
Integrated Mobility as an approach to Elevate urban quality

(case study of Al Rehab neighbourhood)

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Abstract:

The Quality of urban mobility is rapidly declining in our country and most of the developing world. This reflects on the quality of urban life in Egyptian cities and all of its aspects like social life or economic improvements. Issues like complete motorization that is incompatible with our existing urban structures, constant traffic congestions, accidents, need for public transportation and neglecting the necessity of pedestrian networks in the face of commercial use and illegal violations are issues that indicate that our perspective for urban mobility should change.

Developing countries are in desperate need of new techniques to elevate the quality of their urban mobility to convoy the rapid population increase where cities need to grow and expand therefore a more efficient and more evolved urban mobility system is needed. While taking in consideration the culture and personal needs of the Egyptian urban community toward better quality of urban life through mobility.

The purpose of this paper is to illustrate the physical and non physical aspects of urban mobility and ways to improve and elevate this urban element in an integrated concept to better the lives of people specially in residential neighbourhoods.

keywords:

Mobility, walkability, movement Network, inclusive mobility.

Literature review:

1. Introduction

Streets are the vein of urban life, whenever a path exists urbanism can start and grow around it and in its direction. Its one of the most ancient and fundamental urban element that urbanists realized in their many studies how the design, direction and hierarchy of movement networks can affect the shape of urban form and urban growth in consequence.

An easy predictable mobility allows people to connect and sets the right conditions for a city to become an economic generator.[1]

1-Gakenheimer, Ralph. "Urban mobility in the developing world." *Transportation Research Part A: Policy and Practice* 33.7-8 (1999): 671-689.

1.1. Definitions :

Mobility: The ease and support of motion, this includes meanings of Connectivity, permeability and accessibility, not to mention good linkage to public transportation.

Urban mobility it means that mobility is no longer just about moving people around by motorised vehicles. But also the accessibility to various urban services.” [1]
- The World Bank, 2015

Connectivity and permeability: A well-connected and permeable built environment is described as a feature of high quality, Gehl argues that well-connected pedestrian routes are well-used, preferred to deserted or quiet routes Small block sizes give pedestrians more route alternatives, allowing them to get around easily where Large urban blocks with little activity can contribute negatively to people’s feelings of safety and ease while moving around a neighbourhood particularly after dark.[2]



Fig. (1.1) an illustration of high quality mobility in a neighbourhood

2. Aspects of Urban mobility

2.1 Physical aspect of Mobility : Quality of movement Networks :

Good connections to places and linkages between different modes of transport, ensures equitable access to facilities, services and public transport. The design and layout of the movement network greatly affects people's mobility and travel options as well as their safety and wellbeing. Streets enable people to be more physically active and healthy. Streets also play an important role as public spaces, supporting social interaction and providing places for cultural expression. [3]

1-Peralta-Quirós, Tatiana. World bank "Mobility for All." (2015).

2-Gehl, Jan. Cities for people. Island press, 2013.

3-Mulligan, Gordon F., and John I. Carruthers. "Amenities, quality of life, and regional development." Investigating quality of urban life. Springer, Dordrecht, 2011. 107-133.

2.1.1 The importance of high-quality movement networks to the users' lives:

According to world's health organization, more than 3400 lose their lives in road accidents daily. Children, bicycle users and the elderly are considered most endangered, therefore a good street design should include the following:[1]

- A paved sidewalk with an adequate width comfortable for all pedestrian types.
- Safe Pedestrian bridges/crossings accessible for children and handicap.
- Signage and warning lights that helps organizing the man/car crossings and warns of special cases like schools, construction sites or drop offs.
- Good street intersections design according to street speed and width.
- Protection against occasional dangers, like opened manholes, construction sites.
- High quality street infrastructure and maintenance.(like paving and rain drainage).



