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A Planning Framework for Enhancing Street Aesthetics in Kisii Town

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Abstract

Likability is the degree to which people find a specific street or location pleasant, appealing, and desirable. Street aesthetics have a significant impact on user likability since they influence people's perceptions, emotions, and overall experience with the street environment. This study investigates the relationship between urban street aesthetics and user likability in Kisii Town, focusing on the visual characteristics of urban streets. It employs a quantitative research method to gather comprehensive insights into how visual elements influence user experiences. The research highlights the significance of factors such as greenery, order, cleanliness, legibility, and coherence in enhancing the overall aesthetic appeal of urban environments. The findings reveal that well-designed urban spaces contribute positively to user satisfaction and social interactions, emphasizing the importance of visual aesthetics in urban planning. The study identified key attributes that affect user attitudes, including street furniture, lighting, and the presence of greenery, which collectively enhance the livability of urban areas. Additionally, the research underscores the need for a holistic approach to urban design that prioritizes aesthetic considerations alongside functionality. In conclusion, the study provides valuable recommendations for urban planners and policymakers to improve the aesthetic quality of urban spaces in Kisii Town. By fostering environments that prioritize user likability through thoughtful design, cities can enhance the well-being of their residents and promote a more vibrant urban life. Additionally, it is critical to examine further the long-term impacts of urban aesthetics on community dynamics and individual well-being.

Keywords

User Likability, Urban Design, Urban Street Characteristics, Factor Analysis, Relative Importance Index (RII), Kisii Town

1. Introduction

The aesthetics of urban streets, including the visual and sensory elements that

define their character, play a crucial role in shaping the overall livability of a city (Montejano et al., 2019). Street aesthetics go beyond mere visual appeal; they contribute to a sense of place, community identity, and residents' well-being. The aesthetics of a street are often shaped by architectural styles, landscaping, and public art, each telling a story of the city's past and its aspirations for the future. The visual coherence of a street, characterized by well-designed buildings, public art installations, and green spaces, fosters a collective identity among residents (Josephine et al., 2021). A visually appealing street is more likely to attract businesses, tourists, and residents, increasing economic activity. Nasar (1988) suggests that aesthetically pleasing environments positively affect people's perception and behavior. The presence of well-maintained storefronts, attractive public spaces, and aesthetically pleasing architectural features creates a positive impression, fostering a conducive environment for commerce and real estate development. The relationship between aesthetics and likability has a profound impact on the character and functionality of cities (Brady, 2019). Aesthetics influence our perception and experience of the built environment. They play a critical role in determining how we perceive and engage with the built environment. This demonstrates the importance of the visual attractiveness and overall aesthetic quality of urban streets on inhabitants' well-being and contentment. Public spaces are essential to a city's social fabric, serving as crucial hubs for social interactions, cultural exchange, and community bonding (Liu et al., 2012).

As urbanization progresses, the urban environment is undergoing significant transformations, leading to changes in the established standards of urban design (Meseneva & Milova, 2018). These shifts necessitate the exploration of new approaches to shaping the visual environment of cities. Diverse elements of the urban environment including buildings, landscapes, city panoramas, historical traditions, cultural aspects, environmental factors, and climate conditions impact people's quality of life and evoke emotional responses. Design of adaptive and responsive urban street environment requires consideration of contemporary trends in advertising, architecture, landscaping, lighting, color schemes, artistic expressions, and monumental sculptures (Meseneva, 2020). Jacobs (1961) pioneered the idea that well-designed streets contribute to community life by enabling spontaneous social contact. The street is an excellent example of a multipurpose public space, a stage for private and public activities, including trading, physical exercise, active transportation, and social engagements. Hassen and Kaufman (2016) argue that public streets act as conduits, connecting diverse parts of the urban environment via traffic flow. Streets are dynamic spaces that contribute considerably to the overall urban experience, reflecting the complex interaction of beauty, functionality, and social vibrancy.

Previous studies on metropolitan street characteristics have focused on physical components, with planners designing places based on their own experiences and preferences, and environmental determinism. While this technique may work for new developments, it is less effective in established places such as Kisii Town,

where it frequently fails to take into account residents' genuine requirements, preferences, and feelings. This gap emphasizes the significance of incorporating citizens' viewpoints into urban planning frameworks aiming at improving street aesthetics. The study was framed using 4 questions namely, how can the street visual degradation of Hospital Road in Kisii Town, characterized by defaced building facades, peeled-off walkways, littered walkways and unregulated Signages (ads) causing visual clutter, be addressed to enhance its aesthetic appeal? How does this impaired environment affect the psychological well-being and sense of safety of residents and visitors? What urban planning strategies can be used to enhance harmony and coherence in this area? How can enhancing Hospital Road's aesthetics contribute to community pride and expand the municipality's economic potential?

