

THE ROLE OF IMAGEABILITY IN STRENGTHENING PLACE ATTACHMENT IN UPGRADED ALLEYS: A SURVEY-BASED STUDY IN THE COMMERCIAL DISTRICT OF KUALA LUMPUR, MALAYSIA.

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ABSTRACT

This quantitative study investigates the correlation between imageability and place attachment, specifically in the context of urban alley regeneration in Kuala Lumpur. Although the alleys of Southeast Asian cities are increasingly being transformed into livable public spaces, few studies have investigated the visual and spatial characteristics that shape users' attachments to place. A quantitative survey approach was utilized to evaluate user perceptions of five upgraded alleys in Bukit Bintang. A total of 695 participants were assessed with a structured questionnaire. Both descriptive and inferential analyses were performed to examine the impact of perceived imageability on place attachment. Findings indicate that place imageability attributes, including distinctiveness, visual clarity, and legibility, significantly predict place attachment levels. Specifically, legibility significantly influences both emotional and functional user attachment to a space, while perceived distinctiveness strongly correlates with emotional attachment. Using empirical methods to validate how imageability shapes place attachment in reimagined micro-public spaces, this study advances the theoretical debate in urban planning and design related to the quality of public spaces from physical and emotional perspectives. Additionally, the findings support policymakers in developing urban regeneration policies that transcend the physical aspect of place within the dense urban context of the Global South.

Keywords: Imageability, Place Attachment, Urban Alleys, Urban Regeneration, Kuala Lumpur.

1.0 INTRODUCTION

Urban alleys have historically functioned as practical backstreets in congested cities, often serving as secondary infrastructure (Askarizad et al., 2024; Blazy, 2019). Recently, urban-regeneration discourses worldwide have foregrounded these overlooked spaces as potentially pivotal for fostering inclusive and livable public realms (Pan & Cobbinah, 2023). Alleyway upgrading programs are being implemented in cities across Asia, including Kuala Lumpur, to transform narrow corridors into animated pedestrian networks, culturally vibrant spaces, and green connectors (Zhang & Liu, 2024; Wartmann et al., 2021; Omar et al., 2016). However, despite growing interest in spatial revitalization, research on how users emotionally engage with urban alleys remains limited (Zhang et al., 2024; Liu et al., 2024). At the heart of this debate are two concepts: place attachment—the emotional and psychological bonds people form with a place (Moulay & Ujang, 2021a)—and imageability, which refers to how easily a built environment can be recognized and recalled based on its spatial characteristics (Moulay & Ujang, 2021b). Therefore, well-conceived upgraded alleys can offer more than visual or practical improvements; they can deepen human-place connections and contribute to urban livability and social sustainability (Zhang & Liu, 2024).

While the interaction between imageability and place attachment has grown in environmental psychology and urban design, it has received less attention in urban alley regeneration (McCunn & Gifford, 2021). Prior research has highlighted women's greater safety and spatial-legibility concerns in narrow urban spaces (Chen et al., 2024),

but less attention has been paid to how visual and spatial cues in upgraded alleys affect a broader range of users (Alamouh & Kertész, 2022; Wan, 2017). This gap is particularly pronounced in Southeast Asia, where regeneration often prioritizes form over meaning (ASEAN Sustainable Urbanisation Report, 2022; Jensen, 2021). Understanding how people perceive and inhabit these micro-urban spaces is crucial for inclusive design strategies that address both cognitive navigation and emotional belonging. These insights help urban planners, designers, and policymakers ensure upgraded alleys function as living extensions of the public realm, not merely aesthetic corridors.

To fill this gap, this study examines the effect of imageability on place attachment in five upgraded alleys in Bukit Bintang, Kuala Lumpur. The study has three goals: (1) to examine user perceptions of imageability features in upgraded alleys; (2) to investigate the link between imageability and place attachment; and (3) to assess how imageability influences long-term emotional attachment to these micro-spaces. The research questions are: How do users perceive imageability in Bukit Bintang's upgraded alleys? What is the relationship between perceived imageability and place attachment? How can imageability shape long-term emotional connections to these spaces? By answering these questions, the study provides empirical evidence for human-centered urban regeneration and informs design practice focused on spatial quality and psychological well-being.

