

Research Article

Evaluating the Visual Pollution in Urban Corridors-Case of Al-Madina Al-Munawara Corridor, Amman

Lamis K. Shaban, Sarinaz Suleiman, Dania Abdel-Aziz and Hasan Y. Isawi
Department of Architecture, The University of Jordan, Amman, 11942, Jordan

Abstract: Urban corridors play important roles in all cities. The term corridor suggests a connection and access between urban districts, besides planners considered them as major elements in shaping the city image and forming its identity. This study examined the visual effects (quality) that resulted from the contemporary urban transformation practice in Al-Madina Al-Munawara Street which local planners considered one of the main urban corridors in Amman, the capital of Jordan. This study aimed to direct the efforts to search for positive visual characteristics that may strengthen the identity of urban corridors and reduce the visual pollution created by the lack of one language and clear regulation by analysing the visual characteristics at this corridor and linking them with the factors that affected its urban growth. Researchers also studied the discordant chaos resulting from designed facades practices where each building owner seeks attention. The paper sighted the massive visual pollution resulted in this corridor and concluded that the undefined architectural statements, the lack of awareness and the absence of clear regulation were the main factors that produced a chaos in its visual properties.

Keywords: Architecture, street facades, urban design guidance, urban transformation, visual properties

INTRODUCTION

Lynch (1960) articulated that the city is never complete while the details at every morphological level are in constant flux. In all growing cities and urban environments change is the lifeblood of economic, social and political systems that underpin society as well as the built fabric that accommodates facilities activity (Dovey, 2001).

Bentley (1999) describes a number of economical and cultural factors that help strip substance and visual quality out of the fabric of buildings built or that cause the design of each new intervention to seek attention. As a result, these buildings are anything but well-mannered and often they fail to develop even a fleeting relationship with those around them (Gjerde, 2011).

The architectural profession, professional development and awards programs lead to the conclusion that an architectural object overcomes the architectural manners.

Changing occurring in the contemporary cities is making transformations in the final image of the built environment that are not viewed positively. The majority of professionals and educated people dislike the appearance of the transformed cities in the recent years, while some find these unique changes favourably (Gjerde, 2011). Architects, as well as planners, should increasingly be aware of the role of the distinctive and

well-designed streetscapes play in creating positive mental images and place identity (Lynch, 1960) (Carmona *et al.*, 2010).

This study took a step in analyzing one corridor in Amman City (Al-Madina Al-Munawara Corridor), focusing on the architectural typology: solid versus void ratios, opening types, building materials and consistency with neighboring context, the suitability of fit by each building into an urban setting; this is to understand when an entire group of buildings are read as a whole.

Two important questions were the base query of this study, inspired by Bentley (1999) which are, the way cities have been changing and the architectural design and design control, by focusing on Abstract beauty.

MATERIALS AND METHODS

In urban context one can't see beauty in a building alone; beauty/visual chaos should be read within its context. Investigating the visual pollution aims to study the contrasts between old and new buildings by concentrating on the unity as well the differences in; building construction techniques, architectural values for the built environment, signage system and building material and colour.

This reading is conducted by using a multi-disciplinary approach that was designed to investigate the urban corridors definition and its visual aesthetic perception combined with various visual analysis techniques (photography and site visits).

The perception of any city is based on its aesthetics and visual impacts thus, direct interpretation of the urban streetscapes were mainly based on analysis of photographs. Photography provides a useful qualitative method for evaluation of street facades, as subjective representations of reality and visual provision evidence to support data captured in other forms, besides site visit, survey and continuous observation of the continuous development occurring by new buildings.

A deep analysis of the local planning and design documents were undertaken to know how those regulations influence the shape and image of streetscapes, directly and indirectly as well. Those documents illustrate all the rules and legislation that were formed by the decision makers in the Greater Amman municipality, in which our corridor (Al-Madina Al-Munawara Corridor) relates.

Urban corridors: In the planning history, there are many traditional concepts of urban structures taking the form of linear belts. This could have a strong link with the emerging concept of the corridors. Probably the first such linear plans were envisaged by the Spanish engineer Soria Mata in the early 1880s while there is no such thing as an ideal corridor as the circumstances of each area are different (Tufek-Memisevic and Stachura, 2015).

