ALAM CIPTA
International Journal on Sustainable Tropical Design Research and Practice

THE ROLE OF PHYSICAL AND VISUAL ELEMENTS IN CREATING STREETSCAPES: CASES IN KUALA LUMPUR CITY, MALAYSIA

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ARTICLE INFO

***Keywords**:*
streetscape,
physical elements,
transparency,
building façade,
resilient

ABSTRACT

Evaluating the role of physical elements in creating visually pleasing streetscapes has not been deeply addressed in recent research flow, especially for the context of Kuala Lumpur City. The gap is also accentuated by Kuala Lumpur City Hall as disharmony and inconsistency in streetscapes and lacking visual coherence in most streets in Kuala Lumpur. Therefore, the current paper seeks to evaluate the role of physical and visual elements in creating visually pleasing streetscapes of Bukit Bintang and Tuanku Abdul Rahman using a self-administered questionnaire survey. The respondents of the study comprise 330 passers-by aging from 18 to 50 years old, who visit the streets, reside, or work there. The results demonstrate that transparency, the quality that makes the function of a building visually accessible, and seating places play the most and the least important role in creating streetscapes in the study areas respectively. Comparison of the results in two streets highlights that harmony between and consistency in the facades of modern and traditional buildings, simplicity in design elements of facades, inviting building entrances, and covered walkways contribute to creating attractive streetscapes. Overall, the findings build foundations for restoring the visual coherence, which results in resilient streetscapes in cities.

1. INTRODUCTION

Various studies on the design of built environment have given a due attention to a street as a public space (Lynch, 1960; Moughtin, 2003). People may regularly visit streets and communicate with friends, neighbors, co-workers, and even strangers (Mehta, 2007). A street is deemed as a dynamic public space that instills the sense of movement (Carmona et al., 2003). Observers' evaluation of streetscapes mainly relates to the physical and visual elements of streets such as buildings and landscape features. Although a plethora of studies such as Askari & Dola (2009), Askari et al. (2014), Askari & Soltani (2018), and Santosa et al. (2018) evaluated the role of visual elements and features, determining the role of physical and visual elements in improving streetscapes in Southeast Asian urban contexts, especially Kuala Lumpur is still a gap (Oranratmanee & Sachakul, 2014). On top of that, piecemeal development has negatively tarnished the quality of streetscapes in Kuala Lumpur, which is represented by physical character, continuity of streets, building frontages, street lighting, and other forms of street furniture (Kuala Lumpur City Hall, 2008).

The theoretical base of the paper builds upon the studies of Jacobs (1993) and Sucher (2010) that worked on streetscape and its physical elements. In this regard, the paper focuses on the visual and physical features such as building facades, trees, seating spaces, and transparency. Having this considered, the first part of the paper reviews the relevant issues concerning streetscapes. The second part discusses research methods and data collection procedures. Last, the paper presents results, discussions, conclusions, and contribution to the field.

2. RESEARCH AIM

The aim of the current paper is to improve streetscapes in the city of Kuala Lumpur. In light of that, the objective is to evaluate the role of physical and visual elements in creating visually pleasing streetscapes in the city of Kuala Lumpur.

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3. PHYSICAL ELEMENTS OF A STREETSCAPE

Streetscapes play an important role in defining characteristics of urban areas (Nasar, 1990 and Shamsuddin, 2011). From another viewpoint, streetscape is considered a street view that relates to a complex of physical elements, people, vehicles, and urban infills (Rozaly et al., 2018). Streetscape, a significant part of townscape in cities, relies on tangible and intangible characteristics. Tangible refers to physical elements of the area, while intangible relates to behavior of people and culture within the area (Said & Hamzah, 2020). Rosnan et al. (2021) in a study on Raja Alang Street, found out that streetscape can be a strategy for creating socially livable places for people. They stated that streetscape improvement directly fosters traffic issues, pedestrian friendly circulation, landscape and hardscape of areas in cities. A well-designed streetscape leads to a better quality of life. Designing visually pleasing urban streetscapes contributes to fostering desirable living environments, legible city images, and place identity (Ab Rahman et al., 2017).

