

## #124

### TOURIST- TRAIL DESIGN:

The interpretation qualities of built heritage as a motivating force for tourist's route choice behaviour, Turkish Town, Alexandria, Egypt Case

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#### ABSTRACT

Cultural tourism is one of the largest and fastest-growing global tourism markets that reveal new political, economic and social opportunities for the development of cities. The central challenge in linking culture and tourism lies in reconstructing the past in the through 'interpretation'. It is defined as a process of communicating to people the significance of a place through stimulating their understanding. Different approaches could be used to achieve this goal. A Tourist trail is one of the convenient approaches for realizing interpretation. It is an essential tool for enhancing tourists' experience and appreciation of old heritage by revealing the quality of a place. Both physical and non-physical aspects of cultural areas play a key role in supporting the interpretation qualities of the heritage trail. However, the design of tourist trails is directly affected by the qualities of the built environment which determine the choice of pedestrian route. This is considered to be the main concern of this research.

This paper poses the question of how to design tourist trail based on examining the relation between the built heritage qualities and the tourists' route choice behaviour. It applies its approach to the Turkish Town – a historical part of the City of Alexandria - as a well-defined conservation area in the City. To answer the paper's question, a hypothesis was designed, taking in consideration the qualities that is responsible for enhancing interpretation, and managing tourist's experiences of place. Thus, the research follows a methodology comprised of a number of stages. The first stage investigates the qualities of the built heritage that have a direct effect on tourist's route choices. This is done to extract a number of criteria used as a benchmark for the analysis process. The second stage applies these criteria to the selected historical urban pattern. This is achieved through two analytical methods used during the evaluation process. The first method is the Space Syntax Theory to measure spatial configuration of urban spaces using both angular segment analysis and visibility graph analysis (VGA). The second method is a detailed field survey to examine each street segment's characteristics, objectively, in terms of its physical features.

The research ends by performing data manipulations and analysis to propose optimal routes with interpretation qualities that facilitate tourists' navigation in the area as well as manage their experience. The preliminary findings imply the importance of using computer aided analytical tools as decision support systems for designing and manipulating tourist trails based on the built heritage qualities

## KEYWORDS

Cultural tourism, Tourist trail, Route choice behaviour, Built environment, street configuration, Turkish Town

## 1. INTRODUCTION

Heritage interpretation is considered one of the principle methods of enhancing the identity of a place and people's sense of it. It can be achieved through planned and designed interpretation that has the potential to convey a deeper understanding and appreciation of time and place (Uzzell, 1996). From various studies of interpretation, the idea of "notion of a place", as an appropriate way to consider the relationship between people, their experience and the site being interpreted, has emerged. Steward (1998), for example, conducted a study on the Sense of a Place Theory to develop a new approach to evaluate interpretation (Stewart et al., 1998). Similarly, Uzzell (1996) concluded the importance of Place Identity Theory to achieve place interpretation (Uzzell, 1996). In this regard, it was found that 'place' is considered to be a valuable aspect in studying heritage interpretation.

In order to reveal a place's characteristics, various approaches can be devised. Tourist trail is one of these approaches that realize interpretation (Al-hagla, 2010). It can be defined as "the purposeful or interpreted route that draws on the natural or cultural heritage of an area to provide an educational experience that will enhance visitor enjoyment" (Silbergh et al., 1994). Many studies have discussed the role of tourist trail interpretation, which is perceived as an essential tool for achieving sustainable development objectives (Al-Matarneh, 2015). Regarding the scope of this study, tourist trail interpretation has adopted the role of enhancing tourists' experience through exploring, understanding and appreciating old heritage.

Experience is central in tourist trail design (Mansouri & Ujang, 2016). Therefore, it is essential to study the trail as a whole experience which enables to imply a value that is greater than the sum of its parts. So, tourist trail can contribute to a cultural asset by offering a number of shared experiences and characteristics (Anon., 2008). In order to manage this experience, this study has focused on regarding built heritage as an important dimension in analysing tourists' experiences.

Therefore, investigating the facets of built heritage, as a motivating force for designing tourist trail and managing the aforementioned tourist experience, has been considered as the main study concern with an emphasis on those built heritage qualities related to route choice behaviour. In other words, this study has attempted to examine how investigating qualities related to the built heritage could contribute to formulating CRITERIA to design multiple tourist routes. In order to investigate these qualities, the study has proposed a number of tools and methodologies to understand the urban form of the area being studied, for which the Space Syntax method has been utilized. Data obtained from the analysis emphasized the important of this computer aided analytical tool for designing and manipulating tourist routes. It also suggested that this design process requires the integration of other built heritage aspects in order to achieve interpretation qualities.

## 2. DATASETS AND METHODS

According to this study, a tourist trail can be defined as a designed route that is responsible for enhancing the interpretation qualities of a built heritage and managing tourists' experiences of a place. There is a considerable body of literature on tourists' place experience formation

in cultural areas (Kubat et al., 2012; Salat, 2010; Mohareb, 2003 and Kubat, 1999). This related literature emphasized that built heritage, as a main determinant of tourists' experience, is a complex environment which requires a multilayered description of its spatial form (Kubat et al., 2012). First, the literature underlined the essential role of street network configuration to reflect tourists' route choice behavior from the urban morphological perspective. The configurational approach has been adopted in order to pinpoint how the built form in terms of both its connectivity and visibility patterns could affect the spatial experience in touristic spaces. In this regard, Space Syntax Analysis is considered appropriate in order to examine the relations between street network configurations and tourists' route choices (Hillier & Iida, 2005). Space Syntax also examines these relations at diverse scales from local to global. This multi scale defines space, not only by its surrounding structure, but also by how it is embedded in the larger system (Hillier & Hanson, 1984). On the other hand, tourists' spatial experience is related to the local visual street qualities and not limited to the overall connections of its spatial structure (Argin & Ozbil, 2015; Erem & Gür, 2007). Physical characteristics of a built heritage that determine its visual qualities can affect tourists' experience as they impact a tourist's perception of space (Ewing & Handy, 2009).

