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LEGIBILITY OF REGENERATED ALLEYS AS SOCIAL SPACES: THE CASE OF KUALA LUMPUR COMMERCIAL DISTRICT

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ABSTRACT

Alley regeneration has emerged as a crucial strategy for revitalising urban areas that are in decline. This study specifically examines how the legibility of regenerated alleys impacts user engagement and social interaction within the *Bukit Bintang* commercial district of Kuala Lumpur. It combines quantitative analysis with behavioural observations to assess both spatial functionality and user engagement. To achieve this, correlation and multinomial regression analyses were conducted based on on-site questionnaire surveys involving 695 respondents who had visited the regenerated alleys. Systematic physical and behavioural observations were conducted to gain a comprehensive understanding of the existing issues, spatial functionality, and activity patterns within these alleys. The study revealed a moderate correlation between the legibility of an alley and the social interactions of its users. While visual elements positively affect social interaction, they show a lower standardised coefficient. In contrast, a clear structure demonstrates a much stronger relationship, indicated by a higher standardised coefficient. This finding strongly suggests that a clear structural layout has a significant impact on social interaction. By emphasising clear structural layouts alongside visually appealing elements, urban planners can create more engaging public spaces that effectively foster social interaction among users.

Keywords: Regenerated alleys, Legibility, Social interaction, Users' engagement, Commercial district.

1.0 INTRODUCTION

Urban design is essential for conceptualising and planning clusters of structures, streets, and public spaces within city environments to meet the needs of inhabitants (Eni et al., 2020). The evolution of urban areas is driven by a complex interplay of social and economic dynamics, necessitating revitalisation when these areas face significant challenges. Urban redevelopment and regeneration projects extend beyond enhancing private spaces; they substantially shape the built environment, leading to ongoing evolutionary processes over time (Hyseni, Nepravishta, & Asanbejlli, 2021). This paper investigates explicitly regenerated alleys as vital social spaces within commercial districts, aiming to clarify their role in fostering community interactions.

Current regeneration practices aim to enhance the physical, economic, and social dimensions by capitalising on the unique characteristics, history, and identity of a region. Strategies employed in urban regeneration encompass both physical interventions, such as building and infrastructure improvements, and non-physical enhancements, with a focus on community dynamics and vibrancy. These efforts are crucial for restoring the historical identity of sites and fostering community cohesion. In recent years, there has been a notable increase in urban regeneration projects that highlight cultural and social identities through urban art, significantly

attracting tourism and enhancing destination engagement, a phenomenon further accelerated by social media dissemination of vibrant urban narratives (Andron, 2018; Chang, 2023; MacDowall, 2019; MacDowall & de Souza, 2018).

The transformation of vernacular urban alleyways in different Asian urban settings such as *Hutongs* in Beijing, *Golmok* in Korea, *Soi Trok* in Thailand, as well as similar alleyway networks in Singapore, Vietnam, or Taiwan have been a subject of scholarly exploration, shedding light on the changing urban forms and the significant role these alleys play in shaping these cities' cultural and historical fabric (Gibert and Imai, 2020). Despite Kuala Lumpur's prominence as a major Southeast Asian city, initiatives aimed at enhancing its urban alleys remain limited.

A fundamental aspect of urban regeneration focuses on the physical characteristics and visual aesthetics that define a place. As asserted by Lynch (1960), these elements greatly influence a space's legibility, facilitating users' ability to identify, organise, and navigate through it efficiently. Therefore, this study aims to address the question: How does the legibility of regenerated urban alleys in Kuala Lumpur's commercial district impact their effectiveness as social spaces, considering both user experience and social interaction? In the context of Kuala Lumpur's urban alleys, enhancing social interactions necessitates an in-depth examination of the relationship between physical attributes and place legibility. Specifically, the research will concentrate on the *Bukit Bintang* commercial district, evaluating how perceptible clarity and visual elements of legibility in these alleys impact social interaction and user experiences.

2.0 LITERATURE REVIEW

2.1 The Semiotics of Place: Legibility and Meaning in Urban Alleys

The "sense of place" is a fundamental concept in urban studies, encompassing the intricate relationship between individuals and their environments beyond just physical location. It involves complex psychosocial structures that integrate cognition, emotion, and behaviour within specific settings (Relph, 1997). Factors such as landmark visibility, colour dynamics, and design symmetry significantly influence legibility, impacting community interaction and sense of place (Askarizad et al., 2022). Building on this, Lynch's (1960) concept of "legibility" emphasises the ease with which urban environments can be understood and navigated, thereby enhancing social engagement. Contemporary urban theory expands on this concept through "urban semiotics," which views cities as rich tapestries of symbols and signs that convey cultural values and historical narratives (Urban Psycho-Geography, 2025). This perspective examines how elements like street art, monuments, and architecture influence psychological states and social interactions, treating urban forms as non-linguistic signs imbued with meaning (Raj & Patil, 2023; Sima et al., 2016; Chen & Hu, 2024). Consequently, fostering a distinctive sense of place in urban alleys requires not only visual clarity but also a deep appreciation for the cultural and symbolic narratives woven into these spaces.

2.2 Alleys and Urban Regeneration: Art vs. Infrastructure

The debate between art-led and infrastructure-led urban regeneration highlights distinct pathways for regeneration. While infrastructure provides foundational improvements, art-led approaches offer cultural sensitivity and community engagement. However, art-led regeneration often faces criticism for contributing to gentrification and social exclusion (Balliger, 2021; Johnson, 2022). Equitable and sustainable regeneration, regardless of its primary driver, must address socio-economic inequalities and implement policies to protect vulnerable populations. The "The Lost Stream of *Alor*" project in Kuala Lumpur, which used murals (Roche, 2021) to transform neglected alleys, exemplifies an art-led strategy. Murals are considered tools for shaping collective identity (Bruce & Creighton, 2006) and fostering community engagement (Petronienė & Juzelėnienė, 2022), aligning with aesthetic governance, which uses artistic initiatives for urban management and economic aims like touristification (Chang, 2023). While art-led regeneration can enhance social fabric and civic identity (Andriotis, 2022), it also raises concerns about potential displacement and the commodification of local culture.

2.3 Social Interaction in Alleys: Beyond functionality

Building on Lynch's (1960) theory, research has increasingly explored how urban alley legibility, particularly in conjunction with public art, influences social engagement. Elements like kiosks and cafes cultivate social ties (Naghibi, 2024), similar to how shade structures encourage use (Bahriny & Bell, 2021). Al eys can evolve from simple routes into vibrant hubs for cultural exchange. Historical examples**,** such as Japan's *roji* (Imai, 2013; Wardhani & Wang, 2023)**,** demonstrate that these semi-public spaces foster communal activities and neighbourhood identity, challenging their traditional utilitarian view. Social interaction evaluation often considers user presence duration and intensity (Carmona et al., 2010; Gehl, 2011; Moulay, Ujang & Said, 2017). The social environment facilitates emotional bonding and non-verbal communication (Ujang et al., 2018). Despite being historically overlooked, alleys are now recognised for their potential to foster pedestrian activities and relationships (Martin, 2002; Hess, 2008). Therefore, this study aims to correlate the legibility of places with physical elements that influence social interaction in regenerated alleys within commercial districts.

