
1 Framing Cultural Landscapes: 2 A Comparative Analysis of Binondo and 3 George Town's Gateways as Mediators 4 of Heritage and Enclave Identity

7 Abstract

8 *In Southeast Asian cities shaped by colonial legacies and diasporic entanglements,*
9 *ceremonial gateways serve not only as spatial thresholds but also as articulations of*
10 *cultural identity. This study offers a comparative analysis of symbolic gateways in*
11 *Binondo, Manila—the world's oldest Chinatown, and George Town, Penang, a*
12 *UNESCO World Heritage Site known for its characteristic shophouse streetscapes. In*
13 *Binondo, cultural presence is made visible through monumental Pailous (Paifang)*
14 *arches strategically erected at key entry points to the district, marking its boundaries,*
15 *such as the Binondo Welcome Arch, Filipino-Chinese Friendship Arch, and the*
16 *Ongpin South and North Bridge Arch. In contrast, George Town does not feature*
17 *boundary-defining gateways; instead, its urban landscape is punctuated by more*
18 *localized, culturally embedded threshold markers within community enclaves, such as*
19 *the Little India Arch, Campbell Street Gateway, Zhang Clan Qinghe Hall Entrance*
20 *Arch, and Lee Jetty Clan Arch.*

21 *This study looks at how gateways contribute to the character of historic cities, using*
22 *both visual analysis and spatial measures. These measures include the Green Visual*
23 *Index, which captures how much greenery is visible; the Road Area Index, which*
24 *quantifies pavement or foreground coverage; the Sky Open Index, which reflects how*
25 *open or enclosed a space feels; and the Spatial Enclosure Index, which gauges how*
26 *much the surrounding buildings create a sense of containment. Together with ideas*
27 *from Lynch's imageability theory and Tuan's phenomenology of place, these tools*
28 *help reveal the visual impact these gateways create.*

29 *While Binondo's gateways serve as focal points that stabilize identity within a*
30 *fragmented, commerce-driven landscape, George Town's dispersed gateways embody*
31 *a conservation-oriented approach that prioritizes multicultural coexistence and*
32 *community-shaped spatial order. This study looks at how monumental gateways—and*
33 *sometimes their absence—shape the character of historic cities. It considers the roles*
34 *they can play in cultural landscapes, and how they connect to questions of memory,*
35 *governance, and identity over time. Overall, the comparison shows that gateways—*
36 *and even their absence—do more than just mark thresholds. They express different*
37 *cultural ways of making places legible, shaping how heritage landscapes carry*

38 *identity, governance, and memory through time.*

39 Keywords: Chinatown, George Town, Penang, Gateways, Sightlines, Visual Framing

40 **Introduction**

41 Ceremonial gateways have long served as symbolic and spatial devices in the built
42 environments of many Asian cities. In the Chinese architectural tradition, the Pailou
43 or Paifang functions as a ritualized threshold—marking entries into sacred, familial,
44 or civic spaces and reflecting Confucian values of honor, ancestry, and social order
45 (Knapp, 2005). As Chinese diaspora communities expanded across Southeast Asia,
46 such forms were often reinterpreted in colonial and postcolonial urban landscapes,
47 where gateways came to represent not just heritage, but also claims to space, identity,
48 and continuity in changing political and economic contexts (Tan, 2007).

49 Binondo, officially established in 1594 under Spanish colonial rule, has evolved into a
50 dense, mixed-use district spanning approximately 66 hectares (City of Manila, 2020).
51 It remains a hub of Chinese-Filipino commerce and identity but is also characterized
52 by infrastructure congestion, inconsistent heritage regulation, and visual disarray,
53 making its monumental Pailous tools for cultural recognition. Meanwhile, George
54 Town—formally established in 1786 following British acquisition and named in
55 honour of King George III—has a UNESCO-designated core zone of 109 hectares
56 and a buffer zone of 150 hectares, and it retains a formal heritage management plan
57 that emphasizes multicultural layering, architectural continuity, and community-based
58 conservation (UNESCO, 2008). Unlike Binondo, George Town does not employ a
59 monumental gateway to assert district-wide boundaries. Instead, its urban identity is
60 articulated through a network of dispersed ceremonial markers embedded within
61 specific cultural enclaves. Each gateway is designed uniquely and contextually,
62 reflecting their embeddedness within distinct cultural enclaves and the city's
63 conserved, multicultural fabric. These gateways respond to their immediate spatial
64 environments, serving as intimate, localized markers rather than grand district-scale
65 placemakers.

66 **Study Site**

67 This study compares the roles of ceremonial gateways in Binondo, Manila and
68 George Town, Penang, using visual and spatial analysis to investigate how these
69 structures mediate cultural identity in their respective urban contexts. In Binondo, the
70 gateways stand as monumental boundary markers—anchoring visibility in an
71 increasingly vertical and chaotic commercial landscape. In George Town, the
72 gateways are internally embedded within ethnic enclaves, and integrated into the
73 surrounding architectural typologies of late 19th- to early 20th-century shophouses,
74 temples, and clan associations (Yeoh, 2001; Logan, 2002). These differences are
75 reflective not only of architectural traditions but also of divergent governance
76 regimes, urban development pressures, and diasporic strategies for cultural continuity.



Figure 1. Map of Binondo Showing Location of Gateways

77

78

79 Binondo is marked by four key gateways that serve as symbolic thresholds into the
 80 district. The most prominent, the Binondo Chinatown Welcome Arch, stands at the
 81 southern entry via Jones Bridge. It signals the transition from Manila's civic core into
 82 Chinatown. Further along Quintin Paredes Street is the Filipino-Chinese Friendship
 83 Arch, a more modest structure symbolizing the longstanding relationship between
 84 Chinese migrants and Filipino society. Blending cultural motifs from both traditions,
 85 it functions as an intermediary threshold guiding visitors deeper into Binondo.

86 Ongpin Street, the cultural spine of the district, is framed by two smaller pailou-style
 87 arches that both cross the Estero de la Reina. The Ongpin North Bridge Arch, near
 88 Sta. Cruz Church, marks the intersection of Spanish colonial and Chinese cultural
 89 zones, symbolizing a confluence of spiritual and historical identities. The Ongpin
 90 South Bridge Arch concludes this sequence, reinforcing Binondo's boundary and
 91 enhancing spatial orientation.