There is a relatively high correlation between measures of streetscape quality and respondent preference (Talen et al., 2022). Analysis of a streetscape is essentially an individual's interpretation of what appears to be visually significant (Tucker et al., 2004). Physical elements of an environment play an important role in constructing its identity (Proshansky, 1978). Esthetic evaluation of a streetscape mainly relates to street furniture and buildings (Warnaby, 2009) that create or enhance urban distinctiveness and experience (Carmona et al., 2003). Physical elements of a streetscape are a group of elements that shape streets as the community gathering places. Appleyard (1981) and Madanipour (1996) contended that physical characteristics of a streetscape fall under building facades, urban patterns and landscape features.

Streetscape, as the combination of hard and soft elements, contributes to creating a street's environment and view (Anuar & Asif, 2020). They pointed out that streetscape relates to visual elements and characters of a street, which comprises green spaces, pedestrians, and street furniture. Othman & Othman (2018) in a study documenting the public's scenic preferences for future urban streetscape, asserted that colorful landscape elements including natural and man-made components place higher preferences for streetscapes. Soft and hard landscape, categorized under urban street furniture, have a very important role in adding meaning to the city identification and facilities of the societal life (Bulut & Atabeyoğlu, 2007). Street furniture has a major effect on improving urban decoration, organizing of the city and imparting identity to it (Bulduk, 2012).

Green infrastructure significantly imparts quality to urban streetscapes in cities (Zairuddin et al., 2020). Soft-landscape includes natural aspects, which play an important role in place settings. Soft-landscape features are divided into two groups of natural and man-made with three sub-elements of water features, vegetation, and topography (London Borough of Croydon, 2009 and Ja'afar et al., 2012). Planting proper trees with suitable distance according to guidelines and choice of trees compatible with the planting placement prevent any future problem and give esthetic values to streetscapes (Kadir & Othman, 2012). Natural elements, such as shrubs, are unique urban elements in a tropical country like Malaysia where lush green environments are intrinsic characteristics.

In most cities in Malaysia, old trees impart unique tropical characters to streetscapes. This premise is well observable in traditional streets where mature trees together with historically-significant buildings are important parts of city heritage (Shamsuddin, 2011). Hard-landscape features are the man-made (e.g. benches and street lamps) features designed to complement the soft-landscape features (Hussain & Ahmad, 2010). These elements are the characteristics that offer a connection between people, give areas a certain functional and esthetic meaning, have various quantities, and identify and complete the area (Bulut & Atabeyoğlu, 2007). Seating opportunities of a street as benches, chairs or other surfaces provided by a public agency or a private business, near activity-supporting businesses, have a strong interrelationship with liveliness and improve the memorability of streetscapes (Jacobs & Appleyard, 1996). Placement of a bench is an important feature of pedestrian amenities that influences a streetscape (Shaftoe, 2008).

Building façades outline the connection between public and private domains and their continuity defines urban spaces. Harmonious rhythm of articulated building facades plays a considerable role in improving urban streetscapes (Shokouhi & Gharai, 2006). Lower facades create an important linkage between scales, buildings, and people. For the buildings regarded as a unified entity, the lower facades should own a brilliant and friendly design (Gehl et al., 2008). Transparency is the visual quality that affects streetscape and plays an important role in public sightseeing (Frank, 2010). Transparency along frontages forms a connection between the edge and the space it surrounds. It also gives a close control over urban open spaces, permits frontages to enjoy the visual qualities of urban open space and secures users in a space (Mehta, 2009). Definition along the streets edge is important to enhance the consecutiveness of buildings along streets. The level of transparency from the private to the public realm should be adequate and the stores should have large windows with displays giving the user an idea of what is in. In traditional streets of Malaysia, five-foot walkways are the urban elements that impart a rich sense of transparency to the experience of streetscapes (Shamsuddin, 2011).

Change of the physical elements of streets has negatively affected the soft and hard landscape of the streets in old cities in Malaysia owing to rapid urbanization and modernization (Ja'afar et al., 2012). A review of the research conducted on historical zones in the City Center of Kuala Lumpur reveals that inconsistency among the physical elements of building facades negatively influences streetscapes (Askari & Dola, 2009 and Ja'afar et al., 2012). More specifically, the piecemeal building development in Kuala Lumpur has extensively affected the quality of streetscapes represented by building frontages, soft landscape, and hardscape. In other words, lack of streetscape visual consistency in Kuala Lumpur leads to unmemorable streets (Kuala Lumpur City Hall, 2008).