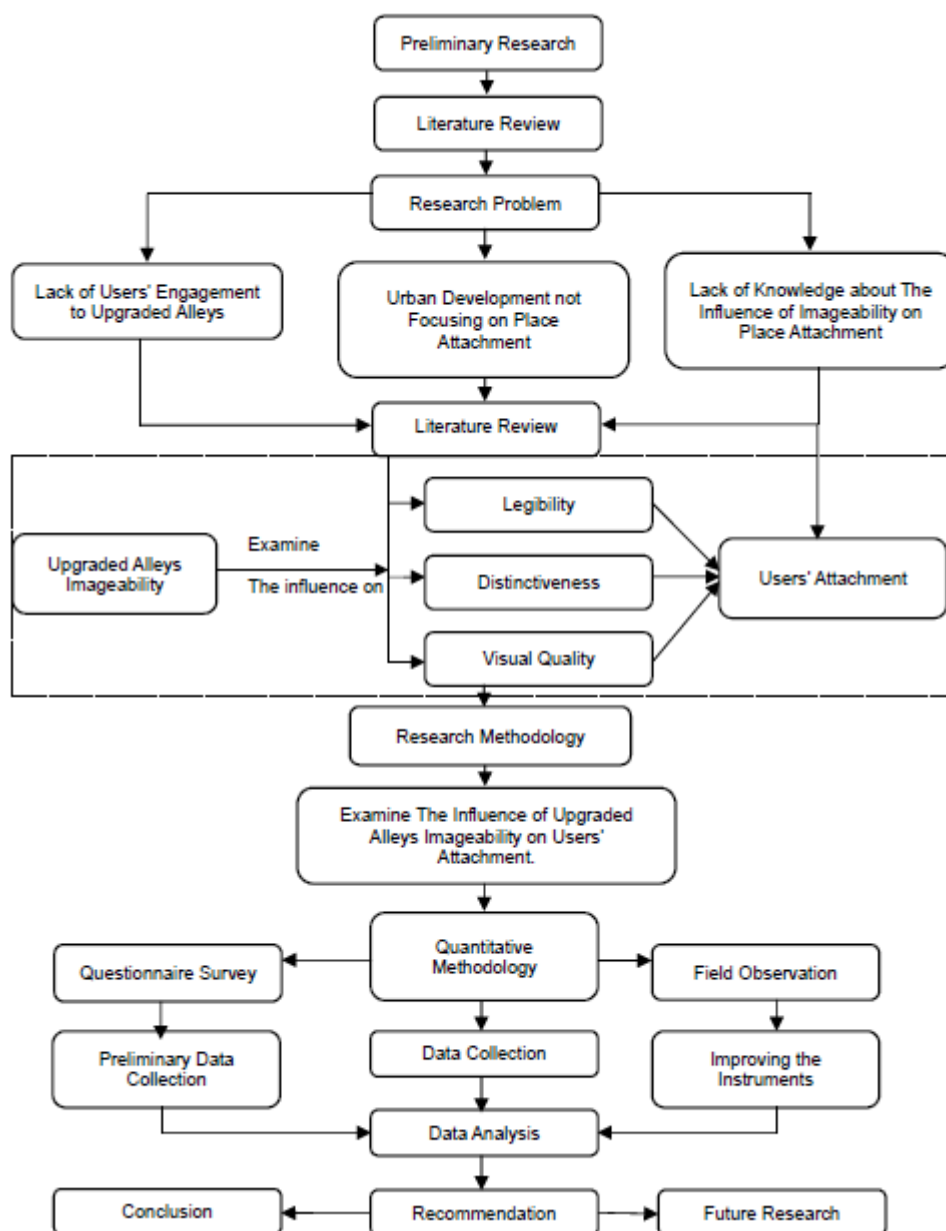


Fig. 1: Conceptual framework (Author, 2024).

2.0 LITERATURE REVIEW

Place attachment has long been acknowledged in environmental psychology and urban design as an important emotional and cognitive connection that humans develop with the physical environment (Balakrishnan & Bleibleh, 2025; Moulay et al., 2024). Place attachment includes the symbolic attachment to a place, referred to as place identity, and the functional attachment via spatial engagement, referred to as place dependence (Moulay & Ujang, 2021b; Scannell & Gifford, 2010; Tuan, 1974). Together, these two dimensions influence how people perceive meaning and function within their environments, thereby affecting their behavior, satisfaction, and long-term attachment to place. Place attachment in the urban context, especially in rapidly changing cities, has been associated with well-being, rootedness, and social belonging (Jones & Walker, 2023; Gillespie et al., 2022; Enssle & Kabisch, 2020). Micro-public spaces, like parks, laneways, or walkable alleys, have increasingly become important arenas to express these emotional bonds, especially when incorporated in people's daily lives (Falanga, 2022; Moulay et al., 2018). Southeast Asia's emerging research reveals that revitalizing underutilized urban backstreets into spaces that prioritize pedestrians and reflect local culture, promote a sense of belonging and identity among residents and visitors (Tan et al., 2024; Dameraia et al., 2023).