92 Together, these four gateways offer a narrative of identity, memory, and movement.
 93 More than boundary markers, they shape the experience of Binondo as a living
 94 cultural landscape (Yap, 2021).

95 Beyond these core gateways, the Arch of Solidarity in San Nicolas and the Arch of
 96 Goodwill near Sta. Cruz also contribute to the broader narrative of Chinatown's

97 heritage. However, their locations beyond Binondo’s traditional boundary distinguish
98 their spatial role. While acknowledging their cultural significance, this study focuses
99 on the four main gateways that directly frame Binondo district’s entrances,
100 emphasizing their function as central spatial and cultural thresholds.

101 Unlike Binondo’s monumental arches, which function as territorial placemakers
102 asserting visibility and cultural presence amid urban congestion, George Town’s
103 gateways operate as internalized, context-sensitive spatial cues.

104 This study focuses on four representative examples—the Campbell Street Gateway,
105 the Little India Arch, the Zhang Clan Qinghe Hall Gateway, and the Lee Jetty Arch—
106 each of which articulates cultural identity at the enclave scale rather than serving as
107 district-wide boundary monuments.



108

109 Figure 2. Map of George Town Showing Location of Gateways

110 Located in the heart of George Town’s Indian-Muslim quarter, the Little India
111 Gateway sits within a commercial and religious node characterized by Tamil Muslim
112 businesses, Hindu temples (notably Sri Mahamariamman Temple), and festive street
113 culture (Khoo, 2014). The area lies within the UNESCO Core Zone and is designated
114 a Cultural District under the George Town World Heritage Site Special Area Plan.

115 Situated at the convergence of Chinese trading corridors, this site historically hosted
116 Cantonese and Hokkien commercial activity. Campbell Street was once Penang’s red-

117 light district and now functions as a vibrant textile and gold retail stretch (Lee &
118 Wong, 2022). The area falls in the Buffer Zone, just outside the UNESCO core,
119 allowing more development flexibility while retaining vernacular shoplots.

120 The Qinghe Zhang Clan Association Hall, built in 1906, serves as a focal point for
121 Hokkien Zhang lineage members. The gateway entrance into the hall complex is
122 deeply internalized, reflecting traditional Southern Chinese courtyard typology.

123 The Lee Jetty is one of six Chinese clan jetties built in the late 19th century by
124 Hokkien settlers. Its entrance arch leads into a floating stilt-house community, where
125 architecture adapts to tidal and fluvial conditions (Logan, 2002; Khoo, 2014). The site
126 is recognized under the George Town SAP as living intangible heritage, vulnerable to
127 tourism pressures and sea-level rise.

128 **Rationale**

129 Unlike Binondo, which uses monumental pailou arches to mark territorial boundaries
130 and reclaim visibility amid modern congestion, George Town's gateways operate as
131 internalized spatial cues. Their diversity of placement, proportion, and symbolism is a
132 direct outcome of its UNESCO-led conservation model, emphasizing authenticity,
133 continuity, and inclusivity over spectacle (UNESCO, 2008; ICOMOS, 2011).

134 Amid accelerating urban pressures, this study examines how these gateways frame
135 experience, express identity, and negotiate heritage within their distinct contexts. By
136 comparing their design and spatial roles, the research aims to inform sustainable
137 heritage conservation and urban design strategies that balance tradition with
138 contemporary urban realities.

139 **1. Review of Related Literature**

140 Ceremonial gateways in heritage districts are not merely decorative constructs; they
141 serve as vital spatial and cultural thresholds that mediate identity, guide orientation,
142 and frame collective memory. Scholars across urban morphology, semiotics, and
143 environmental perception agree that the effectiveness of a gateway lies in its ability to
144 articulate symbolic meaning while being legibly embedded within the urban fabric.

145 Stevens and Thai (2024) assert that gateways function most successfully when
146 morphologically aligned with coherent urban patterns—such as axial continuity,
147 consistent façade lines, and rhythmic street interfaces—ensuring that the structure
148 maintains visibility and reinforces wayfinding. This echoes Lynch's (1960) theory of
149 imageability, where distinct urban elements enhance a city's cognitive legibility.

150 Expanding on the symbolic dimension, Ying and Liu (2025) argue that gateways act
151 as ideological signifiers whose meanings are not fixed but evolve alongside
152 sociopolitical contexts. They anchor the intangible aspects of identity—rituals,

153 migration memory, and cultural resilience—within physical thresholds. These insights
154 are particularly relevant in diasporic settings like Binondo and George Town, where
155 hybrid identities emerge through layered architectural signifiers.

156 Tan (2023) foregrounds the perceptual dimension of gateways, noting that spatial
157 enclosure, skyline harmony, and uninterrupted sightlines are necessary for
158 maintaining visual salience—especially in congested heritage districts. This is
159 reinforced by Rui and Cheng’s (2023) spatial metrics framework, which empirically
160 demonstrates that lower visual entropy and higher enclosure indices correlate with a
161 stronger sense of place, pedestrian comfort, and symbolic clarity.

162 In Binondo, the symbolic presence of its Pailou arches is diminished by signage
163 saturation, visual clutter, and intrusive modern infrastructure. Such conditions obscure
164 their intended role as cultural landmarks, underscoring the importance of strategic
165 spatial framing to safeguard their legibility within the urban fabric. Conversely, in
166 George Town, Penang, the absence of monumental boundary-marking arches and the
167 preference for embedded, site-specific gateways reflects a different conservation
168 approach—favoring integrative, community-scaled interventions within a UNESCO-
169 regulated urban core (UNESCO, 2008).

170 Together, these scholarly perspectives highlight a crucial intersection: for gateways to
171 be effective in shaping cultural landscapes, they must balance symbolic meaning with
172 spatial clarity. This research adopts this dual framework—symbolic and spatial—as a
173 lens for comparing how Binondo and George Town articulate heritage through their
174 gateway typologies under differing urban governance regimes and morphological
175 contexts.

176 **2. Research Objectives**

177 This study aims to examine how ceremonial gateways in Binondo, Manila, and
178 George Town, Penang, function as spatial and symbolic mediators of cultural identity
179 within their respective urban and heritage contexts. Drawing from Lynch’s (1960)
180 theory of environmental legibility and Tuan’s (1977) phenomenology of place, the
181 research investigates how the design, scale, placement, and framing strategies of
182 Binondo’s monumental Pailou arches contrast with George Town’s dispersed and
183 context-specific thresholds.