4. PROGRAMS IMPROVING STREETSCAPES OF KUALA LUMPUR

Considering the context of Kuala Lumpur, Think City carried out projects related to conservation and city vibrancy. In a project named "The Light Project", the city was planned to be lit up with curated public arts and performances. Specifically, the project aimed to foster local art markets and bring creativity into Klang Valley. In another

project, "Feasibility Study of Sultan Abdul Samad Complex", the institute aimed to analyze the site and develop potential space use in order to vibrate the space. In order to obtain more sustainable walkways, C40 team in cooperation with Kuala Lumpur City Hall performed revitalizing Kuala Lumpur Klang River waterfront into resilient sustainable pedestrian areas. The project was aimed at highlighting the historical and cultural identity of the area, improving street furniture, vibrating the river bank, and shading the sidewalks using native species revegetation. It, focused on regenerating the area, has contributed to a comfortable place embellished with high-quality streetscape features aesthetically pleasing (Zuraimi & Radzuan, 2020).

In the vicinity of Bukit Bintang Street, the Raintree Plaza project was rejuvenated by improving streetscapes and intensification of its landscape with the installation of lights and signage. At the intersection of Sultan Ismail and Bukit Bintang Streets, new projects such as Mass Rapid Transit entrance stations and buildings such as Wolo and Chatz Brasserie were constructed to contribute to the streetscapes of the area. In addition, two mega projects of Zepp Kuala Lumpur, LaLaport Bukit Bintang City Center impart aesthetic values to the surrounding areas. In a program planned out by Kuala Lumpur City Hall, the area located in a 1 km radius from the Masjid Jamek, where Tunku Abdul Rahman Street is located, is revived. Complying with the goals of a sustainable city, Kuala Lumpur City Hall is looking for a mega project to pedestrianize the street and transform it into "green public transport-pedestrian shopping district".

5. METHODOLOGY

As supported by Yin (2003), observation in this study acts like primary data. In this phase, the researcher through personal notes and visuals documented the real scenario in the study areas. The field observations occurred between 10 am to 1 pm to study the existing situations with maximum visual accessibility to physical and visual elements and key urban issues of the study areas. The observed features of streetscapes were building facades, trees and shrubs, seating places, and visual access to the buildings. Mehta (2007, 2008, 2009), Ja'afar & Usman (2009), Mehta & Bosson (2009), Sulaiman et al. (2008), and Ujang (2012) used this method to portray existing situation of streetscapes. A self-administered questionnaire survey (English and Malay) measured people's evaluations of the role of physical elements in forming streetscapes in the study areas. Mehta & Bosson (2009), Askari et al. (2014), and Askari & Soltani (2018) used a questionnaire survey in eliciting people's evaluations of physical and visual elements of the study areas. The questionnaire includes 28 questions about trees and shrubs, seating spaces, building facades and frontages, and visual accessibility, which are used as the independent variables for Pearson Correlation Analysis Test. Moreover, six questions evaluate the public's opinions about creating a memorable streetscape, which are considered the dependent variable for the test. Totally, 330 passers-by, shoppers, workers, shopkeepers, shop owners, and Malaysian residents participated in the survey, ranging from 18 to 50 years old and above with an equal ratio of male and female. Similar to the studies by Johnson & Christensen (2011) and Ja'afar & Usman (2009), the researcher used time-interval sampling method that surveyed the passers-by every 10 minutes. The surveys happened in two months on weekdays, weekends, and public holidays in the morning, afternoon, and evening. The survey measured public evaluations using five scales of strongly agree, agree, not sure, disagree and strongly disagree and very much attractive to not attractive. The role of physical and visual elements in creating attractive streetscapes was determined using Pearson Correlation Analysis Test. The results showed that Cronbach's Alpha was 0.705 for soft-landscape elements, 0.767 for hard-landscape elements, 0.794 for building facades, 0.728 for transparency, and 0.85 for Tunku Abdul Rahman streetscape. In addition, the Reliability Test illustrated 0.772 for soft-landscape elements, 0.783 for hard-landscape elements, 0.808 for building facades, 0.725 for transparency, and 0.725 for Bukit Bintang streetscape.