Fig (1.11) an example for a well-designed street with paved sidewalks for pedestrians with pedestrian crossings on the street

2.1.2 Physical characteristics of high quality movement networks According to the national association of city transportation in N.Y. [2]:

- **Diversity and hierarchy**, Creating a street space that is diverse and integrating of all movement types , different vital or settlement activities in addition to being well furnished and landscaped.
- **Encouraging walkability**, designing an integrated interconnected pedestrian network that graduates to smaller paths. Also providing Close car parks that ensures the usage of public spaces, small shops and encourages walkability by reducing street motions.
- **Intimacy (Human scale streets)**, this increases the quality of street space for people and enhances their sense of connection, and belonging.
- **Accessibility**: means the ease of reaching public places through the whole movement network.
- **Inclusiveness**, Building whole streets, whole streets are streets that include all kinds of users of different social backgrounds or physical abilities as well as all types of transportation.
- **Permeability** refers to the extent to which the urban structure permits, or restricts, the movement of people or vehicles through an area, and the capacity of the area network to carry people or vehicles.
- **Supportive of all means of transportation**, The movement network accommodates the diversity of transport modes and supports activities, including active transport.
- **Safe street mobility**: the movement network provides for safe interactions between transport modes

1-National association of city transportation officials:"[global street design guide](#)" island press,New York, USA,2016,p10

2-<https://www.urban-design-guidelines.planning.vic.gov.au/guidelines>



Accessible entrance for units

Bike lanes and crossings

sufficient car parking

Fig (1.2) Some characteristics of high quality movement networks

2.2 Mobility Urban Quality of Life:

Mobility is one of the main factors to promote the quality of life for the citizens; it is linked to accessibility, traffic and transportation. a low level of mobility is generally leading to a low quality of life, as it may become a barrier to satisfaction of basic needs and participation in social life.[1] It is the precondition for economic growth, trade and creativity, as well as for personal wellbeing.It creates access to opportunities for advancement, individuals and for the community as a whole.[1]

Agenda 21 at the UN Conference on Environment and Development (UNCED) addresses profound recommendations for efficient and environmentally sound transport systems, as following [1]:

- 1.Integrate land-use planning and transport to promote a development pattern that reduces demand for transport and supports other environmental means.
2. Adoption of urban transport programs to support public transport throughout the country.
3. Providing safe roads and corridors in urban areas.
4. Attention to traffic management and periodic maintenance of roads.
5. Re-assess the different modes of transport, in order to reduce the use of energy and improve the environmental aspects



Fig (1.3) Mobility urban quality of life has multi-dimensional indicators such as accessibility, walk ability, cycle ability, traffic load and public transportation.(source:www.nacto.org)

1-UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992.

2.3 The relationship between physical characteristics of mobility and mobility characteristics considering urban quality of life :

Through gathering characteristics of both aspects of urban mobility , they can be illustrated in the following diagram fig (1.4)