184 The study examines how these gateways function as cultural markers of identity and
185 memory, shaped by diasporic traditions and differing governance—from Manila’s
186 fragmented growth to George Town’s UNESCO-guided conservation (ICOMOS,
187 2011). Drawing on Stevens and Thai (2024) and Ying and Liu (2025), it highlights
188 how spatial clarity, symbolic coherence, and contextual integration enhance their role
189 as urban placemakers.

190 Ultimately, this comparative analysis seeks to develop a spatial-heritage framework
191 that underscores the significance of legibility in understanding how gateways mediate
192 between tradition and modernity within multicultural urban environments.

193 **3. Methodology**

194 **3.1 Spatial Data Acquisition**

195 To facilitate the spatial and visual analysis of the selected gateways in Binondo,
196 Manila and George Town, Penang; photographic documentation was undertaken. The
197 gateways were photographed from a standardized eye-level height of approximately
198 1.50 meters, simulating an average pedestrian's perspective. A viewing distance of
199 roughly 8 - 10 meters was maintained from the side of the pedestrian approach,
200 aligning with standard practices in streetscape perception studies where consistent
201 sightlines are critical to comparative analysis (Li et al., 2020).

202 The documentation took place during daylight hours, a temporal setting chosen to
203 reflect typical levels of pedestrian activity and ambient lighting. These spatial and
204 temporal parameters were implemented to ensure that the resulting imagery
205 constitutes a valid and reliable dataset for subsequent visual and spatial index
206 analysis.

207 **3.1 Selection of Evaluation Indicators**

208 To analyze the spatial and visual characteristics of each gateway, this study employed
209 the Street Landscape Evaluation Index (SLEI). Originally developed from visibility-
210 based landscape perception metrics such as the Green View Index (Li, Ratti, &
211 Seiferling, 2015), the framework has since been extended in urban morphological
212 research to include additional indicators of sky, road, and building visibility (e.g., Guo
213 et al., 2025; Liu et al., 2024). These indices have proven effective in capturing how
214 streetscapes are perceived in terms of openness, greenery, accessibility, and enclosure,
215 making them particularly relevant for assessing heritage gateways situated within
216 dense urban contexts.

217 The following four indices were selected based on their applicability to the acquired
218 photographic data:

- 219 ● **Green Visual Index (GVI):** Proportion of visible green elements (primarily
220 vegetation), used as a proxy for environmental quality and visual comfort.
221
- 222 ● **Sky Open Index (SOI):** Proportion of visible sky, indicating spatial openness
223 and vertical permeability.
224
- 225 ● **Spatial Enclosure Index (SEI):** Proportion of midground built structures
226 (e.g., facades, walls, fences), contributing to the perceived degree of

227 enclosure.

228

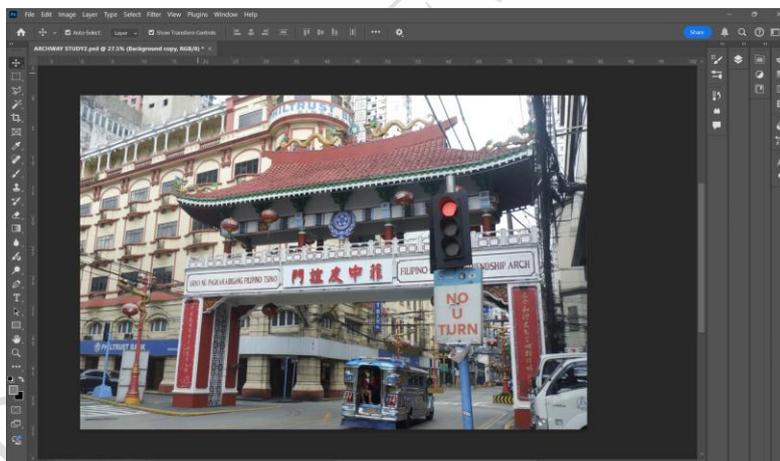
- 229 ● **Road Area Index (RAI):** Proportion of paved circulation surfaces in the
230 foreground, reflecting accessibility and functional movement space.

231 Each metric was derived from street-view photographs using manual visual
232 classification rather than automated semantic segmentation. This approach ensured
233 accuracy given the modest dataset and the architectural specificity of heritage
234 gateways, aligning with established practices in streetscape evaluation research.

235 0.2 Visual Attribute Quantification

236 Each photographic image was imported into Adobe Photoshop, where a fixed
237 analytical frame was established, demarcated by the openings of the gateway—
238 framing the subject view. Within this frame, the image was segmented into the four
239 primary landscape components: green (vegetation), sky (open air), middleground
240 (built or vegetative enclosures), and road (paved foreground). Each component was
241 quantified by measuring the number of pixels it occupied relative to the total image
242 area.

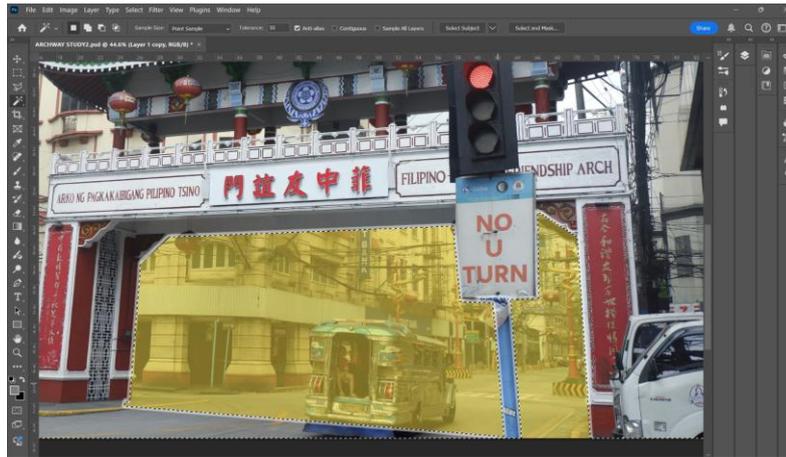
243 Step 1: Open the image in Adobe Photoshop



244

245 **Figure 3.** Screenshot of Adobe Photoshop interface displaying the subject gateway image file