The corridor according to Hall's concept 'beads on a string' should not be one of continuous development while a great attention should focus on the open spaces for recreation and nature conservation within the corridor (Hall and Tewdwr-Jones, 2010).

Urban corridors can be seen as a dynamic space, but at the same time, they are produced to create a range of experiences in their own right. Corridors are an axis of infrastructure, economic development and urbanization of industrial development. A need to develop acceptable models, of higher-density compact urban form, that allow spaces between clusters and spines to remain low-density. The perceived and quality of setting depends on evaluations of those who regularly experience it (Sanoff, 1991; Nasar, 1998).

The urban growth and the spatial quality of streets and corridors in urban Amman are affected by various development factors such as; building regulation, population growth, social habits and lack of awareness that can be summarized into three main factors; (1) social, (2) economical and (3) political.

Visual pollution: Visual pollution is an aesthetic issue and refers to the impacts of pollution that impair one's ability to enjoy a vista or a view. It includes all the environmental elements which society finds them

unaccepted and inappropriate. Visual pollution cannot be generalized; it is a changing value of the environment and it depends on the cultural background of the viewer or the perception receiver and the society.

The aggregate of multiple, the building's elevations architectural statements in a single setting can lead to visual cacophony (Smith, 1977) and the generally uninvolved public has had to bear the brunt of environments that have poor visual qualities (Matthew and Steve, 2007).

The visual pollution happens because of neglecting, malfunction, bad use or misuse and irresponsible behavioural attitudes caused by lack of awareness. Visual pollution appears in the built environment especially buildings, streets and landscape. The specifications of the visual pollution can be defined as:

- No consistency in the shape of the openings, colors and proportions
- Finding one or two elements in the built output that is odd
- All drawings and gestures that are imposed on the city culture
- All factors that reduce the perception of the environmental beauty
- The misuse of the architectural forms; morphology, building materials
- Changes on the existing built environment that distort its proportion or order
- Signage types and lack of systems (order) on the commercial buildings

Many researchers raised the question in which we can be able to define the visual pollution in urban corridors since it depends on specific criteria related to the visual impact positive or negative. Visual pollution has aesthetic values that can be described in a context where the beauty is missing. Al-Faqih described Amman Architecture "hybrid architecture", mixing between different building technology and system of the age (Al-Faqih, 2009).

Kim (2009) and Abu-Ghazzeh (1997) had investigated the use of signs on the buildings facades as a factor that contributes in forming visual pollution, both came up with guidance for signs that increase the perceived beauty and decrease the visual pollution.

Al-Faqih and Al-Diab (1996), discussed spatial qualities for a residential/commercial street in Amman and comes out with a result that shops signs were the main element that produces visual pollution in streets, this study search for other factors.

Visual pollution can be defined as the disappearance of beauty and distortion (garble, mangle.) of any view that you can see which causes a psychological discomfort when you look at it. It is also losing our artistic perception because of the

disappearance of the beautiful elements of all surroundings such as buildings, roads and pathways. Visual pollution is all man's work that hurts the viewers and it is artificial and odd with the surroundings. These outputs are polluting the surrounding environment and hiding its' beauty which causes discomfort to the viewers. Sometimes visual pollution is not mentioned because our eyes are accustomed to ugliness we are seeing daily (Alkubaissy, 2016).

Visual pollution is considered the least of the environmental pollution but it is difficult to calculate and specifically because it needs a great cultural background and a big environmental awareness and a trained eye that can spot the ugliness (error or chaos, disorder, confusion, amalgam) mixture in the built environment. The danger of the visual pollution is its strong relation first with losing the sense of beauty and the collapse of beauty consideration also comes the acceptance of the ugliness because it is widespread and it becomes according to the measurements of eyes an existing law and costume (Portella, 2014; Alkubaissy, 2016).

Punter (1999) cautions policymakers and controllers to be mindful that they are entrusted to represent the interest of the public, besides to what extent is it reasonable to expect citizens preferences.

As a conclusion, this research defined the real problem by relating the visual pollution to the factors that lead to in order to derive a suitable solution as follows:

- Planning issues: Neglecting, miss use (abuse), bad planning, artistic low value and wrong social habits behavioural attitudes or Shortness in the laws and legislation.
- Cultural aspects as a conclusion of lack of awareness and neglecting of beauty issues of the people concerning about their cities.
- Economical issues are an important factor that causes visual pollution. The prices of building materials and facades cladding that determines the final outlook of the building.

