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MENA Region: The Case of Metropolitan Cairo

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Abstract: Extreme auto dependency, and consequent congestion issues are increasingly exacerbating the urban environments in the metropolitan Cairo region; overshadowing the total quality of life; physical, social and psychological. It has become inevitable to utilize human centric mobility modes such as bicycling, to create an "active environment" through motivating non-motorized design concepts, which will alter the lives of the city's residents. Transportation, urban planning and public health would be greatly enhanced by adopting bikeablity street design infrastructure interventions, especially in a historic urban fabric. Cairo, is an eligible city (with roots to the beginning of civilization) to examine the possibilities of transforming it into an -active city- with active citizens. Therefore, more research needs to be directed towards methodologies on how to transform existing streets of greater Cairo, to adopt the active design concept. This paper will discuss and analyze the urban fabric typologies in the context of Cairo with a specific number of categories, and show existing problems, potentials to utilize form-based codes, and linking it to its current congestion problems and auto-dependency. Based on that, it will present possible bicycle solutions within the chaotic behavior pattern and transportation grid to promote human-powered mobility interventions. The outcome is in the form of an analysis of urban fabric forms and street types, and their potential to promote bicycle urbanism by design.

Keywords: Keywords: auto dependency, urban, Cairo, human centric mobility modes, active environment, Transportation, urban planning, public health, active design, bicycle urbanism

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1. Introduction

The current congestion of traffic has become a notable concern in most historic cities; among these are Cairo, Damascus, Istanbul, Mumbai, Mexico city, Sao Paulo. Traffic and population density are not predominantly directly proportionate but they have a strong relationship due to the recent auto dependency phenomena. As a consequence of population growth and urban sprawl, cities have reformed to auto centric approach that has turned to be the leading mode of transportation. Although urban street patterns of historic cities were originally designed to accommodate human centric modes of transportation creating an active urban design, now they have become inactive polluted streets merely connecting spaces. Cairo, a megacity that dates back to the beginning of civilization, suffers high density of 9,000 person/km2 in addition to extreme auto dependency, (El Araby, 2002). These conditions have caused exacerbating the urban environment that has affected the total quality of life; physical, social and physiological.

Transportation, urban planning and public health would greatly be enhanced by adopting bikeability street design infrastructure interventions, especially on historic street patterns.

2. Results and Discussion

The need for transportation has existed since the establishment of the relocation understanding. Walking was the earliest mode of transportation whoever it is completely dependent on the individual's effort, (Southworth, 2005). Understanding human's limitations, human powered and animal powered transport developed to utilize adequate amount of effort in relation to the time spent to reach the required destination. As technology advanced, the dependence on vehicles has become inevitable due to poor planning and engagement of active citizens in the design. Street design's main concern and priority is vehicles and their mobility in other words street design is auto centric design which partially overlooks pedestrians and bicyclists. As a result, human powered transport has become second rate on the street and in design factors.

Transportation planning paradigm set the basis of accessibility, landuses and economic vitality, (Thünen 1966) related distance travel to market. Christaller (1966) and Losch (1954) followed these development tell the conditional wisdom establish location theory (Wingo 1961). The less accessible downtown historic area became: the worse it became for use and value. Telecommunications and virtual networks have eased the community processes throughout the city and net specifically pedestrian basic neighborhood (Fathy 1991). According to Southworth's definition of walkability, providing pedestrian wellbeing and connecting people to different destinations having the built environment that can largely support, accommodate and encourage its active residents, whoever Greater Cairo Region does not match that definition inestimably.

Defining areas of actions in the megacity context mandate a selection methodology of urban typology. It should illustrate characteristics and similarities to embrace wide spread public policies related to the expansions and geographical areas. Many scholars attempted to systematically categorize urban types in complex cities by several methods. Procedure for developing typology of urban context had statistically used cluster analysis methodology to objectively produce distinct urban patterns of Los Angeles

metropolitan area, (Gordon et al. 1986). Utilizing this typology method allows it to be applied to cities and was applied to Greater Cairo Region.

Fahmy et al (2008) have categorized three distinctive urban fabric typologies; dot pattern, linear shape pattern and compact shape pattern. Furthermore, this pattern encompasses organic/irregular street pattern type which is best designed for walkability and human powered transport. This type appears in many historic contexts in Greater Cairo Region; Islamic district, Khedivial Cairo and Fustat area. Each of these patterns shares a similar urban fabric – compact shape pattern – that is surrounded by main nodes, public transportation (underground metro and buses) and can accommodate car parking structures. They are suitable to adopt human powered transport permitting only emergency vehicles. Human powered transport is defined as the movement by depending only on human energy; among these are walking, bicycling and skateboarding. These areas should be transformed into strictly pedestrian access which will pave the way to be adopted to other large part of cities and promotes the healthy lifestyle. Human powered mode of transportation allows the revitalization to pedestrian streets.

Old Cairo Islamic district streets hold the characteristic of irregularity and narrowness that were designed based on functionally of the surrounding buildings; mosques, houses, palace and markets. Vehicles in that area at large produce high levels of noise and air pollution which disrupts the essential quality of life for an active citizen. Consistent with Ali and Tamura, road traffic is the largest contributor to noise chiefly in developing countries where vehicle horns are not regulated. Old Cairo has a high density of 150,000 person/km2 in addition to nearly 1,000 vehicles at high peak time which causes 64.5% noise pollution that can be decreased by adopting active design approach. Municipality of Cairo certified an "Architecture Control Ordinance" on historic sites to preserve and reinstate its previous character, since the area has become overly dense turning into slums according to the Egyptian classification, (Bakr 1981). Al Moez Street is an excellent existing example of a public policy applied to prevent non emergent vehicles to enter a touristic site to give tourists the original experience of the space without external interventions. Areas that share these characteristics could have this public policy applied; Al Jamila and Darb Al Ahmar Street. Within further expansions of revitalizing these streets to their former use, Khedivian Cairo and Fustat area could also absorb this change and will enhance the active citizens' experience.