So, the study investigated mainly the spatial and visual qualities of the selected built heritage in order to design its tourist trail. An analysis process has been adapted to the selected urban pattern through applying a number of theories and methodologies:

- Spatial analysis to examine the street configuration qualities by applying the Space Syntax Theory as an analytical tool. Visual connectivity analysis, choice and integration analyses at the variable radius of 2000.0, 800.0, 200.0 m have been applied.
- Visual analysis based on the three concepts stated by Gordon Cullen in his publication 'THE CONCISE TOWNSCAPE': optics, place and content to investigate initially the main visual qualities of the study area. From this analysis, the study has considered three urban design qualities: Complexity, Enclosure and Human Scale as the main determinants of tourists' visual experience.

### Measures:

According to this study, two different sets of measures have been considered. First, concerning the spatial analysis, the application of the Space Syntax Methodology as an analytical tool has contributed to evaluating those configuration properties using a set of techniques. This study chose to examine those configuration properties in terms of both visibility and connectivity patterns to determine how the structure of an urban pattern could affect route choice behaviour. Both visibility and connectivity analyses have been performed using depthmapX; a multi-platform software created by Alasdair Turner and further developed by Tasos Varoudis. Regarding the visibility patterns, visibility graph analysis technique has been adopted to examine how visual properties affect tourists' route choice behaviour through the complex fabric of the study area by imposing a grid onto a space and using it to measure the relative mutual visibility among each of the squares that compose such a grid (Turner, 2001). On the other hand, connectivity patterns capture the overall connections that are given to a person through his navigation and quantifies to what extent a space is directly or indirectly connected to other spaces (Peponis et al., 1990). The basis of analysis according to this study was angular segment analysis assigned to relations between adjacent segments in terms of the least angular change between all pairs of nodes (Hillier & Iida, 2005). The syntactic measures of angular choice and integration were used as the main determinants of the through and to movement potentials. This has been applied at the various metric radiuses of 2000.0, 800.0 and 200.0 m to capture the spatial qualities at different scales.

Second, concerning the visual analysis, street segments that comprise the selected study area have been audited through a detailed on-site observation in terms of the physical features that characterize its built environment. The study has determined three urban design qualities: Complexity, Enclosure and Human Scale to describe how a tourist perceives the surrounding built environment. To measure those subjective qualities, the study has adopted one of the attempts conducted by Ewing and Handy (2009) to objectively measure the subjective qualities

of a walking environment. According to Ewing and Handy, this could be achieved by linking specific physical features, rated by a panel of experts and provided by empirical evidence, to five perceptual urban design qualities stated in urban design literature: Imageability, Enclosure, Human Scale, Transparency and Complexity (Ewing & Handy, 2009).

## 2.2 DEFINING THE APPLIED CRITERIA

Table 1 illustrated the formation of the applied criteria and their related measures. After

	Criteria		Measuring Tools and Methods
Tourist Trail design	Spatial qualities	Examining street network configuration in terms of both :  - Visibility patterns  - Connectivity patterns	Adopting Space Syntax Methodology:  -Visibility Graph Analysis (VGA)  -Angular segment choice R:2000.0, 800.0, 200.0 m  -Angular segment integration R:2000.0, 800.0, 200.0 m Software: DepthmapX
	Visual qualities	Examining three subjective urban design qualities:  - Complexity, Enclosure and Human Scale	-Detailed on-site observation: measured by adopting Ewing and Handy's study

Table 1 - Representing the formation of the applied criteria

applying the aforementioned criteria to the selected area, a number of streets were highlighted after getting the highest values for one or more of the applied criteria. In addition, the study has adopted data analysis in order to investigate how each street could correspond with the other criteria. The study ended by conducting data manipulation in order to design the optimal route. According to this study, the designed optimal route needs to adopt the following considerations. First, it has to consider the integration between the components of the defined criteria; the main determinants of the interpretation qualities stated by the study. Second, the route should create a linkage between global and local qualities, both spatially and visually, by enhancing its internal structure and connecting it to its wider context.

## 3. THE STUDY AREA

### Morphological evolution of the Turkish town:

The Turkish Town (Al-Gommrok District) is considered to be one of the oldest inhabited settlements in the City of Alexandria. Therefore, it retains many values and potentials. The historical evolution of the study area has affected its urban pattern. Starting from the Ptolemaic reign (332 B.C. – 30 B.C.), the area was characterized by its rectangular street pattern divided by two main streets: the Canobic Street running from east to west (El- Hurreya Street now) and Some Street from north to south (El-Nabi Daniel Street now). In addition, there was the Heptastadion, linking Pharos island to the mainland creating the eastern and western harbours (Meskens, 2010). During the Roman Empire, the area was extended to the east. Then, in general, walls were built enclosing small areas of Alexandria in the Arab City. By the beginning of the Ottoman reign in 1517 A.D., the area was characterized by a certain degree of irregularity in terms of its street pattern, which was created by a variety of buildings located in different positions and at different angles from one another. This pattern reflected the introverted lifestyle, which characterized the Turkish Town's social life, paying tribute to the Islamic concept of division between public and private spaces (Kubat, 2010). This could be observed in the hierarchical order of streets that can be classified as follows: Shariah serves as a main street, Harah serves as a secondary street and forms the first community unit, Atfa represents the link between a main street and Harah, and Zuqaq which leads directly to a house's private entrance (Ahmadi et al., 2012). The modern city also affected Turkish Town by enlarging France Street in the 20th

century and creating El-Nasr Street to link the East and West harbours (Hanafi, 1993). In this regard, social, economic and political evolutions of Turkish Town have affected its physical urban fabric and also contributed to a complex pattern characterized by the above-mentioned process of development.