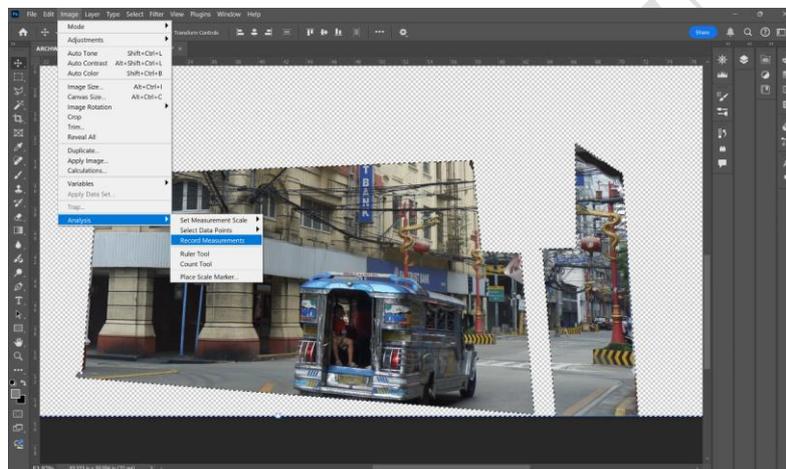
246 Step 2: Demarcate the view framed by the arch using a lasso tool



247

248 **Figure 4.** Screenshot of Adobe Photoshop interface displaying the subject gateway image file

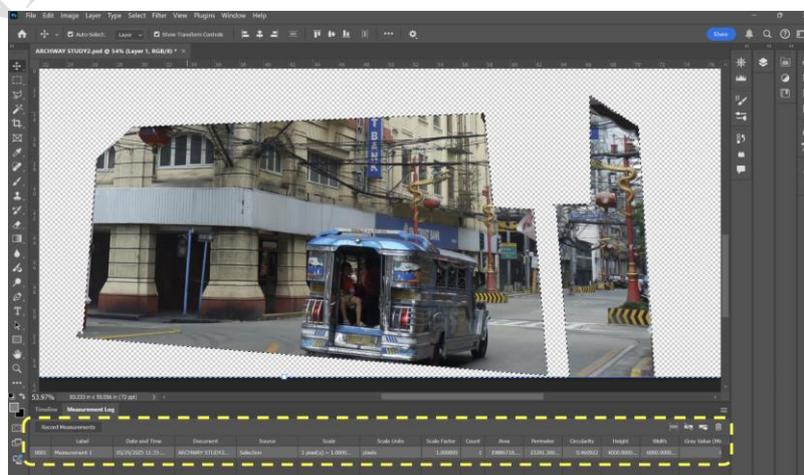
249 Step 3: On the menu bar above, click image > analysis > record measurements



250

251 **Figure 5.** Screenshot of the Adobe Photoshop interface displaying the subject gateway image
 252 file, and showing the process of visual attribute quantification

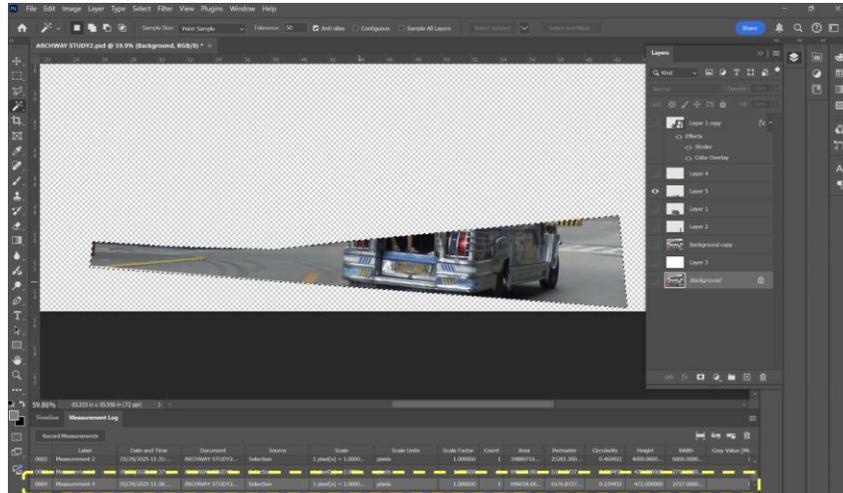
253 Step 4: A measurement log panel will appear below the screen where the number of
 254 pixels will be displayed. Log down the total area of pixels.



255

256 **Figure 6.** Screenshot of Adobe Photoshop interface displaying the subject gateway image
257 file, and showing the process of visual attribute quantification

258 Step 5: In the same manner, demarcate all segments composing the frame based on
259 each corresponding index, and record the pixel measurement.



260

261 **Figure 7.** Screenshot of Adobe Photoshop interface displaying the subject gateway image
262 file, and showing the process of visual attribute quantification

263 These pixel-based measurements recorded were normalized as percentage values to
264 ensure cross-comparability among images. The quantified data were systematically
265 tabulated, with each row representing one gateway and each column corresponding to
266 an individual visual index.

267 3.3 Comparative Synthesis and Interpretation

268 Following data quantification, a comparative synthesis was conducted to analyze
269 variations in spatial composition, environmental quality, and visual structure across
270 the four gateways. This multi-index evaluation provides an evidence-based
271 framework for interpreting the spatial composition created within monumental
272 thresholds that hold key identity of the cultural fabric.

273 4. Results and Discussion

274 In this study, the gateways of Binondo and George Town are examined not just as
275 structures, but as lived spaces shaped by both tradition and modern urban life. Using
276 measures such as the Spatial Enclosure Index (SEI), Green Visual Index (GVI), Sky
277 Open Index (SOI), and Road Area Index (RAI), the analysis shows how each gateway
278 balances heritage symbolism with the practical realities of a changing city.

279 4.1 Binondo

280 The gateways in Binondo reflect the area’s role as a commercial and cultural hub,
 281 with forms that emphasize visibility and symbolic entry. The following results present
 282 their spatial indices, showing how enclosure, greenery, sky openness, and road space
 283 shape the experience of Manila’s Chinatown.