3.0 STUDY AREA

The study was conducted in *Bukit Bintang*, the main commercial area in Kuala Lumpur City Centre, where streets comprise approximately 35% of the area (Wan, 2017). Notably, with 52 alleyways comprising 56.5% of *Bukit Bintang's* public walkways, efficient use is crucial to improving the city's overall quality of life (Wan, 2017). In 2015, Kuala Lumpur City Hall (KLCH) specifically selected the five alleyways (*Alor, Komuniti di Alor, Laman Belakang, Alam Alor,* and *Kehidupan Alor*) as part of the Kuala Lumpur City Regeneration Project. These alleyways were selected due to their proximity to the core urban environment of *Alor* Enclave, *Bukit Bintang*, a vibrant area undergoing significant development. The regeneration initiatives implemented in these locations, which were comprehensively renovated in 2018, sought to enhance not only aesthetic values but also functionality, social interaction, and community cohesion. The study included comprehensive on-site assessments to evaluate the current condition of these renovated alleys, ensuring that each site offers unique characteristics important to the regeneration project. This systematic assessment provided baseline data on the condition of the alleys' infrastructure, landscape, and overall usability.

4.0 METHODOLOGY

This study investigated the relationship between legibility and social interaction in urban alleys within Kuala Lumpur's *Bukit Bintang* commercial district. A mixed-methods approach was employed, combining systematic one-month field observations (with sessions conducted on weekdays and weekends, each lasting one hour) with a visual questionnaire survey. Observations were recorded of the environmental context, infrastructure, alley conditions, features, and user behaviour, including volume, usage, accessibility, and connectivity (Figures 1 & 2). The visual questionnaire assessed legibility attributes, including "Clarity of Structures" and "Visual Elements," and their impact on "Place Engagement" (duration, frequency, and purpose of usage) and "Social Interaction" (place image and types of contact). The survey involved 695 individuals (436 foreigners, 157 Malays, 78 Chinese Malaysians, 24 Indian Malaysians), utilising systematic and time-interval sampling to minimise bias, with respondents answering questions based on alley photographs.

The study will employ descriptive analysis and Multinomial Logistic Regression (MLR) to investigate the relationship between legibility attributes and social interaction/place engagement. ML is suitable for comparing multiple groups of risk processes (Bayaga, 2010), such as different levels of engagement and types of social interaction. It accommodates several explanatory variables, making it ideal for this study. ML can compare multiple groups of risk processes through binary logistic regressions (Bayaga, 2010), providing a nuanced understanding of how specific legibility attributes affect social interaction in regenerated alleys. This approach emphasises the importance of user experience in urban regeneration.

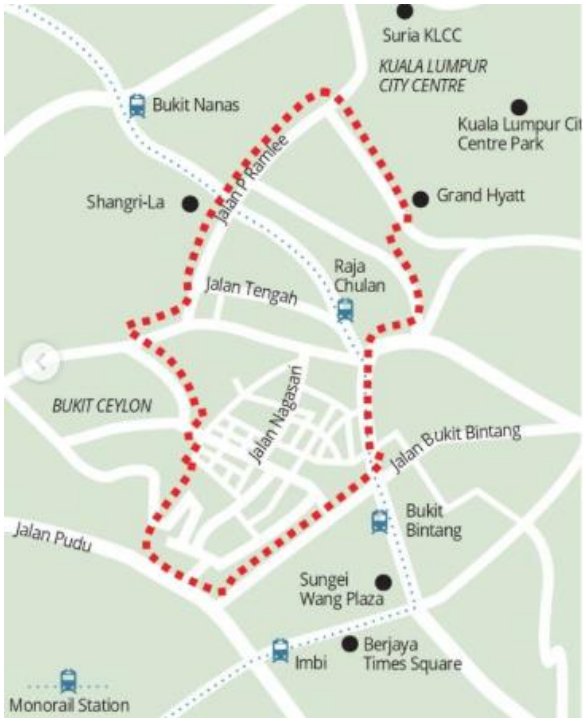

Figure 1: Alleys' location (gmbb.kl, 2020)

Figure 2: Alleys' connectivity (KLCH, 2018)

1. Alor
2. Komuniti di Alor
3. Laman Belakang
4. Alam Alor
5. Kehidupan Alor

5.0 RESULTS

Based on the Likert scale description by Chyung et al. (2017) and James & Lee (2011), the questionnaire survey results can be classified into four groups with an equal range (m = 0.8). The classification shown in Table 1 is derived from Bernard's (2011) framework. Nonetheless, the range established for this classification adheres to the Likert scale (1-5) used in the questionnaire. Furthermore, the number of respondents in *Bukit Bintang* was also taken into consideration during this classification process. Cronbach's Alpha was used to measure the reliability of a set of items or a single unidimensional latent construct. Cronbach's α reliability coefficient was 0.842, indicating a strong correlation.

Table 1: Classification of legible elements for questionnaire survey (Source: Author).

Scale	Weight	Range (mean)	Legibility	Social interaction
Strongly agree	5	4.1 – 5.0	Highly identifiable	Strong SI
Agree	4	3.1 – 4.0	Moderate recognisable	Moderate SI
Disagree	2	2.1 – 3.0	Poorly recognisable	Weak SI
Strongly disagree	1	1.0 – 2.0	Unrecognisable	No SI

This section presents results from descriptive and regression analyses examining the relationships between legibility, place engagement, and social interaction. The discussions of the findings follow them.

5.1 Legibility among Users

Descriptive statistics were employed to analyse and compare the legibility of both clarity and visual elements based on mean scores. As illustrated in Table 2, the feedback from respondents regarding the legibility of the alleys is delineated through the primary variables of Clarity of Structure and Visual elements. Slight differences

were observed between the variable of visual elements (m=3.46) and Clarity of Structure (m=3.61). The findings revealed that the location of the alleys plays a significant role in the clarity of the place. In contrast, the signage and direction within the alleys show a moderate level of clarity. Moreover, the trees and greenery in the alleys were not as prominently featured as murals, colored walls, and facades, which are highly recognisable. Consequently, the Visual elements of the regenerated alleys are less recognisable than the clarity of the place.

Table 2: Legibility of regenerated alleys.