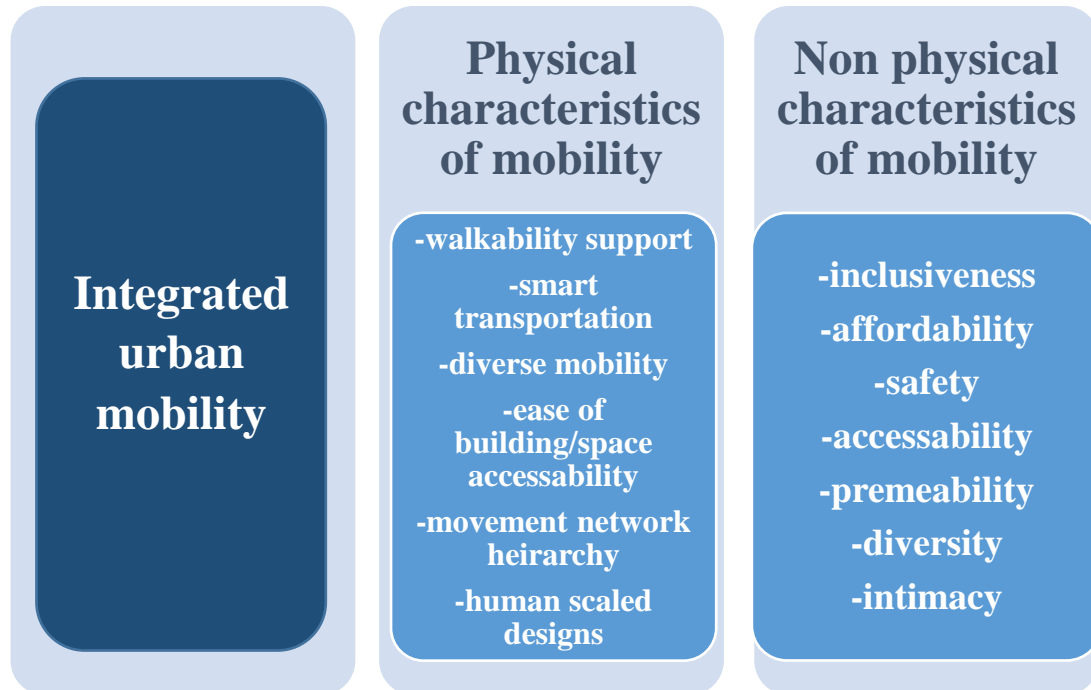


Fig (1.4) The relationship between physical characteristics of mobility and mobility characteristics considering urban quality of life .(source: the author)

2.3.1 urban solutions that Supports urban mobility:

A-Smart transportation: a smart transportation network would be a network that facilitates walkability with least distances possible while also providing a clear direct network for vehicle movement with least possible chances of congestion.

B-Pedestrian network: this movement network needs to have:

- Intimate or human scale.
- Comfortable for all kinds of users.
- Inclusive specially for special users (handicap, children, elderly.etc)
- Provided with suitable signage and landmarks as gathering points.
- Provided with suitable furnishings and landscaping.
- Reinforced with high mentainance infrastructure.

c-Other Characteristics that supports mobility:

Permeability: the ease and allowance of movement flow.

Accessibility: the ease and clearance of reaching entrances.

Walkability: a walk-able neighborhood would support high sense of connection and belonging and encourages social life and general health.





Hierarchy: streets grading in sizes and movement density.

1- Tony Kim” Smart and Connected Urban Mobility: Concept and Examples in Korea”, online report.

d-Methods of applying smart, efficient eco friendly urban mobility :[1]

- Adapting new eco friendly transport modes; eg.Bicycles, scooters...etc.
- Maximizing utilization of existing public transport.
- Traffic flow tracking and location based services.
- Lowering public transportation costs to encourage less private vehicles.
- Extend transportation routes to new areas and vital destinations around the city.
- Smart efficient parking.

2.3.2 Example on high quality urban mobility:

Case study over view:	
Project brief	<p>One of the most architecturally significant and bastion of the creative communities of the city. It consists of three <u>colonias</u> or officially recognized neighborhoods: Colonia Condesa, Colonia hipódromo and Colonia Hipódromo Condesa. The area is considered to be very distinctive and artistic. It is residential but also with a large number of international restaurants, nightclubs.[1]</p> <p style="text-align: center;">Fig (1.5) la condesa neighbourhood</p> 
location	The Cuauhtémoc Borough of Mexico City.
Reasons for choice	Being in Latin America implies specific cultural and environmental differences. The neighbourhood has the architecture style of art nouveaux. And it has several concepts of environmental and cultural sustainability.
Analysis of urban mobility	<p>The area is served by the Mexico City metro at its edges but inside the area run the Metrobus, city buses,private minibuses and mid-sized buses, trolleybuses, in addition to the EcoBici bikeshare and scooter-share, carshare, etc.</p> <p style="text-align: center;">Fig (1.6) street Network</p>  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Fig (1.7) public transport</p> </div> <div style="text-align: center;">  <p>Fig (1.8) side walks and Vehicular streets</p> </div> </div>

1- https://wikitravel.org/en/Mexico_City/Condesa_and_Roma.

3 Field Study:

3.1. Introduction:

This part of the research paper aims to apply the theoretical findings on one of the most elite neighbourhoods in Egypt. The in-depth study will aid to a more accurate analysis of the effect of urban mobility on the quality of urban life.

3.2. Field study objective:

providing assessment guidance for the urban designers, developers, community and decision makers to evaluate the urban mobility of a certain neighbourhood in consideration with our local Egyptian culture, architecture and the needs and requirements of residents to either design or develop and enhance the quality of urban life in Egyptian districts.

3.3. Field study methodology:

Basically, the followed methodology of this case study is using the concluded standards and characteristics of the integrated urban mobility to apply it on the chosen case study. And assessing the quality of mobility elements as well as the satisfaction levels of residents over their lives in the neighbourhood. This study is more detailed in depth considering aspects such as the current circumstances, urban issues, and differences in Egyptian communities.