#### **The selected area:**

The selected area is embedded within a rich cultural and historical heritage location of the Turkish Town (Figure 1). Its spatial layout is comprised mainly of the three main zones which characterize the Turkish urban pattern:

1. A residential zone, which comprises the majority of this area and is characterized by a complex pattern. It reflects the introverted lifestyle of the Turkish Town. The "Harah" is considered the social unit, which identifies the residential zone. It also has its own integrity and is enclosed while maintaining spaces linking it to the spatial order.
2. A commercial zone classified into commercial buildings, urban markets and other trading areas. Commercial buildings, known as "Wekalahs", serve as dual purpose buildings; their ground floors were used for commercial activities and their upper floors were considered residential units for merchants e.g. Wekalat El-Lamoun and Wekalat Fatma Khatoun. Urban markets have a variety of commercial goods. The Turkish market or "Souq" is organized into commercial corridors which specialize in textile, spices, embroidery and jewellery. Examples include Souq El- Khayateen (the tailors' market), Souq El- Attarin, Souq El-Akkadin and Souq El-Magharba. In addition, Zanket El-Setat (Women's Squeeze) is a narrow market selling haberdashery, accessories, cosmetics, lingerie, cloth and curtains. Other trading areas include the food trade section in Souq El-Midan Street, one of the principle thoroughfares of the Turkish Town.
3. Religious buildings or mosques are mainly integrated within the commercial zone and are totally segregated from the residential one. Most mosques have followed the Turkish pattern e.g. Terbana Mosque and El-Shurbagi Mosque located in the main thoroughfares and El-Ardi Mosque and El- Senanya Mosque integrated with the Turkish Souq.

## **4. THE APPLIED CRITERIA**

### **4.1 SPATIAL QUALITIES**

Space Syntax Theory has been adopted to conduct a spatial structure analysis for the Turkish Town. Syntactic measures can be described as an index required for legible orientation through an area. In order to investigate which measures were more related to route choice behaviour, especially those that can describe tourists' movement patterns, the research has examined previous studies that conducted experimental research to identify navigation choices. First, a study conducted by Kubat et al. (2012), which contributed to a better description of tourists' movement patterns in the Historical Peninsula in Istanbul, by clarifying the inter-relation between spatial configuration of its urban fabric and visitors' way finding paths. This was done by recording first time visitors' search patterns. This experiment concluded that the average visual connectivity is the strongest determinant of search patterns, particularly while walking through unfamiliar surroundings (Kubat et al., 2012). Then, concerning the configuration measures of the angular segment map, many studies adopted the syntactic measures of integration and choice as major determinants of tourist movement behaviour (Hillier & Iida, 2005). One of the attempts was presented by Argin and Ozbil (2015) which emphasized the importance of the choice variable at global and local scales in describing route choice behaviour (Argin & Ozbil, 2015). In another study, Li et al (2016) investigated the role of spatial configuration of street networks in understanding tourists' spaces and their preferences in the case of Gulangya, China. This study stated that global integration represents whether spaces are easily accessible or not, while local integration indicates spaces' vitality and attractiveness. Places that manage to balance between local and global integration can become hot tourist spots (Li et al., 2016). So, a spatial analysis has been conducted, for the sake of this research, in terms of both visual



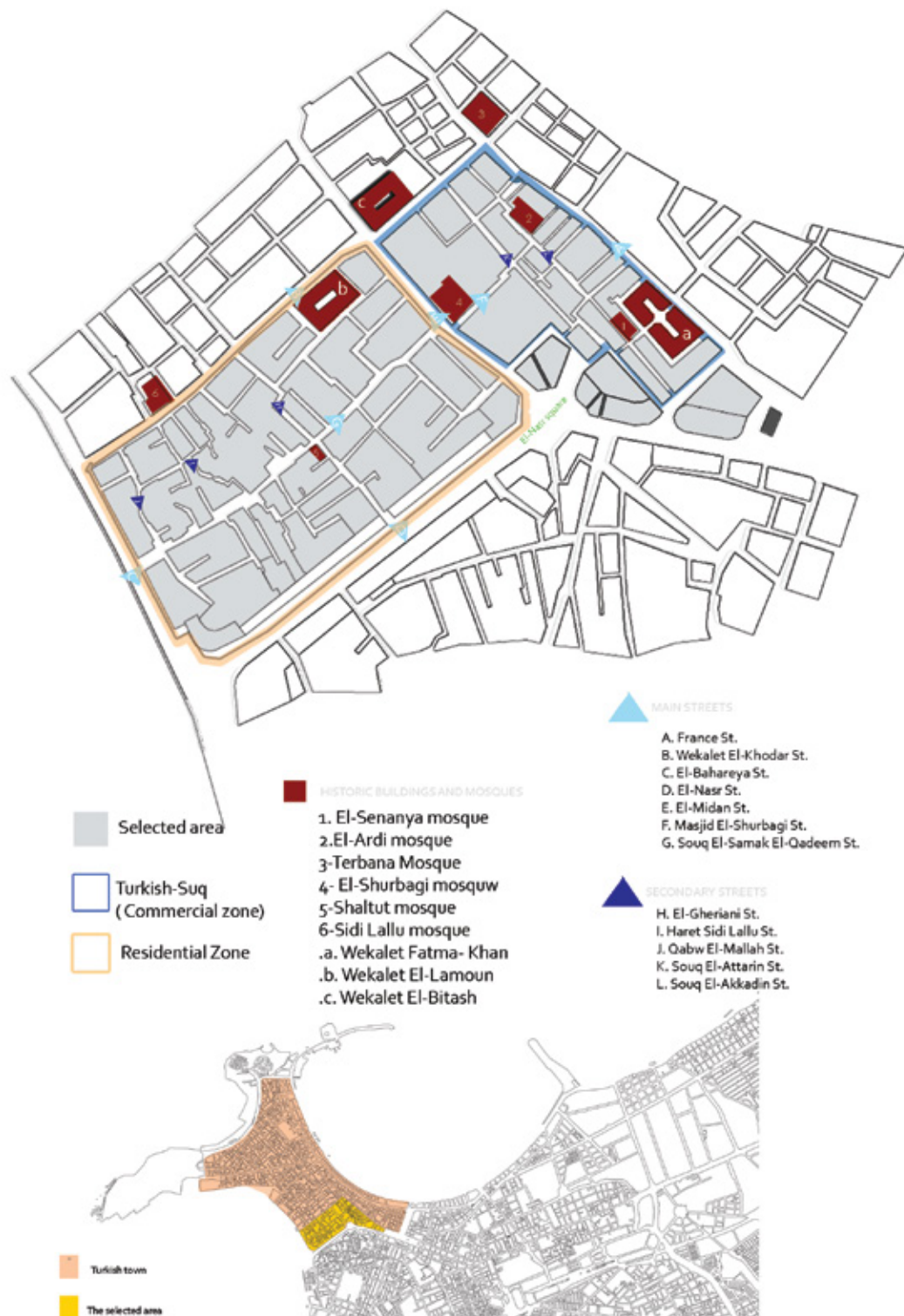


Figure 1 - The study area- representing its context

connectivity analysis and angular segment analysis (choice and integration).