Legibility	Items	M	SD	SE
Clear structure	They are strategically located. (m 3.83) Have a strong physical connection to adjacent streets. (m 3.69) Very clear layout, easy to move. (m 3.62) Very exciting views. (m 3.53) Very clear signage and directions. (m 3.38)	3.61	.50	.19
Visual elements	Colourful place. (m 3.86) Attractive mural art. (m: 3.70) The facades are well decorated. (m 3.60) The place has different lighting designs. (m 3.57) This place has attractive traditional/old buildings. (m 3.33) Attractive wayfinding signage. (m 3.20) There is a lot more greenery /beautiful trees. (m 3.00)	3.46	.47	.18

M: Mean Value, SD: Standard Deviation, SE: Standard Error

The central alleys that traverse the major city blocks of *Bukit Bintang* showcase a myriad of vibrant artworks in the form of painted murals. These murals feature bright colours and depict natural imagery, including rivers, rainforests, and tropical fauna Indigenous to Southeast Asia. Enhancing the artistic landscape, the area also features unconventional neon sculptures shaped like playful cloud silhouettes that hover above the streets and illuminate the night sky after dark. Notably, *Jalan Alor, Berangan, Changkat, Rembia,* and *Tengkat Tong Shin* stand out as some of the most adorned alleys in this district (Figure 3). However, upon conducting field observations, the initial data collection phase revealed several common issues. These include substandard paving and flooring of walkways, insufficient shelter and canopies, inconsistent signage, narrow thoroughfares, a stark contrast between the architectural styles of old and new buildings, limited facilities for individuals with disabilities, and inadequate public services and maintenance (Figure 7). These challenges significantly contribute to the degradation of urban alley legibility.

Fig. 3: *Alor*, playful cloud silhouettes (KLCH, 2018)

5.2 Relationship between Legibility, Social Interaction, and Place Engagement

The following section will examine the relationship between legibility, social interaction, and user engagement in the study context.

5.2.1 Social Interactions within The Regenerated Alleys

Table 3 summarises the level of social interaction in the alleys. The regenerated alleys demonstrate generally positive social interactions, with a combined mean score of 3.58 (SD = 0.501).

- Place Image: The alleys are perceived positively (mean: 3.58), driven by good accessibility (mean: 3.77), attractive mural art (mean: 3.70), and well-decorated facades (mean: 3.60), which collectively create a welcoming environment. However, "Shaded all day" received a lower mean (m: 3.02), indicating a potential comfort issue.
- Type of Contact: Social contact is moderately favourable (mean: 3.43), with notable perceptions as a meeting place for different cultures (mean: 3.87) and a popular spot (mean: 3.52). Sc res for "The best place is what I like to do" (m: 3.10) and "The place makes people friendly" (m: 3.25) were lower, suggesting less strong personal alignment or perceived friendliness.

Overall, the regenerated alleys promote moderate social interaction, primarily due to their strong accessibility and positive aesthetic. While they successfully serve as multicultural gathering points, enhancing shaded areas and implementing strategies to boost a sense of personal connection and friendliness could significantly improve user experience and elevate the alleys' role as dynamic social hubs.

Table 3: Social interaction.

Construct	Variables	Items	Level of Social Interaction
Social interaction	Place image	Good access from many parts of the area. (m 3.77) Good image. (m 3.72) Attractive mural art. (m: 3.70) Strong physical connection to adjacent streets. (m 3.69) Well-decorated facades. (m 3.60) Shaded all day. (m 3.02)	M SD 3.58 0.501 Moderate Social interaction
	Type of contact	The meeting place for people from different cultures. (m 3.87) Popular place. (m 3.52) The place makes people friendly. (m 3.25) The best place is where I like to be. (m 3.10)	M SD 3.43 0.475 Moderate Social interaction

M: Mean Value, SD: Standard deviation

5.2.2 Relationship Between Legibility and Place Engagement

The researcher recommended using the multinomial logistic regression (MLR) to determine the relationship between legibility and place engagement. The multinomial (or polytomous) logistic regression model extends the binomial logistic regression model. Firstly, it is utilised when the dependent variable consists of more than two nominal or unordered categories. Similar to binary logistic regression, multinomial logistic regression employs maximum likelihood estimation to assess the probability of membership in each category (Ashok & Balasubramanian, 2014; Tabanick et al., 2001). Secondly, the strength of the MLR relationship was assessed to determine its significance. Lastly, it evaluated the usefulness of the logistic model and the relationship between the independent and dependent variables.

5.2.3 Relationship Between Independent and Dependent Variables

Two types of tests are used to identify the significant individual independent variables. The likelihood ratio test evaluates the overall relationship between independent and dependent variables (Table 4). At the same time, the Wald test assesses whether or not the independent variable is statistically significant in differentiating between groups in each embedded binary logistic comparison.

Table 4: Likelihood Ratio Tests.

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	507.220	37.161	3	.000
Legibility	494.931	24.872	3	.000

p<.05, n=693

Likelihood ratio tests confirm that "elements" and "clarity" (legibility) are highly significant independent variables influencing user visit duration in upgraded alleys.
Analysis of parameter estimates (Table 5) reveals how legibility impacts the odds of users spending different durations in these spaces, compared to visits "less than 1 hour":

- 1-4 Hours: Legibility has no statistically significant influence on visits lasting 1-4 hours (B: 0.112, Sig: 0.679).
- 4-8 Hours: Surprisingly, increased legibility is associated with a significant *decrease* in the odds of spending 4-8 hours (B: -1.186, Sig: 0.015). The odds ratio (Exp(B): 0.305) suggests a 69.5% reduction in likelihood for each unit increase in legibility. This might indicate that improved navigation efficiency allows users to complete tasks quickly or that mid-range visitors prioritise other factors.
- More Than 8 Hours: Conversely, higher legibility is strongly associated with a significant *increase* in the likelihood of stays exceeding 8 hours (B: 2.688, Sig: 0.000). The substantial odds ratio (Exp(B): 14.708) indicates well-defined, easily navigable spaces facilitate prolonged engagement and social interaction, potentially by reducing cognitive load.

In summary, legibility has a complex, varied impact on visit duration: it doesn't affect short visits, appears to shorten mid-range visits, but significantly encourages very long stays. These findings suggest that while clear pathways may expedite some activities, they also create environments that foster extended engagement, although other factors likely contribute to these patterns.

Table 5: Multinomial regression analysis between legibility and duration of using alleys.

Time duration of using alleys: a		B	Std. Error	Wald	Df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1-4 hours	Intercept	1.730	.951	3.312	1	.069			
	Legibility	.112	.271	.171	1	.679	1.119	.658	1.902
4-8 hours	Intercept	2.451	1.604	2.334	1	.127			
	Legibility	-1.186	.487	5.923	1	.015	.305	.118	.794
More than 8 hours	Intercept	-11.840	2.649	19.978	1	.000			
	Legibility	2.688	.670	16.093	1	.000	14.708	3.955	54.701

a: The reference category is: Less than 1 hour

5.2.4 Frequency of Using Regenerated Alleys and Legibility

Table 6 reveals a significant relationship between legibility and the frequency of alley usage, compared to "not frequent" visits.

