CATALYTIC QUALIFICATIONS FOR URBAN REDEVELOPMENT-MOBILITY HUBS AS URBAN REGENERATION ANCHORS

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ABSTRACT

The continuous growth of motorized vehicles and air pollution caused by them, are among the major reasons in which strategies related to transportation and land uses are being implemented enhancing the built environment. This paper introduces approach leading catalytic effects for urban redevelopment through introducing Mobility hubs. According to academic arguments regarding the relation between urban form, built environment and travel patterns, the more urban development around transit stations referred to as transit oriented development (TOD) is compact, the more it contributes to sustainable metropolitan system. Mobility hubs are types of TOD projects, which strive to create opportunities for development. The current research examines the possible role of mobility hubs as anchors in urban regeneration strategies aiming to formulate a model that evaluates hubs' effects on surrounding contexts' regeneration. This research is divided into two parts; the first examines the concept of mobility hubs as catalysts to existing urban areas' regeneration, the dimensions and elements responsible for the hubs' success as catalytic projects, the second investigates case study for transit station and its context, in Alexandria city, Egypt. The analysis of this case will be through designed model assessing the catalytic effect of the hub on its immediate contexts of value.

KEYWORDS: Mobility hubs, urban catalyst, transit oriented development.

1.   INTRODUCTION

According to the "WCED, 1987" [1], sustainable development means *"a development that meets the needs of present without compromising the ability of future generation to meet their own needs"*. Accordingly, cities represented in policy and decision makers, urban designers, urban planners, stakeholders, etc. are always

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seeking sustainable urban redevelopments, through many urban movements such as New Urbanism, smart growth and Transit-Oriented Development (TOD).

Peter Calthorpe was one of the pioneers who expanded the theory of "the new urbanism" to include a regional design scheme termed "transit-oriented development" in which the new urban areas are connected to each other and to a larger metropolis by public transportation. In this approach, transit and land-use integration is one of the most promising means of shifting the trend of automobile-dependent sprawl and placing cities in developing countries on a sustainable pathway [2].

A transportation hub is a gathering place for people to access local and regional destinations as well as providing a place for people to get to local amenities and work opportunities. It also serves a critical function in the regional transportation system as the origin, destination, or transfer point for a significant portion of trips. They are places of connectivity where different modes of transportation come together seamlessly and where there is a great concentration of working, living, shopping and playing [5]. The ideology of the transportation hubs has gained numerous terms over the years to convey the idea of mobility hubs, such as "transit village," or "transit village hub". Away from the names, mobility hubs are claimed to have the opportunity being catalysts for making the urban contexts vibrant and exciting places to live and visit, so the study's main objective is to shed light on mobility hubs, their designing principles and to formulate an evaluation model assessing TOD effect on existing urban areas.

A model is designed based on literature review examining indicators and dimensions that can assess catalytic effect of hubs on surrounding physical context and related communities, the formulated model will be used in assessing and analyzing an Egyptian case study in Alexandria providing a tool to understand hubs effect on settings and how to successfully turn a hub into a catalyst for a regeneration strategy in a context of value. The applied model will be filled through author's observation of user's behavior and their response to the newly renovated hub, as well as data collected from hub's immediate context showing the effect of the hub on the types of uses and

activities that appeared in the context as a result to the increased pedestrian flow created by the new hub.

2. SUSTAINABLE URBAN DEVELOPMENT DEFINITIONS & CONCEPTS

According to the report of the UN-Habitat in 2009 [6], cities around the world had to face economic, social, and environmental challenges, as well as fast urban changes, such as rapid population growth and social-spatial changes which all had significant impacts on urban areas especially in the developing countries. A great interest for the urban sustainability raised in regeneration strategies.

The sustainability concept appeared first in 1972 at the united nations conference on the human environment in Stockholm [7]. And then the sustainable urban development appeared, as a dynamic process aiming for achieving sustainable conditions that address environmental, economic, social, and governmental sustainability concerns [8]. A number of theories that can create and promote sustainable urbanism, can be discussed When addressing the sustainability of the built environment. Some of these theories are: New Urbanism (NU), Smart Growth, TOD and Sustainable Urbanism [9]. This research is focusing on the transit oriented development concept and how it can contribute in the sustainable urban development.