284 The Chinatown Binondo Welcome Arch presents a moderately enclosed spatial
 285 composition, with a Spatial Enclosure Index of 66%, giving it a strong sense of
 286 framed entry typical of ceremonial gateways. The Green Visual Index at 15% adds a
 287 subtle layer of softness to its visual impact, suggesting some landscape presence—
 288 likely from nearby trees or planting strips. However, with a Sky Open Index of only
 289 3%, the background is heavily compressed, creating a dense urban foreground that
 290 may limit visual relief. Its Road Area Index of 16% balances circulation needs with
 291 visual massing, closely aligning with the ideal framing proportions.



292
 293 **Figure 8.** Framing analysis of the Chinatown Binondo Welcome Arch, illustrating the
 294 delineated Street Landscape Enclosure Indices (SLEIs).

Chinatown Binondo Welcome Arch		
	Pixels	Percentage
Green Visual Index	371,287.50	15%
Road Area Index	396,040.00	16%
Sky Open Index	74,257.50	3%
Spatial Enclosure Index	1,633,665.00	66%
<i>Total</i>	<i>2,475,250.00</i>	<i>100%</i>

296 **Table 1.** Quantitative values and proportional distribution of Street Landscape Enclosure
 297 Indices (SLEIs) within the visual frame of the Chinatown Binondo Welcome Arch.

298 The Filipino-Chinese Friendship Arch demonstrates a high level of spatial
 299 compression, with a 69% Spatial Enclosure Index and minimal Green Visual (5%)

300 and Sky Open (4%) Indices. The high degree of enclosure contributes to a dense
 301 spatial character, limiting openness and reducing environmental softness. The Road
 302 Area Index, at 22%, slightly exceeds the ideal, suggesting a broader foreground space
 303 that offsets the tight enclosure of the background and middleground. Overall, the
 304 space conveys a rigid, urban character with limited spatial permeability.



305
 306 **Figure 9.** Framing analysis of the Filipino-Chinese Friendship Arch, illustrating the
 307 delineated Street Landscape Evaluation Indices (SLEIs).
 308

Filipino-Chinese Friendship Arch		
	Pixels	Percentage
Green Visual Index	994,035.50	5%
Road Area Index	218,687.81	22%
Sky Open Index	795,228.40	4%
Spatial Enclosure Index	13,717,689.90	69%
<i>Total</i>	<i>19,880,710.00</i>	<i>100%</i>

309 **Table 2.** Quantitative values and proportional distribution of Street Landscape Enclosure
 310 Indices (SLEIs) within the visual frame of the Filipino-Chinese Friendship Arch.

311 The Ongpin North Bridge Arch demonstrates a particularly high level of spatial
 312 enclosure at 85%, creating a tightly framed, corridor-like spatial experience. The
 313 complete absence of greenery and sky (0% Green Visual and Sky Open Index)
 314 reinforces a visually compressed environment, where architectural elements and
 315 building edges dominate the experience. The 15% Road Area Index supports this
 316 sense of constraint, close to the ideal ratio but reinforcing a narrow, enclosed
 317 threshold.



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Figure 10. Framing analysis of the Ongpin North Bridge Arch, illustrating the delineated Street Landscape Evaluation Indices (SLEIs).

Ongpin North Bridge Arch		
	Pixels	Percentage
Green Visual Index	3,896,881.80	28%
Road Area Index	4,175,230.50	30%
Sky Open Index	695,871.75	5%
Spatial Enclosure Index	5,149,450.95	37%
<i>Total</i>	<i>13,917,435.00</i>	<i>100%</i>

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Table 3. Quantitative values and proportional distribution of Street Landscape Evaluation Indices (SLEIs) within the visual frame of the Ongpin North Bridge Arch.

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In contrast, the Ongpin South Bridge Arch presents no measurable GVI and a significantly high Spatial Enclosure Index (SEI), producing a much more confined visual experience. Unlike its northern counterpart, this arch is situated immediately after the crossing, making its approach more compressed and abrupt.



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Figure 11. Framing analysis of the Ongpin South Bridge Arch, illustrating the delineated Street Landscape Evaluation Indices (SLEIs).

Ongpin South Bridge Arch		
	Pixels	Percentage
Green Visual Index	0.00	0%
Road Area Index	1,914,064.20	15%
Sky Open Index	0.00	0%
Spatial Enclosure Index	10,846,363.80	85%
<i>Total</i>	<i>12,760,428.00</i>	<i>100%</i>

332 **Table 4.** Quantitative values and proportional distribution of Street Landscape Evaluation
333 Indices (SLEIs) within the visual frame of the Ongpin South Bridge Arch.
334

335 4.2 George Town

336 In George Town, the gateways are smaller in scale and integrated into the conserved
337 streetscape. The following data highlights how their spatial indices capture variations
338 in enclosure, vegetation, openness, and circulation within the city's heritage setting.

339 The Little India Gateway offers a well-balanced spatial experience, aligning closely
340 with ideal framing values. The 10% Green Visual Index reflects the presence of
341 modest vegetation—enough to soften the urban environment and symbolically anchor
342 the gateway to the vibrant, sensory landscape of Little India. Its high Sky Open Index
343 (40%) suggests a generous vertical openness, enabling the gateway to visually project
344 against the skyline.

345 Meanwhile, the moderate Spatial Enclosure Index (35%) and relatively low Road
346 Area Index (15%) foster a pedestrian-friendly and culturally engaging threshold. In
347 George Town's multicultural context, this spatial openness allows the gateway to

348 represent Indian-Malay identity without overt monumentality. It aligns with urban
 349 theories that value visual access and human-scale openness in pluralistic cities
 350 (Madanipour, 1996). As an urban threshold, it enhances identity without exclusion,
 351 echoing the spirit of George Town’s UNESCO World Heritage designation that
 352 celebrates layered cultural expressions (UNESCO, 2008).



353

354 **Figure 12.** Framing analysis of the Little India Arch, illustrating the delineated Street
 355 Landscape Enclosure Indices (SLEIs).

Little India		
	Pixels	Percentage
Green Visual Index	311,035.10	10%
Road Area Index	465,403.00	15%
Sky Open Index	1,244,140.40	40%
Spatial Enclosure Index	1,088,622.85	35%
<i>Total</i>	<i>3,110,351.00</i>	<i>100%</i>

356 **Table 5.** Quantitative values and proportional distribution of Street Landscape Enclosure
 357 Indices (SLEIs) within the visual frame of the Little India Arch.