- At Least Once a Week: Increased legibility substantially boosts the odds of visiting weekly (B: 1.991, Sig: 0.000). The odds ratio (Exp(B): 7.325) indicates a 632.5% increase in likelihood for each unit increase in legibility, highlighting it as a strong predictor of frequent use.
- At Least Once a Month: Legibility also significantly increases the likelihood of monthly visits (B: 1.219, Sig: 0.000). The odds ratio (Exp(B): 3.383) suggests a 238.3% increase in odds per unit increase in legibility, emphasising its role in attracting regular visitors.
- 2-3 Times a Month: A robust positive relationship exists between legibility and visiting 2-3 times per month (B: 2.081, Sig: 0.000). The odds ratio (Exp(B): 8.012) shows a 701.2% increase in odds with each unit increase in legibility.

In conclusion, legibility consistently and significantly enhances the frequency of alley usage. Better legibility not only aids navigation but also acts as a strong incentive for users to incorporate the alleys into their routines. The most pronounced impact is observed in the "at least once a week" category, indicating that frequent users are particularly responsive to legibility. This highlights the crucial importance of effective design and signage in promoting sustained and frequent use of public alleys.

Table 6: Multinomial regression analysis between legibility and alley usage frequency.

Usage frequency: a		B	Std. Error	Wald	Df	Sig.	Exp(B)	95% Confidence Interval for Exp (B)	
								Lower Bound	Upper Bound
At least once a week	Intercept	-7.422	1.658	20.051	1	.000			
	Legibility	1.991	.472	17.809	1	.000	7.325	2.905	18.469
At least once a month	Intercept	-2.634	.899	8.593	1	.003			
	Legibility	1.219	.274	19.830	1	.000	3.383	1.978	5.783
2-3 times a month	Intercept	-5.615	.990	32.137	1	.000			
	Legibility	2.081	.296	49.353	1	.000	8.012	4.483	14.318

a: the reference category is not frequent

5.2.5 Purpose of Using Regenerated Alleys and Legibility

Table 7 indicates that legibility does not statistically significantly influence the *purpose* of using the regenerated alleys ($p > 0.05$), meaning there's no direct relationship between the legibility of a space and whether it's used for visiting or entertainment.

Field observations, however, highlight critical needs for enhancing daily maintenance services. The absence of adequate lighting was a concern, underscoring the importance of proper illumination, visibility, and well-managed services to foster social activities and diverse uses. While user perception of the alleys has improved, further enhancements are needed, particularly in terms of safety, through improved lighting and the installation of surveillance cameras. Engaging activities, such as workshops and galleries, can also play a vital role in regeneration.

Since legibility is not a primary determinant for visiting or entertainment purposes, urban planners should investigate other influential factors such as social dynamics, specific events, accessibility, amenities, and personal preferences. Further research using different methodologies or examining broader variables could help to explore these complex relationships further.

Table 7: Multinomial regression analysis between legibility and the purpose of usage.

Purpose of usage: a		B	Std. Error	Wald	Df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Visiting	Intercept	.488	.888	.303	1	.582			
	Legibility	.200	.252	.628	1	.428	1.221	.745	2.000
Entertainment	Intercept	1.342	.879	2.329	1	.127			
	Legibility	-.054	.250	.046	1	.830	.948	.580	1.548

a. The reference category is others. P> .05

5.26 The Relationship between Legibility and Social Interaction

Linear regression analysis revealed a significant relationship between visual elements, clear structure, and social interaction.

- Visual Elements positively impact social interaction (standardised coefficient: 0.198, $p < 0.001$), indicating that improvements lead to increased social engagement, albeit modestly. The confidence interval is [0.118, 0.241].
- A clear structure demonstrates a significantly stronger positive relationship with social interaction (standardised coefficient: 0.704, $p < 0.001$), making it the most impactful variable. The confidence interval is [0.605, 0.735].

Both variables are highly statistically significant ($p < 0.001$), with confidence intervals that do not include zero, reinforcing their genuine effect. The adjusted R-squared value of 0.771 indicates that 77.1% of the variance in social interaction is explained by these variables, showing a strong model fit.

In conclusion, both visual elements and clear structure significantly contribute to social interaction, with clear structure being particularly potent. These findings underscore the critical role of well-designed, explicit communication materials in fostering social engagement.

Table 8: Linear regression analysis between social interaction and legibility (clear structure, visual elements)

Dependent Variable	Independent variables	Standardised coefficient Beta	t-value	Sig.	95.0% Confidence Interval for B	
Social Interaction	Visual elements	0.198	5.707	.000	.118	.241
	Clear structure	0.704	20.287	.000	.605	.735
	Adjusted R^2: .771			P<0.001		

6.0 DISCUSSIONS

The regeneration of *Bukit Bintang's* alleys has significantly altered the daily experiences and patterns of engagement for its users. In the 2000s, public art creation focused on engaging with local communities, positioning public art not merely as a visual solution, but also as a tool for community engagement and problem-solving (Pan, 2015, p.154). In this context, Malaysian local authority initiatives have included vibrant aesthetic enhancements, such as murals incorporating local flora and fauna inspired by the historical *Alor* stream (Figure 4). While these efforts ostensibly aim to imbue the spaces with cultural and historical significance, research and observation suggest a potential disconnect in users' complete understanding or recognition of these artistic elements and their intended meaning. This raises critical questions about the "politics of visibility" in urban regeneration, where certain narratives and aesthetics are made prominent, potentially serving broader "urban branding" initiatives more than deep community connection. Research indicates that certain narratives and aesthetics are indeed made prominent in urban branding, often serving broader "urban branding" initiatives, sometimes at the expense of deeper community connection (Moussaoui, 2024). This is more aligned with economic interests than with fostering genuine community ties.

Fig.4: Alor Information Plaque (KLCH, 2018)

In this study, the pattern of extended engagement (often exceeding an hour) reveals a compelling paradox: users who spend more extended periods (one to four hours) report a diminished sense of legibility compared to those with shorter visits. This "clutter of details" that, while initially interesting (e.g., the visual quality influenced by colours, art, and facades), can ultimately obscure a clear mental map, suggests that the aesthetic legibility primarily caters to transient, first-impression users—often tourists—rather than fostering sustained comprehension for those who linger. The physical dimensions of alleyways, especially in tropical countries, significantly impact walkability. Their length and varying width within a dense commercial sector play a crucial role in this outcome. The typical height of the buildings in *Bukit Bintang* alleys ranges from 7 to 21 meters (2 to 5 stories), resulting in a height-to-width ratio of 3:1 and 2:1 (Figure 5). However, when it rains, people tend to avoid using alleys because they essentially have no shading features for pedestrians (Wan, 2017) (Figure 8).

