Understanding and formulating gated communities inside GCR new towns urban fabric

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1. Introduction

This paper is part of PhD research in gated communities in Egypt, it is interested of analyzing this pattern of urban development, criticizing its efficiency as a holistic pattern for urban development, hence asking the following questions, are gated communities a good urban form or not, are it compatible with Egyptian urban context, or not?. And if not, how to reduce its spillovers and use it with minimum bad impact on both micro private urban pattern and macro public urban fabric? How to increase its rule in urban development?.

In a previous published paper (ghonimi 2010), first, we have explored the process that privatization has affected the formulation of gated urban form in the city, then we analyzed gated communities comparing it with open communities in the ways in which these types of developments are collectively reshaping the public and private realms. Then we Criticized gated communities as a holistic development pattern for urban development through The revision of traditional Egypt early stages for development, The compatibility for unique characteristics of Egyptian new towns, The revision to historical Egyptian city The compatibility with dimensions of good urban form. Finally we explored the local context specially the role of the state and developers, and the consequently produced urban development legislation impact on the pattern of using these gated communities.

We concluded that gated communities are not a holistic approach for urban development. There is a division between practice of gated communities and theories of good communities; there is a division between inserted westernized gated pattern and required supposed compatible pattern with unique characteristics of G.C.R new towns. And that gated communities always make micro interest on the cost of macro spillovers, this is not only in livability but also in safety, sustainability, and other different characteristic of good urban form. Finally we concluded that the authority don't have any awareness of the impact of varied physical characteristics of gated communities.

From this point, and as the spread of this pattern and its problems has to be appeared, a great theoretical trend has started to discover this phenomena. As a planners, we should deal with this phenomena, Discover and measure its impact on micro, macro, micro-macro relation of urban form, discover its potentialities and constraints, and Define its role in urban development. We should find the suitable planning response to deal with this phenomena. Directing it to the sake of sustainability, integrity, livability of urbanism.

This paper aim to continue understanding gated communities inside urban fabric, in relevance to Egyptian context. therefore, it question the role that Gated communities physical characteristics, and hence development control tools, can make to formulate the right and most efficient strategies for using gated

communities taken in mind the measurement of its impact on micro, macro, total development. In fact many will be impatient with question such as: do the big size has the same impact like the minimum size? How big should gated communities be?, where they should locate? And how they should relate to the city?. What efficient characteristics should gated communities have?. What is the efficient characteristics, that has impact on development, all these questions is a problematic echo, how to put a development control tools that can control and help us understand and direct these physical features for both micro, macro and total urban development. A significant lack of research on this point exist, So this research intend to contribute to fill this gap.

2. Methedology

As a consequence, in order to answer the main question of this paper, the study firstly needs to define the two side impact of gated communities then theorize the relation between micro impact and macro impact, as a constraint for determining gated features physical charachtersticis. To improve the debate on gated communities, we offer here a micro – macro urban form analysis of gated communities urban form. We use spatial structure analysis to undertake both pure and applied research combining substantive interests and analytical methods. We seeks to develop computer based models and methods for spatial analysis, visualization, mapping geographical information systems. Substantive interests cover: micro and macro feature charachterstics impact. This is including measures of firt: micro pattern of development density, land use, housing type, street network patterns, second: macro pattern of collecting gated communities. And offer analytical measure of these urban form micr- macro impact, We compute these measures for gated communities of varying pattern of urban form We then use those measures to illustrate how gated urban development patterns differ with different physical charchterstics. We argue that our measures provide not only richer information on the design character of gated communities and offer new, interesting insights into how characteristics has affected micro- macro urban development, but suggest equilibrium effecient charachterstics in which land subdivision, land use and transportation policies might be most needed and influential. Afurther future research is being done to validate the riality and objectiveness of this model.

3. Micro private - macro public duple face impact of gated communities

To discover the impact of gating in changing in micro-macro relationship, and its role and way for determining gating spatial pattern physical characteristics is a critical point, what factor is affecting the efficiency of using gated communities physical feature. Is it related to micro community satisfaction, macro community satisfaction, or both sides. A recent debate has emerged about gated communities impact on micro private versus macro public urban development, do gated communities has a one way impact only on macro urban fabric? Or there is a double impact on both macro public urban fabric and also micro private urban pattern?, is this impact related to gated communities physical characteristics or not? What characteristics could minimize macro public utility disadvantages, and maximize micro private urban pattern utility?. is there a relation between micro and macro utility throgh it we can compromise the suitable physical characteristics of gated communities?. This paper intends to answer these questions.