This paper presents an empirical study on street aesthetics, employing factor analysis and visual observation techniques to identify key factors for improving street aesthetics within Kisii Town's urban planning framework. The study sought to: i) investigate street users' attitudes toward the visual attributes of Hospital Road in Kisii Town; ii) recommend an urban planning framework to improve the visual appeal of Hospital Road in Kisii Town.

2. Literature Review

2.1. Significance of Visual Aesthetics in Urban Environments

Visual aesthetics play an integral part in the urban landscape, adding to the charm of a cityscape while managing and enhancing the health and happiness of its residents. Lynch (1960) pointed out the significance of aesthetics in visual decisions about the shape and appearance of an urban landscape and their consequences for well-being and satisfaction among residents. According to Lynch, the visual characteristics of a city have a considerable impact on residents' mental maps of their surroundings. Similarly, Jacobs (1961) highlights the significance of visually appealing streets in promoting community and social engagement. Both Lynch and Jacobs contend that visual aesthetics involves more than just surface appeal; it is inextricably linked to the utility and livability of urban environments. Aesthetically attractive settings play an important influence on stress reduction and cognitive function, (Kaplan & Kaplan, 1989), implying that exposure to visually appealing places has a good impact on people's mental states, which contributes to overall well-being. In metropolitan environments, where the visual environment is an ever-present backdrop to daily life, the necessity for a visually appealing streetscape is even stronger.

Well-designed urban environments have the potential to have a beneficial psychological influence on citizens, resulting in a healthier and stronger community, UN-Habitat's Global Report on Human Settlements (UN-Habitat, 2022). The paper underscores the close relationship between urban aesthetics and mental health. By emphasizing aesthetically pleasant design concepts, urban planners can build surroundings that not only serve functional functions but also improve residents'

overall quality of life. Green areas, well-designed landscapes, and aesthetically beautiful architecture all play important roles in maintaining a city's environmental balance, UN-Habitat's Global Report on Human Settlements (UN-Habitat, 2022). Integrating visual aesthetics with sustainable practices, as indicated in UN-Habitat studies, is an important method for developing urban places that are both visually appealing and environmentally responsible. Integrating visual aesthetics and sustainable practices is a key strategy for creating more livable, resilient, and ecologically friendly cities. This integration is viewed as a holistic strategy that goes beyond aesthetic considerations, recognizing the interconnection of urban places' visual attractiveness and their impact on the larger ecological system.

A focus on visual aesthetics in urban areas is inextricably linked to the concepts of inclusive and accessible design, which are consistent with modern ideas of promoting diverse and egalitarian communities (Brady, 2019). This focus goes beyond aesthetic considerations, demonstrating a deep commitment to making the built environment welcoming to people from all walks of life. UN-Habitat's Global Report on Human Settlements (UN-Habitat, 2022), highlights the link between visual aesthetics and inclusion by emphasizing how inclusive design techniques, when combined with visual aesthetics, generate urban environments that meet the requirements of all residents, regardless of age, ability, or cultural background. According to the report, developing a visually beautiful and inclusive urban space goes hand in hand with providing social and cultural opportunities for everybody. The visual quality of streets and public areas influences corporate placement decisions.

2.2. Evaluative Dimensions of Urban Streets

Perceptual and evaluative features of urban streets illuminate the complex relationship between physical design and user happiness (Nasar, 1998b). His research emphasizes the importance of visual features, with cleanliness and order as key predictors of users' preferences for a certain street environment. The concept of visual coherence is emphasized as a key component determining how people perceive and evaluate the overall aesthetics of urban streets. Nasar (2017), highlights how the physical arrangement of features, such as buildings, facades, and streetscapes, greatly influences the sensory experience of urban settings. The perceptual and evaluative characteristics of urban streets include a variety of quantitative elements that influence people's perceptions and urban environmental evaluations.

Coherence, is determinant for the aesthetic value of urban sceneries, as it influences the overall harmony and uniformity of a building's visual arrangement, including its facades and streetscape (Strano et al., 2013). According to Nasar (2017), it is the degree of order, harmony, and unity in a building's composition, structure, and style. It refers to refers to the entire harmony and uniformity of a building's visual arrangement, including its facades and streetscape. According to Nasar (1998a), visual coherence is a quantitative feature of street aesthetics, and its importance stems from its influence on user preferences and contentment with

the surrounding street environment. He emphasizes the significance of visual coherence as a quantitative aspect of street aesthetics that determines user preferences and satisfaction with the street environment. This factor can be assessed objectively by examining the level of visual harmony and uniformity in the design and layout of urban streetscapes.

The second dimension, cleanliness, is an observable factor that influences people's impressions of city streets. Nasar (1998a) underscores the importance of cleanliness as a perceptual factor influencing overall likability and contentment with urban streets. Clean environments visually appeal to street users and attract more traffic. Cleanliness can be measured through observational surveys or evaluations that look for litter, debris, or other evidence of cleanliness in the street (Goswami & Divi, 2019). A clean and well-maintained setting is frequently connected with desirable aesthetic qualities.