AI-MADINA AI-MUNAWARA CORRIDOR

It is located in Amman, Jordan (latitude 35.8 north and longitude 31.9 East, rises from the sea about 950 to 1100 m). It connects several districts in West Amman, starting from the intersection of Queen Rania Street with the University of Jordan Street at the north, extending to the south-passing through Tala' Al-Ali area-, intersecting with Wasfi Al Tal Street at Al-Waha circle, extending till it separates Al-Rabyeh and Um Uthaina districts, then intersecting with the Mecca Street at Al-Haramain intersection, extending to the south of the capital where the endpoint is located between the sixth and seventh circles on Zahran Street, Fig. 1.

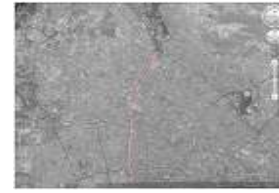


Fig. 1: Shows the residential districts that Al-Madina street corridor passes through. source: (Google earth, 2017)

With the growing population in the western regions of Amman, the street has become as vital nerve centre in the capital, Amman, making it difficult to navigate between the western districts of Amman without passing by or intersect with it.

Al-Madina street corridor is seen as a complex area of braised infra-structure. It responds upon the spatial dynamics of transportation, economic development urbanization and health functions of that area. The importance of transitional linkages physically, institutionally and socially has been increasingly recognized. Al-Madina street corridor is an important transitional linkage between residential, commercial and educational districts.

RESULTS AND DISCUSSION

The street is divided into two parts, commercial and residential, where it runs the commercial part of the north (from the University Hospital to the intersection of the Al-Haramain intersection to the south, passing through the Al-Waha circle), the residential part starts at Al-Haramain intersection, until the end of the street leading to Zahran Street, See Fig. 2 which illustrates the street land-use. Taking into consideration the transitional dimension of the research led to this, being termed part of a mega corridor. Al-Madina street length is around 5 km (Tawil *et al.*, 2014). At the beginning of 1990, it was considered as one of the wealthy Amman neighbourhoods.

The expanding was dramatically formed by a large number of Jordanians citizens coming back after Gulf crisis in the last decades of the twentieth century. Thus, a large number of villas and houses were built. The growing rate of this corridor is high. If zoomed in the part that links Queen Rania Intersection to Al Waha Roundabout, for example, 44% of the buildings are found built after the year 2000.

This research studied one part of the corridor as shown in Fig. 2, which is the part between queen Rania Alabdallah round about; because it has less vacant lots than other parts which means that possible changes in architecture will be less; this will make the study more accurate.

Status of the corridor: After Field Survey, observation and photo collection, analysis had covered. Al-Madina

Table 1: The building year, number of buildings and its percentage for each year zone. source: (researchers, 2017)

Time zone no.	Year	Side A No. of buildings/percentage	Side B No. of buildings/percentage	Corridor (A+B) No. of buildings/percentage
1	Before 1978	1/3.3%	-----	1/2%
2	1979-1992	1/3.3%	2/8%	3/5%
3	1993-2000	15/50%	6/25%	21/38%
4	2001-2005	3/10%	8/33%	11/20%
5	2006-2010	9/30%	7/29%	16/29%
6	2011-2014	1/3.3%	1/4%	2/4%

Table 2: Al Madina Al-Munawara corridors Architectural characteristics. source (researchers, 2017)

Comparison point	Residential buildings	Commercial buildings
Architectural style	Mostly contemporary apartment buildings.	Modern buildings.
Material	Mainly stone.	Stone, curtain wall, concrete and Alucobond.
Height	Generally extends up to 3-4 floors.	4-7 floors.
Morphology	Form is derived from land lot shape; offset blocks with squares and rectangles.	Consist mostly of shops, banks, supermarkets, etc. on the ground floor, Upper floors consist of offices.