#### 4.1.1 VGA (VISUAL CONNECTIVITY):

Figure 2 illustrates a VGA for all accessible spaces on a spaced grid of 1 m. Visual connectivity analysis is used as a local measure capturing the amount of spaces directly visible from each node. The analysis indicated that El-Nasr Square has the advantage of high visual connectivity. This means that it has the highest number of spaces connected to it. It also presents multi-directional fields of view due to its domination. El-Midan Street, in close proximity to El-Nasr Square, also showed high visual connectivity. However, El-Nasr Street connecting El-Nasr Square and the open space facing the gate leading to the port of Alexandria was chosen as the main focus of the area due to its high visual connectivity. As we move through the residential zone, spaces become gradually more clustered through hierarchal thoroughfares. The *zuqaq* was recorded as being the element with the least visual connectivity.



Figure 2 - Visual connectivity analysis of the study area

#### 4.1.2 ANGULAR SEGMENT ANALYSIS (CHOICE – INTEGRATION)

The study used a variable radius of 2000.0, 800.0, 200.0 m. Using a small scale of '200.0 m', which is less than the commonly known local scale radius of 400.0 m (5 min walk) is due to the fine grain fabric which is relevant to the context of Alexandria and especially the Turkish Town. On the other hand, adopting the scale of 2000.0 m identified the main streets at the city-wide scale.

As illustrated in Figure 3, Choice R800.0 m, a measure for capturing the possibility of the space being selected by a navigator within the predetermined radius, indicated the hierarchal order of streets. As such, main thoroughfares had the advantage of a high value for choice. As the streets got clustered, "Zuqaqs" showed the smallest values. This measure highlighted the area's main axis. El-Midan Street, Souq Elsamak Elqadeem Street and Wekalet El-Khodar Street recorded the highest choice values. On the other hand, choice 200.0 m highlighted street segments that comprise the Turkish Souq. Masjid El-Shurbagi Street connecting the Turkish

Souq and El-Midan Street and Souq El-Attarin Street recorded the highest value of choice R: 200.0 m. In addition, the axis penetrating Wekalet -Fatma Khan, connecting most of the Turkish Souq's street segments was chosen as a leading axis. Accessible streets penetrating the residential zone, which lead directly to main thoroughfares e.g. Sidi Lallu, Street connecting Wekalet El-Khodar and Souq Elsamak Elqadeem Street, showed high local choice value as most of the streets that comprise the residential zone are cul-de sacs. Regarding choice 2000.0 m, El-Midan Street and Ras Al-Tin Street presented the top highest through movement potentials (Figure 4).

As shown in Figure 3, El-Midan Street recorded the highest integration value at R: 800.0 m. This indicated that core movements are supposed to take place through El-Midan Street. Regarding integration R: 200.0 m, the highest values were found in El-Midan Street and in street segments which are in close proximity to it from the Turksih Souq side, such as El-Shurbagi Street and the upper part of Souq El-Attarin Street (linking the Turksih Souq and Wekalet El-khodar Street). Integration at R: 2000.0 m highlighted El- Horreya Street as the main spine of the city. It also featured Ahmed Ourabi Street; the linkage between El- Horreya Street and the study area (Figure 4). From this analysis, the study has recorded streets that have the advantage of through-movement and to-movement; the two fundamental elements in human movement (Hillier & Iida, 2005; Li et al., 2016).