5.1 The Study Streets

Bukit Bintang and Tuanku Abdul Rahman streets that lie in the heart of Kuala Lumpur City, are considered to be the study areas. The reason why these two streets are chosen is that they well represent the typical streets of Kuala Lumpur where there are Shophouses, a mix of modern and traditional buildings, shopping malls, tall rain trees, vernacular bushes, and urban vibrancy. Therefore, it is strongly sensed that the findings of the study of these two streets can be generalized to most urban areas in the city and even the entire country. The streets are well-known for popular shopping areas receiving the highest concentration of pedestrians, shoppers, and tourists (Kuala Lumpur City Hall, 2008 cited in Ujang, 2012). Bukit Bintang Street (Figure 1) is within Bukit Bintang shopping district stretching from Pudu Street to Raja Chulan Street and intersects with Sultan Ismail Street. It changed into Kuala Lumpur Golden Triangle in the early 1980's. Visited by foreign tourists, Bintang Walk, approximately one kilometer of pedestrian walkway where hotels stand along modern shopping malls, vibrates the street. The monorail transport links the area to other places, as an access point to local shoppers, tourists and visitors (Ujang, 2008). On top of that, it is deemed as the main shopping street of a newly developed central area in the city.

***Figure 1**: Bukit Bintang Street (Map data @2022 Google Imagery @2022, CNES / Airbus, Maxar Technologies).*

Tuanku Abdul Rahman Street (Figure. 2) is located in Tuanku Abdul Rahman shopping district from Sultan Ismail to Raja Laut Streets, the traditional street with remarkable socio-cultural values and historical importance in the heart of Kuala Lumpur (Kuala Lumpur City Hall, 2008). All in all, it is the former main shopping street of Kuala Lumpur (until the 1960s).

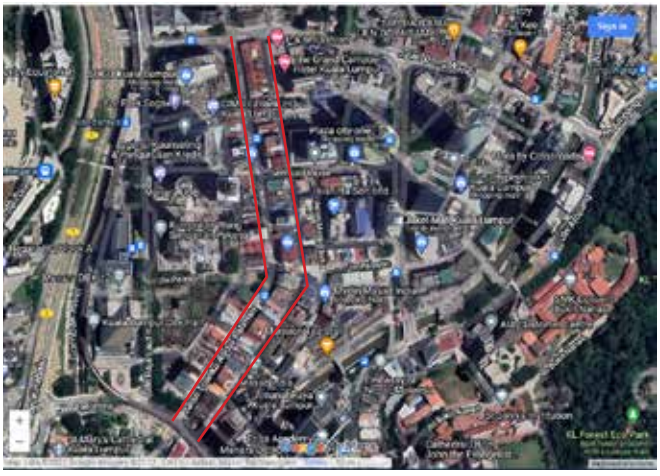

Figure 2: *Tuanku Abdul Rahman Street (Map data @2022 Google Imagery @2022, CNES / Airbus, Maxar Technologies).*

6. RESULTS

6.1 Field Observation: Bukit Bintang Street

The area expanded from Tun Razak Street to Pavilion shopping mall (Fig. 3 (a)) overflows with tall old rain trees, flowers, bushes, and water fountains. Abundance and proper placing green features intertwined with the design elements of buildings make the entrances welcoming. From StarHill Gallery to Bukit Bintang intersection (Fig. 3 (b)), there is a long line of rain trees, flowers, bushes, and water fountains along the street. Part c overflows with many tall rain trees and indigenous bushes from Bukit Bintang intersection to Bulan Street. In part d, two rows of tall rain trees, short bushes, and water fountains flank the area from Bulan Street to Pudu Street. In part a, along the Pavilion shopping mall, seating spaces surrounded with rain trees offers a serene place for sitting and relaxing. There is at least one garbage bin located in a proper place every 300-500 meters. The areas located in parts b, c and d are devoid of public seating opportunities, but restaurants and cafes, and there are garbage bins in proper distances. In parts a & b, awnings in both sides of the street attached to building entrances adorn building facades and offer visual and physical comfort. Most buildings are modern and have interesting constituting elements of facades, proportional use of large glass windows and vertical and horizontal elements that define the entrances. Large windows of galleries, shopping malls, cafes, restaurants, and hotels increase transparency of the buildings. In part B, most buildings are old and have simplicity in their repeated elements, which causes visual monotony. In parts c and d, there are 5-foot walkways covered by awning in both sides of the street, most buildings are renovated, and building facades are rhythmic, especially in old parts of the street (Figure 3).

