International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 09 | Sep 2020 www.irjet.net p-ISSN: 2395-0072

Impact of Major Mosques on Urban Street Patterns; Why the Renaissance's Urban Rules must be Applied?

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Abstract - *Contemporary Arab urbanists argue that major mosques (Jawama'a) must be the centre of the urban entities and they must be the vista of major roads. This study aims at proving that such arguments have no local historic justification.*

Descriptive, analytical and comparative study methods are used to investigate major street patterns and their relationship to the major mosque and major urban magnets in historic Cairo around 1800. The two major cities in the Muslim world; historic Medina and Mecca were chosen to check the study results on historic Cairo.

None of the three historic cities showed a centralized position for their major mosques. The three major mosques showed clear physical integration within the urban context, were not vistas for major roads and presented no impact on major street patterns of the three historic cities. Meanwhile, other urban areas presented a stronger impact on major streets.

***Key Words*: Urban Design, Urban Studies, Governance Networks, Cairo, Medina, Mecca, Street Patterns.**

1. INTRODUCTION

A literature review presented by Cruceru (2011, pp.42–48) demonstrated different street patterns for different historic urbanizations eras. Such a presentation could lead to the generation of urban identity based upon a personal point of view. But one of the negativities of such interpretation is that it is 'centred on an individualistic perspective' (Bernardo and Palma-Oliveira, 2012), rather than a descriptive and practical one. It seems that Paris was long considered to be the template of the city, with its boulevards controlling the 'flow of traffic and commerce' (Jordan, 2015, p. 542; Panerai *et al.*, 2005).

In the Moslem world generally, and in Egypt especially, different arguments were presented in the last few decades for creating mosques as the centre of the urban structure and as urban magnets for street patterns. The author argues that this point of view needs historical justification. Because it misses the consistent theoretical and practical quantitative proves from local urbanization. Comprehending any city requires to account for what is specific for that city. That is, to treat every city as a unique urban entity (Yaneva, 2012, p. 88) and not to treat Paris as an urban role model unless it is proven quantitatively.

Imposing foreign urban identities on local urbanization and neglecting reading local authentic urban sign and symbols quantitatively, should be considered incorrect. Historic cities have developed their urban fabric over centuries, but streets are the most resilient morphological element compared with other urban elements. 'Therefore, streets can exert a powerful long-term influence on urban form' (Hajrasouliha and Yin, 2015, p. 2487).

Saad's (2018, 2017) studies introduced historic Cairo's spatial identity mainly, on the place or local level. Leaving questions concerning its global identity (in terms of the impact of major mosques on the major urban movement) unanswered.

The urban fabric and street pattern of historic Cairo were (and still are) sources for huge debate about their meanings. According to such debate, the characteristic of its traditional street patterns has been fundamentally labelled as 'unstructured' or 'amorphous' in association with it's being 'unplanned'. Meanwhile, 'neo-traditionalists would wish to replicate the currently back-in-favours quality of traditional patterns. But 'if these traditional settlements are to be held as exemplars, their structure deserves more scrutiny. Perhaps they are more "structured" than we have supposed' (Marshall, 2005, p. 133).

2. Hypothesis:

Creating mosques as focal points and magnets for the urban street structure, and as centres of residential entities and cities of the Muslim world is a nonlocal urban identity and has no local authentic justification.

3. Study Aims, Objective and Methods

This study aims at comprehending the authentic role played by major mosques (jawam'a) as urban magnets for movement and accessibility within major historic cities of the Arab-Muslim world and whether they represent a focal point for their street patterns on the global level or not?

Three major cities from the Arab-Muslim world were chosen for their vital urban and spiritual roles. The chosen cities have no historic existence before Muslim urbanization. Cairo was chosen because it was a major cultural, economic, political and commercial hub in the Muslim world (see Fig. 1&2). To test the validity of Cairo's study results, the two major cities of the Muslim world for their religious activities; the historic city of Mecca and Medina (KSA.) will be studied in terms of the impact of their major mosques on major street patterns (see Fig. 3&4). Since they have distinguished

emotional positions in the heart of the Muslims, it is supposed to find their mosques having a clear impact on their major street patterns, if the study hypnosis is wrong. Furthermore, the study will investigate the role of major urban areas (elements) in historic Cairo to pinpoint their impact on major streets.

Fig. 1: Cairo: urban fabric, the French Government,1810.

This study will adopt descriptive, analytical and comparative methods. Related literature will be used to comprehend the urban street pattern and structure, to categorize street types, levels and uses in the three historic cities and to analyze major mosque's role in attracting urban activities, movements, and functions. The earliest cartographic reliable material for the three cities will be analyzed in terms of their major street structure and brought into comparison to each other.

While the earliest map for Cairo was drawn ca. 1800, unfortunately, the earliest accurate cartographic material for the city of Medina and the city of Mecca was drawn in 1945. Meanwhile, Medina map was drawn after its first *percée* was created ca. 1915 by Fakhry Pasha, the military governor of the city (El-Kaaky, 2007).

Fig. 2: Cairo: street patterns in 1800, the author.

