 2020). The administration of the facilities on College Road is the only area that has been neglected. According to the investigation, the area's absurd jurisdictional restriction is the main obstacle in this connection. It was necessary to gain their support for the obvious upkeep and other amenities supplied

because the Cantonment Board and Tehsil Municipal Administration are the two organizations in charge of the administrative management of the city's public facilities.

The below points have been identified that need to be considered in this case study for the development of an urban center to make it alive and sustainable.

<b>Analysis</b>	<b>Recommendations</b>
Sewerage System	The old college road needs a proper sewerage system, which is very important in the development of a city. No dustbins are provided for mass collection from the residential, commercial and institutional areas. As a result, there is various dump site, randomly on the side of the roads making health hazard for the inhabitants.
Road Condition	The road is the link that connects the different parts of the spaces, the present weak condition of the road needs proper maintenance with signage and guidance. The footpaths are not paved properly due to the developmental work of water supply, and internet fiber optic cables.
Parking Area	Building structure i.e., hotel, hostel, flats, banks, and restaurants are part of the urban center but no parking area for the vehicles, and the Tehsil Municipal Administration -TMA / Cantonment Board Administration-CBA need to allocate proper spaces for parking i.e., smart parking zones to facilitate the users.
Construction	The heavy and rough construction is also needed to be considered by changing the use of materials, building heights, and building façade to look and avoid cutting of trees.
Electric Poles and Wire	Electric poles and wires are at risk, which is very dangerous. Better to go for alternate electric supply options such as underground design.
Landmarks	One monument is present at the junction of five single-width roads but some nodes and small monuments need to be designed.
Billboards	Billboards on the building façade are also needed to be standardized, as the present ones are very extra-large size and hide the façade of the building and skylines of the street.
Encroachment	This is very important and in the urban center, most of the need to measure by CBA/TMA, and the violation spots need to be removed from the roads and use that space for plantation and smart footpaths.
Plantation	Need more plantations and the existing trees need to be secure and cared for to make the environment natural and healthy.
Street furniture and lighting	No street furniture and lighting: The most important part of the urban center and street that need to install the street furniture and lighting as per the requirement of the spaces to make the area safe and secure.
Waste of clean water	Clean water is a basic need of an urban center and with the wastage of resources in the last decade, a lot of water is wasted every day and need to be stored for future generation. Many points on the college road are exposed and the running of water on the road is a waste of natural resources?
Green spaces	Green patches and spaces are required to design to make the environment pleasant and environmentally friendly.

Roof garden	The city is one of the green cities in the province and is close to nature and the concept of the roof gardens needs to utilize here by using the xeriscaping landscape on the top of the roof.
Footpaths	One of the important parts of the street roads and urban center. A proper footpath with all required spaces is needed to construct to give a pathway to the people rather than walking on roads and facing traffic incidents and blockage.
Small Business hubs	Need to design proper according to the requirement of the standardize the size of the spaces i.e., food, shopping, etc.
Cultural Spaces	Small cultural spaces are required to be part of the old college road which will be helpful to get knowledge cultural and will be a source of interest for the visitors and students.
School/ College/ University	Schools, Colleges, and University Campus can play a role in the development of an urban center, and they need to take a task and give recognition to the urban center and education in this project is for educational awareness.

### Conclusions:

Public spaces are the most important spaces in the life of urban dwellers. The contextual knowledge and responses of the users can help urban architects to design creatively and enhance the cultural identity of a given place. These spaces are available in a variety of sizes and placements within the urban fabric. The most important and easily accessible, ready-to-experience anytime is the urban streets and centers. The urban centers and streets need to be given due weightage by the urban designers and planners while conceptualizing the newer development or expansions to the already present urban centers. The streets are not merely the corridors to witness the movement of persons and goods, rather it is a basic component that plays a vital role in the establishment of an identity of a city. The streets and small urban spaces need to be designed on a micro-level accommodating the basic functional requirements of connectivity and communication while at the same time capable of having socio-cultural and experiential activities and opportunities for the users, both the visitors and inhabitants alike. This will make the city alive and sustainable.

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