358 This gateway demonstrates the closest alignment with ideal framing proportions,
 359 acting as a quiet but effective urban threshold. The 10% greenery and 17% road index
 360 reflect a tightly controlled urban environment—visually structured but not overly
 361 dominated by infrastructure. Its 34% Sky Open Index provides sufficient upward
 362 visibility, offering a sense of openness without diminishing the urban enclosure. With
 363 a Spatial Enclosure Index of 39%, nearly ideal, the gateway strikes a strong balance
 364 between containment and openness.



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Figure 13. Framing analysis of the Medan Lebu Campbell Arch, illustrating the delineated Street Landscape Evaluation Indices (SLEIs).

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Medan Lebu Campbell		
	Pixels	Percentage
Green Visual Index	238,353.20	10%
Road Area Index	396,900.00	17%
Sky Open Index	810,400.88	34%
Spatial Enclosure Index	929,577.48	39%
<i>Total</i>	<i>2,383,532.00</i>	<i>100%</i>

369

Table 6. Quantitative values and proportional distribution of Street Landscape Evaluation Indices (SLEIs) within the visual frame of the Medan Lebu Campbell Arch.

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371 Unlike other gateways, the Zhang Clan Qinghe Hall Arch exhibits extreme values that
 372 suggest a highly introverted, enclosed spatial character. With 0% green and 0% sky
 373 visibility, the space reads more like an internal courtyard or cloistered heritage
 374 enclave. The 33% road area further reinforces this hard-surfaced, possibly ceremonial
 375 spatial quality. The defining feature is its very high Spatial Enclosure Index (67%),
 376 making it the most enclosed space of the four.

377 This spatial logic reflects traditional Chinese clan hall architecture, where gateways
 378 are designed to protect, mark lineage, and preserve memory, rather than to invite
 379 public interaction or frame large urban views. This arch functions as an inward-facing
 380 cultural marker, more about lineage and heritage preservation than urban wayfinding
 381 or boundary declaration.



382

383 **Figure 14.** Framing analysis of the Zhang Clan Qinghe Hall Arch, illustrating the delineated
 384 Street Landscape Evaluation Indices (SLEIs).

385

Zhang Clan Qinghe Hall Arch		
	Pixels	Percentage
Green Visual Index	0.00	0%
Road Area Index	768,940.26	33%
Sky Open Index	0.00	0%
Spatial Enclosure Index	1,561,181.74	67%
<i>Total</i>	<i>2,330,122.00</i>	<i>100%</i>

386

387 **Table 7.** Quantitative values and proportional distribution of Street Landscape Evaluation
 Indices (SLEIs) within the visual frame of the Zhang Clan Qinghe Hall Arch.

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389 The Lee Jetty Arch, situated within the Chinese clan jetty settlement, blends cultural
 390 specificity with organic spatiality. With 11% greenery, it slightly exceeds the ideal,
 391 softening the jetty's entrance and connecting it to the waterfront. The Sky Open Index
 392 of 29% suggests a moderately framed vertical view—important for emphasizing the
 arch and signifying entry into a unique semi-public space.

393

394 The Road Area Index (27%) is relatively high, reflecting the utilitarian nature of jetty
 395 settlements, where pedestrian and logistical uses coexist in a compact space. Yet the
 396 Enclosure Index (33%) remains within comfortable bounds, creating a sense of
 397 closeness. The archway leads to a series of arches, leading to a wooden dock that
 extends toward the sea.



Figure 15. Framing analysis of the Lee Jetty Clan Arch, illustrating the delineated Street Landscape Evaluation Indices (SLEIs).

Lee Jetty Clan Arch		
	Pixels	Percentage
Green Visual Index	540,272.81	11%
Road Area Index	1,326,124.17	27%
Sky Open Index	1,424,355.59	29%
Spatial Enclosure Index	1,620,818.43	33%
<i>Total</i>	<i>4,911,571.00</i>	<i>100%</i>

Table 8. Quantitative values and proportional distribution of Street Landscape Evaluation Indices (SLEIs) within the visual frame of the Lee Jetty Clan Arch.

4.3 Synthesis

The comparison of Binondo and George Town's gateways through the Street Landscape Evaluation Indices (SLEIs) highlights two different urban logics—one rooted in monumentality and compression, the other in proportionality and permeability.

4.3.1 Spatial Enclosure Index (SEI)

Binondo's gateways register consistently high SEIs, from 66% up to 85% (figures 8, 9, 10 and 11). This creates dense, corridor-like thresholds, where legibility is partially compromised by visual clutter. The effect, however, is a compressed urban environment that often overwhelms pedestrian scale. In George Town, by contrast, the SEI ranges from 33% to 67%, producing thresholds that are enclosed enough to signify identity yet open enough to maintain accessibility and comfort (figures 12, 13, 14 and 15). The more moderate values reflect George Town's sensitivity to human scale and its integration into heritage streetscapes.

418 **4.3.2 Green Visual Index (GVI)**
419 Greenery is minimal in the four Binondo gateways, rarely exceeding 15% and in some
420 cases disappearing altogether (figures 8, 9, 10 and 11). This absence reinforces a hard,
421 urban quality where vegetation plays little role in shaping the experience. George
422 Town’s gateways, meanwhile, consistently register around 10–11% GVI (figures 12,
423 13, 14 and 15). Though modest, this layer of greenery softens the built environment,
424 offering visual comfort and a sense of cultural connection without disrupting
425 architectural rhythm.

426 **4.3.3 Sky Open Index (SOI)**
427 Perhaps the sharpest contrast appears in sky openness. As shown in figures 8, 9, 10
428 and 11, Binondo’s gateways record very low SOIs—typically between 0% and 4%—
429 which reinforces their heavy enclosure and compresses upward views. This visual
430 density heightens monumentality but limits perceptual relief. George Town, by
431 comparison, demonstrates far greater openness, with SOIs ranging from 29% to 40%
432 (figures 12, 13, 14 and 15). This vertical breathing space allows gateways to project
433 against the skyline, improving legibility, orientation, and pedestrian recognition.