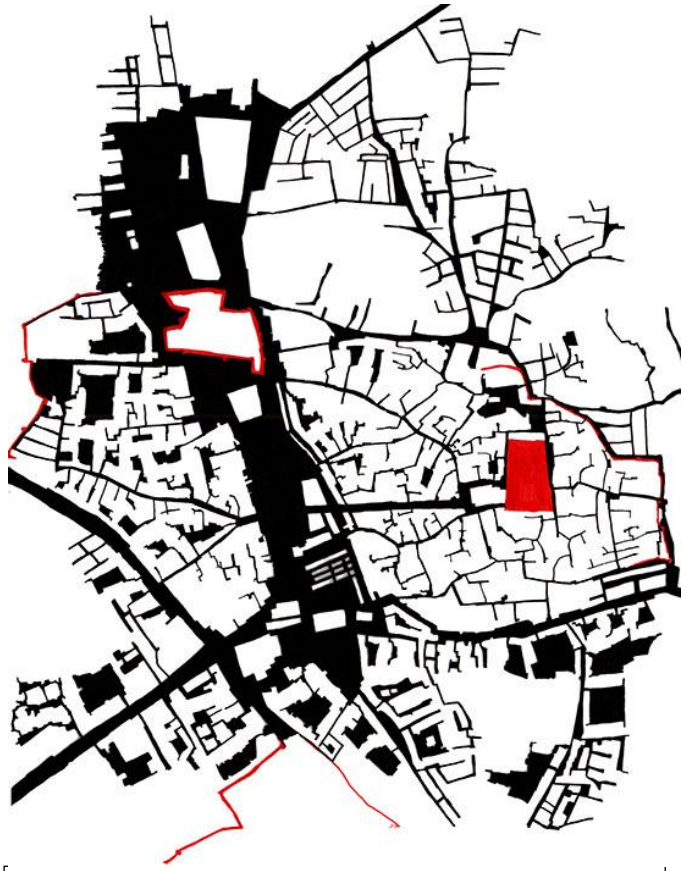

Fig. 3: Medina spatial component in 1945, the author.

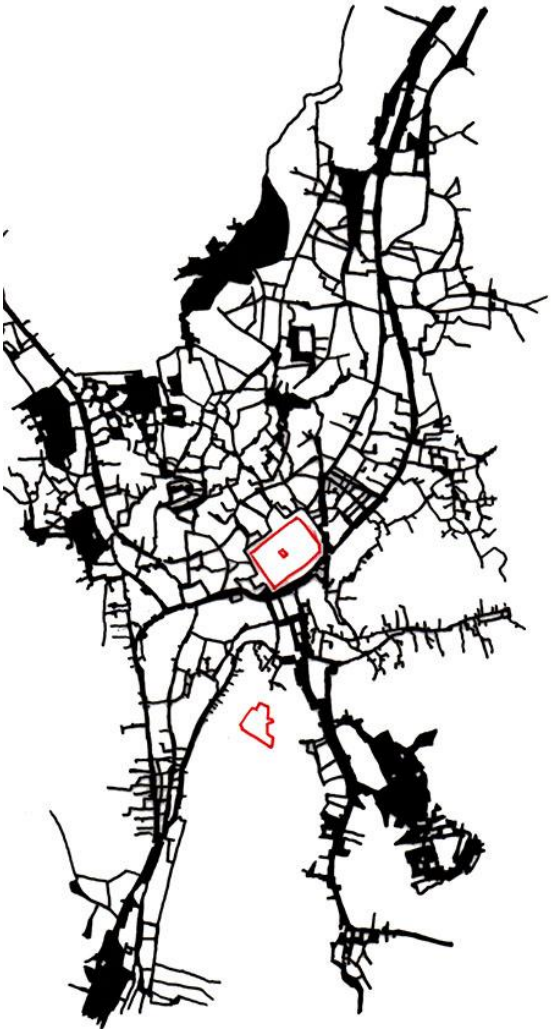

Fig. 4: Mecca spatial component in 1945, the author.

4. Major Street Patterns in Historic Cairo, Mecca, and Medina (Global Level)

The Visual investigation of the three cartographic maps suggests that none of the three major mosques in the three historic cities tends to become isolated structures. They were all physically integrated within their urban context.
Four major arterial roads were identified in historic Cairo and a fifth major arterial road existed during the city original stage -the Fatimid Cairo. This fifth arterial road connected a northern Cairo Gate with *El-Azhar* Mosque but vanished within the urban fabric decades later transforming itself to several medium arterial roads- before reaching the mosque (around 1400) (Al-Maqrizi, 1441), (see Fig. 5).

Three major arterial roads in historic Cairo presented a northern-southern direction including the city central major arterial road or as it was called *Azam* Street. The fourth major arterial road presented a western-eastern direction with a clear shift toward the southern-east area or the city citadel. Two of the northern-southern major arterial roads followed accurately, a river channel crossing the city, on both its sides (see Fig. 5 and 6).