3.4. Tools and Process: the field study is based on three tools to reach the study objective.

3.4.1. Literature Review Analysis criteria: The first tool is taking the literature review as the main guidance in setting a criterion for the site analysis. The assessment of urban features and society, To provide different approaches of analysis in aim of reaching the optimum analysis method for our local urban environments.

3.4.2 Observation and documentation: the researcher observe and records the features and characteristics of each urban element and their observation on the shape of urban life in the studied project. These tools have been applied by the researcher through several site visits. During site visits data about the urban environment and residents' life traits, is collected and analyzed using photographic images and written notes as the main sources of documentation.

3.4.3 Questionnaires and interviews: both are most effective qualitative tools especially for the part of measuring quality of urban life based on investigating the degree of life satisfaction. Several interviews have been performed during the field study process as well as a questionnaire on at least 30 residents of different ages, gender and socioeconomic levels.

There have been three forms of questionnaires:

- a- Online Questionnaire on (google forms) distributed online across the community support groups of each neighborhood.
- b- Excel form questionnaire written in a summarized simplified Arabic for the actual field study distribution on the streets.
- c- Formal detailed questionnaire form for the comprehension and detailed analysis of the researcher included in the annexes section at the end of the thesis.

The following are previews of those three questionnaires:



Form-A



Form-B



Form-C

3.5. Case study of Al-Rehab district:

3.5.1. Case study overview.

Project brief	<p>Al-Rehab city was established in 1997 by the private developer Talaat Moustafa Group Company in New Cairo. The city’s current population is 110,000 residents with a target at final completion of 200,000 residents in 2015. The city is considered a “new city” as an urban area built on greenfield site with the purpose of attracting business, investment and new residential areas. It has benefited from its location as a satellite city of New Cairo.[1]</p>	
location	<p>At the North East side of New Cairo, at the intersection of the Eastern Ring Road with the Cairo/Suez Road.</p>	
Reasons for choice	<ul style="list-style-type: none"> -Al rehab is a new gated compound but also exists since long enough for its residents to grow and form a connection with their urban environment over years. -There are different classes and types of housing ranging from middle and upper middle class to high class. -Al rehab is fully integrated urban community with all services and an architectural/urban character that is definite and highly and easily measurable. 	

Fig (1.9) Al Rehab city

1-Hegazy, Ibrahim Rizk. "The quality of life between theory and implementation in Egypt: The case of Al-Rehab City, Egypt." Ain Shams Engineering Journal 12.2 (2021): 2285-2296.

Mobility

Vehicular mobility :the urban fabric facilitates the movement of vehicles across the neighbourhood. The squares marking nodes that slows down speed for safety of the residents.



Vehicular roads

squares

Fig (1.10) Vehicular mobility

Pedestrian mobility: al rehab is highly walkable and highly pedestrian friendly. Walkways and safe crossings around all the neighbourhood making it easy and enjoyable to go everywhere on foot.



Fig (1.11) Pedestrian pathways

Public transportation from the bust station residents take the rehab bus lines to inside and outside of rehab. Other public transportations like minibuses are stationed also outside al rehab .

Parking lots: each residential





Fig (1.12) Pedestrian pathways

block or service facility has parking lots. But there is a problem at the souq area at rush hour times and vacations, the parking lots in that zone become insufficient.