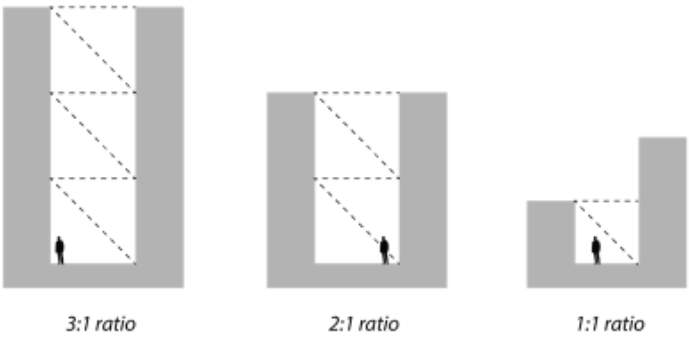

Fig 5: Height-to-Width Ratio (Wan, 2017)

Overwhelming visual density can result from narrow alley sections with numerous commercial signage and diverse storefronts, potentially hindering spatial comprehension and navigational clarity over time. Conversely, wider, unprogrammed sections may lack cohesion. Studies indicate that users primarily engage in leisure activities, such as dining, rather than commercial activities in revitalised alleys, as observed in Alor, Alam Alor, and Laman Belakang alleys (Ng & Sze, 2022) (Figures 7 and 8). This influx of visual information, while initially creating a "wow" factor, can become overwhelming, impacting navigational clarity (Huang et al., 2023). A decline in perception among long-term users may stem from discrepancies between anticipated legibility and actual chaotic signage or confusing spatial arrangements, highlighting a tension between marketability/tourism appeal, on the one hand, and functional legibility for diverse, prolonged resident-oriented use, on the other.

Effective urban design must prioritise user comfort and diverse activities beyond mere aesthetics, especially in tropical climates. Sufficiently broad pathways are crucial to accommodate seating without obstructing movement, and varied lengths encourage exploration while maintaining clear sightlines. While aesthetic upgrades, such as murals, attract initial visitors, particularly tourists (Le & Hoang, 2024), they are insufficient to cater to the varied needs of users and ensure long-term legibility for those who linger. Critiques of "art-led regeneration" suggest it can prioritise superficial visual appeal, potentially neglecting fundamental infrastructure and functional elements crucial for genuine publicness and resident-oriented use. Without addressing these deeper aspects, legibility risks becoming a tool for commodification rather than fostering truly inhabitable spaces for locals.

Legibility is closely tied to fostering social interaction, a crucial aspect for vibrant social environments. Building on Lynch's work, recent research emphasises the role of legibility in promoting spontaneous encounters and enhancing community connections (Jacobs, 1961; Gehl, 2010). The concept of "third places" (Khan, 2021) — informal public gathering spots — is highly relevant, as the physical layout, including alley width and amenities, directly impacts these affordances. Adequately wide alleys can accommodate seating that invites conversation (Figure 8), and carefully considered lengths can create intimacy conducive to social bonding. Well-designed alleys can transform insecure urban passages into welcoming spaces for interaction, such as Kuala Lumpur's Kwai Chai Hong alley, which utilises bright lighting, thematic elements, and murals to create a legible and engaging space that fosters cultural appreciation and interaction (Figure 6).

Fig 6: *Kwai Chai Hong* alley, bright lighting, and murals (Merel Nahuijsen, 2024)

Similarly, the strategic positioning and design of *Alor* Alley (Figure 7), which originated from a feasibility analysis and is rooted in the location's history as a stream (*Alor* in *Bahasa Melayu*), exemplify how regenerated alleys can cultivate connections through shared experiences. However, the lack of clarity in communicating and promoting the historical and cultural significance, such as the *Alor* stream concept, through consistent signage, narrative elements like *manhwa* strips, and wayfinding, can fragment the intended identity and impact visual quality. This 'fragmentation' speaks to a broader issue in urban regeneration, where 'publicness' becomes curated rather than organic. If the historical narrative is unclear, the space risks becoming a generic backdrop for tourist consumption, losing its potential to genuinely foster community pride and identity.

Maintaining consistency in the *Alor* Stream theme is critical for reinforcing *Bukit Bintang's* local identity and significance, encouraging users to develop a stronger connection to the neighbourhood, thereby moving beyond mere aesthetic appreciation towards deeper, resident-oriented engagement. Acknowledging and valuing the historical narratives, such as the origin of the term "*Alor*" (Bavani, 2018), deepens understanding and fosters community pride, intensifying user engagement and contributing to a stronger sense of place (Relph, 1976).

Fig .7: *Alor*, cloudy and green alley (Author, 2025)

Additionally, compared to other alleys, *Laman Belakang* (Figure 8) is the most visited by tourists. Residents and stakeholders express sentiments and emotions about the *Laman Belakang* Alley concept design due to the environment's intense familiarity with the location. The architect Natasha (architect in charge of alley regeneration) stated that the owners who live in the alleys have a strong interest in developing the area, as evidenced by the *Laman Belakang* design concept proposed by one of the owners and the frequent cleaning and maintenance of the plants. The majority of the residents in the other alleys are tenants, who may be interested in the exterior improvements but lack the deeper investment of ownership. Moreover, it was discovered that respondents prefer to spend more time on *Laman Belakang* (Figure 8) than on other alleys; this is due to its strategic location, attracting visitors from *Tengkat Tong Shin* Street, and the provision of facilities (benches) that enhance the experience and encourage lingering, coupled with consistent maintenance. Its dimensions, likely offering a comfortable width for movement and seating without feeling overwhelming, combined with its strategic location within the commercial district, contribute to its success. These variables all contribute to an increase in alley activity. The study found that legibility is substantially connected with achieving people's desires, and higher legibility is dramatically associated with satisfying people's intentions. This implies that when renovated alleys are viewed as more legible, they are more likely to meet the desires of those who use them. Th s success, driven by simplicity of access, clear signage, maintained mural arts, and overall comprehensibility, suggests that genuine resident engagement and practical amenities, rather than just art, contribute to a holistic and truly legible urban space that avoids the pitfalls of mere "artwashing" or arts-led regeneration that conceals issues within the urban community, presenting an attractive veneer of modernity while simultaneously embracing the aesthetics of urban decay as 'authenticity' (Zukin, 2010a, p.30) or grit as glamour (Lloyd, 2010; McIntosh, 2021).