Figure 3(a)*: Tun Razak Street to Pavilion.*

Figure 3(b): *StarHill Gallery to Bukit Bintang Intersection.*

Figure 3 (c): *Bukit Bintang Intersection to Bulan Street.*

***Figure 3 (d)**: Bulan to Pudu Street.*

***Figure 3:** Bukit Bintang Street (Soltani, 2017)*

6.2 Field Observation: Tuanku Abdul Rahman Street

The area from Maju to Dangi Wangi Junctions in part a is covered with many tall old rain trees. Green spaces in front of most modern buildings act like design elements by imparting salient characteristics to entrances and create a strong sense of invitation to the buildings (Figure 4). In part b, shading rain trees flank both sides of the street and create a welcoming entrance of SOGO Complex. There are many tall bulky rain trees located along part b, from Dangi Wangi Junction to Esfahan Street. Different types of shrubs characterize building frontages on the right side of the street. There are a quite number of rain trees along part c, from Esfahan to Bunus Street (Figure 4). There is a meager line of shrubs in the entrance of buildings in part d, from Bunus to Raja Laut Streets. Although there are not many rain trees in this part, the front side of Coliseum Building overflows with many tall old rain trees. In part a, seating spaces covered with cloth awnings along the building at Maju Junction offer cozy places for passers-by. There are abundant public seating spaces on the right side of SOGO Complex (part b). In part c, there are adequate public seating spaces on the right side of the street next to rain trees. The area in part d is devoid of public seating spaces and there is just an open space next to Coliseum building offering places for sitting. The design of street in part a, tallies with hygienic standards and there is at least one garbage bin every 300-500 meters. In more details, the area from Maju Junction to Dang Wangi Junction in part b, the area from Esfahan to Bunus Streets in part c, and the area from Bunus to Raja Laut Streets in part d are clean and overflow with a garbage bin every 300-500 meters (Figure 4). In part a, entrances of most buildings and stores in both sides of the street do not have awnings. The five-foot walkways prevent rain from penetrating into the buildings. On the right side of the street, along the Pertama Complex, vertical and horizontal design elements make modern buildings outstanding. Large windows of the shopping malls, hotels, and restaurants make them recognizable for the people passing by. In part B, awnings and covered five-foot walkways flank both sides of the street. Most Shophouse facades designed with "British Colonial Style" include repeated, rhythmic, and colorful elements. Large displays of shopping malls and Shophouses contribute to creating transparent streetscapes. Renovated building facades in front of SOGO Complex, cleanliness, and consistency of building facades play an important role in creating attractive streetscapes of the area. In Fig. 4 (c and d), covered five-foot sidewalks attached to buildings are wide enough and contribute to creating memorable streetscapes. Most building facades are renovated and have colorful, rhythmic, and repeated elements.

***Figure 4(a & b)**: Maju to Dang Wangi Junction*

Figure 4(c): *Dangi Wangi Junction to Esfahan Street*

Figure 4 (d): *Esfahan to Bunus Streets*

Figure 4 (e): *Bunus to Raja Laut Streets*

Figure 4*: Tuanku Abdul Rahman Street (Soltani, 2017)*

Alike Bukit Bintang Street, existing soft-landscape such as tall old rain trees and shrubs, highly-glazed and well-designed facades, which increase transparency, harmonic juxtaposition of modern and traditional buildings, variety in horizontal and vertical elements of facades, proper colors and materials of facades, seating opportunities, five-foot walkways, and inviting entrances mostly covered with awnings significantly contribute to creating memorable streetscape of Tuanku Abdul Rahman. Overall, the observation pinpoints that soft-landscape, building facades, seating opportunities, and transparency play a vital role in forming streetscapes.

6.3 Role Of Physical Elements In Forming Streetscapes

Pearson Correlation Test (Table 1) indicates that there is a correlation between soft-landscape (r=0.494, p< 0.01), seating spaces (r= 0.367, p<0.01), building facades (r= 0.494, p<0.01), transparency (r= 0.497, p<0.01), and streetscape of Bukit Bintang. Transparency contributes to forming Bukit Bintang streetscape most. Soft-landscape and building facades play a similar role in forming memorably attractive streetscape of Bukit Bintang.