At the same time, imageability has become a significant urban design concept contributing to the legibility and memory of space (Alamouh & Kertész, 2022; Constantinides et al., 2021). Lynch's theory of imageability offers useful concepts, paths, edges, landmarks, orientation, and coherence that help explain navigation and attachment. But applying these ideas uncritically to Southeast Asian cities risks overlooking hybrid, multitemporal contexts. In Bukit Bintang, alleys carry memory, social exchange, informal economies, and everyday rituals, not just visual cues, revealing the limits of treating imageability as an objective design quality. Key tensions include space fluidity, informal social life, cultural memory, and gendered experiences (Agustí et al., 2022; Jiang et al., 2017).

A Southeast Asian reading treats imageability as relational, multisensory, and layered in time. It should consider multisensory imageability (soundscapes, smells, textures); temporal rhythms (markets, festivals, day-to-night life); socially produced meanings from residents, vendors, and visitors; culturally grounded storytelling co-authored with communities; and inclusive accessibility for women, elders, migrants, and children. Cross-site comparisons across Southeast Asian cities can test transferability while honoring local specificity (Nakić et al., 2022; Tang et al., 2020; Wardhani & Wang, 2023; Nur, 2020; Zhang & Liu, 2024).

Imageability-related interventions—murals, lighting, paving, and signage—have driven alley regeneration globally. In Southeast Asia, cities such as Kuala Lumpur, Bangkok, and Jakarta upgrade service corridors to become thriving connectors and cultural pockets (Wardhani & Wang, 2023; Nur, 2020; Zhang & Liu, 2024). Many programs follow top-down logics of order, security, and beautification, which can overshadow lived experiences (Falanga, 2022). By contrast, user-centered design foregrounds daily perception, memory, and social interaction, yet the link between visual design and emotion remains underexplored; only limited regeneration frameworks assess whether enhanced legibility yields deeper emotional interpretation or richer human-place bonds (Shynu & Suseelan, 2023; Zhang et al., 2021).

In Bukit Bintang, alleys function as social filters, informal gathering spaces, and accumulative memory loci. Western imageability can guide design but must be adapted to reflect temporality, sensory cues, and local narratives co-authored with communities. Design should weave local stories into wayfinding while preserving informal uses and social practices, moving regeneration beyond visual polish toward approaches that embrace psychological complexity, cultural specificity, and everyday lived experience (Qwasmi et al., 2022; Wan, 2017). Gender and social diversity add complexity: women often prioritize safety, legibility, and spatial affordances, yet post-regeneration studies rarely account for differential experiences (Agustí et al., 2022; Jiang et al., 2017; Gong et al., 2023; Khalid et al., 2022). Ultimately, Western imageability theories offer valuable entry points, but Southeast Asian contexts demand an expanded, culturally responsive theorization that foregrounds lived experience, temporality, and communal meaning (memory, sound, scent).

To fill these gaps, the current study empirically examines how the visual-spatial cues intrinsic to upgraded alleys influence users' functional and emotional bonds to these narrow corridors. The research focuses on five upgraded alleys in Bukit Bintang, Kuala Lumpur, and attempts to link conceptual and contextual knowledge to facilitate more holistic and emotionally engaged urban regeneration approaches. It argues for a transformation from an predominantly visual design paradigm to one that incorporates psychological complexity, cultural particularity, and the everyday lived experience.