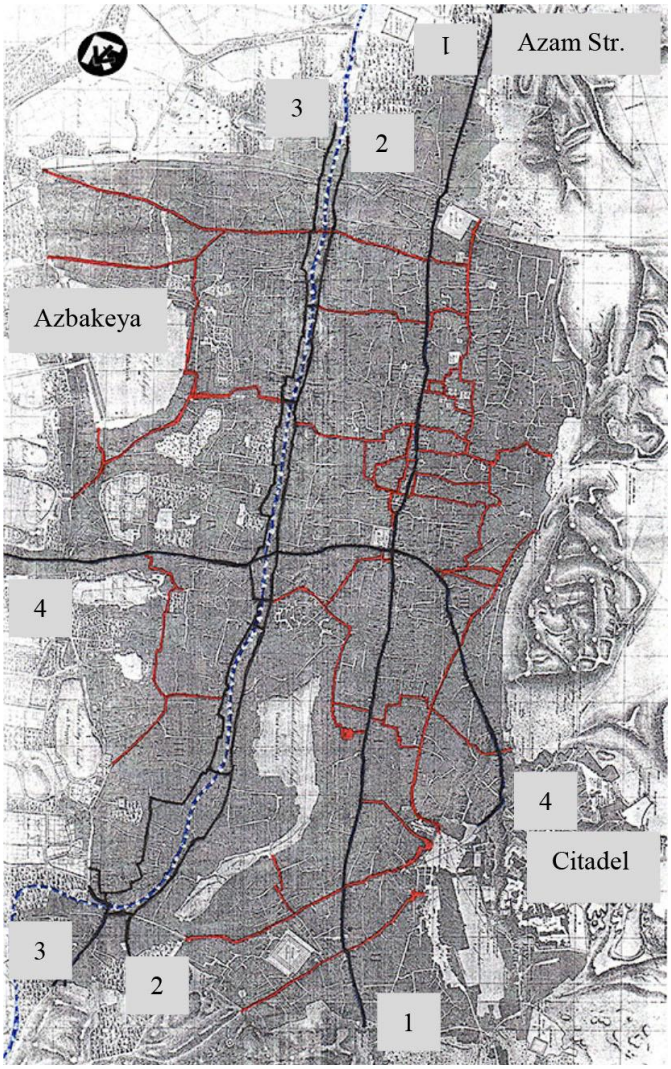

Fig. 5: Historic Cairo in 1800, Major and minor street pattern. (Major: blue), (Secondary: red), the author.

If continuity is taken as the number of links that a route is made up of, or length of a route measurement in links then, depth measures how distant a route is from a particular datum (Marshall, 2005, p. 120). Accordingly, the *Azam* Street demonstrated the highest degree of continuity but not to the extent of becoming a boulevard, and a high degree of locomotive permeability (Saad, 2007) but not to the extent of becoming a one-4483m-long linear space. Furthermore, *Azam* Street presented a high depth value related to *the Azhar* Mosque.
The two major arterial roads parallel to the river channel presented a low degree of continuity and higher depth values to *Azhar* Mosque. The river channel might have had its impact on its connectivity and continuity.

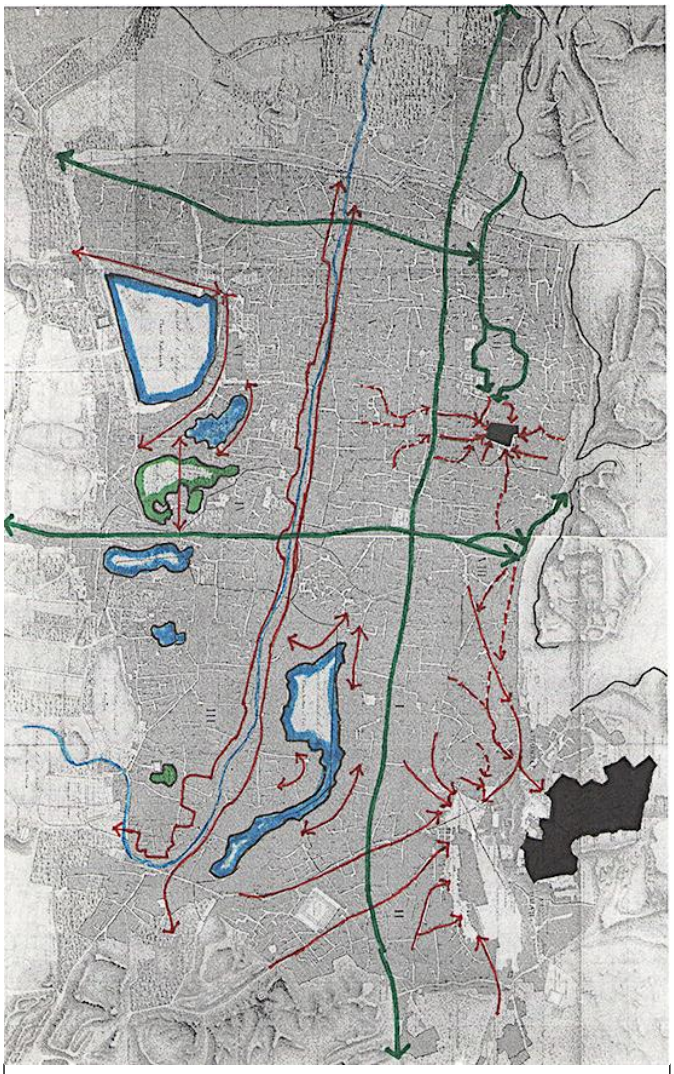

Fig. 6: Historic Cairo's major street patterns and its urban magnets, the author.