Fig 8: *Laman Belakang*, well-maintained alley (Author, 2025)

In contrast, observational data reveal key challenges that hinder user engagement and social interaction within *Alor's* communal spaces. Specifically, *Komuniti di* Alor (Figure 9), *Kehidupan Alor* (Figure 10), and *Alam Alor* (Figure 11) experienced reduced usage during evening hours due to several factors. These alleys suffer from a lack of integration into the surrounding urban environment, resulting in underutilisation. The ambiguous layout and unclear signage act as barriers, impeding navigation and contributing to user isolation (Nasar & Julian, 1995; Francis et al., 2012). The varying and often inconsistent widths of these alleys, combined with their commercial district context, exacerbate these issues; a narrow, poorly lit section feels unsafe, while a wide, unprogrammed area might become a forgotten thoroughfare or parking space. Moreover, inadequate lighting and insufficient maintenance heighten safety concerns, deterring visitors, especially during evening hours, particularly in *Komuniti di Alor* (Figure 9), where walls show signs of damage and wear, including extensive graffiti and water stains. This evident neglect, particularly the "lack of resident engagement in maintaining regenerated alleys," can be directly linked to a weak sense of belonging. When individuals feel like tourists rather than residents, they are less likely to invest in the upkeep and improvement of public spaces. This highlights a crucial critique of art-led regeneration: if the art and "improvements" are perceived as externally imposed or solely for "urban branding," rather than genuinely rooted in and supported by the community, they fail to foster a sense of collective accountability for the well-being of society (Gürman & Buldan, 2024). Di ly lit conditions compromise legibility, negatively impacting users' perception and sense of security, further reinforcing the idea that purely aesthetic interventions without functional support or community investment can lead to spaces that are visually appealing but ultimately fail as true public realms.

Fig 9: *Komuniti di Alor*, lack of maintenance (Author, 2025)

Fig10: *Kehidupan Alor*, lack of maintenance (Author, 2025)

Alam Alor (Figure 11), the widest and largest alley in the area, holds significant potential due to its strategic location connecting the vibrant *Jalan Bukit Bintang* and *Jalan Alor* in Kuala Lumpur. Its considerable width, while offering potential for diverse activities, ironically contributes to its misuse as parking when not thoughtfully programmed (Figure 11). This situation exemplifies the "instrumentalisation of art" in urban development; a space with high potential for genuine public use is neglected because its "aesthetic" regeneration is incomplete or misguided, failing to create a compelling reason for sustained human activity. The concept of a public space with high potential for genuine public use being neglected due to incomplete "aesthetic" regeneration is a recurring theme in urban studies and regeneration literature. Several academic works explore how regeneration efforts, when overly focused on superficial aesthetic improvements or driven by commercial interests, can fail to foster authentic public engagement and, in some cases, lead to further neglect or displacement of communities.

For instance, research on abandoned buildings in Berlin highlights how a focus on aesthetic changes, often tied to "touristification" and "commodification," can result in neglect of the inherent tangible and intangible qualities of these spaces and the communities that might informally re-appropriate them, challenges and opportunities in the reuse of abandoned buildings (Zecca, 2019). This type of regeneration, driven by "neoliberal immediate revenues," can overlook the existing value and potential for genuine public participation. The paper suggests that "informal re-appropriation" and "minimal interventions" that prioritise public involvement can better preserve a city's unique aesthetics while fostering public use, contrasting with regeneration that prioritises incomplete or misdirected aesthetics over social value (Zecca, 2019).

The idea that "inexpensively providing aesthetic form" can leave spaces "suspended, forgotten or abandoned" further supports this notion, implying that a lack of comprehensive planning beyond mere aesthetics can render regeneration incomplete and ineffective for public utility (Polyak, 2016). Instead, there's an argument for integrating aesthetic function with social value, ensuring that regeneration efforts exploit both aspects for meaningful urban renewal (Landry et al., 1996). To fully leverage its potential and extend the vibrancy of the adjacent streets, Alam Alor requires consistent maintenance and a comprehensive mural program to establish a distinct identity for the space, transforming it into an inviting and engaging public area. Addressing these issues requires prioritising thoughtful design principles that foster inviting environments conducive to social gathering and enhance the overall integration of these spaces into the urban fabric, moving beyond the superficial "prettifying" of urban spaces to cultivate true publicness.

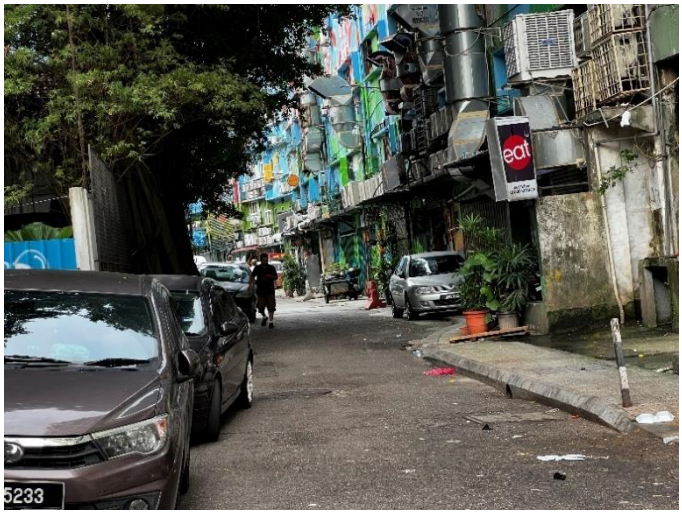

Fig 11: *Alam Alor*, parked cars, and overlooked alley (Author, 2025)

In conclusion, regenerating urban alleys into vibrant, community-oriented social spaces requires a comprehensive, user-centred approach that critically examines the interplay between aesthetics, legibility, and the profound impact of an alley's length, width, and surrounding commercial land use on user experience. Prioritising straightforward navigation, sufficient lighting, regular maintenance, and integrated historical narratives is essential for transforming these underutilised areas. This goes beyond simply using art for "urban branding" or commodification; it demands a focus on authentic community engagement and the creation of truly legible and functional spaces for residents, not just tourists. Successful regeneration also necessitates collaborative efforts among government, community, and private stakeholders to ensure sustainable outcomes that foster social interaction, strengthen community ties, and align with the goals of Sustainable Development (SDG 11), thereby avoiding the pitfalls of "artwashing" and promoting genuine urban resilience.

7.0 CONCLUSION

The regeneration of urban alleys, as exemplified by *Bukit Bintang*, unequivocally demonstrates that spatial legibility is the cornerstone of fostering genuinely vibrant and sustainable communal spaces. While aesthetic enhancements, such as public art and murals, are instrumental in initial attraction and "urban branding," this study reveals a critical paradox: a "clutter of details" can diminish legibility for sustained engagement, effectively prioritising transient tourist appeal over profound resident connection. This highlights a fundamental tension where superficial visual improvements, if not deeply integrated with functional design and authentic community needs, can hinder navigational clarity and social interaction, resulting in visually appealing spaces that are ultimately underutilised and lacking in genuine publicness. Therefore, successful urban alley regeneration must transcend mere "art-led regeneration" or "art washing" and instead embrace a holistic, user-centred paradigm. This necessitates prioritising intuitive spatial design, clear wayfinding, consistent maintenance, and the strategic integration of amenities that facilitate a range of diverse activities. Furthermore, embedding historical narratives and fostering genuine community engagement are vital for cultivating a strong sense of place and ownership. Ultimately, by marrying compelling aesthetics with robust functional design and collaborative stakeholder involvement, cities can transform underutilised urban passages into legible, resilient, and equitable public realms.