3.0 METHODOLOGY

This study was conducted in Bukit Bintang, a major business district in Kuala Lumpur City Centre, where approximately 35% of the area consists of streets (Wan, 2017). Fifty-two lanes account for 56.5% of Bukit Bintang's public walkways, making their effective use crucial to improving the city's standard of living (Wan, 2017). A comprehensive assessment of physical conditions and user experiences formed the basis for selecting the five alleys: *Alor*, *Komuniti di Alor*, *Laman Belakang*, *Alam Alor*, and *Kehidupan Alor* (Fig 2). The DBKL regeneration project, started in 2015, targeted these alleys because they lie near the bustling *Alor* Enclave in Bukit Bintang. Redevelopment in 2018 aimed to enhance visual qualities, community cohesion, social interaction, and functioning. To analyze current conditions, the study conducted extensive on-site inspections, ensuring each site offered distinct qualities relevant to regeneration. The evaluation collected data on landscaping, infrastructure, and general usage.



Source: KLCH, 2018

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

Fig. 2: Location and names of regenerated alleys in Bukit Bintang, Kuala Lumpur (author, Google Map 2024).

The study employed quantitative methods to investigate the relationship between imageability and place attachment, specifically within the upgraded alleys of the Bukit Bintang commercial district. Utilizing quantitative approaches is advantageous for generating measurable and objective data, allowing for the identification of patterns and trends that qualitative methods might overlook. Jorgensen and Stedman (2006) point out that their quantitative framework effectively aligns place attachment with various environmental factors, establishing imageability as a significant predictor of attachment levels. This idea is further supported by Goldar and Daneshpour (2015) and Kamani Fard & Paydar (2024), who reiterate that imageable features significantly enhance residents' emotional connections to their environments. Furthermore, Ujang highlights the effectiveness of questionnaire surveys in quantitatively examining user attachment to urban spaces. Her findings reveal that specific characteristics, such as imageability, influence users' emotional ties to these places, thus demonstrating the empirical validity and practical application of quantitative methods in urban research (Ujang, 2010). Therefore, this study conducted a visual questionnaire survey of a sample of 695 randomly selected participants; the current study gathered quantitative data regarding perceptions of the upgraded alleys. The survey focused on physical features, visual appeal, and legibility, while also probing participants' feelings and connections to these spaces.

Table 1: Descriptive analysis for legibility, distinctiveness and visual clarity

	Items	Mean	Std. Deviation
Legibility (m= 3.51, SD= 0.67)	Very exciting views.	3.53	0.73
	Very clear signage and direction.	3.59	0.73
	Very clear layout, easy to move.	3.67	0.67
	Strong physical connection to adjacent streets.	3.73	0.67
	Attractive wayfinding signage.	3.20	0.63
Distinctiveness (m= 3.41, SD= 0.66)	Well-known by its international and modern image.	3.35	0.61
	Unique landscape features.	3.44	0.66
	Different lighting designs.	3.57	0.64
	Visually different from the rest of other places.	3.68	0.64
	More popular than other places.	3.52	0.70
	No place is comparable to this place	2.90	0.74
Visual clarity (m= 3.46, SD= 0.63)	Good image.	3.72	0.60
	Attractive mural art.	3.70	0.66
	Well decorated facades.	3.60	0.67
	Colorful place.	3.86	0.53
	Shaded all day.	3.02	0.51
	Attractive traditional/old buildings.	3.33	0.88
	More greenery /beautiful tree.	3.00	0.56

This large sample size enhances the study's reliability and validity, facilitating a detailed understanding of how the upgraded alleys encourage interaction among users, thereby reinforcing the importance of measurable attributes in fostering place attachment. Overall, this robust quantitative approach substantiates the findings that imageability in urban design plays a crucial role in fostering stronger emotional bonds between residents and their environments.

4.0 RESULTS

4.1 Perception of imageability

Visitors rated clear signage and layout highly (3.59–3.67) in Table 1, attributing this to effective upgrades such as better circulation, clear sightlines, and utilitarian signage that enhance wayfinding. A strong score for physical connections to adjacent streets (3.73) suggests that well-integrated alleys promote accessibility and perceived safety through visible entrances and cohesive design with surrounding streets. Colorful features and artwork received the highest ratings (3.86 for "Colorful place," 3.70, and 3.60 for murals/facades), because they were visually impactful and memorable, thus aiding orientation. Conversely, attractive wayfinding signage scored lower (3.20), indicating a distinction between functional but plain directional signs and aesthetically pleasing designs, which may have been neglected in favor of utilitarian elements. The lowest score (3.00) for greenery reflects limitations associated with hard-surfaced alleys, as planting opportunities were likely limited by design priorities focused on circulation and art rather than landscape enhancements.