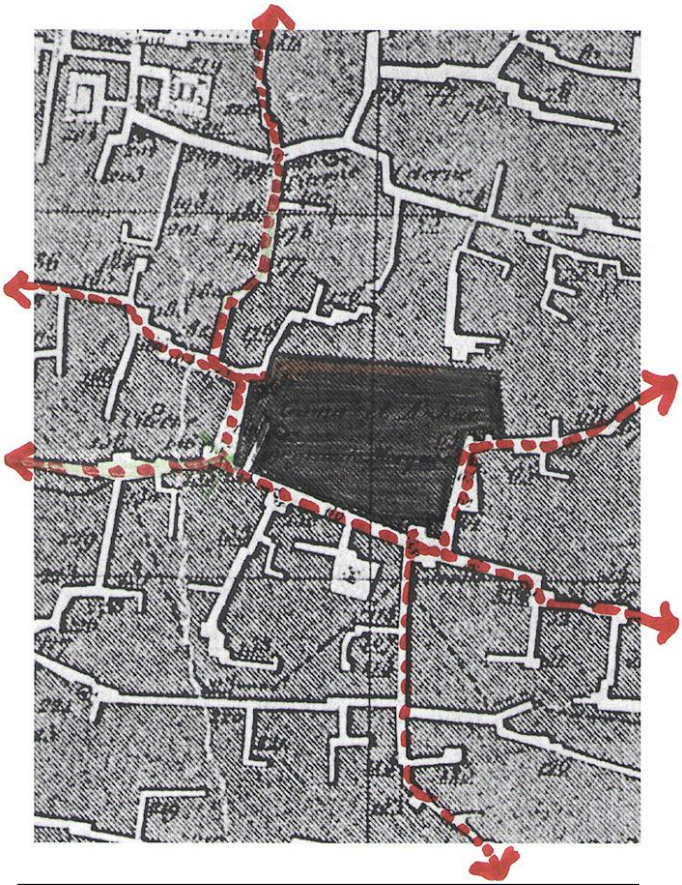

Fig. 7: *Azhar* Mosque in historic Cairo; a minor urban street magnet, the author.

Azhar Mosque (as the major Mosque in Cairo) occupied a decentralized position with a high depth value related to arterial roads and created a low impact on movement by directing minor arterial roads only, to its area (see Fig. 7). On the other hand, the city citadel area presented a high degree of impact on major movements by redirecting a major arterial road number 4 and directing several medium-level arterial roads toward it. Furthermore, a major lack in the northeast side of the city, called *Azbakeya* lack, presented a medium impact on the urban movement by redirecting several medium arterial roads and directing several minor ones to it (see Fig 6).

Investigating the impact of the two major mosques of Mecca and Medina on their street networks has proven similar results. Both major mosques did neither found a place in the city geometric centroid nor were visual vistas of major or medium arterial roads, (see Fig 8 and 9). Meanwhile, the area of the major mosque in Mecca -*el-Qa'aba* Mosque- presented the strongest degree of attraction to movements by directing several minor arterial roads and two major arterial roads but tangible to the mosque (see Fig 8 and 9). The major mosque in Medina -the prophet Mohammed Mosque- presented a low degree of physical impact in terms of attracting movement (see Fig. 10 and 11).

The roads network in Medina contained a minimum of 9 major arterial roads[i] None of them created a celebrative impact despite their continuity nature. Medina's major arterial roads presented from medium to high depth values related to the Prophet Mohammed Mosque. It could be argued that the rough terrain and topographic conditions of the natural context of Medina are responsible for the low degree of continuity of its major roads, but such argument is not valid as a cause for their high depth values (see Fig 3 and 10).

Historic Mecca accommodated the most spiritually important mosque in the Muslim world. It is surrounded by several hills, its natural context can be characterized also, as harsh and rough. The author was able to determine four major arterial roads only[ii] with a high degree of continuity but not to the extent of creating a Bulverde with celebrative visual impacts. Two of the major arterial roads only

presented low depth values, but they were tangible to *Qaaba's* Mosque, (see Fig 4 and 10).

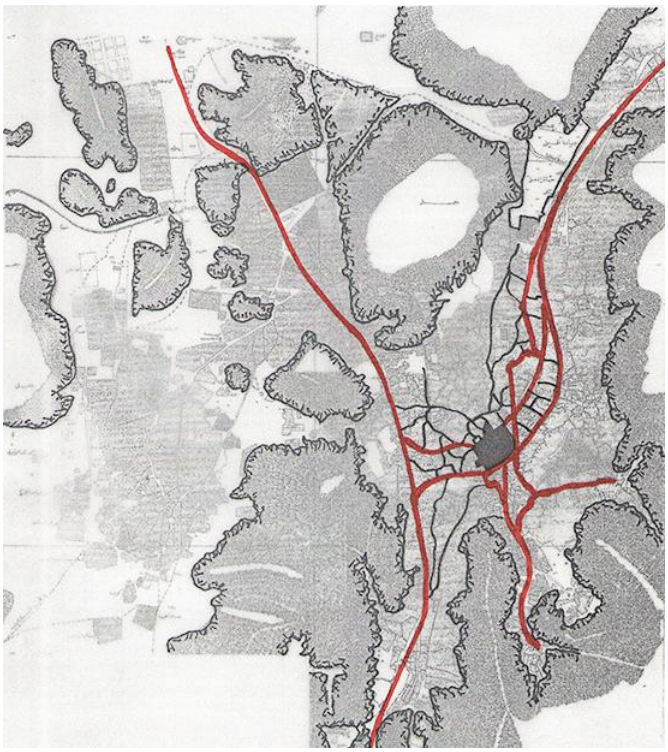

Fig. 8: Mecca's major street patterns and its urban magnets in 1945, the author.