In an awareness initiative in June 2014, Abdel Fattah El Sisi has promoted for cycling to engage citizens into an active life style, pollution reduction and being less dependent on fuel. It was a first-rate unprecedented project or action. Such a political action/ public relation should be followed by public policies to introduce bikeable streets and create an alternative to auto centricity. Since the Egyptian government has a tendency to sprawl off the city and expand to accommodate the growing population, merging public transportation and human powered transport including walking will connect sprawl development to exclusive historic areas into their urban flavor and unrivaled land uses.

Lately, public health has been extensively promoted for as a raise of awareness to the general public. Active transport aids with individual's overall health index through increased physical activity excreted in the daily commute. Active citizens are then inseparable from active design that enables active transportation to operate with the urban fabric pattern. Green and Klein have stated that compact community design is an example of urban fabric relatively than sprawl communities to adopt active transport. Sprawl communities limit physical activity to within the neighborhood. With that fact taken into account, old Cairo districts are ideal candidates to host active transport and walkability. Walking

and human powered transport promote for physical and mental health; strengthened overall fitness, increased attentiveness and creativeness, (Southworth 2005).

Figure 1. Map provided of Al Moez, Al Jamalia and Darb Al Ahmar Streets (El Sayyad, 1981).

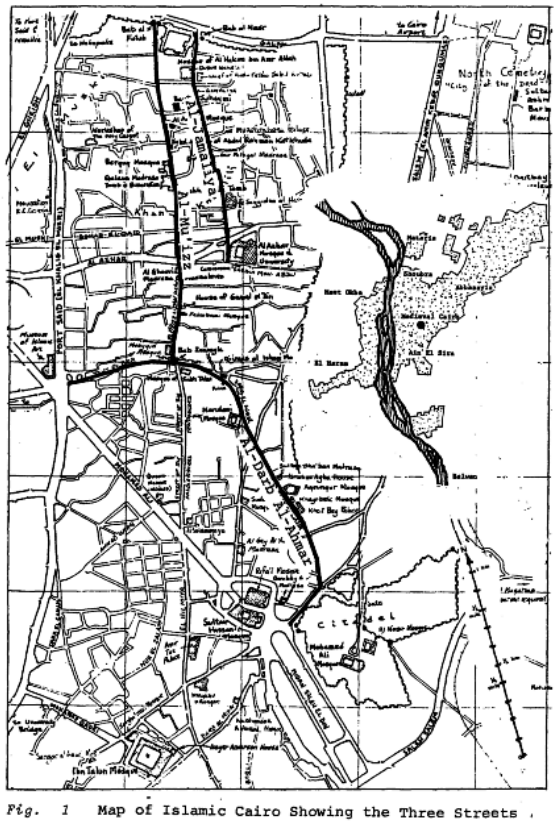
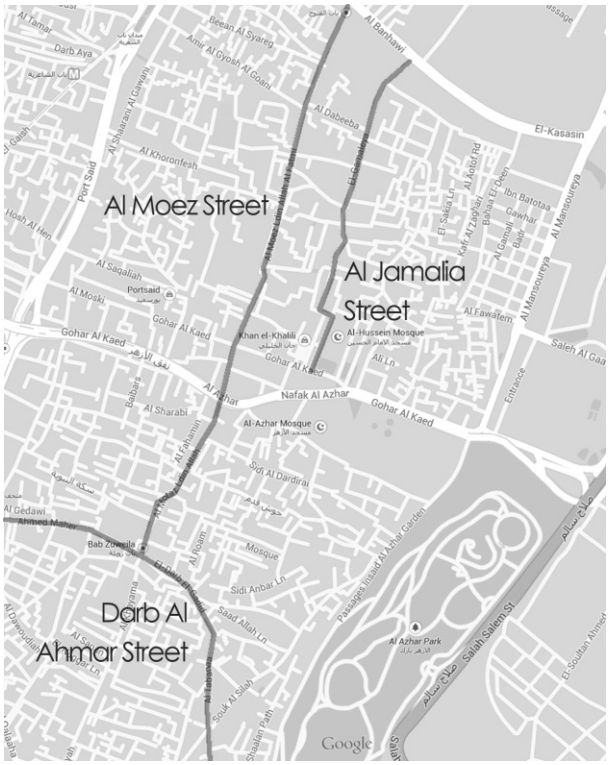


Figure 2. Updated Map of Old Islamic Cairo; Three proposed streets.



4. Conclusions

Mobility is a focal concern and further attention to human powered transport is crucially necessary. It will promote for enhanced environmental quality, economic strength, community cohesion and public pride. Al Moez Street is a successful project and should be extended to the neighboring main streets; al Jamalia Street and Darb Al Ahmar Street. Sisi's cycling initiative was an excellent start and should be followed by a public policy, action and a design manual for active street design to welcome human powered transport including walkability suitable for compact shaped urban fabric type with irregular street pattern.

Conflict of Interest

The authors declare no conflict of interest.

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