The findings emphasize the importance of legibility in urban design, highlighting that clear navigation and spatial organization enhance cognitive mapping and a sense of place. High scores for color and distinct murals indicate that visual distinctiveness strengthens identity. At the same time, lower appreciation for greenery shows that users prefer navigation aids and recognizable cues over broad landscape features. The practical recommendation is to merge functional signage with memorable visual elements to improve both wayfinding and emotional connection, prioritizing simple, low-maintenance improvements that align with user preferences for integrated design strategies.

4.2 Users' attachment to upgraded alleys

The evaluation of urban alleys reveals several key findings (Table 2). Firstly, alleys score high for their "strategic location" (m = 3.83), as users find them convenient due to their proximity to homes, transit, markets, and workplaces. They facilitate quicker routes through dense urban areas, bolstered by visible improvements such

as paving and lighting, which enhance their functionality.

Conversely, the scores for "relevance to user interests" are moderate ($m = 3.10$), with some users enjoying recreational and social uses; however, the alleys lack adequate programming and amenities to fully cater to diverse needs, particularly for older adults and those with mobility limitations.

Economic opportunities receive lower scores (income $m = 2.69$; business activities $m = 2.97$) due to spatial constraints, regulatory challenges, and insufficient customer traffic, which hinder business viability. Furthermore, perceptions of alleys as secondary spaces limit commercial investment potential.

On a positive note, the alleys promote inclusivity and cross-cultural interaction ($m = 3.87$) by serving as neutral public spaces that encourage interactions among diverse groups through shared amenities and seasonal programming. The overall emotional attachment score is favorable ($m = 3.38$), indicating that upgrades have fostered pride and identity in these spaces. Frequent usage and community involvement amplify this emotional bonding.

Table 2: Descriptive analysis of functional and emotional attachment

	Items	Mean	Std. Deviation
Functional Attachment ($m=3.02$, $SD=0.67$)	The Up-Graded Alley is the best place for what I like to do.	3.10	.67
	The Up-Graded Alleys is very important to me.	2.84	.71
	I like doing business in the Up-Graded Alleys.	2.97	.91
	The best place to earn money/ income	2.69	.60
	Strategically located	3.83	.56
Emotional Attachment ($m=3.38$, $SD=0.65$)	Strong physical connection to adjacent streets.	3.69	.60
	Appropriate to my cultural background.	2.99	.75
	The place makes People-friendly.	3.25	.70
	Meeting place for people from different cultures.	3.87	.52
	I am attracted by the Up-Graded Alleys.	3.63	.70
	I feel secure being in the Up-Graded Alleys.	3.01	.56
	I have a positive impression about the Up-Graded Alleys.	3.73	.68
I feel more comfortable being here than in any other place.	3.24	.65	

Security and comfort perceptions are moderate (security $m = 3.01$; comfort $m = 3.24$), with recent improvements falling short due to ongoing maintenance issues and design gaps that affect long-term perceptions of safety.

High strategic location, complemented by emotional attachment to inclusive programming, underscores the importance of social function and opportunity structures in place attachment. While instrumental and socially welcoming spaces foster public engagement, moderate scores for programming and amenities indicate unmet potential for routine use. This aligns with social sustainability theories that highlight the need for accessible programming and inclusive design. The takeaway emphasizes the necessity for design and programming to address everyday needs and culturally inclusive activities to enhance both functional use and social belonging.

4.3 Effect of imageability on users' emotional attachment to upgraded alleys

The linear regression analysis unveils significant insights regarding the influence of imageability on emotional bonding with upgraded alleys in Kuala Lumpur (Table 3). Key findings indicate that legibility is the most substantial predictor of emotional attachment ($B = 0.506$, $t = 13.273$, $p < 0.001$). This relationship suggests that navigable and easily understood alley designs alleviate wayfinding stress and enhance perceived safety, thus promoting frequent use that fosters familiarity and belonging. Additionally, distinctiveness emerges as a crucial factor ($B = 0.195$, $t = 6.678$, $p < 0.001$), as unique features such as public art and memorable architecture cultivate identity and emotional connections through shared memories. In contrast, the study found that visual clarity has no significant impact ($B = 0.036$, $t = 0.963$, $p = 0.336$), suggesting that aesthetic clarity alone does not drive emotional engagement; instead, residents tend to value navigability and unique characteristics more than mere visual simplicity.