3. TRANSIT ORIENTED DEVELOPMENT CONCEPT
3.1 Basic Theory

Since the urban sprawl in the last decades has increased, researchers focused on achieving planning theories which can solve urban problems like air pollution and traffic congestion caused due to urban transportation strategies relying on private cars and enhance the quality of life in new and old areas. They found that the alternative to automobile dependency is not a total lack of private vehicles. Rather, it is a multi-modal transport system often called TOD, in which the citizen has various transport options to provide high degree of accessibility.

The researchers are dealing with the TOD concept as a planned design process for a community which encourages compact, mixed use, pedestrian friendly

environment where development spreads out within quarter to half mile distance of a public transit station. It is a tool for achieving three main goals [10]:

1- Walkable streets

2- Building intensity and concentration

3- Integration of transit

The integration of transit and land use is one of the most important strategic initiatives for more sustainable urban development [11]. At the macro level, cities that are compact and have a rich mix of land use—as a result of the TOD—are highly livable. There is no one universally accepted definition for the TOD, some define it simply as a high-density area located within walking distance of a transit station and others highlight the walkability factors as well as high-density and mixed-use aspects.

The concept of TOD was defined by some researchers as *"moderate to higher density development, located within an easy walk of a major transit stop, generally with a mix of residential, employment and shopping opportunities designed for pedestrians without excluding the auto"* [12]. TOD analysts explained that in a community served by the TOD, there would be potentials to provide residents with improved quality of life and reduced household transportation expense and at the same time, providing the region with stable mixed-income neighborhoods that in return reduce environmental impacts and provide real alternatives to traffic congestion [13].

3.2 TOD Concept

The concept of the TOD was firstly introduced by the American scholars and was closely related to the development of American cities. Before the 1930s, trams and buses were the main urban transportation means in America. After the World War II, urban transportation began to rely on cars due to the development of car industry, and accordingly a series of urbanization problems have been caused as: low efficiency of land use, traffic congestion, huge consumption of energy, air pollution. To solve these problems, many scholars began to seek for new theories of city development [14].

Calthorpe has noted some concepts relating to the new urbanization problems such as pedestrian pockets, traditional neighborhood developments and urban villages [2] and he was the main person responsible for defining and initially implementing a TOD [15]. TOD has 4 characteristics which are: relying on bus stops for mixed and high-density land development, excellent environment for walking and public transit and also taking bus stops as hubs [2]. In Calthorpe basic TOD structure, the typical community consists of the following land-based functional parts: public transportation station, core commercial, office/employment area, TOD residential area, secondary area and public open space [16] as shown in Fig. 1. Every successful TOD community must have a central business district close to the station and it should be related to community's size, function and location. To keep the job and employment balanced in the area.
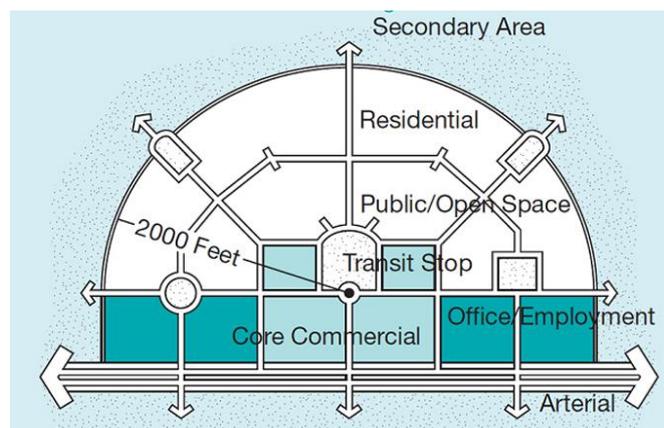
Fig. 1. Neighborhood-scale TOD site design, with mixed-use development within a walk shed of a public transport stop [2].

3.3 TOD Performance Criteria

Some performance criteria were proposed that can be used to evaluate any TOD outcomes and function that should look beyond creating compact physical form at station level [3].

1- Location efficiency

It requires for any neighborhood to have an efficient location's some features as providing high-quality transit, a mix of uses, and pedestrian-friendly design. We can't rely only on the proximity to transit as it is only one variable determining the location efficiency of a neighborhood. There are other factors that determine the location efficiency as the residential density, transit frequency and quality, access to community amenities, and a good quality pedestrian environment and these can be summarized in: Density which indicates the sufficient customers within walking distance of the transit stop, Transit accessibility which indicates the transit stations and stops that are centrally located within the TOD and Walkability which indicates the network of streets within the transit district that is interconnected to the pedestrians.