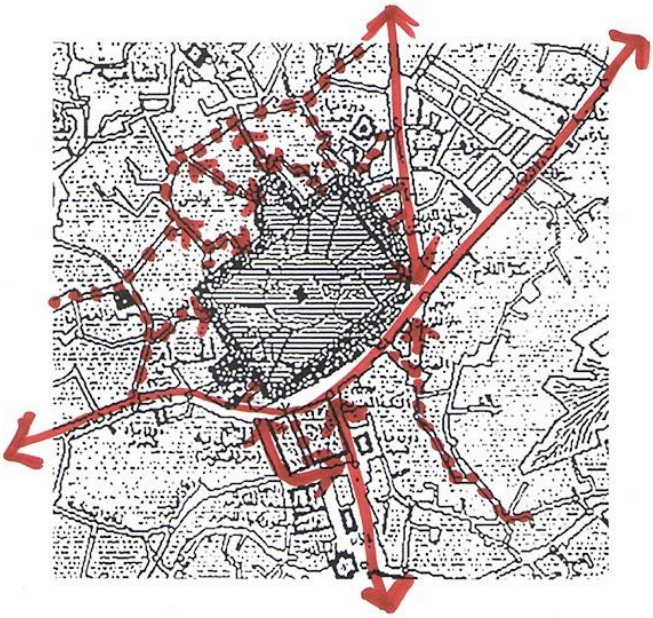

Fig. 9: *The mosque of Mecca*; a secondary and minor urban street magnet, the author.

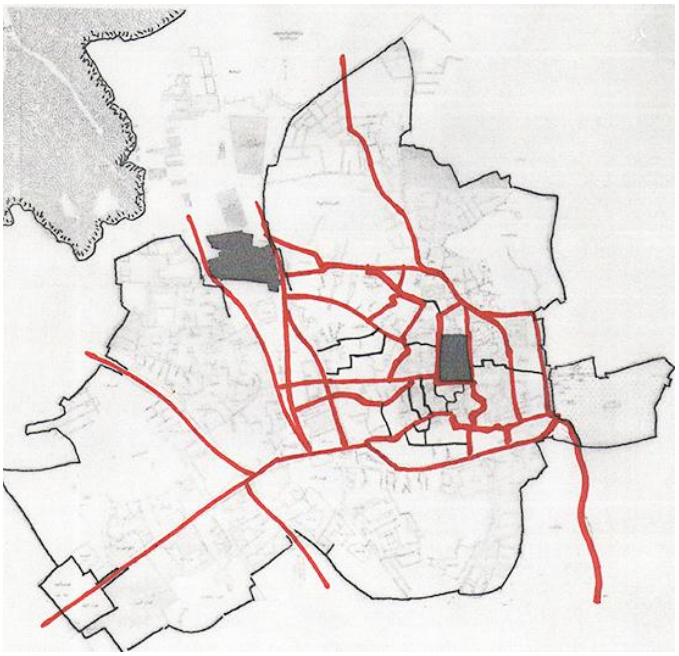

Fig. 10: Medina's major street patterns and its urban magnets in 1945, the author.

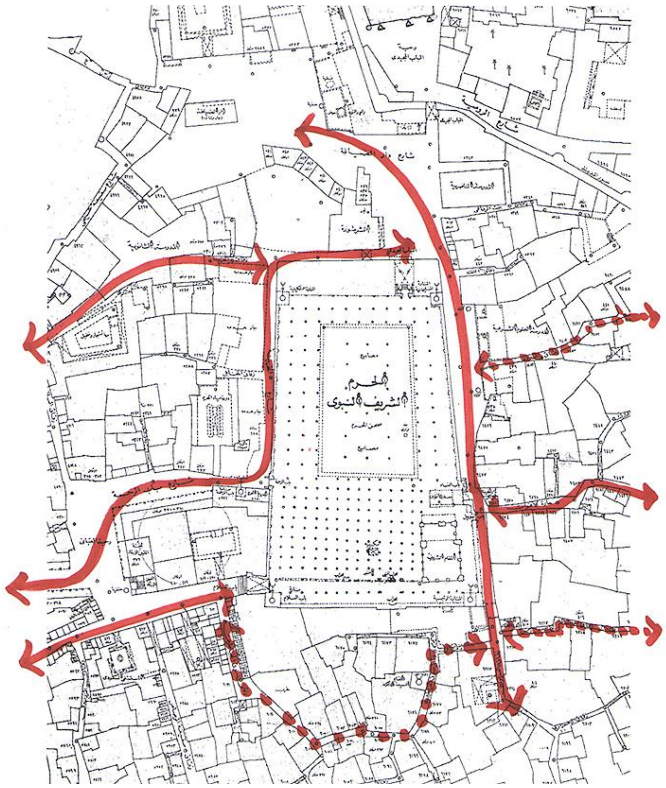

Fig. 11: *The Prophet Mohammed's mosque* in historic Medina; a minor urban street magnet, the author.

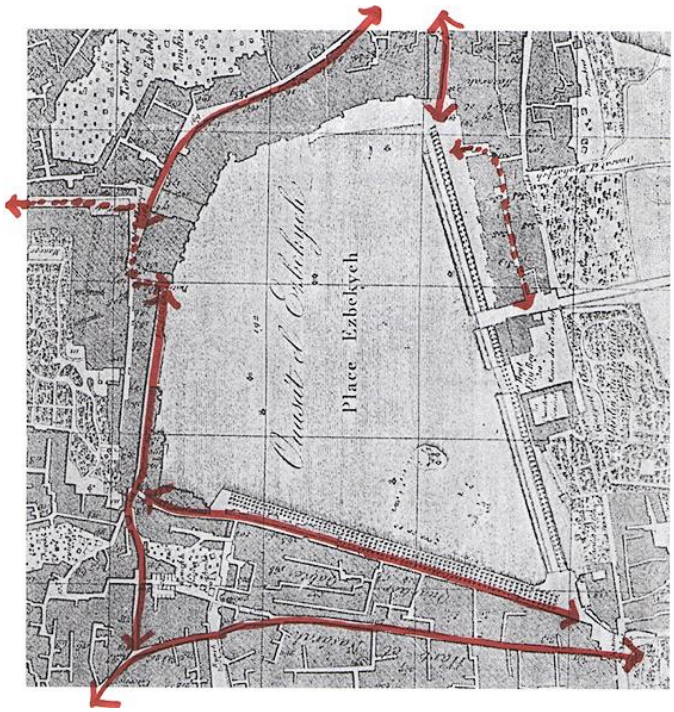

Fig. 12: *El-Azbakeya* area in historic Cairo; a secondary urban street magnet, the author.