Scale, refers to how the physical proportions of a street environment relate to the human body. It considers the proportions, dimensions, and spatial characteristics that make roadways more comfortable and welcoming to people (Ye et al., 2019). Le Corbusier, a pioneer of modern architecture, emphasized the importance of human scale in urban street design. His approach was rooted in the belief that cities should be designed to accommodate the physical and social needs of their inhabitants. He saw buildings and cities as machines for living, where every part should serve a specific purpose efficiently. His architectural philosophy included pilotis (supporting columns), free façades, open floor plans, horizontal windows, and roof gardens, all aimed at creating functional, spacious, and well-lit urban environments. In his vision for the Radiant City, he proposed a city with large open spaces, green areas, and high-density living, all organized in a geometrically precise manner. He used the human body as a reference for proportions in design and aimed at creating spaces in harmony with the scale and needs of human beings. Gehl (2016) emphasizes that design should be at a human scale in generating dynamic and usable streets. Human scale can be measured by examining sidewalk width, building height, and the existence of factors that foster intimacy and connection with pedestrians.

Order, is significant in shaping the visual appeal of urban streetscapes since it influences people's views of the overall aesthetics of the built environment. Nasar (1998b) emphasizes the importance of order as a significant visual feature that influences people's perceptions of street aesthetics. Examining urban streets reveals that order is a multifaceted concept that encompasses a variety of aspects that work together to improve the streetscape's aesthetic attractiveness. Objective measurements of order include the arrangement and organization of objects along the roadway, the absence of visual clutter, and the provision of clear signage and wayfinding systems, all of which contribute to a sense of order and coherence in the street environment (Boeing, 2019). Lynch (1960) underscores the necessity of readability in urban settings. A well-organized streetscape with clear signage promotes ease of mobility and improves the overall user experience. The confluence

of visual order with functional efficiency emphasizes order's overall impact on the urban environment. When pieces are arranged along an urban street in an orderly manner, they not only contribute to visual appeal but also influence the space's utility and navigability.

Legibility, explains the degree of clarity, distinctiveness, and recognizability in a building's identity, function, and location. Lynch (1960) emphasizes the importance of readability in urban architecture because it enhances people's sense of orientation and wayfinding. Legibility can be assessed using criteria such as signpost clarity, the presence of landmarks, and the overall comprehensibility of the street layout. Visual street aesthetics are important in urban contexts as they shape residents' perceptions and mental maps, which in turn influence their well-being and satisfaction. Aesthetic components such as coherence, cleanliness, human scale, order, and legibility play a vital role in influencing user preferences and their overall satisfaction with street environments (Nasar, 1998a; Strano et al., 2013).

3. Research Methodology

The study employed a quantitative approach to capture the relationship between street aesthetics and user likability. The study method used for creating a street map of Hospital Road (that includes digitalization) is briefly described. The study commenced with the creation of a digital base map, as shown in **Figure 1**, zoned into 3 sections labeled as A, B, and, C and depicted in **Figure 2**. A researcher-administered interview schedule was employed to collect data on participants' views and preferences for the aesthetics of Kisii Town's Hospital Road.

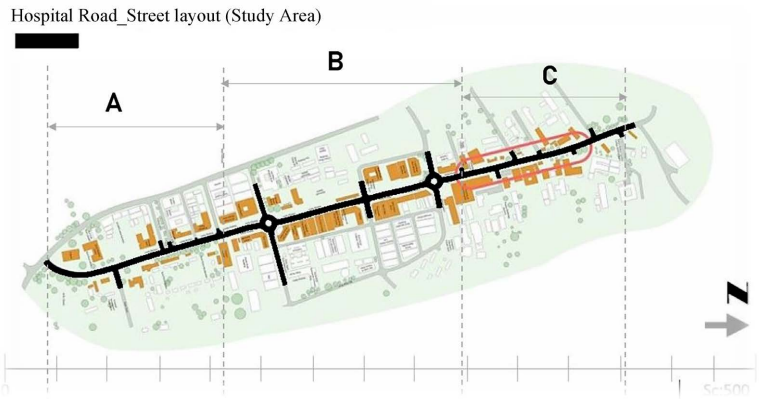

Figure 1. Street map of Hospital Road, Kisii, Kenya. (Author, 2024).

Figure 2. Stimuli of the appearance of Hospital Road, Kisii Town. (Author, 2024).

3.1. Research Design

The study employed one key data collection method: an interview schedule (focusing on residents/business owners of Hospital Road and Street Users/visitors).