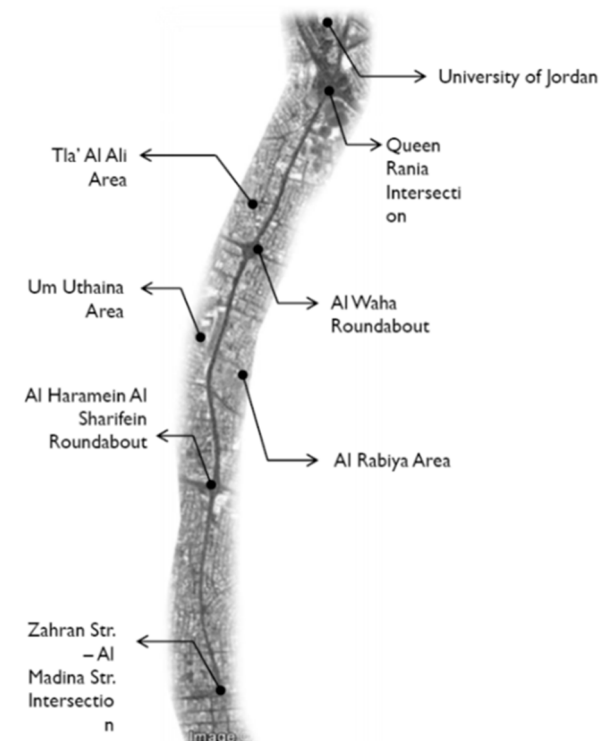


Fig. 2: The part that this study focuses on. Aerial photograph of Al-Madina Al-Munawara corridor. source: (researchers, 2017)

Munawara corridor can be divided into three main sections. The first section is between the University Hospital and Al-Waha circle, the busiest part. The second is between Al-Waha circle and Al-Haramain intersection, this part characterized with commercial buildings that are spreading gradually, but still, vacant lots are available. The third part is between Al-Haramain intersection and end perpendicularly on Zahran Corridor, the majority of these buildings types are residential. These residential buildings are gradually been changed to office buildings. Generally, most buildings in all parts are modern and are in good structural conditions since 1% of buildings have been built before 1978, Table 1.

The use of different building materials colours to appear easily and become a focal point to all those passing street in their cars. See Table 2 and Fig. 3 and 4.

After 1990, after the gulf war, the need to add more commercial corridors to Amman so as to encourage more investors. Stakeholders made a new legislation of transferring the Al-Madina Al-Munawara corridor to commercial from University of Jordan Hospital intersection to Alkilo roundabout, while the third part of the corridor kept residentially.

Figure 3 shows the main function of the first section in the Al-Madina Al-Munawara corridor which is 85% mixed-use building (office building above a commercial base); this use covers 70% of the existing buildings. Besides 15% are now commercial but they are partially built, when completed they will be transferred to mixed use. The left 15% were a divided gas station, hospital and restaurant (each 3.6%) and there are one office building and one house.

Until the year 2000, all buildings were built from local white stone, having window opening with a solid vs. void percentage less than 60% and using local building techniques see Table 1 and 2. After 2000 (in time zone 4) new materials were introduced to the corridor such as metal cladding. A new type of openings (strip windows, curtains glass) has been spread along with new building techniques. After 2006 coloured concrete, coloured metal cladding and coloured stone become new building materials for this corridor. In this time zone, a lot of the shops, in the commercial lower strip, tend to redesign their facades with a colourful material (metal and plastic wall cladding). All of these changes added up to the existing chaos Table 3 to 5.

The research also conducted a survey of the continuity of the architectural typology in this corridor by comparing adjacent buildings; the proportion of openings, solid vs. void percentage, building materials and colours, the aim was to find out how much these buildings Consist pattern with the neighbour. The study found out that on the side A there is no consistency except in two buildings next to each other percentage