Streetscape		Soft-landscape	Seating spaces	Building facades	Transparency
Bukit Bintang	Pearson Correlation	.494(**)	.367(**)	.494(**)	.497(**)
	Sig. (2-tailed)	.000	.000	.000	.000
Tunku Abdul Rahman	Pearson Correlation	.499(**)	.389(**)	.566(**)	.685(**)
	Sig. (2-tailed)	.000	.000	.000	.000
N		330	330	330	330

Table 1: *Correlation between physical elements and streetscapes*

*** Correlation is significant at the 0.01 level (2-tailed). Source: SPSS 22 by Soltani (2017).*

Table 1 indicates that there is a correlation between soft-landscape (r= 0.499, p< 0.01), seating spaces (r= 0.389, p<0.01), building facades (r= 0.566, p<0.01), transparency (r= 0.685, p<0.01), and streetscape of Tunku Abdul Rahman. The results show that transparency play the most important role in the streetscape of Tunku Abdul Rahman. The results show that seating opportunities do not have a strong impact on streetscape of Tunku Abdul Rahman. Yet, building facades and soft-landscape significantly impact on the streetscape. The results support what Shokouhi & Gharai (2006) emphasized that harmony and rhythm of the elements of facades play an important role in strengthening streetscapes. Although Mehta (2009), stressed the role of seating opportunities in forming streetscapes, this study shows that seating opportunities influence the streetscape of two exemplary areas in Kuala Lumpur City less than other physical factors and elements. Comparing the results, the variety of seating opportunities, five- foot walkways, consistency between physical elements, proper height of tall old rain trees, ornate historical building facades consistent in shape,

and dimension and juxtaposition of modern and historical building facades in Tunku Abdul Rahman Street create more memorable streetscape than in Bukit Bintang Street. Overall, the findings show that building facades and soft-landscape features of Tunku Abdul Rahman Street have a more significant impact on its streetscape than those in Bukit Bintang Street. As shown in the Correlation Test, the reason why the physical elements play stronger impact on the quality of urbanscape of Tunku Abdul Rahman Street than on that of Bukit Bintang Street might be what Loodin & Thufvesson (2022) in their study revealed that classical architecture plays a more significant role on the quality of streetscapes than modern one. This is exactly what is more conspicuous on Tunku Abdul Rahman Street than on Bukit Bintang Street. In a study, Askari & Soltani (2018) only focused on how building facades contribute to attractive streetscapes in two exemplary representative streets in Kuala Lumpur. The gap still exists that what other physical and visual elements form streetscapes in cities. In light of that, the current paper, conducting a quite different attribute, evaluates to what extent these elements contribute to distinctive streetscapes, which distinguishes the paper from the previous studies in either the same urban context or any other similar ones.

7. CONCLUSION

The findings outline that streetscape transparency, which is the visual accessibility to buildings as the result of harmony among constituting physical elements, proper placing trees and shrubs, and building facades play the most significant role in creating attractive streetscapes. In line with the objectives of Think City and Kuala Lumpur City Hall to promote the quality of streetscapes, incorporating the findings of the paper in the process of urban restoration and rejuvenation assists urban designers in creating more sustainably livable cities. In addition to that, the paper presents a series of findings in relation to the interplay between the elements of streetscapes that imply designed-based suggestions for making more memorable streets in cities either in Malaysia or even in other similar urban contexts. In fact, as Ab Rahman et al. (2017) and Rosnan et al. (2021) determined, the findings of the paper contribute to creating identifiable places in cities and improving urban quality of life.

The exploration of these factors in the current paper contributes to environmental perception and evaluation of the physical elements of built environment. The findings insinuate that harmony of building facades has a more effective impact on creating attractive streetscapes than their mere outlook. The findings are internationally extrapolative to the future restoration and development of similar urban settings due to the representative nature of the study areas. In other words, the paper offers insights into a better understanding of how people assess the role of physical elements in creating attractive streetscapes in cities based on the notions of environmental psychology towards the built environment. Last, the paper suggests a study on the role of spatial arrangement of the physical elements and attributes in vibrating streetscapes of cities.

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