Interview Schedule Method

A researcher-administered interview schedule was employed to collect data on participants' views and preferences for the aesthetics of Kisii Town's Hospital Road as zoned out in Figure 1. The schedule had a series of statements rated on a seven-point Likert scale, with responses ranging from strongly disagree to strongly agree, and was divided into two sections: demographic information and scaled questions (Bryman, 2016). Conducting the interviews personally ensured consistency and accuracy in data collection. The collected data was processed and analyzed using the Confirmatory Factor Analysis technique in SPSS.

3.2. Sampling Design

The study adopted purposive sampling for the interview schedule, which targeted general road users and business owners to ensure participation from various groups. This approach ensured that Hospital Road's aesthetics and functionality were taken into account from a range of perspectives. According to Zeisel (1995), purposive sampling helps in the collection of in-depth, contextually relevant information. The approach helped improve the research findings' validity and generalizability and support well-informed urban planning and design decision-making.

4. Data Analysis and Discussions

4.1. Analysis of Reliability, Appropriateness, and Suitability of Data

This study categorized the statements into seven broad themes: coherence, order, cleanliness, legibility, verdancy, enclosure, and scale. Cronbach's Alpha was used to determine the survey instrument's reliability, which was determined to be 0.932, indicating excellent internal consistency and reliability of the 53 items used in the survey. Table 1 shows the result of this reliability test. The appropriateness of the data for factor analysis was confirmed through the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. For this study, the KMO value was 0.870, considered "meritorious," suggesting that the sample size was adequate. Bartlett's Test of Sphericity was significant, $p < 0.001$, thus supporting sufficient correlation between variables to conduct a factor analysis. These are presented in Table 2 and show that data are adequate for factor analysis.

Table 1. Reliability statistics.

Reliability Statistics	
Cronbach's Alpha	N of Items
0.932	53

Table 2. KM0 and Barlett's test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.870
Bartlett's Test of Sphericity	Approx. Chi-Square	5657.572
	df	1378
	Sig.	0.000

The Anti-image Correlation Matrix was adopted to assess the variables' suitability for factor analysis. The matrix is made up of two parts: the anti-image covariance matrix and the anti-image correlation matrix. The Anti-image Covariance Matrix generated partial covariances of variables after accounting for the linear effects of other variables. In this case, diagonal elements like Coherence (0.324), Order (0.336), and Cleanliness (0.439) represent the anti-images' variances, and off-diagonal elements like as Coherence and Order (−0.167) demonstrate their partial covariances. The Anti-image Correlation Matrix depicted partial correlations across variables, with diagonal elements indicating Measures of Sampling Adequacy (MSA). High MSA values, such as Scale (0.879) and Cleanliness (0.843), suggesting that these variables were suitable for factor analysis. Overall, the study revealed that most variables had acceptable MSA values, thus confirmed their suitability for further factor analysis. As indicated by Table 3, most variables have acceptable MSA values, and thus they are suitable to continue the factor analysis.

Table 3. Anti-image correlation matrix. (Author, 2024).

Anti-image Matrices								
		Coherence	Order	Cleanliness	Legibility	Verdancy	Enclosure	Scale
Anti-image Covariance	Coherence	0.324	−0.167	−0.119	0.011	−0.103	−0.031	0.065
	Order	−0.167	0.336	−0.090	−0.077	0.048	−0.048	0.068
	Cleanliness	−0.119	−0.090	0.439	−0.092	0.043	0.004	−0.172
	Legibility	0.011	−0.077	−0.092	0.372	−0.202	−0.136	0.061
	Verdancy	−0.103	0.048	0.043	−0.202	0.528	−0.064	−0.012
	Enclosure	−0.031	−0.048	0.004	−0.136	−0.064	0.585	−0.167
	Scale	0.065	0.068	−0.172	0.061	−0.012	−0.167	0.863
Anti-image Correlation	Coherence	0.810[a]	−0.507	−0.315	0.031	−0.249	−0.072	0.124
	Order	−0.507	0.820[a]	−0.235	−0.217	0.114	−0.107	0.126
	Cleanliness	−0.315	−0.235	0.843[a]	−0.228	0.089	0.007	−0.279
	Legibility	0.031	−0.217	−0.228	0.819[a]	−0.457	−0.292	0.107
	Verdancy	−0.249	0.114	0.089	−0.457	0.802[a]	−0.115	−0.017
	Enclosure	−0.072	−0.107	0.007	−0.292	−0.115	0.879[a]	−0.235
	Scale	0.124	0.126	−0.279	0.107	−0.017	−0.235	0.270[a]

a. Measures of Sampling Adequacy (MSA).

Relative Importance

The study applied the Relative Importance Index (RII) to find out what factors residents and users of Hospital Road perceived were most important for street attractiveness and functionality. The RII was determined using the formula:

$$\mathbf{RII} = \sum Wni / \mathbf{A} \times \mathbf{N}$$

where W is the weight assigned to each response, ni is the frequency number of responses at each weight, **A** is the maximum weight in survey which in this case is 7 and **N** is the total number of respondents. This index was designed to rank the importance of various street characteristics according to participant perceptions. The study grouped the statements into seven key themes: coherence, order, cleanliness, legibility, verdancy, enclosure, and scale, and then ranked the statements that were considered important within each category. Table 4 shows the results of the Relative Importance Index identifying the factors valued most by the respondents for attractiveness and functionality of the streets.