3.1 Theoritecal relation:

Extending our previous criticism, and with reference to the requirements of the aim of this paper, here we will make a new classified criticism for gated communities impacts on two levels the first on micro level aspects and the other on macro level aspect separately. And then compare these two poles to find the relation between them. As a primary stage to measure there relationship with gated communities physical

characteristics. Some argue that only private gated communities, are seen as environmentally or socially sustainable And that only some bad impact exist on the macro public urban fabric (abdelkhalek 2009), other argue that it offers promises of healthy environment, comfort, convenience, various community services, peace and quiet (kuppinger& college 2004), other argue that it is " a prestigious suburban lifestyle attained by Common features such as a lush manicured landscape, architecture character security, and distinctive amenities and service facilities" (yousry 2009). And that only some bad impact exist on the macro public urban fabric. So the answer seems yes, however, this is not actually true when looking in depth to the overall urban form and development of these cities. The paper assumes that these new trends in developing new cities would create various urban, functional, social, and economical problems, Not only on macro public urban fabric put also on micro private urban community, and that this impact is double complementary between micro private urban pattern and macro public urban fabric. And that this relation is connected to physical characteristics, to define the most efficient characteristics we need to look to both these two sides. through this physical characteristics we can control the both impacts.

3.1.1 Gating and micro-macro community

According to both theories of good urban form and unique characteristics of Egypt context, urban form on micro and macro level supposed to be carachterised with the following aspects in defferent urban, functional, social, economic and environmantal aspects:

3.1.1.1 Urban aspect

Enhancing micro Urban aspects by, improving place-based quality of urban form and life, to be attractive, human, urbanized, urban vitality, health and quality of life(Urbed 1997, Evans 2001, Michael Breheny 1992, commission of the European community 1990, others…....): **First:** Increasing quality of urban form, attractive, human, and urbanized (urbed 1997) through making a framework of streets and squares that are will observed and accessed, a critical mass of activity to sustain facilities and animate streets and public spaces, Encourage urban greening in ameliorating pollution, improve public transportation needs, encourage compact and mixed use forms of development (Michael brheny 1992). **Second:** Enhancing visual appearance, through making Creative relationship between building, routes, open spaces. **Third:** urban diversity and choices, through making mixed uses, support diversity in character, localize facilities and services. Integrate travel modes, Varity in services and facilities, Fine grained street network. **Fourth:** Increase urban vitality through making the presence of other people and eyes on the street that make places as safe as possible. **Fifth:** Constellation to Egyptian unique characteristics.

Enhancing macro urban aspects by improving place-based quality of urban form and life, to be attractive, human, urbanized, urban vitality, health and quality of life: **First:** Increasing quality of urban form, attractive, human, and urbanized (urbed 1997) through making a framework of streets and squares that are mixed use so will observed and accessed, a critical mass of activity to sustain facilities and animate streets and public spaces, Encourage urban greening in ameliorating pollution, improve public transportation needs, encourage compact and mixed use forms of development (Michael brheny 1992), Creative relationship between building, routes, open spaces. **Second:** Enhance visual appearance, through using variety in uses, housing types, architectural features. Design visually interesting networks of space. **Third:** Beautiful city, through making art, architecture and landscaping to spark the imagination and move the spirit. **Fourth:** urban diversity and choices, through making mixed uses, support diversity in character, localize facilities and services. Integrate travel modes, connected route networks, variety in services and facilities. Fine grained network, remove barriers to accessibility. Through abroad range of activities create animation,

inspiration and foster a vital public life. **Fifth:** Easy contact, through making public realm that encourages community and mobility. **Six:** Increase urban vitality through making the presence of other people and eyes on the street that make places as safe as possible. Design for walking and cycling and public transportation. **Seven:** Increase urban distinctiveness, through making protect any regional identity and landscape character, Design visually interesting networks of space. **Eight:** Animated urban form, through making, a critical mass of activity.