However, this study's insights are tempered by its limitations, which stem from its specific geographical and cultural context, as well as methodological constraints, particularly regarding the nuanced relationship between legibility and the diverse purposes for which alleys are used. The reliance on observational data, while providing valuable initial insights, suggests that the findings may not be universally applicable. Future research should therefore focus on comparative analyses across diverse settings, employing varied and more comprehensive methodologies such as spatial tracking and qualitative interviews. This will enable a deeper exploration of how economic impacts affect local businesses, a more nuanced understanding of diverse user experiences, and a comprehensive assessment of accessibility needs. Such expanded research will be crucial for developing a more globally applicable framework for urban alley regeneration, one that truly integrates both aesthetic and functional considerations to create genuinely public, legible, and sustainable urban spaces.

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REFERENCES

Andriotis, K. (2022). Typology of art produced by travelling artists: Art-led regeneration of a historic urban environment. *Tourism Culture & Communication*, *22*(4), 305-319. https://doi.org/10.3727/109830422X16420405391952

Andron, S. (2018). Selling streetness as experience: The role of street art tours in branding the creative city. *The Sociological Review*, 66(5), 1036-1057. https://doi.org/10.1177/0038026118771293

Ashok, M. B., & Balasubramanian, S. (2014). A multinomial logistic regression analysis to study the influence of residence and socio-economic status on breast cancer incidence in Southern Karnataka. *International Journal of Mathematics and Statistics Invention*, *2*(5), 1–8. https://doi.org/10.5194/isprsarchives-XL-8-193-2014

Askarizad, R., He, J., & Elham M. K. (2022). The legibility efficacy of historical neighbourhoods in creating a cognitive map for citizens. *Sustainability*, *14*(15), 9010. https://doi.org/10.3390/su14159010.

Balliger, R. (2021). Proximal disruptions: Artists, arts-led urban regeneration and gentrification in Oakland, California. *Art and Gentrification in the Changing Neoliberal Landscape* (pp. 39-56). Routledge.

Bahriny, F., & Bell, S. (2021). Traditional versus modern? Perceptions and Preferences of Urban Park Users in Iran. *Sustainability*, *13*(4), 2036. https://doi.org/10.3390/su13042036

Bavani, M. (2018, February 27). Artistic alleys. *The Star Metro*.

Bayaga, A. (2010). Multinomial logistic regression: usage and application in risk analysis. *Journal of Applied Quantitative Methods*, *5*(2), 288–297. https://www.jaqm.ro/issues/volume-5,issue-2/9_bayaga.php

Carmona, M., Tiesdell, S., Heath, T., & Oc, T. (2010). *Public places- urban spaces: The dimensions of urban design* (2nd ed.). Architectural Press.

Chang, H. (2023). *Murals in my front yard: production of space through urban art* (*Doctoral* dissertation, University of Surrey).

Chen, J., & Hu, W. (2024). Geo-semiotic analysis of shared streets in urban historical districts: the case of Jiefangbei, Chongqing, China. *Land*, *13*(8), 1232. https://doi.org/10.3390/land13081232

Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. *Performance improvement*, *56*(10), 15-23. https://doi.org/10.1002/pfi.21727

Eni, S., Razali, M. N., & Maimun, N. H. A. (2020). Urban regeneration policy framework for the city of Kuala Lumpur. *International Journal of Scientific and Technology Research, 9*(4), 2872-2876.

Francis, J., Billie G.-C., Lisa W., & Matthew, K. (2012). Creating a sense of community: the role of public space. *Journal of Environmental Psychology*, *32*(4), 401–409. https://doi.org/10.1016/j.jenvp.2012.07.002.

Gürman, A., & Buldan, E. (2024). From Gated-Community to Gated-Neighbourhood: The Case of a Housing Estate Bank in Mavişehir, Izmir. *Nakhara: Journal of Environmental Design and Planning*, *23*(2). https://doi.org/10.54028/NJ202423412

Hess, P. M. (2008). Fronts and backs: the use of streets, yards, and alleys in Toronto-area new urbanist neighbourhoods. *Journal of Planning Education and Research*, *28*(2), 196–212. https://doi.org/10.1177/0739456X08321799.

Huang, C., Fang, W., Sijia Q., Xuqing C., Lu C., Jing X., Jiayang G., & Qing L. (2023). Interpreting regenerated post-industrial lands as green spaces: comparing public perceptions of post-industrial landscapes using human factor design framework. *Ecological Indicators*, *157*(July), 111282. https://doi.org/10.1016/j.ecolind.2023.111282.

Hyseni, R., Florian N., & Kristalba A. (2021). Urban neighbourhood regeneration through reading the evolution of urban form in the city of Tirana. *International Journal of Science and Research*, *10*(4), 1259-1269. https://doi.org/10.21275/SR21416003826.

Imai, H. (2013). The liminal nature of alleyways: Understanding the alleyway as a 'boundary' between past and present. *Cities*, *34*, 58–66. https://doi.org/10.1016/j.cities.2012.01.008.

James, T. C., & Ostrom, L. (2011). Using Likert-type scales in the social sciences. *Journal of Adult Education, 40*(1), 19–22. http://www.mpaea.org/publications.htm

Johnson, A. (2022). Place & displacement: a creative study of the Alpine Avenue renovation in McMinnville, Oregon (Doctoral dissertation, University of Oregon).