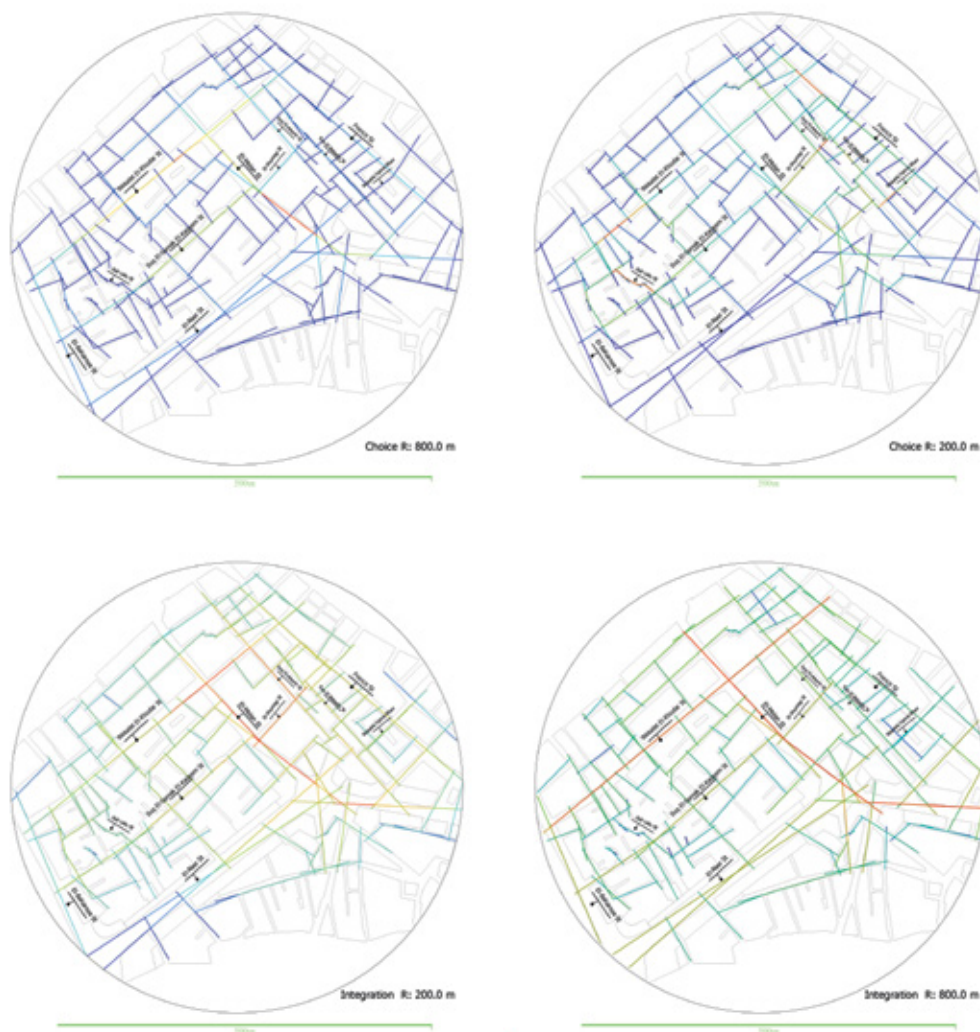


Figure 3 - (Top) Angular choice analysis (Choice R: 800.0, 200.0), (Bottom) Angular Integration analysis (Integration R: 800.0, 200.0)



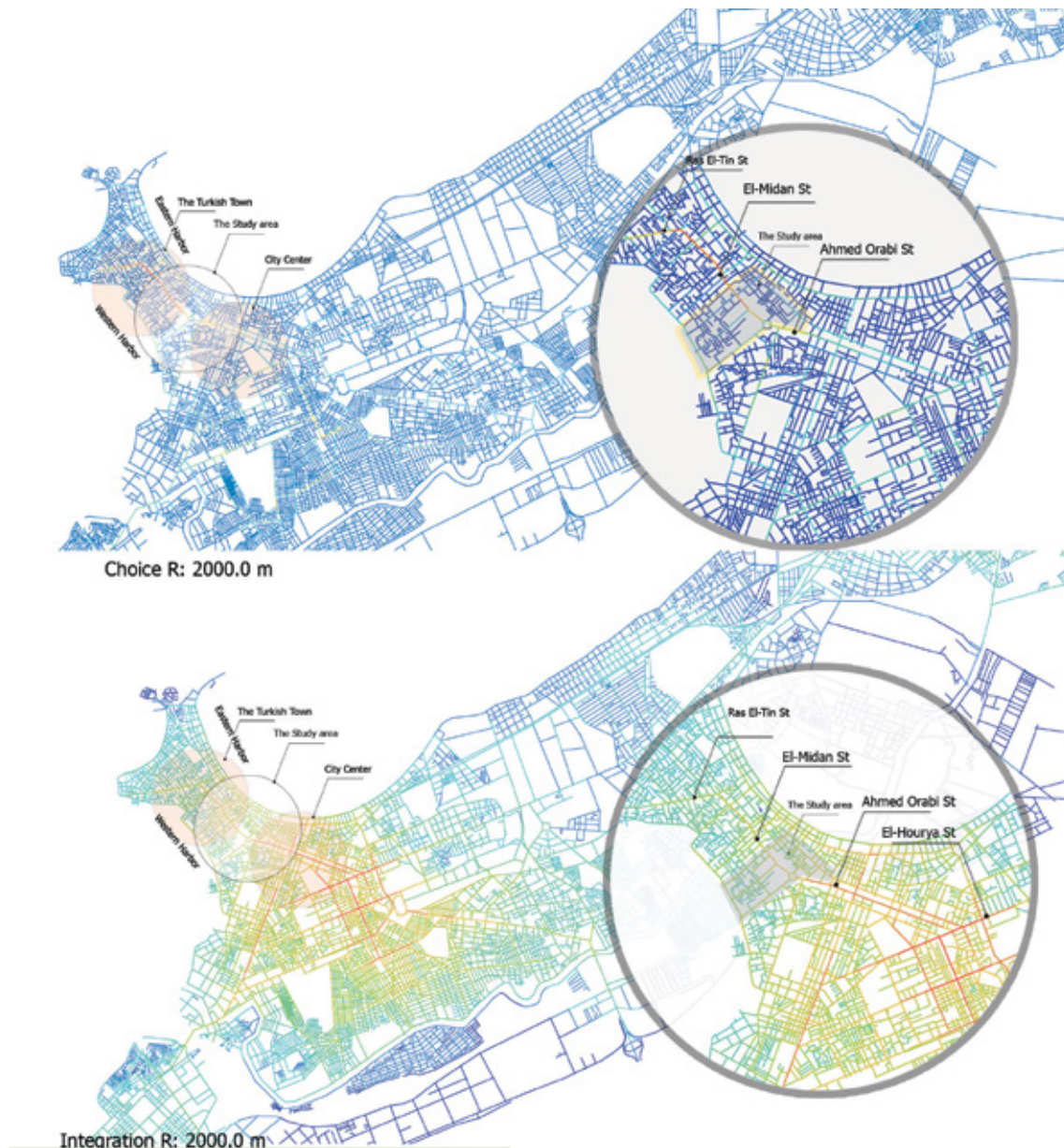


Figure 4- Angular choice and integration analysis at R: 2000.0 m

#### 4.2 VISUAL QUALITIES:

The study has investigated the visual experience of the Turkish Town through a detailed on-site observation. The analysis process was based on the publication by Gordon Cullen 'THE CONCISE TOWNSCAPE '. According to Cullen, buildings, that together shape the city's fabric, can create its visual characteristics. This cannot be done by each of these buildings separately (Cullen, 1961). The Turkish Town has been examined under the main concepts stated by Cullen: Optics, Place and Content in order to investigate the visual experience through this complex.