3.1.1.2 Functional aspects

Enhancing micro functional aspects by, functional effeciency, ability of selfsuffeciency, posibility of external dependency, encourage diversity: **First:** Increasing its ability for self sufficiency through sufficient densities which make the critical mass of activities able to support viable range of uses and facilities, mantain varity and activity, Create a livable community by including mix of uses, Encourage Social Interaction by including mix of housing levels. **Second:** Increase possibility to external dependency through increasing access points and connection to urban context.

Enhancing macro functional aspects by, permiability, varity, diversity, connectivity, ligibility, and accsess: **First:** Increase functional effeciency (reduce travel time and cost, reduce traffic volumes) through making Using compact and mixed forms of development, Connected route network, Using Public transportation, Remove parries to accessibility. Energy effecient movement networks- taking circulation of people in Integrate travel modes on foot, bike, and public transportation as astarting point. **Second:** encourage variable alternative transportation options, to reduce car dependency and increase improve pedestrian oriented public realm to satisfy both urban livability and sustainability. **Third:** Increasing urban permeability through increasing the choices of routes by making places accessible through a variety of alternative routes (Evans 2001, Ian Bertly 1990). **Fourth:** Increasing urban variety through providing the choices for use and experience through multifunctional districts with varied building styles and ages and conditions (graham Haughton and colin hunter (1994). Varity in services and facilities. **Fifth:** Increasing diversity and choices, through making variety and mix of uses and housing levels. **Six:** Increasing connectivity, through providing accessibility to services and connecting people with each other. **Seven:** Increasing ligibility, through designing urban form to be understood by resedints, understanding the potential for choices. **Eight:** Reducing travel distances, through will connected street network.

3.1.1.3 Social aspects

Enhancing micro social aspects by: **First:** encourage Social Interaction throgh making including mix of housing levels, Pedestrian circulation, Traffic calming, Sheltered public space for (functional, social, political) public interaction. **Second:** Promote Safety and security through making spaces to enhance personal safety and pedestrian/vehicle conflict, mix of uses that make continuous eye on streets. **Third:** Promote equity through making land-use disposition, service disposition. **Fourth:** Promote social equity in micro through making variety and mix of housing types, socially mix communities. **Fifth:** Distinctiveness through sense of community, sense of belonging, sense of place, sense of identity through making settlement image and enhance legibility through design visually interesting network space with landmarks and spaces disposition. **Six:** A feeling of belonging to increase feeling of stewardship and responsbility through making..... **Seven:** social contraction and feeling of stewardship and responsibility through increasing sense of identity, and belonging. **Eight:** Distinctiveness in landscaping, environmet and culture(evans et al(2001), Mentainance of regional identity (commission of the European community 1990),

and reflecting local condision, traditions, and resources. **nine:** Constulation to Egyptian unique social charachterstics.

Enhancing macro social aspects by: **First:** promote sense of belonging and identity, through making charachter image that enhance legibility. Design visually interesting networks of space. **Second:** Promote equity through making land-use disposition, service disposition. **Third:** Promote Safety and security through making spaces to enhance personal safety. by mix of uses that make continuous eye on streets and rediscovering street as social space. **Fourth:** Justice city, through **making** services, education, health, and hope are fairly distributed and all people participate in governance, and have fairly accommodation. **Fifth:** Constulation to Egyptian unique social charachterstics.

3.1.1.4 Economic aspects

Enhancing micro community economic aspects by: **First:** Consultation to meet local needs, respect traditions, tap resources, economic situations. **Second:** self suffeciency through making build densities to support viable range of services and facilities. **Third:** Constulation to Egyptian unique economic charachterstics, through making disposition of land-uses for all social levels and housing types.
Enhancing macro community economic aspects by: **First:** Consultation to meet local needs, respect traditions, tap resources, economic situations. **Second:** self suffeciency through making build sense of micro sense of community to involve and participate in vision and decision making, and civil responsibility, and pay for improving the macro community. **Third:** Constulation to Egyptian unique economic charachterstics, through making disposition of land-uses for all social levels and housing types. **Fourth:** Reducing travel costs, through designing will connected street network, altarnative public transportation, byc, walking.