2- Livability

TOD would contribute directly to improvements in livability and it can be measured by: improved air quality, increased mobility choices, decreased congestion and improved access to services.

3-Financial Return

The financial return can be presented by different means such as: higher tax revenues from increased retail sales and property values, higher return on investment encouraged by the TOD developing projects, shorter predictable commute times and easier employee access.

4. Choice

It can be measured by how much prosperity of choosing TOD can provide to residents and this prosperity can be formalized as: diversity of housing types, range of affordable housing options, diversity of retail types and balance of transportation choices.

When a TOD is created in an existing context with high densities and mixed uses, it should verify all previous criteria to achieve a successful impact that can help catalyzing regeneration process in designated settings.

4.   MOBILITY HUBS

4.1   Mobility Hubs as Catalytic Projects

The mobility hubs are more than just stations. They are places of connectivity where different modes of transportation (walking, riding, transit) come together and where there is an intensive concentration of working, living, shopping and playing [5]. A lot of scholars tried to figure out the key elements for a successful mobility hub that defines how a mobility hub can satisfy users and start to be a catalytic project, they are illustrated in Fig. 2.

The catalytic project is usually part of a wider program that includes local's needs and comprehensive analysis of physical context to ensure that the project fits the physical and spatial contexts it occupies and creates a successful catalytic action.
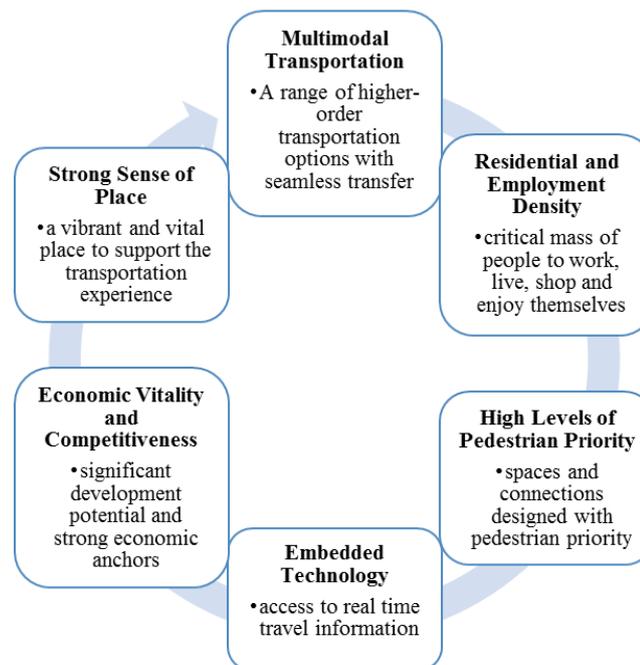
Fig. 2. The Key elements of a successful mobility hub [5].

4.2   Mobility Hubs in Relation with Context

To assess the catalytic effect of mobility hubs on surrounding settings and related communities, many indicators and dimensions were examined in recent researches. The following 4 "P's" concept can assess success of transit communities [17]:

- People: the number of residents and workers in an area which has direct relation with the reduction of auto trips.
- Places: areas with commercial urban amenities such as restaurants, grocers, and specialty retail can allow residents to complete daily activities on foot without using the private cars, they also increase the residential land values that in return improve the likelihood of higher density development.
- Physical Form: small block sizes promote more compact development and walkability.
- Performance: high quality, frequent transit service makes public transportation a more reliable means of getting around and can be correlated to less driving.

It could be stated that the critical contextual considerations are morphological, perceptual, social, environmental and functional factors according to the previous analysis. Hence to create a comprehensive understanding, it would be practical to rely on Carmona's urban design dimensions' for evaluating the mobility's hub performance.

1- Morphological Dimension

The Mobility Hub is considered to be a place that includes a series of interconnected vibrant spaces filled with activities throughout all times of the day and is linked with different transportation modes and also is integrated in the built fabric of the surrounding area. Accordingly, an understanding of how the hub and the adjacent area fit well in the context is needed and it was helped through the analysis that often express features of the context (built fabric/environment) along five core factors or the '5 Ds': density, diversity, design, destination accessibility and distance to transit [18].