##### Optics:

What Gordon Cullen calls "Serial Vision" or "Sequential Experience" is a series of sudden contrasts, which he describes as the existing and emerging views. This sequential progress is characterized by extreme organic networks formed by the shape and location of buildings and the fine grain structure that has a high number of connections. These connections can enhance the physical permeability of the whole urban form.

This could be applied to the Turkish Town through the consecutive views taken starting from France Street and moving to the gated entrance of Wekalet Fatma Khan's building, then to a narrow path leading to a courtyard and finally within it. This courtyard may possibly be the entrance to a completely new sequential view (Figure 5).

#### Place:



Figure 5 - Serial vision through the Turkish town

This concept deals with a person's reaction for the position of his body in the environment. Cullen has adopted several main topics related to this theme such as: Possession, Vista and Feeling of the user. Through applying these concepts to the Turkish Town, the observation made was that it seems like courtyards have the quality of being enclosed, which creates a sense of belonging. In addition, the seemingly enclosed narrow compact streets give the feeling of being in a private space, which provides more social and spatial relations between people. Differentiating between public and private spaces is considered one of the features that characterize the urban pattern of the Turkish Town by providing a hierarchical sequence between public, semi-public and private spaces. This sense of hierarchy was shaped according to the Ottoman tradition, with spaces getting gradually more clustered up to the level of the Zuqaq (dead end street). In addition, the spatial structure of the Turkish Town reveals that outdoor public life was not promoted. This reflects the introverted lifestyle of the Ottoman tradition, which did not include exposure to public.

#### Content:

This topic deals with the fabric's physical appearance in terms of colour, texture, character, style, scale and uniqueness. Cullen has adopted the concept of "Seeing in Detail" to examine the fabric's content. This could be observed through ornamentalations which characterize El-Shorbaji Mosque. In addition, the placement of Wekalahs within different buildings with variations in size and height is considered a form of detailing. On the other hand, the existence of multi-use buildings which forms a community is a concept to be examined under the topic of content. This could be observed through the placement of various mosques integrated within the commercial zone.

#### Measuring the visual qualities:

After investigating the visual qualities of the selected area by applying the main concepts of Gordon Cullen, the study has translated them into three urban design qualities: Complexity, Enclosure and Human Scale. They were considered as the determinants of tourists' perceptual experience. Then, these qualities were measured based on Ewing and Handy's study. That is by providing a value for each audited street segment in terms of each urban design quality. According to Ewing and Handy, this could be achieved through linking specific physical features to each quality. Complexity consists of the number of buildings, the number of basic and accent building colours, the number of people using the space and the proportions of historic buildings and mosques for each street segment. Enclosure includes the number of long site lines, the proportions of street walls and the proportions of the sky for each street segment. Human scale includes the proportions of windows at street level, the average building height and the number of street items along each street segment. Lastly, each physical feature has been recorded through a detailed on-site observation by giving it a value. This value could be

a count, a proportion or a dummy variable. Each measurement has a corresponding multiplier that comes from a statistical model estimated during Ewing's research. The final step requires adding a constant which is unique for each urban design quality; this constant is also stated by Ewing. Figure 6-(A, B, C) illustrated the recorded value for each street segment in terms of the three urban design qualities after adopting the aforementioned steps.



Figure 6-(A, B, C). The recorded value for each audited street segment in terms of the three considered urban design qualities: Complexity, Enclosure, Human scale.

## 5. RESULTS

After applying the analysis process, it was obvious that various street segments have been highlighted in terms of their spatial and visual qualities. This could be explained as follows: after measuring the urban design qualities in terms of their physical characteristics; first, main thoroughfares reflected the complexity of the Turkish pattern. This was obvious in France Street and El-Midan Street which contain most of the commercial activities rather than the residential ones. In addition, transparent façades and the number of entrances found along each street suggested the presence of pedestrians and their interaction with these activities. It was also found that most of the historic buildings and mosques are also located in Turkish Town's main thoroughfares e.g. El-Midan Street, Souq Elsamak Elqadeem Street, Wekalet El-Khodar Street and France Street. Second, Human Scale and Enclosure qualities recorded the highest values in most of the internal streets of the Turkish Town. This indicated that navigating through the narrow corridors of the Turkish Souq e.g. Souq El-Akkadin Street and Souq El-Attarin Street and the various harahs e.g. Haret Sidi Lallu can enable tourists to obtain this sense of spatial enclosure.

Furthermore, from the spatial form analysis of the study area, El-Midan Street at R: 800.0 m, El-Shurbagi Street and El-Attarin Street at R: 200.0 m denoted a high to-movement potential. Those streets highlighted the most active uses of the Turkish Town. In addition, El-Midan Street, Souq Elsamak Elqadeem Street, Wekalet El-Khodar Street at R: 200.0 and Masjid El-Shurbagi, Souq El-Akkadin, Wekalet Fatma Khan and Sidi Lallu Streets at R: 200.0, indicated a high through-movement potential. Besides, spatial analysis at R: 2000.0 m, a measure for capturing the relation between the study area and its surrounding urban fabric, featured a central spine that consists of El-Horreya, Ahmed Orabi, El-Midan, and Ras Al-Tin Streets. This spine, that penetrates the study area, comprised the linkage between the city centre from the east and the rest of Turkish Town from the west and indicated a high to and through movement potentials. In terms of visual connectivity, El-Nasr Street and El-Midan Street were chosen as the main focus of the area.

### Aggregating the outputs:

The study aggregated all the streets that were highlighted during the previous analysis process. It only considered the highlighted streets that comprised the study area, so choice and



integration at R: 2000.0 m have not been considered in this data aggregation. As reported in Table 2, the average value for each applied criteria has been calculated for the selected streets. This data analysis enabled the study to examine how each highlighted street fared in each of the other applied criteria. As such, adopting the integration between all the components of the applied criteria stated by this study could be considered as a pre-requisite for designing the optimal route through.