3.1.1.5Environmental aspects

Enhancing micro Environmenatal aspects by: **First:** reduce resources consumption through making reduce parking standards, provide local access to public transport, use passive energy, minimize external resources consumption in construction and use (air, water, minerals, energy). **Second:** reduce environmental pollution through making low travel energy movement systems, match projected co2 emission with tree planting. Control private motorized transport. Give public transport priorities. **Third:** improve health and quality of life through making appropriate linked public and private open and civic connected spaces networks (commission of the European community 1990). **Fourth:** Constulation to Egyptian unique environmental charachterstics, through making provide maximum shade, to allow minimum reflection in streets and open spaces and minimize indirect solar radiation to avoid heating the air, (Golany 1978), and reduces water consumption(El-Zamly 1994, p.47, Merdan 1999, p.34).

Enhancing macro environmental aspects by: **First:** reduce resources consumption through making invest in public transport infra structure, provide local access to public transport, create connected fine grained street network that enhance public transportation and alternative traveling options walking, bycing, public transports, remove barriers to provid acces and reduce travel distance. **Second:** reduce environmental (noise, air) pollution through making use low travel energy movement systems, control private motorized transport. match projected co2 emission with tree planting. Give public transport priorities. **Third:** improve health and quality of life through making appropriate linked public and private open and civic connected spaces networks (commission of the European community 1990). **Fourth:** Constulation to Egyptian unique environmental charachterstics, through making compact, mixed use easy connected urban pattern to

provide maximum shade and allow minimum reflection in streets and open spaces and minimize indirect solar radiation to avoid heating the air, (Golany 1978), and reduces water consumption(El-Zamly 1994, p.47, Merdan 1999).

When measuring these aspects in respect to gated communities micro and macro level separatly we find the following conclusions: Gated communities in Micro level is charachterised by the following. First: single use, second: single housing level, third: treed street network, fourth: small, midium and large size, fifth: low no. Of access points, six: depend completely on motor car for every day needs, and dicourge transportation altarnatives (public transportation, walking, byc) which is for some kind the oposite of the previous supposed theoritical urban form charachterstics. So it is charachterized in urban functional, social, economic, and environmental aspects as follow:

Hence in urban aspects, although it provid improving place-based quality of urban form and life, to be attractive, human, urbanized, urban vitality, health and quality of life, and Enhancing visual appearance on the contorary it does not provide any diversity or choices, niether in urban appearance or services, or even travel modes. It discourge altarnative travel modes, and It is not vital. While in functional aspects, it is not always self suffecient, hence not support the required facilities and size for social interaction. And also it does not support any external dependency. While in social aspects, although it omote Safety and security, sense of micro community, sense of micro belonging, sense of micro place, sense of micro identity through making settlement image and enhance legibility through design visually interesting network space with landmarks and spaces disposition, on the conterary it fails to be diverse, and not encourge any social interaction and not equitable solution.. while in economic aspects, although it increase realestate values, on the conterary it does not meet local needs, economic situations. it is not always self sufficient.

while in environmental aspects, although it makes better environment full with green area and facilities, it is not regarding environmental requirments, it use huge area of land, causing more commute distances that consume more time and feul, use large amount of water for green irrigations.

Gated communities in Macro level is charachterised by, first: no use only walls and gates, second: no disposition of landuse for defferent housing level, only high class, third: treed street network, fourth: small, midium and large size, fifth: low no. Of access points, six: bad connected street network, , six: depend completely on motor car for every day needs, and dicourge transportation altarnatives (public transportation, walking, byc). which is totaly the oposite of the previous supposed theoritical good urban form charachterstics. So it is charachterized in urban functional, social, economic, and environmental aspects as follow:

Hence in urban aspects, it dose not provide any diversity or choices, niether in urban appearance or services, or even travel modes. It discourge altarnative travel modes. It is not vital. While in functional aspects, it decrease functional effeciency (increase travel time and cost, increase traffic volumes) create parriers to accessibility. Reduce urban permeability and hence reduce choices of routes, reduce urban variety there is no choices for use and experience of varied building only walls and fences, no choices for services and facilities. decrease diversity and choices decrease connectivity no accessibility to services or other people decrease ligibilityReducing. While in social aspects, it fails to be diverse, do not encourage civic participation, socially excluding, are not accessible, and eliminate public life from the city. So not make sense of community, belonging or identity, hence lose social contraction and civic responsibility. while in economic aspects, it is not always self sufficient, it does not meet local needs, economic situations. while in

environmental aspects, it is not regarding environmental requirements, it use huge area of land, causing more commute distances that consume more time and fuel, use large amount of water for green irrigations,