Consistent with imageability and place-identity theories, legibility emerges as the most influential predictor of emotional attachment, underscoring that easy navigation and predictable spatial cues foster safety and familiarity, which in turn strengthen affective bonds. Distinctiveness also plays a meaningful role, indicating that unique features of public art and notable architecture contribute to identity-anchored attachment through

shared memories and meaning. The lack of a significant effect for visual clarity suggests that mere aesthetic clarity without navigational or identity content is insufficient to drive emotional attachment. Place attachment is most robust when environmental cues support both wayfinding and identity construction.

Table 3: Linear regression analysis (imageability, emotional attachment)

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	.684	.075		9.095	.000
Legibility	.506	.038	.557	13.273	.000
Distinctiveness	.195	.029	.269	6.678	.000
Visual Clarity	.036	.038	.039	.963	.336

a. Dependent Variable: Emotional Attachment

4.4 Effect of imageability on users' functional attachment to upgraded alleys

Several plausible mechanisms can explain the linear regression results (Table 4). Legibility's strong positive effect ($B = 0.921$, $p = 0.000$) likely reflects that clear spatial cues, coherent signage, and predictable paths reduce cognitive load, making alleys easier to navigate and therefore more useful in everyday routines; when people can find their way and anticipate how spaces connect, they form stronger functional attachments because the place reliably supports tasks (shopping, commuting, socializing). The non-significant effect of distinctiveness ($B = 0.022$, $p = 0.239$) suggests that novel or unique aesthetic features alone do not improve practical use. Distinctive elements may attract attention or foster identity, but if they don't improve wayfinding, comfort, or utility, they won't increase functional attachment. The negative association for visual clarity ($B = -0.053$, $p = 0.032$) can be interpreted as over-simplified or overly uniform visual environments reducing opportunities for meaningful affordances or landmarks; in upgraded alleys, too much minimalism may remove texture, seating cues, micro-activities, or perceptual richness that signal usability and human presence, thereby lowering people's practical engagement.

The importance of legibility in enhancing functional attachment to spaces aligns with theories of affordances and cognitive load. Clear cues improve usability for daily tasks, while distinctiveness alone does not enhance practical use unless it contributes to navigational or comfort benefits. Additionally, overly minimalistic designs may negatively impact visual clarity, reducing perceived usability and user engagement by lacking necessary texture and cues.

Table 4: Linear regression analysis (imageability, functional attachment)

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	.368	.049		7.536	.000
Legibility	.921	.025	.957	37.165	.000
Distinctiveness	.022	.019	.029	1.178	.239
Visual clarity	-.053	.025	-.053	-2.152	.032

a. Dependent Variable: Functional Attachment

Overall, the regression analysis reveals that legibility is a crucial factor in users' emotional and functional attachment to upgraded alleys in Kuala Lumpur. Legibility enhances emotional attachment by creating user-friendly environments that foster safety and familiarity. In contrast, while distinctiveness also plays a role, its impact is less significant, and visual clarity may even detract from functional attachment (Fig 3), indicating that overly simplistic designs can result in a lack of user interaction. Urban planners should prioritize improving navigability through effective signage and intuitive layouts, while also incorporating distinctive architectural elements. This approach can strengthen emotional connections and enrich the overall user experience. Ultimately, enhancing legibility and thoughtful design integration will create vibrant urban spaces that address

both functional needs and users' emotional attachments.

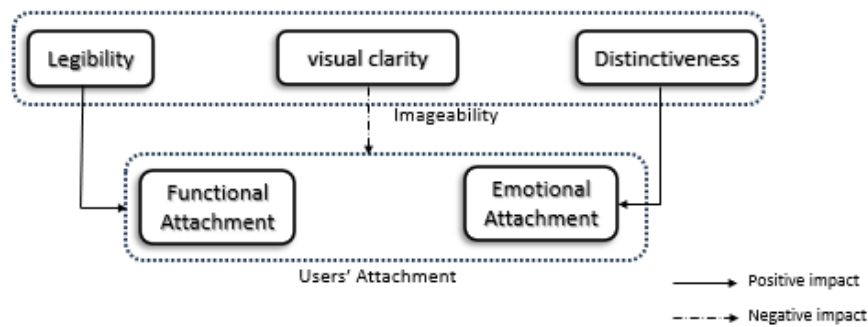


Fig. 3: Imageability and Users' Attachment Relationship
(Source: Author, 2024)

5.0 DISCUSSIONS

This study contributes to the growing body of knowledge on urban regeneration by examining the relationship between imageability and place attachment in Kuala Lumpur's upgraded alleys. It analyzes both functional and emotional attachments that users—residents and visitors—form with these spaces, offering insights into how design features such as legibility, distinctiveness, and visual clarity shape urban experiences and attachment. The findings underscore the need for an integrative urban-design approach that balances aesthetic and functional criteria while fostering community engagement and preserving cultural identity.