2- Social & Perceptual Dimension

There is a relation between the catalytic projects and their contexts; the contexts shape them and in turn they shape their contexts. This is also true in terms of the social stage. Social dimension actually influences the relation between people and urban settings. At the social scale, the influence of age has been documented in lots of researches. For example, in Germany, it was showed that people aged 65 years and

older, make less trips per year and are less mobile and that they as result need a particular quality in the transport system as higher accessibility and more user-friendliness [19].

On the other hand, perceptual dimension deals with one's awareness and appreciation of place, it embraces the images, experiences and meanings that people attach to the built environment. A catalyst needs to be perceived by its users and the catalytic project should have enough imageability to become engrained in one's cognitive map of the city, district, and neighborhood.

3- Functional & Environmental Dimensions

A functional space is the space which is able to serve the needs of the users. There are some needs that people seek to find in any urban public space such as comfort, relaxation, passive engagement, active engagement, and discovery [20]. Accordingly, catalytic projects need to respond to these basic needs that people seek and by responding; a catalyst can then offer variety of uses and have a higher possibility to generate activity that will strength the vitality of the project and the surrounding area [17].

On the other hand, mobility hubs can serve the context environmental as it helps in reducing the gas emission through using the green transportation and encouraging the public transportation, it helps in raising the air quality by decreasing the number of the passengers' cars.

5. DEVELOPING AN EVALUATIVE MODEL

The previous literature reviews of mobility hubs in relation to surrounding contexts provides an insight into the conception and potentials of considering hubs as catalytic pivots, and the means of enhancing their effect on settings and related communities.

The paper suggests a tool to evaluate and analyze the catalytic effect of the mobility hubs' projects on their surroundings. It deals with principles gained from the interrelated field of practice and from theories and combine these factors in one model

appeared in Table 1 that can help professionals and decision makers assessing the catalytic effect of the mobility hubs on existing settings. The proposed approach tries to mix between the technical principles of transportation in one side and the contribution of urban design dimensions.

6.   SIDI GABER STATION, ALEXANDRIA, EGYPT

This part will examine an Egyptian case in Alexandria and assess the catalytic effect of the chosen hub on its surroundings by applying the previous model.

Understanding a transit hub and its surrounding contexts requires collecting data to analyze and classify it and the analysis of the case in shown in Table 2. The following entries were chosen to examine Sidi Gaber case study:

1- Descriptive introductory about the project.

2- Context's history, main urban and architectural features.

3- The transit station and strategic redevelopment plans.

4- The key actors.

5- Assessing the project's impact on the surroundings.

6.1   Descriptive Introductory About the Project

It is an urban regeneration project in Alexandria. It is a major transport hub for the city. It is located in Sidi Gaber district to the center of Alexandria. It connects Cairo and Alexandria together. The redevelopment is executed and inaugurated in 2014 and involved redeveloping of the station's historic building as well as a new construction. The project included the construction of a huge mall comprising two stories and a multi-level garage encompassing 850 cars, an aerial view of the project is shown in Fig. 3 a, b shows the station's surroundings including: main streets, pedestrian escalator, parking station and surrounding shopping malls.

Table 1: Model Assessing the catalytic Effect of Mobility Hubs on surrounding contexts, author.

Administrative & Economical Dimension

Indicator				
Economic				
Area Economic conditions	Need to attract new customer	Need to provide opportunities	shifted economic base	Large scale investment
Local community income level	Highly low income level	Highly medium income level	Highly medium income level	high-medium income level
Types of investors and funds available	National governmental only	Resident donation	international organization funds	National government investment & private ones
Housing units' values	Low value of the units	Medium value of the units	High value of the units	Expensive value of the units
Collaboration between key actors	No collaboration	Between government & N.G.O	Bet. government & investors	Total collaboration between actors

Admin

Environmental & Functional Dimension

Indicator				
Environmental				
Frequency of public transit use	Very low frequency	Low frequency	Medium frequency	High frequency
commute and shop modes	Automobile	Motorcycle and taxi	Public transport	Walk and bicycle
Brownfield development	Never	Not applicable	long term planning	Done before and planning for more
Congestion problem and traffic conditions	Continuous	Only in rush hours	rush hours, decongest suggestions	Easy traffic
Capacity utilization of transit at peak hours	Almost empty transits	Huge passengers load	Medium passengers load	Fair passenger load