3.1.2 Gating and micro, macro relationship

The critical echo in our criticism is the impact of gates on the relation between micro community aspects and macro community aspects. Through the previous theoretical criticism, Comparing these two aspects we can deduce that there is a reversed relationship between micro and macro community utility. Gated communities in its relation to the city highlighted many debatable echoes that explored the division between internal private urban pattern preferences and external public urban fabric preferences, on social, economic, urban and functional levels, and that this is opposite:

1- Debate on urban aspects:
    a. Debate between micro improving place-based quality of life, to be attractive, human, urbanized, urban vitality, health and quality of life on the cost of external not human, urbanized, urban vitality.
2- Debate on Functional aspects:
    a. gated communities converted the city into a large number of clubs that are restricted to its residents, no public access to services or urban space. And which accumulatively affect the overall functionality of the city.
    b. between internal no accessibility on the cost of external permeability.
    c. Debate between internal multi-activity and external no activity.
    d. Debate between internal functional quality and external no functional quality.
3- Debate on Social aspects:
    a. Debate between internal stress social cohesion on the cost of large social division.
    b. Debate between micro sense of community on the expenses of sense of being part of bigger community of the city.
    c. Debate between micro internal safety on the expense of safety of the bigger community of the city.
4- Debate on economic aspects:
    a. Debate between micro ability of self sufficiency on the expenses of macro no self sufficiency.
5- Debate on urban sustainability, gated communities strives for internal sustainability on the cost of external overall sustainability.
6- Debate on Urban liveability, gated communities increased internal urban liveability on the cost of macro city liveability which transformed into merely continuous set of walls, have no life.

Through the previous theoretical analysis we extend our conclusions that, gated communities are not a holistic approach for urban development, and it has a bad urban, functional, social, economic, and environmental impact on both micro internal community and macro external community. So when we try to determine gated communities physical features characteristics we need to put in mind both of these impacts, to make a degree of some holistic solutions for urban development. And that it has highlighted many debatable echoes that explored the division between internal private urban pattern preferences and external public urban fabric preferences one on the cost of the other. Yet more research and tests are required to define the outcomes of varied gated communities physical characteristics on the quality of life or the quality of the built environment in both micro and macro urban form in order to minimize the negative impacts and promote the full potential through a compatible management.

So the important question is, is there any relationship between both of these impact, through it, we can optimize our choices and holistic solutions for choosing the most efficient gated communities characteristics that enhance development?. The paper supposes that there is an inverse complementary relationship between micro community utility and macro community utility, with change in physical characteristics. Through this inverse complementary relationship we can optimize and Indifferentiate solutions for gated communities. For example, we can choose the optimum point for size. A more developed model in equalizing and optimizing[i] both micro utility as a factor of micro community features characteristics and macro utility as a factor of macro community features characteristics. Through this process we can control the suitable development control tools for a holistic development model through gated communities. To verify the previous assumptions, the study need to measure both micro impact and macro impact in varied physical features characteristics, so we developed a hypothetical spatial model to measure and verify the previous assumptions. The following part will verify empirically this relation.

3.2 Imperical relation

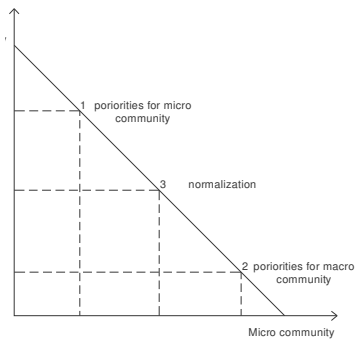
We need to invent a methodology to understand and measure gated communities physical charachteristics impact on urban form and urban development. Upon which to build plan policies and development control tools that could control the behaviour of gated communities inside new city urban fabric. These output formulate development control tools to reach the most effecient charachteristics. which would articulate goals and policies to guide greater Cairo metropolitan area new towns and its future growth following enactment by the legislature.