5.1 Perception of Imageability and Urban Connectivity

The study shows a strong connection between users and the urban alleys, indicated by a mean imageability score of 3.73. The alleys are legible, easily navigable, and well-integrated into Kuala Lumpur's urban fabric. Their connection to adjacent streets, such as *Jalan Alor*—a high-profile culinary destination—highlights the importance of spatial connectivity for user satisfaction. The physical links between the alleys and surrounding streets facilitate movement and accessibility, aligning with Cullen's (1997) theories of urban connectivity, which state that well-connected spaces foster cohesion and enhance the user experience.

Urban environments that prioritize spatial legibility are more likely to elicit positive emotional and functional responses from users (Abaas & Khalid, 2023). This study supports that legibility, distinctiveness, and visual clarity are key drivers of attachment, especially in Kuala Lumpur's diverse and dynamic context. Moreover, *Jalan Alor*'s symbolic significance as a cultural and culinary landmark heightens the emotional resonance of the surrounding upgraded alleys. This integration suggests that urban regeneration projects can strengthen physical connectivity and community identity, thereby attracting diverse user groups, including residents and tourists.

The role of cultural and historical narratives in urban regeneration becomes evident in *Jalan Alor* and *Alam Alor* (Figures 4 and 5). These spaces, especially *Alam Alor*, are not only connectors within the urban grid but also repositories of local heritage. However, Moussaoui (2024) argues that regeneration projects often foreground narratives and aesthetics that serve broader economic and branding objectives, potentially sidelining organic community connections (Harizi et al., 2025). In Kuala Lumpur, the *Alor* Stream's historical origin of *Jalan Alor* illustrates a cultural narrative that could be more explicitly integrated into the urban landscape. While the alley's aesthetic improvements (e.g., murals depicting local flora and fauna) has enhanced its visual appeal, the absence of a consistent, clearly communicated narrative undermines deeper community connections. This echoes Zecca's (2019) observations on the commodification of space, where regeneration often prioritizes aesthetic transformation over local engagement.



Fig. 4. Alor Alley leads to *Changkat Bukit Bintang* street (author, 2025)



Fig. 5. *Alam Alor* links between *Jalan Alor*, *Tingkat Tong Shin*, and *Changkat Bukit Bintang* streets (author, 2025)

The lack of consistent and meaningful signage in *Alam Alor* fails to communicate the historical and cultural significance of the *Alor Stream*, resulting in a fragmented identity and hindering deeper user attachment. To address this, urban planners should embed cultural elements in the design process rather than treating them as superficial additions to reinforce local identity and foster community pride (Bavani, 2018).

Among the upgraded alleys, *Laman Belakang* (Figure 6) stands out as the most frequented by tourists. Residents and local stakeholders express strong sentiment toward its design concept, largely due to long-standing familiarity with the space. According to Natasha, the lead architect for alley regeneration, property owners along the alley show a high level of commitment to improving the area. One owner proposed the original design concept and continues to participate in routine cleaning and plant maintenance. In contrast, most residents in other alleys are tenants; while they may appreciate streetscape improvements, they generally do not show the deeper, sustained engagement associated with ownership.

The study also found that respondents prefer to spend more time in *Laman Belakang* than in the other alleys. This stems from its strategic location, drawing visitors from *Tingkat Tong Shin* Street and the availability of amenities such as benches that encourage lingering and enhance comfort. Consistent maintenance further strengthens its appeal. The alley's proportions balance spatial openness and enclosure, and its position within the commercial district contributes to its success and higher activity levels.

Findings indicate that legibility is strongly associated with fulfilling users' needs and intentions. In other words, the more legible a renovated alley is perceived to be, the more it satisfies users' expectations. *Laman Belakang's* success, supported by easy access, clear signage, well-maintained murals, and overall spatial coherence, suggests that meaningful resident involvement and practical amenities are crucial. These factors create a legible and inclusive urban environment, not one that relies solely on aesthetic interventions. This helps avoid artwashing or arts-led regeneration, which can mask deeper urban issues behind superficial modernity or uplift "grit as glamour" (Lloyd, 2010; McIntosh, 2021) and related critiques (Zukin, 2010a).