Gehl, J. (2010). *Cities For People*. Island Press.
Gibert-Flutre, M., & Imai, & H. (2020). *Asian Alleyways*. Amsterdam University Press.
Khan, S., & Kumar, R. (2021). Revisiting Oldenburg's third place: Leisure in the coffee house. *Journal on Tourism & Sustainability*, *5*(1), 5-18.
Landry, C., Greene, L., Matarasso, F., & Bianchini, F. (1996). The art of regeneration: Urban renewal through cultural activity. *Comedia*. https://illuminart.com.au/wp-content/uploads/2012/08/indonesia-charleslandry-
Le, T. Q., & Hoang-Thi, P. T. (2024). A study on art-led regeneration and historic village preservation—artworks vitalising space. In *International Conference on Sustainable Development in Civil, Urban and Transportation Engineering* (pp. 211-218). Springer Nature.
Liu, Y., Liyin S., Yitian R., & Tao Z. (2016). Regeneration towards suitability : A decision-making framework for determining urban regeneration mode and strategies. *Habitat International*, *138*, 102870. https://doi.org/10.1016/j.habitatint.2023.102870.
Lynch, K. (1960). The image of the city. MIT Press.
Lloyd, R. (2010). Neo-bohemia: Art and commerce in the post-industrial city. Routledge.
MacDowall, L. (2019). *Instafame: graffiti and street art in the Instagram era.* Intellect Books.
Marans, R. W. (2012). Quality of urban life studies : An overview and implications for environment-behaviour research. *Procedia-Social and Behavioural Sciences*, *35*, 9–22. ht ps://doi.org/10.1016/j.sbspro.2012.02.058.
Martin (2002). Community Profile: Northampton. Massachusetts Department of Housing and Community Development. http://www.state.ma.us/dhcd/iprofile/214.pdf.
McIntosh, E. (2021). An Examination of artwashing in changing urban communities. *Who is to blame* for *artwashing and how can artists minimise their contribution to gentrification* (Bachelor Dissertation, Goldsmiths University of London).
Mdlias, S. F., Tawil, N. M., Usman, I. M., & Tahir, M. M. (2012). Lorong belakang : kajian awalan keberkesanan hubungan sosial-ruang di perumahan teres , Nilai, Negeri Sembilan, Malaysia. *Journal Design + Built, 5*, 1-10.
Moulay, A., & Ujang, N. (2016). Legibility of neighborhood parks and its impact on social interaction in a planned residential area. *Archnet-IJAR: International Journal of Architectural Research*, *10*(1), 184–94. https://doi.org/10.26687/archnet-ijar.v10i1.686
Moulay, A., Ujang, N., & Ismail, S. (2017). Legibility of neighborhood parks as a predictor for enhanced social interaction towards social sustainability. *Cities,* 61, 58–64. doi: 10.1016/j.cities.2016.11.007.
Moussaoui, M. El. (2024). Aesthetics, authenticity & city place-making. *Open Edition Journals*, *85*, 35–49. https://doi.org/10.4000/12tq9
Naghibi, M. (2024). Re-thinking small vacant lands in urban resilience : decoding cognitive and emotional responses to cityscapes. *Cities*, *151*, 105167. https://doi.org/10.1016/j.cities.2024.105167
Ng, V. F. P., & Shern Y. S. (2022). The alley as public living room: user satisfaction of alley transformations in Kuala Lumpur. Journal *of Engineering Science and Technology*, *17*, 15–27. https://jestec.taylors.edu.my/Special%20Issue%20THINK%20SPACE/STAAUH%2002.pdf
Pan, L. (2015). *Aestheticizing Public Space Street Visual Politics in East Asian Cities*. Intellect.
Paydar, M., & Asal, K. F. (2021). The impact of legibility and seating areas on social interaction in the neighbourhood park and plaza. *Archnet-IJAR: International Journal of Architectural Research*, *15*(3), 571–588. https://doi.org/10.1108/ARCH-07-2020-0146.
Petronienė, S., & Saulutė J. (2022). Community engagement via mural art to foster a sustainable urban environment. *Ss tainability (Switzerland)*, *14*(16), 10063. https://doi.org/10.3390/su141610063.
Polyak, L. (2016). Civic space (Doctoral Dissertation, Central European University).
Roche, E. (2021). *How does Murals for Communities : The Walls Project Waterford employ co-creation through mural art to foster social inclusion and regenerate Waterford city?* (Doctoral Dissertation).
Raj, M. P., & Patil, D. R. (2023). Semiotics in architecture of public spaces: contemporary city-centres; case of Bangalore, India. *Journal of Umm Al-Qura University for Engineering and Architecture, 14*(4), 212-225. https://doi.org/10.1007/s43995-023-00031-3
Relph, E. (1997). Sense of place. In S. Hanson (Ed.), Ten geographic ideas that changed the world (pp. 205–226). *Rutgers University Press*.
Relph, E. (1976). Place and placelessness. London: Pion Limited.
Sima, V., Matthew, B., & Tooran A. (2016). Urban form and wayfinding: review of cognitive and spatial knowledge for an individual's navigation. In *Proceedings of the 38th Australasian Transport Research Forum* (pp. 1–14). AT F.

Tabanick, B. G., Fidell, L. S., & Osterlind, S. J. *Using multivariate statistics*. Allyn and Bacon.

Tawil, N. M., Md Lias, S. F., Usman, I. M. S., Yusoff, N. I. M., Che Ani, A. L., & Kosman, K. A. (2013). Evolution of back lane design: A view of terrace housing in Malaysia. *As a Social Science, 9*(15), 277–288. https://doi.org/10.5539/ass.v9n15p277

Ujang, N., Kozlowski, M., & Maulan, S. (2018). Linking place attachment and social interaction: towards meaningful public places. *Journal of Place Management and Development, 11*(1), 115–129. https://doi.org/10.1108/JPMD-01-2017-0012.

Urban Psycho-Geography (2025). Sustainability Directory. https://lifestyle.sustainability-directory.com/term/urban-psycho-geography/.

Wan I. W. H., & Ching, L. H. (2016). Back Lanes as Social Spaces in Chinatown, Kuala Lumpur. *Environment-Behaviour Proceedings Journal*, *1*(3), 293-299. https://doi.org/10.21834/e-bpj.v1i3.373

Wan, W. (2017). Little streets and hidden routes: A study on alleys of Bukit Bintang, Kuala Lumpur. *Journal of Built Environment, Technology and Engineering*, *2*, 223-234. https://oarep.usim.edu.my/entities/publication/9b15487d-a27f-4eea-862f-c8e6f9687ef8

Wan, W. (2020). Little streets and hidden routes : A study on alleys of Kuala Lumpur City Centre (Doctoral dissertation, University of Liverpool). https://livrepository.liverpool.ac.uk/3105328/

Wardhani, M. K., & Wang, Z. (2023). Spatial dialogues of historic alley through serial vision theory (Case study : Pontocho Roji and Jalan Rukunan). *Modul*, *23*(1), 22–29. https://doi.org/10.14710/mdl.23.1.2023.22-29

Yeung, H. W. C., & Victor R. S. (1996). Urban imagery and the main street of the nation: the legibility of Orchard Road in the eyes of Singaporeans. *Urban Studies*, *33*(3), 473–494. https://doi.org/10.1080/00420989650011870.

Zecca, C. (2019). Challenges and opportunities in the reuse of abandoned urban space. *Robert Gordon University Repository*. https://rgu-repository.worktribe.com/output/842190/challenges-and-opportunities-in-the-reuse-of-abandoned-urban-space%0Ahttps://rgu-repository.worktribe.com/output/842190/challenges-and-opportunities-in-the-reuse-of-abandoned-urban-space.