Function

Morphological Dimension

Indicator				
Density				
Residential density around transit stop	Low densities' percentage	Low but expecting to increase later	High percentage	accepted percentage
Employing Density to residential around station	No Employment uses are found	Are found only in the station primary area	Med. densities to residential	Sufficient Employment densities to housing
The underutilized lots reclaimed for construction	Barely lots are found	Few lots with no plans for future use.	Few lots with supportive developing plans.	Many lots reclaimed for development
Accessibility				
Number of transit stops	Low number of stops	Low number that can't be increased	Fair number with efficient places	Fair number, planned to increase
Number of employees' trips per day by the station	Low number of trips	Low no. of trips at the station primary area	Medium-high number of trips	High number of trips
Improved street crossings for pedestrian	Intersections are risky for pedestrians	Low quality of crossings for pedestrian	Medium, crossings quality	High quality with maintenance
Pedestrian & bicycle lanes	No lanes are found	Are not found but can be created	Low percentage	High percentage
Street Connectivity	Few intersections, large building blocks	Fair number of intersections acceptable block length	Ability to upgrading block length	30 or more intersections per square km
Walkability				
Ratio of pedestrian paths to road network	No pedestrian paths	Low ratio	Medium ratio	High ratio
Method of journey to work daily in the area	High percentage is private cars	High percentage is buses	High percentage is transit station	High percentage is walking
Minutes travelled on foot to job/retails	Not walkable area	≥ 30 min.	15-30 min	5-10 min.

Table 1: Model Assessing the catalytic Effect of Mobility Hubs on surrounding contexts, author.

Morphological Dimension

Criterion				
Walkability				
streets sheds & pedestrian facilities	Sheds are missing	Little number of sheds	Little number of sheds, but to be increasing	Sheds are available
Pedestrians' safety	High pedestrian collision rates at inters.	High pedestrian collision rates at road segments	Low-medium pedestrian collision rates	No collisions can be verified
Accessible amenities using pedestrian paths	accessibility is not considered	Found with low quality accessibility	High percentage of medium quality	High percentage of good quality
Diversity				
Mix level of uses within the TOD area	Residential uses with poor commercial and retails activities	Residential uses with poor commercial and entertaining activities	Residential uses with fair commercial activities and no parks	High level of mixing between residential and commercial uses

Political & planning Dimension

Criterion				
Studies undertaken in the planning process	Very few & insufficient studies in planning level	Studies in some disciplines in planning level only	all related disciplines in planning level only	all related disciplines in planning & implementation
Community participation	No community participation is found	Only ques. being asked in planning level	Community partic. only in planning level	Community partic. in planning and impl.
Stakeholders' concerns	Only policymakers' concerns are taken	Policymakers, transport associations concerns	Policymakers, investor, transport association	Any policymakers' concerns are taken into account
Systematic application process	High bureaucracy levels from the policymaker	Medium bureaucracy levels from the policymaker	Medium tolerance level between the policymaker & investor	Medium level between policymakers and stakeholders
Evaluation of the project	Evaluation is not being taken at any stage	Evaluation is taken only after the project	Evaluation is taken before and in project	Evaluation is being taken before, in and after project

Social & Perceptual Dimension

Criterion	Low ratings	Medium ratings	High ratings	Very high ratings
Place making (Livability, Belonging)				
Pedestrian use ratings according to walking within 1/4 mile	Low ratings	Medium ratings	High ratings	Very high ratings
Condition of pedestrian paths	Bad Condition	Good condition	Very good condition	Excellent condition
Number of neighborhood institutions (clubs....)	Not found at all in the area	Only one. found within the area	Few number found within the area	appropriate number with good quality
Percentage of parks and open areas	Not found at all in the area	Small percentage with poor quality	Medium percentage, planning for more	High percentage with good quality
Street scape detailing as vegetation, materials and street trees	Not found at all in the area	Poor street scape detailing	Poor street scape detailing but working on enhancing	Good and attractive street scape detailing
Active street front that supports local retails pride	Small number of retails with no cafes	Cafes only are found with retails of basic needs	Cafes and some retails	Cafes, events, and retails
Number of heritage buildings preserved	No heritage buildings are found	No heritage buildings are preserved	Conservation programs are found	High upgrading efforts for heritage buildings
Social				
Community support for further development	Not welcoming at all	Less than 25% has interest in	Less than 50% has interest in	Highly accepted by res.
Residential diversity in age, education, income level	Diversity in age with common income level	Diversity in age, slightly diverse in income	Moderate level of diversity	High diversity yet strong community

| Fig. 3a. An aerial view of Sidi Gaber Station and the surrounding area [22]. | Fig. 3b. The surrounding main streets, Google earth program. |