Street name/ Applied criteria	Spatial qualities					Visual qualities		
	Integration 800.0m	Choice 800.0m	Integration 400.0m	Choice 400.0m	Visual con- nectivity	Com- plexity	Enclosure	Human Scale
El-Midan	335.6	93115.5	139.0	2638.2	481.7	8.9	3.4	5.2
Souq Elsamak Elqadeem	260.0	47400.0	95.0	2425.0	90.0	6.3	3.9	2.7
Wekalet El-Kho- dar	315.5	74057.1	108.8	2262.7	420.0	5.4	3.5	2.0
France	234.5	20839.1	89.1	1645.3	359.6	7.6	3.1	5.2
Masjid El- Shur- bagi	260.0	28150.0	122.8	3330.0	55.0	4.1	3.9	2.9
Souq El-Attarin	251.7	19661.4	115.8	2340.0	107.7	3.7	4.2	4.7
Wekalet Fatma Khan-Axis	208.0	5321.0	94.7	2638.1	33.3	4.8	4.2	4.2
Sidi Lallu	196.0	5165.8	72.6	2618.9	8.3	4.8	4.2	2.6
El-Nasr	267.1	8868.2	88.3	396.2	1120.0	5.2	1.6	2.4

Table 2 - Representing the estimated average value for each highlighted streets in terms of the spatial and visual qualities.

El-Nasr Street has been excluded because despite its high visual connectivity, it recorded the lowest value in terms of the other visual and spatial qualities. This could be predicted as El-Nasr Street is one of the major thoroughfares which was constructed during the modern era giving a new scale, form and style to the Turkish Town. So, it could not reflect the spatial and visual qualities of the Turkish Town itself.

From data analysis (figure 7), it was also found that the spatial qualities of the study area highly correspond to its visual qualities. This clearly indicated that those physical characteristics, which reflect the visual qualities of the Turkish Town, were located on the same streets selected for their spatial configuration properties. It was also found that each of the three urban design qualities: Complexity, Enclosure and Human Scale corresponded with the spatial configuration properties at a specific scale. This could be explained as follows: the main thoroughfares that lay on street segments with the highest 'global' choice and integration analyses reflected the highest visual complexity qualities. On the other hand, the internal corridors that reflected the sense of spatial enclosure and human scale qualities of the Turkish Town lay on the street segments with the highest 'local' choice and integration values. In this regard, the study concluded that the spatial and visual qualities of the Turkish Town could be classified as global

and local qualities. Thus, the issue is to link between those global and local qualities that could both strengthen the internal structure of the designed route and better connect it to its wider context. Choice and integration at R: 2000.0 m have also been added at this stage to manipulate how the designed route could be linked to its surrounding environment.

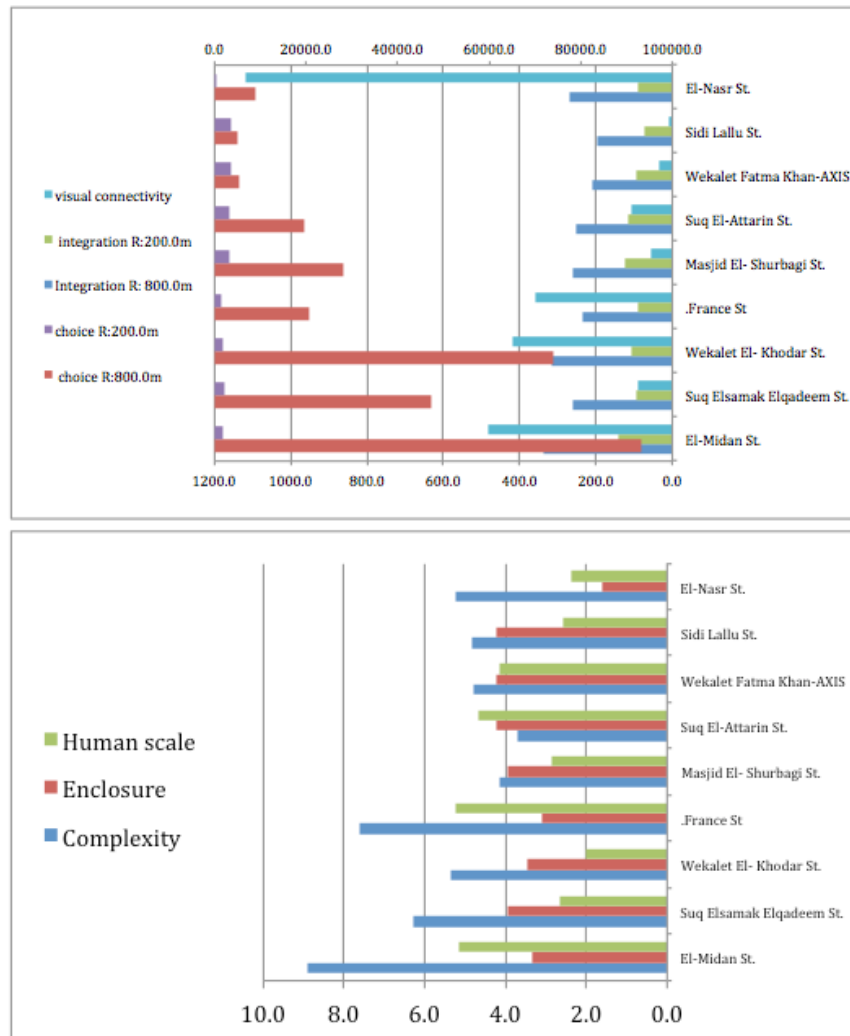


Figure 7 - Representing how the spatial qualities correspond with the visual qualities.

The result as illustrated in is the creation of a transition from city wide scale to the local scale within the study area by linking the internal structure of the designed route to its wider context.

The outcome of the conducted data manipulation led to the design of Turkish Town's optimal route (figure 9) that could adopt the integration of multiple place qualities and could also enhance the physical connections between its internal structure and the surrounding urban fabric.