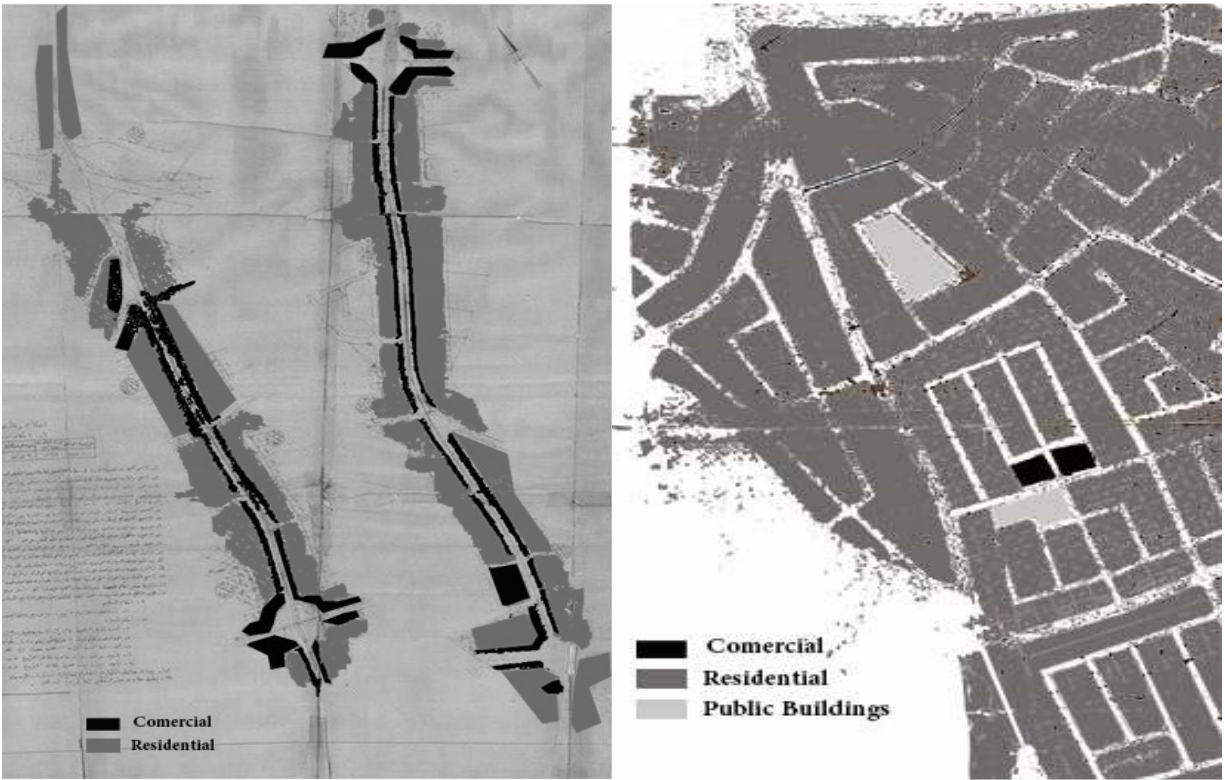


Fig. 3: Up; land-use (1983), Document from Amman Municipal), Down; land-use Commercial strip shown in the black colour with an average width of 30 m then residential land-use continue as it was before analyzed by the researchers. source: (researchers, 2017)

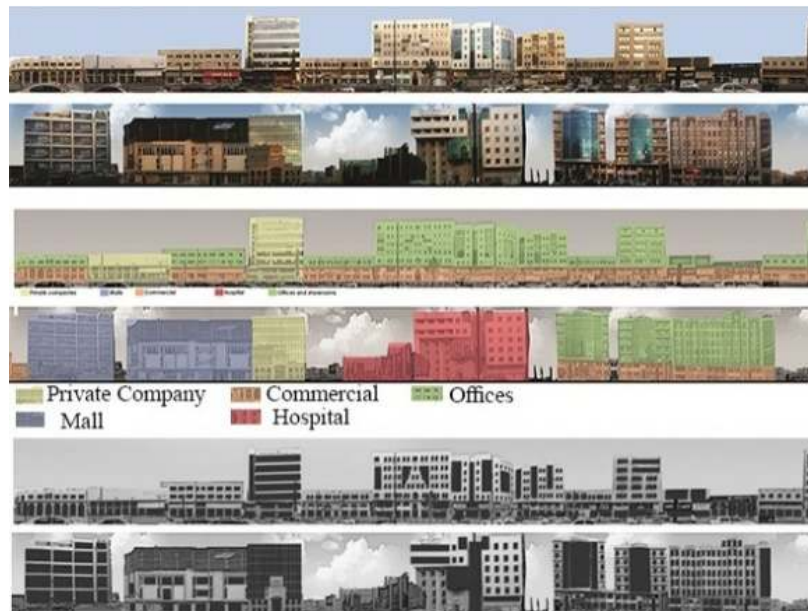


Fig. 4: Street Facades Analysis. source: (researchers, 2017)

7%). 25% of buildings, on side B, is consistent with one side neighbour and (17%) are consistent with the neighbour of both sides. See Fig. 5. The chaos occurred in the final image of the building caused by:

- Adjacent buildings were built in different time periods; this means different building materials were introduced in the construction market and each building wanted to be new up to latest.