Table 4. Relative importance index. (Author, 2024).

Constructs	Rank/Statement	N	Total	A*N	(RII)
Coherence	1. Street furniture (seats, barriers, waste bins) positioning is attractive.	240	867	1680	0.516071
	2. Street lighting placement enhances attractiveness.	239	1234	1673	0.737597
	3. Sidewalk paving is pleasing.	238	1056	1666	0.633854
	4. Decorations on buildings enhance appeal.	238	1168	1666	0.70108
	5. Green spaces (trees, flowers, grass) improve the street attractiveness.	240	1122	1680	0.667857
	6. Ads and billboard location make the street attractive.	240	1054	1680	0.627381
	7. The pedestrian crosswalk linkages are impressive.	240	969	1680	0.576786
	8. The shape and height of buildings increase street visual attractiveness.	240	1201	1680	0.714881
	9. The size of the buildings' front canopies is appealing.	240	1176	1680	0.7
Order	10. The sidewalks are well organized.	239	971	1673	0.580395
	11. Walking paths and sidewalks are easy to follow.	239	1050	1673	0.627615
	12. The buildings' front sides are welcoming.	238	1180	1666	0.708283
	13. The organization of buildings boosts the overall street appearance.	239	1176	1673	0.702929
	14. I feel safe walking down the street.	240	1130	1680	0.672619
	15. Decorations on buildings improve street appeal.	238	1179	1666	0.707683
Cleanliness	16. The placement of rubbish collection bins enhances street cleaning.	240	833	1680	0.495833
	17. Storm water management is adequate.	240	943	1680	0.56131
	18. Pavements are appealing.	239	1018	1673	0.608488
	19. The walkways and pathways are clear from stains and spills.	239	1052	1673	0.628811
	20. Street furniture, such as benches and trash bins, is regularly cleaned.	240	749	1680	0.445833
	21. Building walls are free of vandalism.	240	1084	1680	0.645238
	22. The drainage channels are free of litter.	237	940	1659	0.566606
	23. The sidewalks are free of garbage and obstructions.	240	991	1680	0.589881
	24. The street is free of overgrown foliage and weeds.	240	1138	1680	0.677381

Continued

Legibility	25. Clear street markings enhance movement.	240	967	1680	0.575595
	26. Landmarks increase the walking experience in the street.	238	1086	1666	0.651861
	27. Uniform street size and condition ease movement.	239	1030	1673	0.61566
	28. The positioning of street lights improves safety.	239	1272	1673	0.760311
	29. I feel safe walking down the street.	238	1181	1666	0.708884
	30. The street is clear and welcoming.	240	1052	1680	0.62619
	31. Clear street naming enhances pedestrian movement.	239	920	1673	0.54991
	32. Street signs are clear and easy to follow.	240	878	1680	0.522619
	33. Legibility-clear junctions.	240	1049	1680	0.624405
	34. Walking down the street is effortless.	240	1163	1680	0.692262
Verdancy	35. Diverse tree shapes enhance visual appeal.	237	1097	1659	0.661242
	36. A variety of vegetation promotes biodiversity.	239	1086	1673	0.649133
	37. Tree canopies provide shade, enhancing street attractiveness.	239	1025	1673	0.612672
	38. Green areas enhance the street's appearance.	239	1137	1673	0.679617
	39. Overgrown street vegetation reduces street attractiveness.	240	1089	1680	0.648214
Enclosure	40. Building walls and fences enhances safety.	239	1149	1673	0.68679
	41. Enclosure-vulnerability.	238	1089	1666	0.653661
	42. Enclosure-walking.	239	949	1673	0.567244
	43. Open/undeveloped spaces increase insecurity.	240	1190	1680	0.708333
	44. Building heights decreases visual distances.	237	962	1659	0.579867
	45. Large building openings e.g. windows enhance street security.	240	1215	1680	0.723214
	46. The organization of the building enhances street continuity.	240	1268	1680	0.754762
	47. Wide Street enhances air circulation and street ambience.	240	1185	1680	0.705357
Scale	48. Buildings are of uniform heights.	239	642	1673	0.383742
	49. I feel overshadowed while walking.	239	898	1673	0.53676
	50. Scale-building sizes.	238	1190	1666	0.714286
	51. Some areas lack sunlight.	239	753	1673	0.45009
	52. I feel intimidated while walking.	238	819	1666	0.491597
	53. I experience blocked views while walking.	239	893	1673	0.533772

The analysis of Hospital Road in Kisii Town identified numerous important themes that influence street attractiveness and usability, with the Relative Importance Index (RII) serving as a basis for rating these factors. Under the theme of Coherence, the highest-ranked element was street lighting arrangement (RII = 0.737597), implying its importance in improving visual harmony and attractiveness. This was followed by building shape and height (RII = 0.714881), building decorations (RII = 0.70108), and building canopy size (RII = 0.7). These features are critical for creating a cohesive visual experience that is both aesthetically pleasant and practical. In terms of Order, the welcoming quality of building fronts (RII

= 0.708283) and building decoration (RII = 0.707683) were scored highly, showing the importance of demonstrating the significance of orderly and appealing street features in developing a structured cityscape.