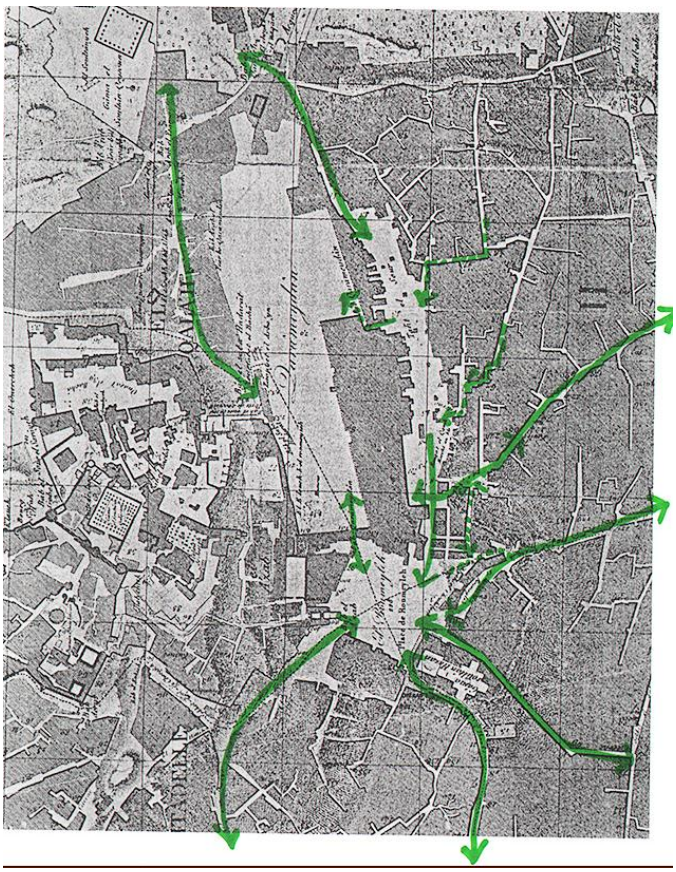

Fig. 13: Citadel area in historic Cairo; a major urban street magnet, the author.

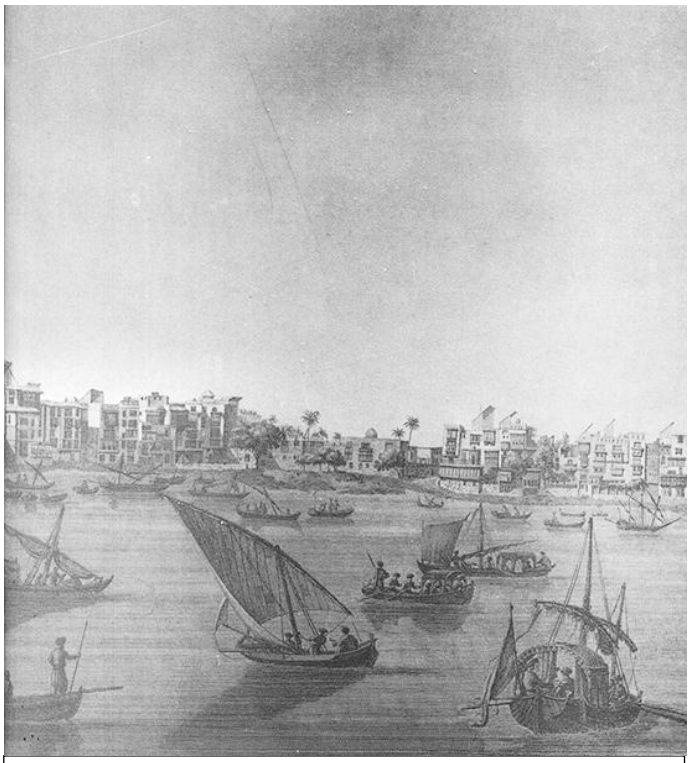

Fig. 14: *El-Azbakeya* Lack, the French Government, 1810.

4. Discussion

The study findings indicate that historic Cairo's arterial road patterns can be categorized into three groups. The categorization was made in terms of being affected by major urban elements. The three groups were found to be located in three urban areas. The *Azhar* Mosque area, the city citadel area, and *el-Azbakeya* lake area. The first area demonstrated an intimate visual impact on minor arterial roads and no impact at all on major streets. The second area demonstrated a high impact on a medium and major street with a visual celebrative character. The third area demonstrated a high impact on medium road types and no visual celebrative quality due to its recreational character and quality of its contextual urban fabric (see Fig. 11&12).

Cairo is originally built as a 'castle' or a '*Temenous*' (Hamdan, 1993) with a gridiron road pattern and a big quadrilateral plaza at its centre by the Calif palace (Abu-Lughod, 1965). A century later, both the gridiron road pattern and the regular plaza disappeared (Raymond, 2001). Can such transformation be considered random? Probably not, it will be a huge error if any assumption is made 'that this rejection of the grid is a random act. It is a rejection of regimentation' (Crawford 2005, n.p.).