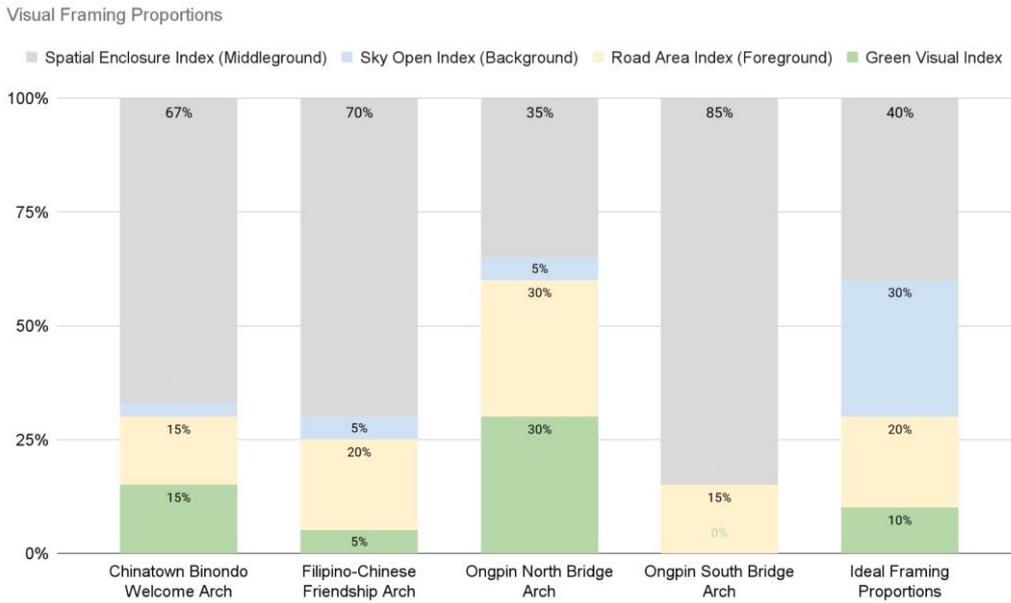
434 **4.3.4 Road Area Index (RAI)**
435 Binondo’s road indices fall within a narrow range of 15%–22%, aligning with
436 circulation requirements but functioning largely as utilitarian forecourts to
437 monumental structures (figures 8, 9, 10 and 11). In George Town, the RAI varies
438 more widely from 15% to 33%, reflecting adaptation to different cultural settings—
439 from clan halls with ceremonial forecourts to jetty settlements where circulation is
440 both functional and symbolic (figures 12, 13, 14 and 15). These variations highlight
441 George Town’s flexibility in embedding gateways within lived environments rather
442 than staging them as isolated monuments.

443
444 Taken together, Binondo’s SLEIs highlight patterns of enclosure and compression,
445 where spatial thresholds are shaped by dense urban fabric. This density reinforces
446 cultural identity by intensifying the experience of passage and emphasizing gateways
447 as symbolic anchors within the crowded landscape. George Town, by contrast, relies
448 on balance—moderate enclosure, modest greenery, generous openness, and adaptive
449 circulation—to create gateways that are less about monumental assertion and more
450 about permeability, contextual integration, and pedestrian experience.

451 **4. Conclusion and Recommendations**

452 The comparative spatial analysis of gateways in Binondo and George Town reveals
453 profound insights into how architectural framing mediates cultural identity, legibility,
454 and spatial experience in heritage districts.

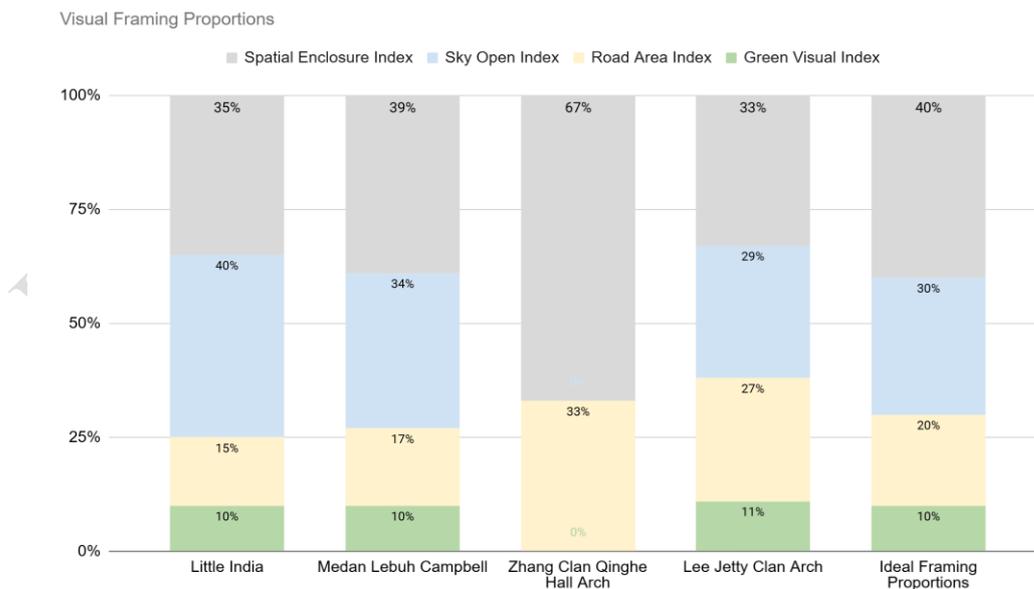
455 In Binondo, the dominant spatial language of its gateways—exemplified by the
456 Chinatown Binondo Welcome Arch and the Filipino-Chinese Friendship Arch—is
457 marked by high enclosure, limited sky openness, and minimal greenery. This results
458 in dense, compressed visual fields that emphasize monumentality but often
459 compromise perceptual clarity and environmental comfort (figure 16).



460
461
462

Figure 16. Comparative analysis of the Street Landscape Enclosure Indices (SLEIs) of the Binondo Gateways

463 In contrast, the gateways of George Town—exhibit a more calibrated spatial
464 composition that foregrounds permeability, cultural legibility, and environmental
465 balance. The Little India Gateway, for example, achieves a well-proportioned Spatial
466 Enclosure Index (35%) while offering generous vertical openness (Sky Open Index of
467 40%) and a modest but effective layer of greenery (10%). This spatial configuration
468 supports not only symbolic legibility but also pedestrian comfort and ecological relief
469 (figure 17).