To understand the impact of gateing on physical charachterstics we use the following assumptions: Gated communities has a double face impact, the first on micro internal gated urban pattern which affect its benfits achieving internal development , and the other on macro external urban fabric which affects its spillovers and hence affect its development. The both sides constitue utility function of urban form (micro pattern, macro fabric), and has a complementary impact, one on the cost of the other, both these Factors affect gated communities most effecient determinant physical charchterstics, first: Internal pattern behaviour impact on gated features and charachterstics. Second: External fabric behaviour and utility on gated features and charachterstics. Which could be explained in the following part.

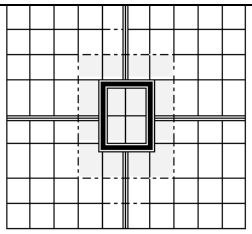
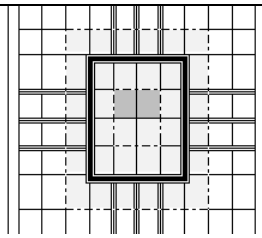
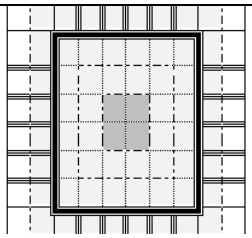
3.3 Micro-macro relationship: Utility Function and Indifference curve

An inverse relationship exist between the impact on community of ineer urban pattern and the impact on community of outer urban fabric. Best utility for micro private urban pattern always combined with expenses on the utility for macro public urban fabric.

Suppose a certain modular area of land, that is public, and we will construct a private gated community inside its fabric, this modular area can be defined as a difinitive resources could be even, first: orinted totaly to micro gated scale increasing its ability and desire to have self suffeciency on the cost of a great spillovers on macro external scale, or second: it could be oriented totaly to macro gated urban scale with maximum spillovers on micro urban scale, or third: it could be equally divided to both micro private urban pattern and macro public urban fabric.



1- Point (1) explores Maximam micro utility with minimum macro utility.
2- Point (2) explores Minimum micro utility with maximum macro utility.
3- Point (3) explores optimum or neutral micro and macro utility.

	(point 1): Small size	point (2): Midium size	Point (3): Lare size
			
Micro community utility	18	12	6
Macro community utility	7	13	19
Tot.	25	25	25

As mentioned before, through gated there is an inverse relation between micro utility and macro utility, the total utility of urban form is distributed for open and closed communites, we are indifferent between hese two poles. we could suppose two utilites, the first micro community utility, the other is macro community utilty. Through indifference cureve we can deduce the possible combinations of these two poles between which we are indifferent. Throgh this curve we could confirm the same level of utility throgh deferent senarious of combination between micro and macro community utility. As we increase micro community utility, it will be on the cost of macro community utility. In economics, utility is a measure of relative satisfaction. Given this measure, one may speak meaningfully of increasing or decreasing utility, and thereby explain economic behavior in terms of attempts to increase one's utility. Utility is often modeled to be affected by consumption of various in our case it is micro utility, and macro utility.

In economics, a graph of the various levels of utility achieved at different prices through buying two commodities, for example, magazines and paperback books. It is possible to imagine, at a given price level, various combinations of the two which would yield the same amount of utility; for example, someone might get the same utility from 18 private area and 7 public one as from 6 private area and 19 public one, or 13 private area and 12 public one. (The graph would show public utility on one axis and private utility on the other, and would have a negative slope, moving downwards to the right.) Each combination at a given area gives the same utility, hence the term ‘indifference’. The desision maker then selects one of these combinations, within the limitations of urban resources.

The purpose of this part is to examine and measure the impact of varied gated communities attrbutes, features and charachterstics on micro, macro, overall urban form, and its consequences on urban development. To help us determine the most effecient charchterstics that could increase urban development. To provide such information, we compete a varity of measures of gated communities urban form and its impact on urban fabric throgh spatial structure models.