Urban spaces are places in which the public would practice their collective activities. But such activities create conflict; the conflict between individuals, groups and/or the urban context itself. Because, conflicts within the city can be 'best understood as struggles that articulate rights to inhabit

space' (Routledge, 2010, p. 1167). Furthermore, streets are places in which people practice their rights to the city, thus, places and networks should no longer be considered as separate but interactive elements (Pflieger and Rozenblat, 2010, p. 2725).

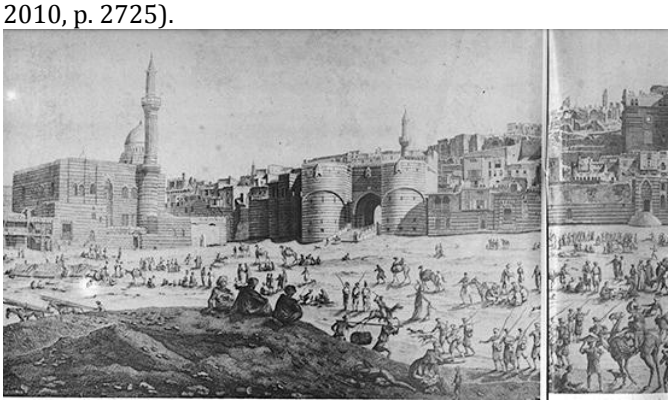

Fig. 15: Cairo Citadel, the French Government, 1810.

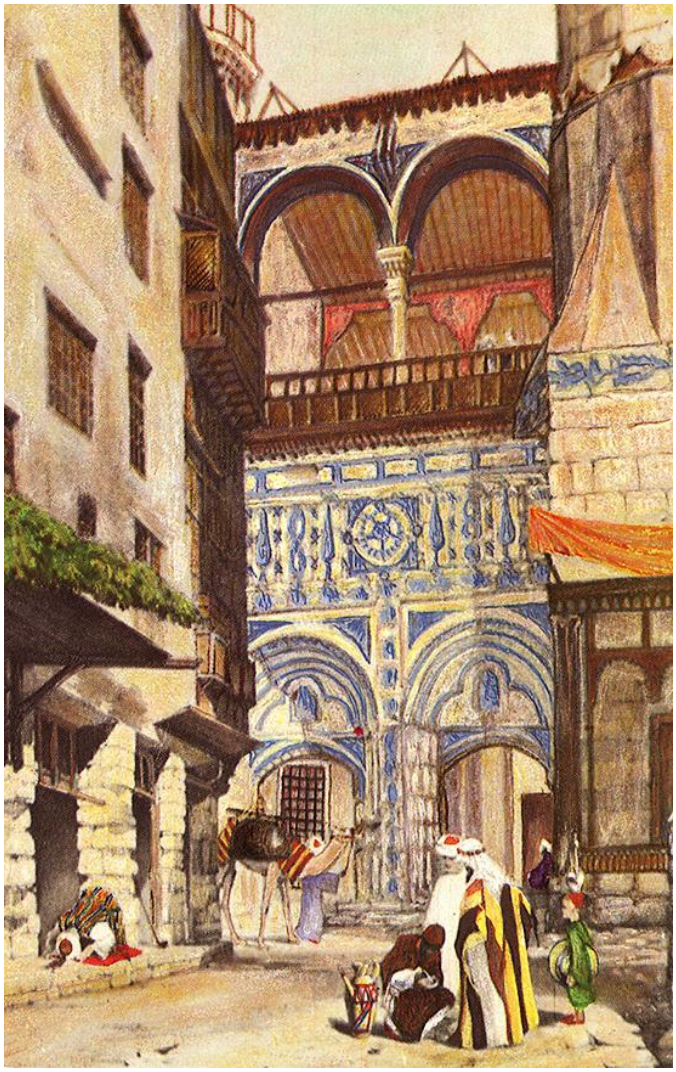

Fig. 16: El-Azhar Mosque's entrance and urban context, (Roberts, D. 1886).

Meanwhile, the place is the 'starting point from which a person tries to orient himself or herself' (Nojima, 2000, p. 2–56) in the city. Major streets in historic Cairo, Medina, and Mecca can be seen as such places, they are datum places, places from which people orient themselves through the city and places of collective struggles demonstration (Saad, 2018).

Major streets within the three historic cities presented different levels of continuities, connectivity, and depths. Each level generated -or have been generated by- different power networks reflecting local urban conflicts. The fact that the urban environment facilitates or limits receptors 'orientation in a city' (Long and Baran, 2012, p. 617), according to the type of urban domain and street type (Saad and Eysa, 2004), must have a direct impact on movements, which were affected by people collective activities. That helps to explain, how the city central major arterial road in historic Cairo was more physically affected by the economic activities of its markets rather than religious and cultural powers.

Al-Maqrizi (1441) and Raymond (2002) gave historical evidence that the citadel area (during the *Mamluk* (1250–1517) and Ottoman (1517–1798) eras) exhibited a residential area for the ruling military-political classes and their related urban activities. Furthermore, the biggest open urban area in historic Cairo found a place in the city citadel area and was usually used as a military practising and sporting field and as an open market for domestic animals (horses, donkeys, and camels). The high concentration of central nodes in the area could also, be comprehended as a political power demonstration (Saad, 2017) of 'local governing network level' (Pflieger and Rozenblat, 2010, p. 2725).

What Mitchell (1991, p. 63) called an 'appearance of order' seems not to exist in the three historic cities. On the other hand, it seems that there is a hidden urban order which dominated their urban morphology, growth, and zoning. This hidden order was created by the collective struggle and activities. Collective struggle and activities in historic Cairo, Medina, and Mecca created the situation that created the urban rules of its major street patterns, rather than being created by the rule itself (Hakim, 2001).