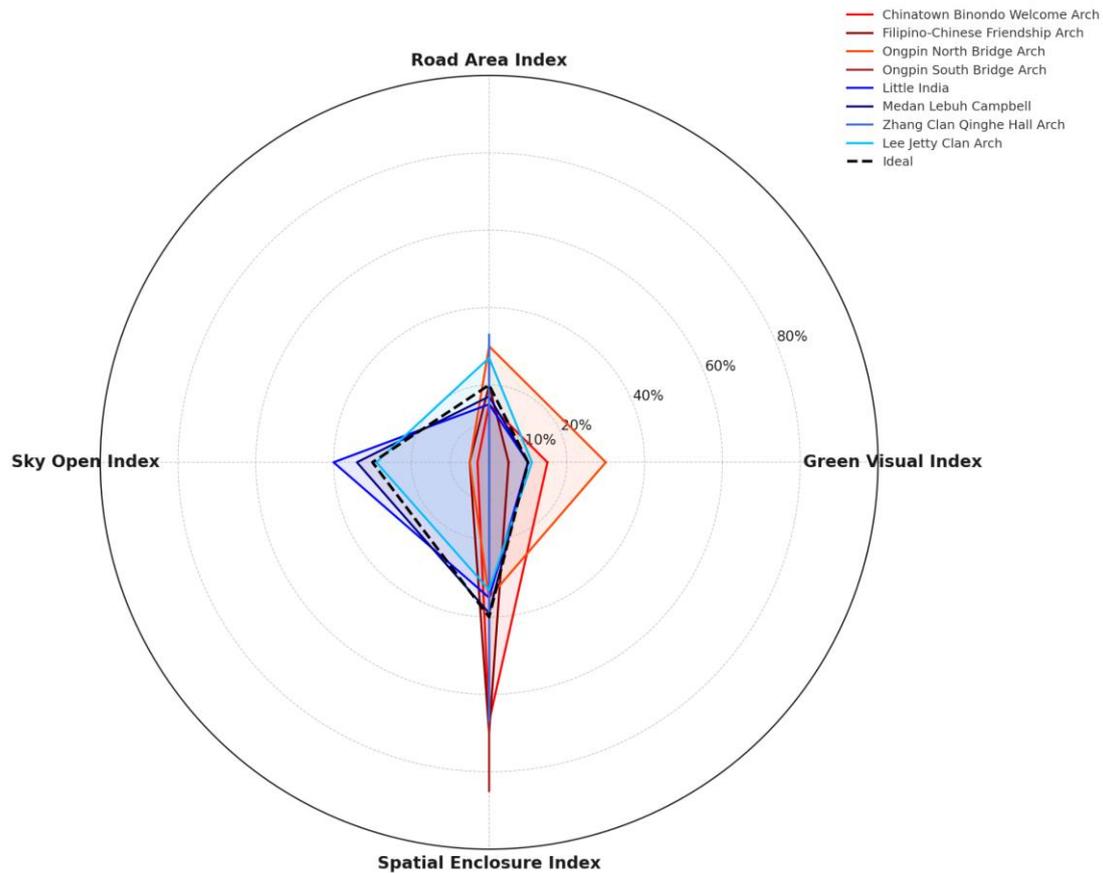


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471
472

Figure 17. Comparative analysis of the Street Landscape Enclosure Indices (SLEIs) of George Town's Gateways

473 Such proportionality reflects Madanipour’s (1996) notion of urban thresholds that
474 prioritize human-scale accessibility and multisensory engagement.

475 Importantly, the spatial legibility of George Town’s gateways does not rely on
476 monumental scale but on contextual alignment, architectural rhythm, and the capacity
477 to mediate transitions—both physical and symbolic—between different zones of
478 identity. In contrast to Binondo, where gateways are strategically placed at boundary
479 thresholds to signify entry, George Town’s island geography naturally defines its
480 spatial boundaries, reducing the necessity for a monumental marker.



481

482 **Figure 18.** Combined Radar Chart comparing the Street Landscape Enclosure Indices
483 (SLEIs) of Binondo’s and George Town’s Gateways

484 Figure 18 presents a radar chart comparing the Street Landscape Evaluation Index
485 (SLEI) values of gateways in Binondo (red hues) and George Town (blue hues)
486 against the ideal framing proportions (dashed black line). The axes represent four key
487 spatial components—green visual index, road area, sky openness, and spatial
488 enclosure. Binondo’s gateways tend toward high spatial enclosure with limited sky
489 openness, emphasizing density and compression, while George Town’s gateways
490 show greater balance across indices, more closely approximating the ideal framing
491 conditions. The figure highlights contrasting spatial logics that shape cultural
492 legibility and placemaking in these heritage districts.

493 The findings in this study thus reinforce a broader theoretical proposition: that
494 gateways in multicultural heritage landscapes should be evaluated not just for their
495 aesthetic or symbolic content, but for their spatial performativity—how they guide
496 perception, and support orientation in built form. It also underlines the value of
497 quantitative spatial metrics, such as the Street Landscape Enclosure Indices (SLEIs),
498 in the context of environmental coherence, especially in cultural districts.

499 Building on the findings of this study, future research should adopt a reverse visual
500 corridor analysis to examine how these gateways are perceived from key vantage
501 points within and around the district. This approach shifts the focus from viewing
502 outward to the gateways to assessing how they function as visible spatial markers
503 when approached from key public spaces, nodes, and peripheral streets. Such analysis
504 can provide valuable insights into the legibility and symbolic anchoring of these
505 gateways within the broader urban landscape (Lynch, 1960; Nasar, 1998).

506 Longitudinal and ethnographic studies are recommended as it is essential to unravel
507 how the symbolic meanings and social functions of these gateways evolve amid
508 shifting political, economic, and social landscapes (Ying & Liu, 2025). Archival
509 research combined with oral histories could contextualize these transformations,
510 offering critical insights into the contested processes of heritage preservation and
511 urban change.

512 Finally, the development of participatory design toolkits tailored to multicultural
513 heritage contexts can empower local communities and planners to collaboratively
514 shape gateway spaces that balance monumental visibility with contextual sensitivity,
515 fostering urban thresholds that are meaningful, inclusive, and resilient (Stevens &
516 Thai, 2024).

517 In sum, this comparative study not only advances the spatial and cultural
518 understanding of heritage gateways but also challenges all stakeholders to enact more
519 accountable, culturally grounded, and environmentally responsive urban design
520 strategies. The future of these gateways lies in their capacity to be simultaneously
521 iconic and inhabitable—spaces that are not only framed visually but lived,
522 remembered, and continually reinterpreted by the communities they serve.

523

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