6.2 Context's History, Main Urban and Architectural Features

The station is one of the oldest in Egypt, it has been serving the eastern regions of the city even before the great transformation done to the area and made it a major urban districts [22]. Sidi Gaber Station included the first railway lines constructed outside Europe and the second in the world. In 1850, "Khedive Abass" signed with the British designer "Robert Stifnson" to construct a railway connecting Cairo and Alexandria together. The famous train station building which was built in 1948 has a special architectural importance due to its special style. The station is always distinguished with the famous clock tower as shown in Fig. 4, and the major map in front of it showing the main streets of the city of Alexandria along with the most important touristic attractions [23].

6.3 The Train Station and Strategic Redevelopment Plans

In 2009, the ministry of transportation with the Egyptian national railways launched a project aiming at developing and expanding the train station with ambitious intention to turn old parts of the station into a railway museum, and include space for commerce in the newer parts. The development firstly included the renovation of the station's building itself as it is a sensitive quality building which brings a symbol of expression on the area more than just a service relying, the designer then tried to link between the old building with its unique character and modern style in architecture [22] as shown in Fig. 5.

Fig. 4. The historical clock tower [22].   Fig. 5. The use of modern styles [22].

Also the development included the construction of a two stories shopping mall as well as a multi-level garage with 850 parking spaces. The project aimed at resolving the traffic problems, improving the visual quality, creating safety walkable areas, improving the connection between Smoha district and Sidi Gaber district, linking Sidi Gaber to coast to the station, improving infrastructure and increasing parking facilities [23].

The Ministry of Transportation and the Egyptian National Railways Station Company offered a tender for a potential operator who will be responsible for the property and facility management for the Shopping Mall, train station building and garage building.

6.4 The Key Actors

The government implemented the project and started preparing for the bid. Then Madar Project management company along with Coldwell Bankers finalized their efforts for preparing the bid process of Sidi Gaber Station New Mall [23]. The mall now is witnessing a huge problem in opening due to the problems found between the client (Egyptian railways organization) and the company which implemented the project. The mall opened in 2012, then it remained closed till July 2014 then it was opened again in September 2014 and closed till now.

6.5   Assessment of the Project's Impact on the Surroundings

The construction of the new building besides the changes and renovations made to the station itself caused changes in the population densities. The flow of people coming to the station in addition to those visiting the new shopping mall increased and caused a chaotic traffic. Walkable areas and paths may be a solution but this wasn't in the developing plans which made pedestrians pass through the fences to reach the station and the mall as well.

At the same time, the project affects the area positively. It offers means of support to the station's users as the renovation includes escalators, and shops which entertain them while waiting for their trains. Also the parking building offers spaces for vehicles which solve one of the huge problems in the area. But unfortunately didn't enhance the collaboration between the required interest of the key actors, as the absence of the collaboration between the key actors and the stakeholders was one of the main reasons behind the lateness of the success resulting from the government's bureaucracy and this is obvious in operating the mall.

Table 2. Model Assessing the catalytic Effect of Sidi Gaber Hub on surrounding context, author.

Administrative & Economical Dimension

Indicator				
Economic				
Area Economic conditions	Need to attract new customer	Need to provide opportunities	shifted economic base	Large scale investment
Local community income level	Highly low income level	Highly medium income level	Highly medium income level	high-medium income level
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Housing units' values	Low value of the units	Medium value of the units	High value of the units	Expensive value of the units
Admin				
Collaboration between key actors	No collaboration	Between government & N.G.O	Bet. government & investors	Total collaboration between actors

Environmental & Functional Dimension

Indicator				
Environmental				
Frequency of public transit use	Very low frequency	Low frequency	Medium frequency	High frequency
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Function				
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Morphological Dimension

Indicator				
Density				
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Number of transit stops	Low number of stops	Low number that can't be increased	Fair number with efficient places	Fair number, planned to increase
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Method of journey to work daily in the area	High percentage is private cars	High percentage is buses	High percentage is transit station	High percentage is walking
Minutes travelled on foot to job/retails	Not walkable area	≥ 30 min.	15-30 min	5-10 min.