Table 3: Al-Madina Al-Munawara corridors construction status till 2014. source: (researchers, 2017)

Construction status	Side A No. of buildings/percentage	Side B No. of buildings/percentage	Corridor (A+B) No. of buildings/percentage
Completed	16/47%	21/68%	37/57%
Partially built	13/38%	2/6%	15/23%
Under construction	1/3%	1/3%	2/3%
Vacant parcels	4/12%	6/23%	11/17%

Table 4: Shows Solid vs. void typology and the ratio of glass. source: (researchers, 2017)

Type of opening	Void ratio (%)	Side A No. of buildings/percentage	Side B No. of buildings/percentage	Corridor (A+B) No. of buildings/percentage
Curtain wall	50	1		
	80	2		
	90	3	3	6/11%
Opening	30	2		
	40	5	1	6/11%
	50	5	2	
	60	1	10	11/20%
	70	3	1	
Combination opening and curtain wall	80	2	1	
	40		1	
	60	4	2	6/11%
	70	2	1	
	80		2	

Table 5: Al-Madina Al-Munawara corridors Building materials. source: (researchers, 2017)

Material	Side A No. of buildings/percentage	Side B No. of buildings/percentage	Corridor (A+B) No. of buildings/percentage
Stone	17	16	33/60%
Metal	9	2	11 /20%
Concrete	1	1	2/5%
Curtain wall notes	3	5	8/15%
	One of stone building half of it is cover now with metal cladding	3 of the 5 are mixed with coloured stone and concrete	



Fig. 5: The diversities of material and colour in the street façade. source: (researchers, 2017)

- Landownership for adjacent lots; one can easily figure out similar adjacent buildings that belong to the same owner had the same building image.
- Lack of clear legislation and rules caused the discontinuity of the image with adjacent buildings.

While similarity can be seen in land use:

- The existence of the lower commercial strip 78% of building while 22% of the buildings don't have a commercial base. But if one takes a close look on this commercial strip will find out many differences; some building the lower strip are one-floor others are two, besides each shop uses different cladding material, colour and signs. The commercial, lower strip, designs its own facades to show the brand name typology and to become eye-catching to cars' riders.
- All the completed buildings are rectangular block similar to the land parcel shape with offset according to setbacks, with exceptions all through the corridor; the study found out four buildings

(two gas stations and two restaurants) one to two floors and gives a front open space, so these buildings were considered to have a good pedestrian level interface.

CONCLUSION

The study proved that the cause of unbalanced artistic formation for the final images and unidentified architectural identity that lead to the visual pollution in Al-Madina Al-Munawara Corridor with a threat of having similar results in other underdeveloped corridors in Amman City. Due to lack of firm and clear rules and guidelines that control the rapid changes and development in Amman's corridors, especially building materials, images building heights and design criteria. And the most important is the people's awareness of conserving descent balance image of the city of Amman.

The aesthetic values and the artistic formation introduced to the building's elevations are in a chaotic situation; there is no definite architectural identity and far from the local architectural heritage and with a wide variety of openings (types and proportions), besides different building materials.

The changing building legislations through time changed the low-rise houses (one to three floors) into mid-rise commercial or commercial office building types (six floors). There has been a change in scale, building materials and building construction techniques within a successive short period of time.

The lack of building and architectural unique language of the city leads to the loss of unity in the built environment. In Al-Madina Al-Munawara corridor case many factors played role in this loss; all stockholders share a part; landowners soak to raise their land value by changing it from residential to commercial. Shop rentals focus on presenting their shop in a different way to stay close to brand names and to visually eye-catching. Building materials market helped in providing different material from outside our country. And above all decision maker didn't have a clear perspective and strict framework to prevent this chaos from occurring.

The local authorities besides all stakeholders should work all together to produce new development proposals, a new framework that promotes the high-quality design of streetscapes, parks and public and private buildings to reinforce Amman as comfortable, usable, beautiful and memorable city. New development strategies should try different place making approaches such as guidelines, pattern books that includes a variety of compatible design styles to allow developments to be consistent with the community's overall goals for urban design, while also providing flexibility and a range of choices for builders and developers.

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