The theme of cleanliness was also cited as being critical to the street's attractiveness, with important factors including the lack of overgrown greenery and weeds (RII = 0.677381) and vandalism-free building walls (RII = 0.645238). Other important factors included the absence of stains and spills (RII = 0.628811) and visually appealing pavements (RII = 0.608488). Effective Stormwater disposal (RII = 0.56131) and the positioning of trash cans (RII = 0.495833) were also observed, emphasizing the importance of regular maintenance to ensure a clean street environment. In the Legibility category, the placement of street lights (RII = 0.760311) emerged as the most significant factor in enhancing navigability, then the presence of landmarks (RII = 0.651861) and uniform street conditions (RII = 0.61566). These findings highlight the necessity of visible street markings and safe walking conditions in supporting pedestrian street usability.

The study further explored the significance of Verdancy, focusing on the presence and maintenance of greenery, which is vital to the street's visual appeal. Well-maintained green areas (RII = 0.679617), distinctive tree shapes (RII = 0.661242), and shade-giving tree canopies (RII = 0.612672) were identified as important contributions to a pleasant street environment. However, it was observed that overgrown vegetation could diminish the street's attractiveness (RII = 0.648214). The theme of Enclosure focused on the sense of security and spatial boundaries offered by street components, with building walls and fences (RII = 0.68679) and perceived vulnerability (RII = 0.653661) playing major roles. Open or undeveloped spaces were considered as potentially increasing insecurity (RII = 0.708333), though building organization (RII = 0.754762) and wide streets that enhance air circulation (RII = 0.705357) contributed positively to the street's ambience.

Addressing these issues through careful urban planning could enhance the street environment's coherence, cleanliness, legibility, verdancy, and enclosure, resulting in a more appealing, safe, and valuable public place. These findings provide important recommendations to enhance the overall user experience and satisfaction with Hospital Road in Kisii Town.

4.2. Analysis of Users' Attitudes toward Visual Street Characteristics of Hospital Road

The study conducted a Confirmatory Factor Analysis to assess street characteristics that Hospital Road users in Kisii Town consider important. It analyzed and grouped these characteristics into components that represent residents' perceptions of their surroundings. The findings provide a comprehensive understanding of how numerous visual elements influence public views and significant suggestions for future urban design improvements in the area. Tables 5-11 below illustrate the factor loadings for the Coherence, Order, Cleanliness, Legibility, Verdancy, Enclosure and Scale themes, respectively, highlighting which specific

elements contribute to each component.

Table 5. Factor loadings of coherence. (Author, 2024).

Factor 1: Coherence		
	Factor Loadings	Mean
coherence-furniture	0.703	4.4135
coherence-lighting	0.455	2.8397
coherence-paving	0.456	3.5696
coherence-decorations	0.567	3.1224
coherence-greenery	0.467	3.3291
coherence-signage	0.367	3.6076
coherence-linkage	0.376	3.9705
coherence-paintings	0.676	2.9831
coherence-shapeandheight	0.617	3.0928
Extraction Method: Factor Analysis.		

Table 6. Factor loadings of order. (Author, 2024).

Factor 2: Order		
	Factor Loading	Mean
order-organization	0.599	3.9402
order-furniture organization	0.592	3.6197
order-sidewalks navigation	0.610	3.0214
order-facade decorations	0.678	3.0214
order-landscaping organization	0.425	3.2521
order-buildings' frontages	0.516	3.0128
Extraction Method: Factor Analysis.		

Table 7. Factor loadings of cleanliness. (Author, 2024).

Factor 3: Cleanliness		
	Factor Loading	Mean
cleanliness-trash bins placement	0.517	4.5532
cleanliness-management	0.429	4.0894
cleanliness-paving	0.451	3.7447
cleanliness-pathways	0.557	3.5787
cleanliness-furniture	0.578	4.8936
cleanliness-building walls	0.657	3.5106
cleanliness-drainage	0.566	4.0213
cleanliness-sidewalks	0.591	3.8681
clean-overgrown bushes	0.344	3.2340
Extraction Method: Factor Analysis.		

Table 8. Factor loadings of legibility. (Author, 2024).