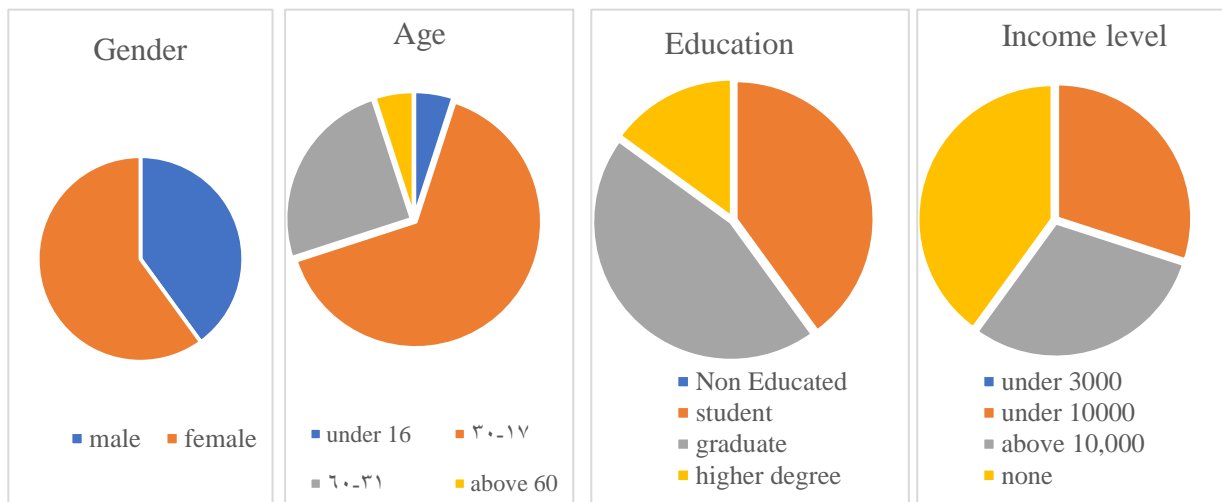
Fig (1.13) Parking lots for every block

	<p>Inclusive Mobility : the safe connected pedestrian network provided by ramps and supports different kinds of activity for residents such as cycling, children playing, baby strollers and wheelchairs all of which indicated inclusive mobility.</p>		
		<p>Safe cycling</p>	<p>Ramps</p>
<p>Fig (1.14) inclusive mobility</p>			

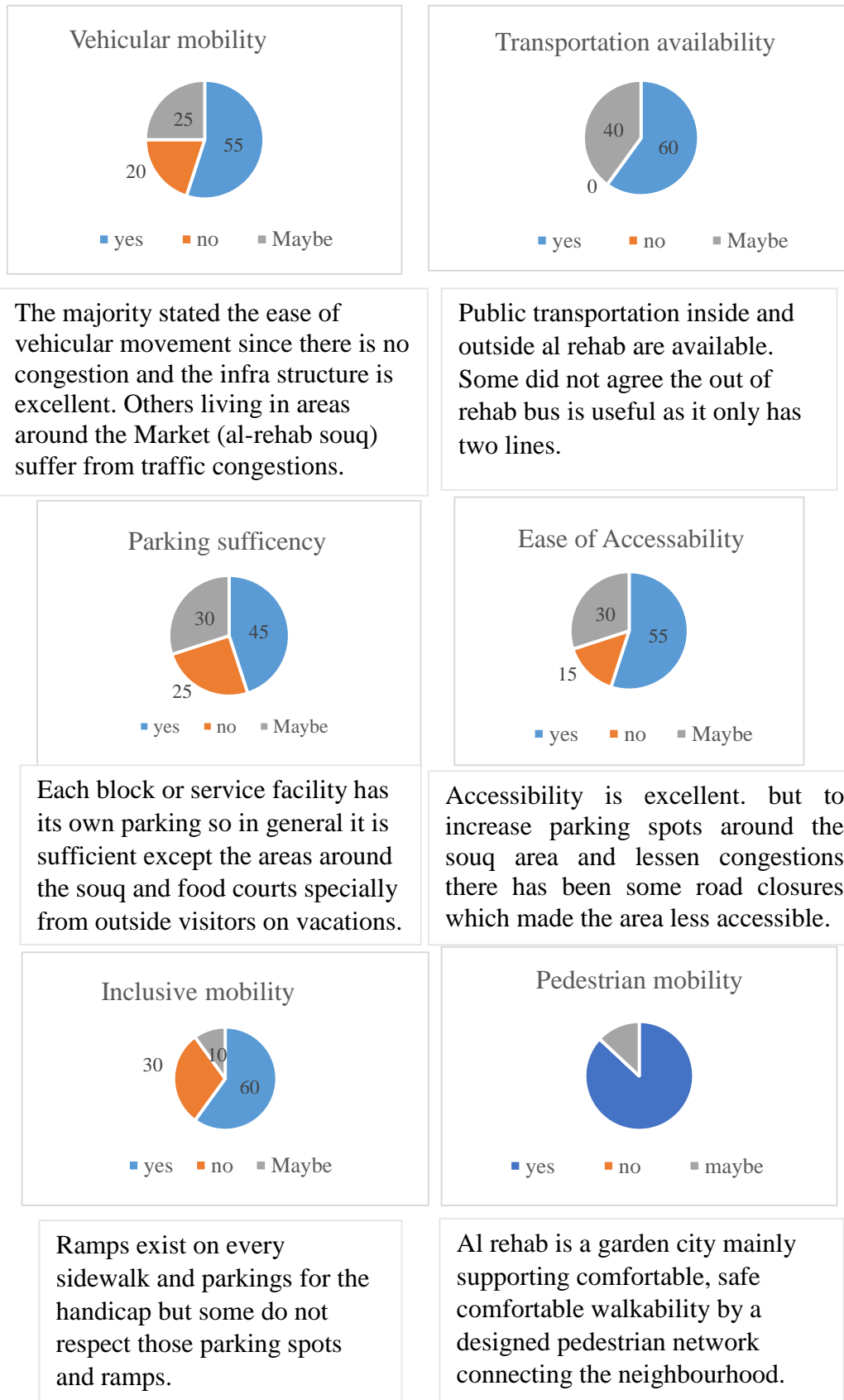
3.5.2 Questionnaire results analysis:

3.5.2.1 Demographic Data:

The demographic data gathered in al rehab shows how so many children and young teens are walking around safely together. It shows how high the social class is in rehab. People are educated, and aware of their urban community affected by their choice of residence and aware of how positive they can affect it.



3.5.2.2 Mobility questionnaire analysis:



3.5.2.3 Interviews:

The interesting thing about interviewing residents in al rehab was the great cooperation of residents where the researcher could interview so many people of different ages. This led to a feeling that residents are generally relaxed, inviting and more expressive. The following points were the opinions gathered from residents about living in al rehab:

- The urban environment is very safe for children to play, gather or cycle around their blocks or walk to their nearby schools at every block.
- The small squares lessen the cars speed for pedestrians' safety.
- The food court and the old Souq area suffers traffic congestion and lack of parking spaces specially at night time, vacations where outsider visitors love enjoying those places and enjoy al rehab greenery.
- There are other forms of public transportation other than the neighbourhood busses. Like minibuses on gate 13. this gives more cheap public transportation options.



Fig (1.15)The design of blocks and spaces

- Living in rehab is comforting psychologically because of the greenery and dense nature and fair weather and it is the main reason people move in from downtown Cairo or preferring to live there instead of other new Cairo satellite cities.
- Al rehab residents love their intense privacy, and exclusiveness in such gated community where they guarantee certain socioeconomic level of the neighbours. Privacy provides feelings of safety.

- Residents can move and grow to bigger better homes since there is the al rehab 2 phases with wider spaces, bigger appartments and a chance to avoid the crowdiness in the first rehab 1 phases caused by the souq area.



Fig (1.16) Photos illustrating the comforting urban environment

3.5.3 .The assessment of Al rehab urban Mobility :

based on the questionnaire applied on al rehab residents, each element of urban Mobility had a percentage number of agreement on its existence with an acceptable quality. These results were analyzed in the following