Fig. 6: *Laman Belakang*, well-maintained alley (author,2025)

5.2 Emotional and Functional Attachment: A Dual Perspective

The findings on user attachment reveal a complex and nuanced relationship between space and emotional engagement. Functional attachment (mean 3.83) stems from the alleys' strategic positioning and their role in urban connectivity. *Alor Alley* exhibits high usage due to thoughtful design and proximity to key urban features. Clear sightlines, intuitive layouts, and good lighting help create spaces that are both functional and engaging. This aligns with Rennick and Jacobson (2003), who emphasize safety, security, and comfort as drivers of repeated visits and attachment.

Emotional attachment scores are lower (mean 3.38), indicating a more nuanced picture. The security score is lower (mean 3.01), suggesting safety and comfort remain barriers to deeper emotional connections. This aligns with literature that emphasizes safety and comfort as key to user attachment. The United Nations (2022) notes that perceived safety shapes decisions to use public spaces, especially in urban environments where crime and discomfort can deter visits.

Kominiti di Alor and *Alam Alor* (Figures 7 and 8) show how murals and distinctive architecture can boost emotional attachment. Their distinctiveness and role as a community-identity focal point foster belonging and social interaction. However, poor lighting, maintenance neglect, and mural deterioration (graffiti, water stains) raise concerns about long-term viability. Spatial degradation at *Kominiti di Alor* underscores the need for sustainable design and ongoing community involvement in maintenance and stewardship. Gürman and Buldan (2024) warn that art-led regeneration can detach from locals if seen as external branding rather than genuine community engagement.



Fig. 7: *Kominiti di Alor*, lack of maintenance (author,2025)



Fig. 8: *Alam Alor*, lack of maintenance and mural arts in the other part of the alley (author, 2025)

5.3 Imageability and Attachment: The Role of Design Features

This study shows imageability—especially legibility and distinctiveness—crucially fosters emotional attachment. Consistent with urban-design literature, legibility is the strongest predictor of both functional and emotional attachment. Easy navigation, supported by clear signage, effective wayfinding, and visual landmarks, boosts user confidence and comfort. This matters in Kuala Lumpur’s alleys, where residents and international tourists interact.

5.4 Political Dimensions and Authentic Urban Regeneration

The findings reveal a tension between aesthetic transformation and authentic community engagement. As Moussaoui (2024) notes, regeneration often prioritizes commercial interests; urban branding shapes public-space aesthetics and function. These branding efforts can obscure deeper social roles and favor tourism over residents’ needs (Harizi et al., 2025).

The *Alam Alor* case illustrates touristification versus community identity. Vibrant murals reflect a cultural aesthetic not fully integrated with the local narrative. Zecca (2019) and Harizi et al. (2025) warn that such interventions risk oversimplifying urban complexity, prioritizing visual appeal over deeper community ties. To avoid this, regeneration must balance aesthetics with spaces that reflect local heritage, social dynamics, and values. Consistent, meaningful communication of historical narratives through design and signage is essential to resonate with residents and visitors, fostering belonging and ownership.

In sum, the findings argue for a holistic, user-centered approach to urban regeneration. Legibility, distinctiveness, and visual clarity are key to spaces that are both usable and emotionally resonant.

6.0 CONCLUSION

This study shows imageability, legibility, distinctiveness, and visual clarity significantly shape place attachment in Bukit Bintang’s upgraded alleys. Legibility is the strongest predictor of both functional and emotional attachment; distinctiveness enhances emotional bonds; visual clarity alone does not sustain attachment without coherent navigation. Extending Lynch’s imageability to micro-scale alleys reveals parallel emotional and functional pathways influenced by local socio-cultural context. Practitioners should prioritise spatial legibility and meaningful distinctiveness, while ensuring cleanliness and amenities that support diverse users.

The study covers five alleys in a single district and relies on cross-sectional, self-reported data, which limits generalisability and may introduce biases. Future work should replicate in other districts and cities, employ longitudinal designs to track changes across regeneration cycles, and use mixed methods alongside quantitative measures. Include objective metrics and explore safety, social cohesion, and cross-cultural differences. Experimental or quasi-experimental studies could test the causal effects of legibility and distinctiveness on attachment.

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