Factor 4: Legibility		
	Factor Loading	Mean
legibility-street markings	0.681	3.9487
legibility-landmarks	0.543	3.4316
legibility-street size	0.486	3.6667
legibility-lighting	0.500	2.6923
legibility-safety	0.681	3.0598
legibility-street barriers	0.604	3.6068
legibility-street naming	0.597	4.1795
legibility-street signs	0.591	4.3547
legibility-clear junctions	0.526	3.5983
legibility-navigation	0.645	3.1667
Extraction Method: Factor Analysis.		

Table 9. Factor loadings of verdancy. (Author, 2024).

Factor 5: Verdancy		
	Factor Loading	**Mean**
Verdancy-tree shapes	0.709	3.3974
Verdancy-greenery	0.741	3.4957
Verdancy-vegetation diversity	0.706	3.7521
Verdancy-shading	0.693	3.2308
Verdancy-green lawns	0.103	3.4658
Extraction Method: Factor Analysis.		

Table 10. Factor loadings of enclosure. (Author, 2024).

Factor 6: Enclosure		
	Factor Loading	**Mean**
enclosure-security	0.487	3.1888
enclosure-vulnerability	0.372	3.4421
enclosure-walking	0.632	4.0515
enclosure-protection	0.487	2.9871
enclosure-visual distance	0.619	3.9270
enclosure-buildings' openings	0.567	2.9399
enclosure-building blocks organization	0.533	2.6824
enclosure-Number of entrances	0.336	3.0730
Extraction Method: Factor Analysis.		

Table 11. Factor loadings of scale. (Author, 2024).

Factor 7: Scale		
	Factor Loading	Mean
Scale-building heights	0.180	5.3476
Scale-overshadowed	0.410	4.2618
Scale-building sizes	0.821	2.9871
Scale-sun paths	0.523	4.8326
Scale-dwarfed walking	0.501	4.5494
Scale-blocked views	0.415	4.2446
Extraction Method: Factor Analysis.		

Results from the CFA, gave a number of elements that best explain the variation in user attitudes towards Hospital Road in Kisii town, mediated mainly through elements of coherence, order, cleanliness, legibility, verdancy, enclosure, and scale. The highest loading for street furniture 0.703 shows that coherence is more influenced by the presence and quality of elements such as seats, barriers, and waste bins. Other aspects comprised included, the placement of street lighting, 0.455, and clarity of signage, 0.367, albeit to a lesser extent. Orderliness is highly informed by organization in street infrastructure where loadings were relatively high for sidewalks 0.610, street furniture 0.592, and facade decorations 0.678. These combined demonstrates order and organization in street environment. Cleanliness, which is determined by the state of furniture (0.578), building walls (0.657), and effective waste bins management (0.517); these factors point out that systematic maintenance is crucial in creating the perception of a clean city.

Legibility formed another important factor with high loadings: clarity of street markings 0.681, effectiveness of street signs 0.591, and visibility of street names 0.597, helping in finding one's way around with ease and safety. Whereas, the characteristics that determine enclosure included features of walking safety 0.632, visual distance 0.619, and building openings 0.567; thus, the important to have well-organized building layout and visibility in views for creating place safety and spatial quality. Verdancy, mainly characterized by greenery 0.741, vegetation diversity 0.706, and shading 0.693, adding not only aesthetic values but also environmental quality to the street. It has a low loading for green lawns, 0.103, which would suggest that, compared with other green elements, its overall impact is less.

Consequently, the size of buildings, 0.821, which indicated spatial proportionality and quality of the pedestrian experience, and the dimensions of buildings in relation to the street were of great importance. This is significantly enhanced by the interaction of sunlight paths with being overshadowed, adding to this perception with a load of 0.523 and 0.501, respectively, indicating how aspects affect the visual and spatial experiences along Hospital Road. These results put together various insights for urban planners and policymakers on where to intervene in order to enhance the general outlook of the urban environment in Kisii Town to be more

appealing, well-organized, and functional to its users.

Table 12, presents the Pearson correlation matrix based on observations made for building designs, street furniture, landscaping, lighting design, and public art, signage, pavement materials, using 240 observations. This suggests that the building designs are highly associated with street furniture, whereas for other elements such as lighting design and signage, the association is less, with a correlation coefficient of 0.212 at $p < 0.01$ and −0.042 at $p > 0.05$, respectively. Stronger positive correlations with Landscaping are: Street furniture: r = 0.591, $p < 0.01$, and Lighting design: r = 0.276, $p < 0.01$. However, in negative correlation, street furniture is with signage: r = −0.140, $p < 0.05$. The landscaping is highly positively related to the lighting design both at r = 0.564, $p < 0.01$, and public art with r = 0.258, $p < 0.01$, but weakly negatively related to pavement material at r = −0.137 and $p < 0.05$. The lightning design technique finds a high positive correlation with public art, r = 0.629, $p < 0.01$, and is moderately positively related to signage, r = 0.204, $p < 0.01$. Public Art has only a significant positive relationship with signage at r = 0.349 ($p < 0.01$), but weaker for other components. On the other hand, signage has a positive and strong relation to pavement materials (r = 0.333, $p < 0.01$), and for the latter, the relationships with other components are weaker or negative.