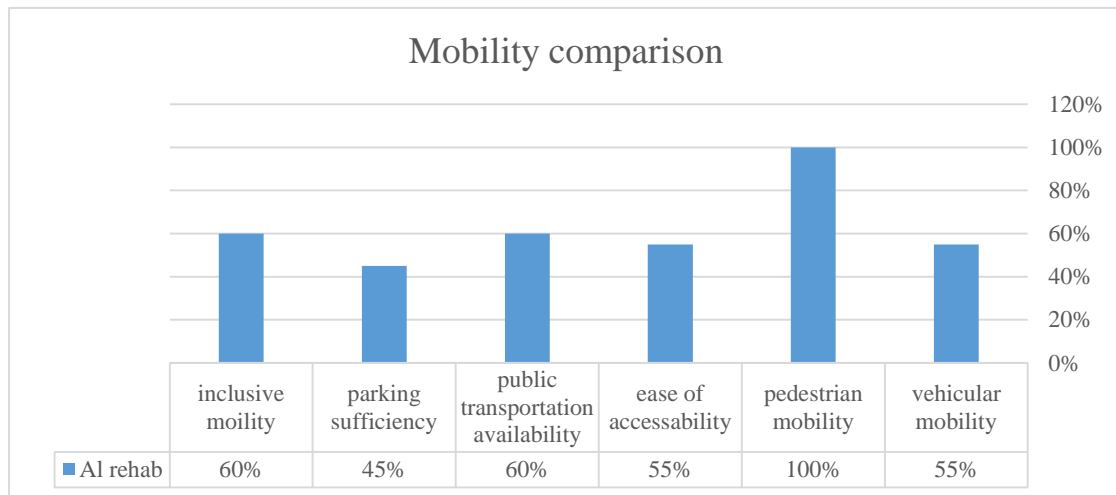


Fig (1.17) chart illustrating. The assessment of AI rehab urban Mobility

- AI rehab has an integrated movement network since it is well planned with a functional movement network for vehicles and pedestrians. However, the souq area causes a lot of traffic congestion, parking insufficiency and walkability blockage for the blocks around.

3.5.4 Discussion:

These results are based on the results of two field analysis survey tools:

First: the observation, interviews and survey taken by the researcher.

Second: the questionnaire results based on residents' opinions.

The following is a discussion of the results of the field study:

3.6. Field study Conclusion:

The field study provides a realistic perspective to the research on urban mobility quality in our local Egyptian neighbourhoods. It concludes the final detailed elements of urban mobility with both its physical and nonphysical aspects.

4. General research Findings:

Integral manifestations of urban Mobility:

The research results in an integrated methodology of measurement to assess all aspects of mobility in an urban environment. Since it is one of the most important factors affecting the degree of urban quality. Those aspects are the following.

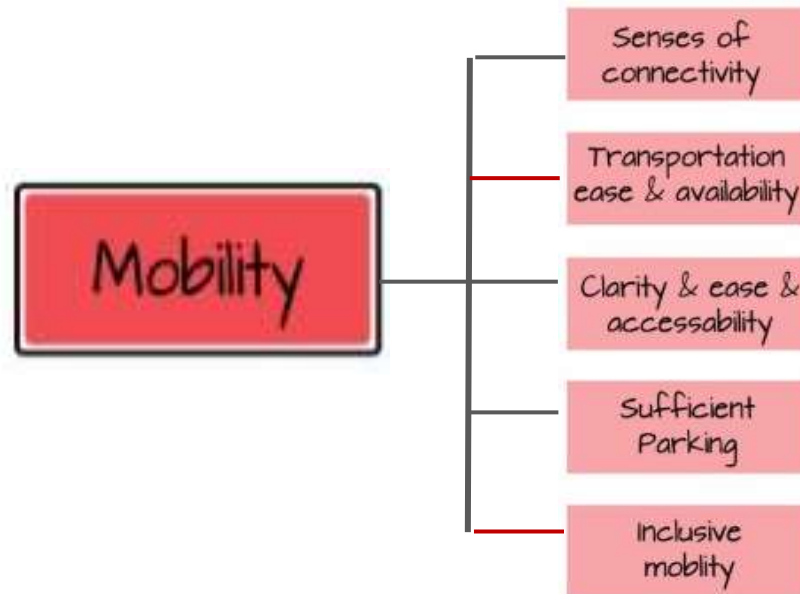


Fig (1.18) chart illustrating aspects of urban

5. Conclusion

In literature, the paper illustrated the two aspects of urban mobility, physical characteristics that an urban design should adopt to leads to a high-quality urban mobility system and the nonphysical manifestations of urban mobility that affects quality of urban life considering the feelings residents should receive. The field study then applies those elements on a local neighbourhood to assess the degree of urban mobility and its effect on urban quality of life. It is concluded that urban Mobility is one of the most important aspects of urban quality. urban designers or development projects should not neglect its importance with previous regards and study of the existing urban context, needs and backgrounds.

6. References:

- 1-Gakenheimer, Ralph. "Urban mobility in the developing world." *Transportation Research Part A: Policy and Practice* 33.7-8 (1999): 671-689.
- 2-Gehl, Jan. *Cities for people*. Island press, 2013.
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- 5-National association of city transportation officials: "global street design guide" island press, New York, USA,2016,p10
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