As Hiller (1996) pointed out that 'retailers and commercial uses appear in the more integrated parts of the city', the *Azam* Street presented the highest density in commercial services followed by other major streets and followed by minor arterial roads. But unlike the physical connectivity, 'where the actual physical distance matters, visual connectivity focuses more on the shape and geometry of the space, .., and how much they show or hide' (Hajrasouliha and Yin, 2015, pp. 2484–2485).

Since the physical structure and geometry of a space is its generating parameter, road structure in the three cities

reflected orientation and movements. Street patterns –as form and use- are the application of the governance network in place, since 'form is related to supply and use is related to demand' (Marshall, 2005, p. 55) in the three historic cities. The three historic City could be seen as the arrangement and integration of several urban elements, which are governed by cultural, social, and economic forces over a long period. To allow the struggle between urban elements to come to the state of equilibrium, major arterial roads pattern in the three historic cities were created. Because consumers of such urban service (the road pattern) will create demand if they were satisfied with the urban good. Meanwhile, decision-making reflects the outcome of the collective struggle and shapes the urban space. Thus, the shape and form of a road in historic Cairo, Medina, and Mecca were the direct cumulative respond for the consumers' satisfaction.

El-Azbakeya lack in historic Cairo hosted entertainment activities during different national and local occasions for the city's residents. It seems that the area also accommodated economic and social Cairene elites during the Mamluk, Ottoman eras (Al-Jabarti, 1930; Al-Maqrizi, 1441) and French high officers during the French occupation of Egypt (1798-1801), (see Fig. 14) (The French Government, 1809). It is important to notice that the three cities; Cairo, Medina, and Mecca presented the same urban products: a physical decentralization of their major mosques in relationship to the urban mass and the same type of impacts on street patterns (compare Fig. 7, 9, 11, 15 and 16). Such similarity could not be considered as a coincidence, rather than a conscious decision from the Muslim in their historic cities reflecting their 'right to their city' (Lefebvre, 1968). Hence, this similarity contradicts the common belief that the mosque must be the centre of the Muslim city.

Christopher Alexander (1987, p. 37) suggests a bottom-up approach to design and creation of urban form, from which the large-scale order will emerge. Such bottom-up creation of urban form can be responsible for the form of the street pattern in the three historic cities; Cairo, Medina, and Mecca. By linking places to 'a series of extensive economic, political and cultural networks' (Routledge, 2010, p. 1167), such bottom-up generation in the three historic cities was the result of collective struggle which produced urban form and street patterns.

Since historic Cairo was not 'enframed', nor was built to be seen from maps (Mitchell, 1991), unlike Paris, no double network of street and 'monumental buildings' (Panerai *et al.* 2005) were presented, neither in historic Mecca nor in Medina. The imposed large-scale order in the three historic cities did not present strong visual domination or physical centralization of their major Mosques.

5. CONCLUSIONS

The study findings indicate clearly that, the impact of political, recreational and economic forces on major road patterns were strongly demonstrated in historic Cairo, rather than religious force.

Struggle over resources and public spaces, are also struggles over processes such as decision-making. If the street pattern is seen as urban goods, then they must have responded to such a struggle.

Because, street patterns were subjected to local demands and needs; when the economic demand in the city major arterial road in historic Cairo was the dominant power in the network, the urban form responded positively. And when the political power dominated the city citadel area the urban form responded also positively. On the other hand, it seems that there was no demand imposed by religious forces on major streets in historic Cairo, Medina, and Mecca.,

The needs and demands of the city residents for urban products accommodating recreational activities in the city created a clear medium impact on its arterial roads leading to el-*Azbakeya* lack.

It is very interesting to notice the different impacts of *Azhar* Mosque, the city citadel area and *el-Azbakeya* area on the urban road structure of historic Cairo. The strongest of them all was the city citadel area, *el-Azbakeya* area came second and *Azhar* area came third. It could be argued that besides the political power in the city citadel area, economic power struggled for creating demand for such type of street patterns and urban spaces.

Cairo, Medina, and Mecca presented different power identities, but the domination of religious power was not among them.

The major arterial road patterns of the three cities presented no indication of visual celebrity. Furthermore, the three major Mosques presented no visual vista for major and medium arterial roads.

None of three major mosques presented a real impact on major and medium levels of road patterns -or the kind of impact contemporary Arab urbanists are implying.

The three major mosques of the three major historic cities in the Arab-Muslim world presented decentralization. The three historic cities presented a clear attitude for integrating major religious structures into the urban ensemble. Such integration can be seen as a response to the local governance network created by needs and supply as forms and uses.

The impact of *the Azhar* Mosque in historic Cairo was limited to its close contextual urban functions rather than the city major street patterns, as well as the Prophet Mohammed Mosque.

Political, recreational and economic forces in historic Cairo presented clear impacts on street patterns. But the first two

forces occupied marginal urban areas of the city, and the third force occupied its central urban heart.

The major mosque should not be the centre of the city nor a vista for its street pattern if major historic cities of the Arab-Muslim world are to be taken as exemplars.

It seems that natural elements in the three historic cities have had stronger impacts on street patterns than the man-made environment, especially, on the local levels.

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[i] It must be noted that the author was unable to determine the exact number of major roads in Medina since he could not find enough data about the function and activities in the city roads.

[ii] It must be noted that the author was unable to determine the exact number of major roads in Mecca since he could not find enough data about the function and activities in the city roads.