Table 12. Correlation matrix of street components. (Author, 2024).

Correlations								
		Street component-buildings designs	Street component-street furniture	Street component-Landscaping	Street component-Lighting design	Street component-Public Art	Street component-Signage	Street component-Pavement materials
Street component-buildings designs	Pearson Correlation	1	0.736**	0.352**	0.212**	0.079	−0.042	−0.030
	Sig. (2-tailed)		0.000	0.000	0.001	0.225	0.514	0.642
	N	240	240	240	240	240	240	240
Street component-street furniture	Pearson Correlation	0.736**	1	0.591**	0.276**	0.129*	−0.140*	−0.100
	Sig. (2-tailed)	0.000		0.000	0.000	0.045	0.030	0.122
	N	240	240	240	240	240	240	240
Street component-Landscaping	Pearson Correlation	0.352**	0.591**	1	0.564**	0.258**	0.046	−0.137*
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.481	0.034
	N	240	240	240	240	240	240	240
Street component-Lighting design	Pearson Correlation	0.212**	0.276**	0.564**	1	0.629**	0.204**	−0.110
	Sig. (2-tailed)	0.001	0.000	0.000		0.000	0.002	0.088
	N	240	240	240	240	240	240	240

Continued

Street component-Public Art	Pearson Correlation	0.079	0.129*	0.258**	0.629**	1	0.349**	−0.080
	Sig. (2-tailed)	0.225	0.045	0.000	0.000		0.000	0.216
	N	240	240	240	240	240	240	240
Street component-Signage	Pearson Correlation	−0.042	−0.140*	0.046	0.204**	0.349**	1	0.333**
	Sig. (2-tailed)	0.514	0.030	0.481	0.002	0.000		0.000
	N	240	240	240	240	240	240	240
Street component-Pavement materials	Pearson Correlation	−0.030	−0.100	−0.137*	−0.110	−0.080	0.333**	1
	Sig. (2-tailed)	0.642	0.122	0.034	0.088	0.216	0.000	
	N	240	240	240	240	240	240	240

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed).

5. Study Conclusion and Recommendations

5.1. Effect of Physical Parameters on Street Aesthetics and User Perception

By adopting the factor analysis method, the study was able to identify seven important elements that define street attractiveness and usability: coherence, order, cleanliness, legibility, verdancy, enclosure, and scale. These elements are supported by a balanced development of integrated urban planning principles that balance aesthetic appeal with functional practicality. The participants maintained that streets should be visually harmonious, functionally efficient, and contextually appropriate to challenges brought about by limited urban space and constricted budgets. Effective street planning and design needs to balance aesthetic principles with practical needs and provide green infrastructure to help ensure efficient flow and safety. Based on these findings, recommendations for improving street functionality by integrating sustainable practice and aesthetic enhancement through community engagement have been made. These insights shall be useful in enriching the lives of urban settings, thus making Kisii Town more attractive and livable.

5.2. Recommendations

From the study, several recommendations can be made to enhance the urban street environment and improve user satisfaction:

- Improve street lighting placement strategically to enhance both visual appeal and safety during night-time hours. Incorporate cohesive design elements such as consistent building aesthetics and harmonious streetscape features. This can include uniformity in architectural styles, materials used, and landscaping themes along Hospital Road.

- Emphasize on the organization of street elements by ensuring that building fronts, sidewalks, and landscaping are well-maintained and thoughtfully arranged. Implement zoning regulations that encourage thoughtful urban planning and design, ensuring that new developments complement the existing urban fabric and enhance overall street aesthetics.
- Increase green spaces along Hospital Road by planting diverse vegetation and maintaining existing greenery. Utilize sustainable practices such as rainwater harvesting and native plant landscaping to enhance environmental sustainability. Green spaces not only improve air quality but also provide visual relief and promote a sense of well-being among urban dwellers.
- Enhance wayfinding through clear signage, landmarks, and consistent street markings. Ensure that pedestrian paths are well-defined and accessible to all users, including those with mobility challenges. Improving legibility enhances navigability and safety, making Hospital Road more user-friendly.
- Ensure that new developments and renovations respect the scale of existing structures and surroundings. Avoid overshadowing and maintain a human-scale environment to preserve the character and charm of Hospital Road.
- Adopt regular maintenance schedules for street cleaning, graffiti removal, and vegetation control. Engage the community in cleanliness initiatives to instill a sense of pride and ownership among residents. Promoting environmental stewardship can contribute to a cleaner and more inviting urban environment.

Conflicts of Interest

The authors declare they do not have a conflict of interest in the publication of this paper.

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