Table 2. Model Assessing the catalytic Effect of Sidi Gaber Hub on surrounding context, author.

Social & Perceptual Dimension

Place making (Livability, Belonging) — Social

Criterion	Low ratings	Medium ratings	High ratings	Very high ratings
Pedestrian use ratings according to walking within 1/4 mile	Low ratings	Medium ratings	High ratings	Very high ratings
Condition of pedestrian paths	Bad Condition	Good condition	Very good condition	Excellent condition
Number of neighborhood institutions (clubs….)	Not found at all in the area	Only one. found within the area	Few number found within the area	appropriate number with good quality
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Residential diversity in age, education, income level	Diversity in age with common income level	Diversity in age, slightly diverse in income	Moderate level of diversity	High diversity yet strong community

Morphological Dimension *(Walkability, Diversity)* and **Political & planning Dimension**

Criterion	(Low)			(High)
streets sheds & pedestrian facilities	Sheds are missing	Little number of sheds	Little number of sheds, but to be increasing	Sheds are available
Pedestrians' safety	High pedestrian collision rates at inters.	High pedestrian collision rates at road segments	Low-medium pedestrian collision rates	No collisions can be verified
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Evaluation of the project	Evaluation is not being taken at any stage	Evaluation is taken only after the project	Evaluation is taken before and in project	Evaluation is being taken before, in and after project

7.   CONCLUSION

Analyzing Sidi Gaber case showed how the hub attracted more passengers to the area though the mall shops are still 80% empty due to stakeholders' non homogeneous visions. The hub also attracted many street vendors around the mall and the station which increased the traffic problem. Due to the resulting traffic chaos low quality shops were attracted to the mall which didn't attract further investments in the area.

Model application on Sidi Gaber case study shows the building potential of becoming a regeneration catalyst for the area, the building as a hub in a mixed use dense context of value had the potential to create a pedestrian environment for local communities, instead of accentuating the traffic chaos. The absence of collaboration between stakeholders and each party sharing different visions and goals weakened the hub's potential of becoming a catalyst for regeneration.

Generally, we can conclude that in order to achieve a project with positive catalytic impacts on the surrounding context, there should be:

1- A well-organized cooperation and common vision between the policymakers, decision makers, residents, planners and urban designers and investors reaching the requested goals.

2- The strategy design process and pilot catalyst implementation should include a dialogue between community, professionals, investors and decision makers, to understand site challenges and ways to overcome them.

3- Effective solutions for bureaucracy and the government has to put a fast implementation program reaching the main objectives of the project.

4- A complete study covering all related disciplines before and during the planning process to avoid any conflicts and assure the good quality of the project.

5- An evaluation process in all project's stages through surveys including the residents and users testing their opinions regarding the different aspects of the project to guarantee a successful project.

6- Catalytic projects which catalyze investments and affects people's life style, it may upgrade surrounding contexts as well. Therefore, it empowers local communities and enhances positive participation.

7- Building a flexible system that allows efficient cooperation between stakeholders and that can accept change according to pilot project success which is essential to guarantee a successful regeneration process.

REFERENCES

1. Brundtland Commission, "Our Common Future: The World Commission on Environment and Development", Oxford University Press, 1987.
2. Calthorpe, P., "The Next American Metropolis: Ecology, Community, and The American Dream", Princeton Architectural Press, 1993.
3. Belzer, D., and Autler, G., "Transit-Oriented Development: Moving from Rhetoric to Reality", Discussion paper prepared for the Brookings Institution Center on Urban and Metropolitan Policy and the Great American Station Foundation, 2002.
4. Jabareen, Y., "Sustainable Urban Forms: Their Typologies, Models and Concepts", Journal of Planning Education and Research, pp. 38-52, 2006.
5. Metrolinx, IBI Group, Arcturus Reality Corporation, et el, "Mobility Hub Guidelines: For the Greater Toronto and Hamilton Area", A Report prepared for Metrolinx and the Government of Ontario, 2011.
6. UN-Habitat, "Global Report on Human Settlements 2009: Planning Sustainable Cities", London, Routledge, 2009.
7. Whitehead, M., "(Re)Analyzing the Sustainable City: Nature, Urbanization and the Regulation of Socio-Environmental Relations in the UK", Urban Studies, Vol.40, no.7, pp. 1183-1206, 2003.
8. Roy, M., "Planning for Sustainable Urbanization in Fast Growing Cities: Mitigation and Adaptation Issues Addressed in Dhaka, Bangladesh", Habitat International. Vol.33, no 3, pp. 276-286, 2009.
9. Khalil, H., "Sustainable Urbanism: Theories and Green Rating Systems", 10th Annual International Energy Conversion Engineering Conference, 48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Atlanta, Georgia, USA, 2012.
10. Maher, S., and Abu Rass, A., "Building a Sustainable and Smart Urban Development Model Based on Transit Oriented Development, Gaza City", A Thesis Study, Gaza, 2012.
11. Suzuki, H., Cervero, R., and Iuchi, K., "Transforming Cities with Transit-Transit and Land-Use Integration for Sustainable Urban Development", Washington, DC, World Bank Publications, 2013.