Figure 8 - Linking between the highlighted streets at the diverse radiuses of 2000.0, 800.0 and 200.0 m

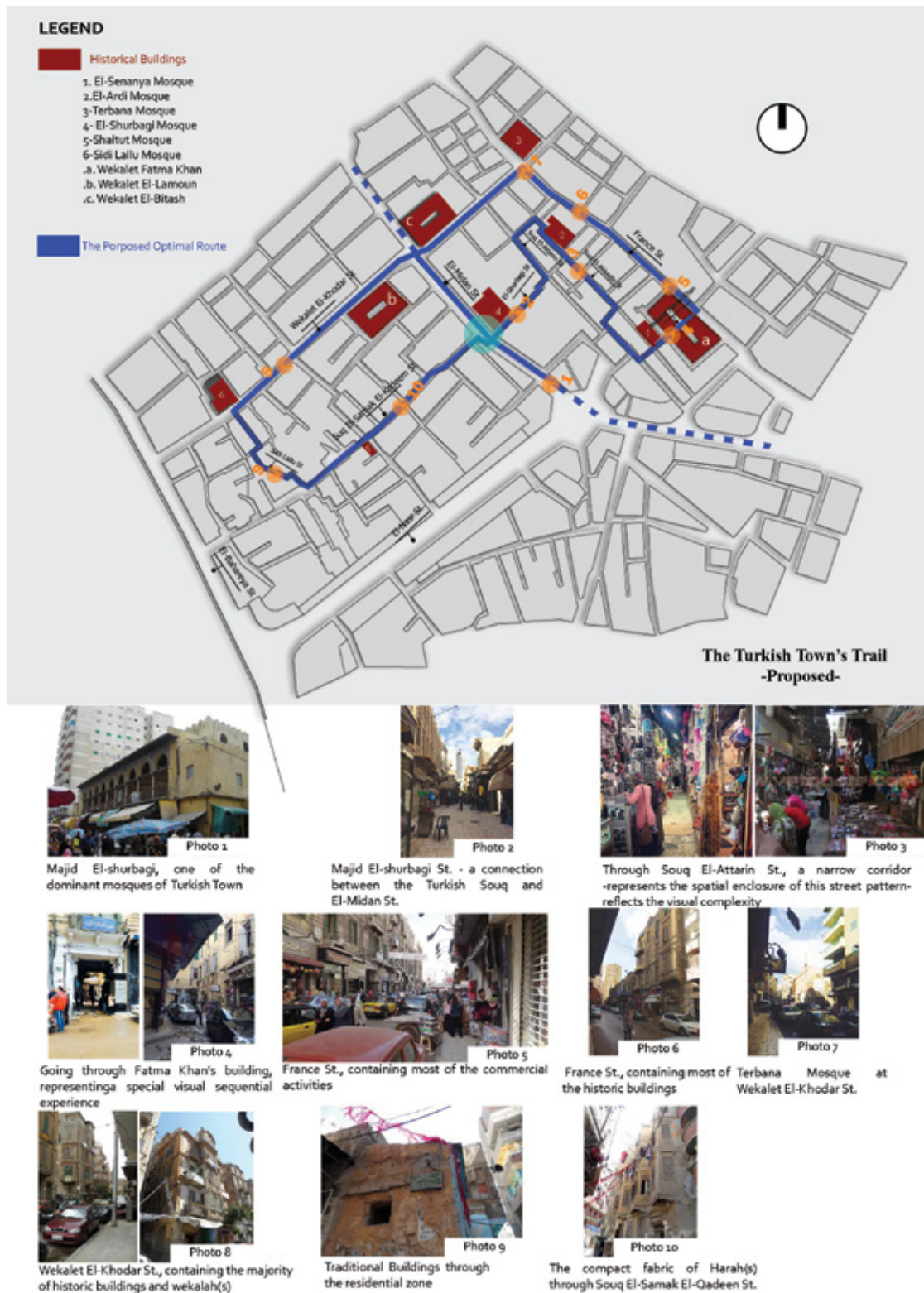


Figure 9. The optimal route for the Turkish -representing a serial vision through the Turkish town's trail in order to demonstrate the sequential experience gained along it.

## 6. CONCLUSIONS

The initial findings of this study demonstrate that tourist trail design is a complex process which requires the integration of multiple qualities that characterize built heritage. The contribution of this study is identified through its methodology which has been formulated in order to design Alexandria's Turkish Town trail. The design took into consideration the integration of the built heritage qualities. The analytical process undertaken throughout this study has defined the importance of the applied tools and methodologies, which have contributed to model and simulate human movement patterns through the built environment. First, the study highlighted the role of the Space Syntax Methodology as a quantitative method of analysis which enabled to propose a number of alternative routes through its syntactic measures. These multiple measures have supported the decision-making process by manipulating different tourists' routes. Second, the contribution of Ewing and Handy's study was to provide a quantitative method to objectively measure urban design qualities. Besides, computing urban design qualities also facilitated data analytics throughout the study.

In addition, the study emphasized that configuration properties, measured by 'Space Syntax', which describe a tourist's cognitive effort to navigate through an area were relevant to the other visual qualities stated in this paper. This was evident through the analysis process as most of the historic buildings and mosques were located in street segments that recorded the highest values of choice and integration. In addition, the most vital spaces that include commercial activities and the presence of pedestrians also lay on the most connected streets. This supported the findings of various studies that highlighted how attractors are located in places that take advantage of the opportunities offered by the most connected streets (Hillier et al., 1992).

On the other hand, by analyzing the spatial structure and observing the visual qualities of the built heritage, it was found that these spatial qualities correspond to the other visual qualities at a specific scale. Thus, the study contributed to creating the local-global relation between scales as a pre-requisite for designing Turkish Town's trail. These findings supported various studies that involved Space Syntax by embedding the local qualities of a place in its wider context and considering this as a way to preserve its unique character and place qualities.

Visual aspects, determined in this study, in the three urban design qualities of Complexity, Enclosure and Human Scale were limited to the specific physical features stated by Ewing and Handy. This could be considered as the limitation of this study. So, an expansion that includes more physical features needs be presented to validate the findings of this study and enhance the framework proposed to design the optimal tourist trail. Hence, future research is needed to formulate a composite model that integrates more measures in order to support the design process.

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