12. Parker, T., McKeever, M., Arrington, GB, et el, "Statewide Transit-Oriented Development Study: Factors for Success in California", California, Business, Transportation and Housing Agency, 2002.
13. Dittmar, H., and Ohland, G., "The New Transit Town: Best Practices in Transit-Oriented Development", Washington, DC: Island Press, 2004.
14. Zou, M., Lin, X., Mao, C., Zhang, K., and Li, M., "Review on the Theory and Planning Principle of Transit-Oriented Development", CICTP 2014: Safe, Smart, and Sustainable Multimodal Transportation Systems: Proceedings of the 14th COTP International Conference of Transportation Professionals, Changsha, China, 2014.
15. Carlton, I., "Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept: Real Estate and Transit, Urban and Social Movements, Concept Protagonist", Berkeley CA: University of California, Institute of Urban and Regional Development, 2009.
16. National Academies of Sciences Engineering, and Medicine, "Transit-oriented development: Developing a Strategy to Measure Success", Washington, DC, The National Academies Press, 2005.
17. Bohannon, C., "The Urban Catalyst Concept: Toward Successful Urban Revitalization", A Thesis Study, Blacksburg, Virginia, 2004.
18. Ewing, R., and Cervero, R., "Travel and the Built Environment: A Meta-Analysis", Journal of the American Planning Association, vol.76, no 3, pp. 265–294, 2010.
19. Klinger, T., Kenworthy, J., and Lanzendorf, M., "Dimensions of Urban Mobility Cultures- A Comparison of German Cities", Journal of Transport Geography, vol.31, pp. 18-29, 2013.
20. Carr, S., Francis, M., Rivlin, L., and Stone, A., "Public Space", Cambridge, Cambridge University Press, 1992.
21. Raslan, R., Bakr, A. and Ayad, H., "Simulation of Pedestrian Behavior in Urban Spaces. A Case Study of "Sidi Gaber" Public Space, Alexandria, Egypt", Proceedings REAL CORP 2011, pp.863-872, 2011.
22. El Din, S.S., and Ragheb, G., " Strengthening Alexandria Urban Fabric by Planning Urbanism's Walkable Area", Wiadomosci Konserwatorskie - Journal of Heritage Conservation, Nauka, vol.50, pp. 93-100, 2017.
23. Aly, S., and Amer, M., "Public Involvement in Sustainable Development: A Public Participation Process in the Sidi Gaber Railway Station Development Project, Alexandria, Egypt", Sustainable Development and Planning of the WIT Transactions on Ecology and the Environment, Vol.150, pp. 537-552, 2011.

مؤهلات المشروعات التحفيزية لإعادة التنمية العمرانية

مراكز الحركة كمرتكزات لإعادة الإحياء العمرانى

يتنـاول البحـث الإحيـاء العمرانـى للمنـاطق القائمـة ذات القيمـة وكيفيـة الإعتمـاد علـى المبـادئ العمرانية المستدامة فى إعادة تطوير تلك المناطق حيث يناقش مفهوم التنمية الموجهة بوسائل النقل والتى تعد إحدى أوجه التنمية المستدامة ومحاولة الوصول إلى تصور ومقترح لكيفية تقييم أداء المحطات بهدف إعادة إحياء العمران حولها لتكون نواة ومحفز للتطوير وإنتهى البحث بجدول خرج من القراءات والنظريات للعديد من الباحثين محاولا تقييم مدى نجاح تلك المشاريع فى إعادة تطوير وإحياء المناطق القائمـة ذات القيمة عن طريق أنوية الانتقال والحركة.