1- Internal community and how to determine physical feature patterns (size, housing type, land use type, street network) to make a real community.
2- External urban fabric including direct impact and overall impact. And how to reduce the physical features bad impact on the urban fabric.
3- Equilibrium between micro and macro impact, the discussion

Then we use these measures to illustrate how gated communities pattern differ with in and across these

varied charchterstics. And then how to develop a methedology that help in developing a development control tool that make the suitable planning response for these types.

3.4 Deduced variables

This section will be mainly concerned with deducing all the variables taken from the different urban form measuring approaches and case studies, and from the developed techniques together with classifying them into urban, economic, demographic and social factor. and formulating the proper tolls for measurement that can explain the relation between them and defining the good community micro macro urban form (change in its degree). The purpose of the following paragrph is to explain the impact of gateing features on both micro community urban pattern, and impact on macro context urban fabric. And explain micro-macro relationship.

Gated communities stresses main echo: self sufficiency for even daily use requirements, how to be independent of the city. Micro good or efficient independent urban form depend on the suitable choice of characteristics for inner features. Through three levels of analysis we will study physical charachterstics in the following topics:

1- Internal pattern behaviour
    a. Internal Micro private urban form (internal structure of gated communities)
2- External pattern behaviour
    a. External micro public urban fabric behavior
    b. External macro public urban fabric behavior

Each of these charachterstics has a role in determining the impact of gated communities on urban development, in the following part we will develop measuring tool for measuring urban form and impact of each component to understand its impact on urban development. These factors are collectivily afeecting gated communities physical features hense Throgh amultiple regression equation we will determine the most affecting component on both iner pattern and outer fabric. Throgh the dominant componenet in each level an Equilibrium between micro in and macro out behaviour could optimize Internal quality according to self suffeciency versus external quality according to minimum impact. There is a limit for physical charachteristics which we can not exced or decrease, when utility function equal cost function.

3.5 Measuring tools

To explain the impact of gated communities physicaal features and collected features, we make he following:

first we will discribe the concept of measuring urban form and spatial structure analysis models. Spatial interacting activity model: (S.I.A M.M.B.R) Micro Macro Relationship. And Measuring urban form, spatial interacting techniques. To begin our analysis, we go through the following steps:

1- We develop a hypothetical conceptual spatial model (D.S.I.A) Developed model:for testing the variation of effects according to variation in these variables. Through this model each we will measure impact of variation in each feature in isolation.
2- We require GIS data for ….. To measure gated communities patterns and to evaluate its impact on micro and macro urban form, we sought to examine a number of new towns in greater Cairo metropolitan area and with differing, physical charachterstics, we had to have high-quality GIS data for every jurisdiction within the metropolitan area. But as because most of gated communities is

under planning, or not popularized, recent statistics are scarce. Because of this and for our purposes, we proposed a hypothetical model that can simulate the reiality of gated communities.

3- A spatial structure analysis model by (**ArcGIS Spatial Analyst**) is used to make large amount of samples that combine varied altarnatives for varied physical charachteristics. To measure the overal impact of these factors. And determine the most affecting factor in micro and macro scale.

Through measuring of internal communities pattern design, and pattern of arrangement inside urban fabric, we can understand and explore the various behaviors that this pattern has affected on micro scale, macro scale and, micro-macro relationship. Which can be used by policy analysts to measure defferences in these impacts according to deference in its characteristics. To help them design and evaluate the proper development control tools for gating urban form. Through theoretical analysis of this development impact on varied levels, and through theoretical international experiments and approaches, the following echoes were chosen and the following effect measuring techniques were developed. This section will be mainly concerned with deducing all the variables taken from the different urban form measuring approaches and case studies, and from the developed techniques together with classifying them into urban, economic, demographic and social factor. and formulating the proper toll for measurement that can explain the relation between them and defining the good community micro macro urban form (change in its degree).

Gated communities is a pejorative term that connotes the undesirable features of contemporary urban development patterns. Such features include, for example, in micro level: low density and separated land uses, automobile orientation, and unsightliness, while in macro level: urban connectivity, permiability, visual apearance, safty and security. Many of these features, however, are difficult to measure or define. For the purposes of this paper, therefore, we use a number of quantifiable spatial characteristics, such as density, land use mix, and street network connectivity. Aprimary requirement for Measuring impact of gated communities physical features charachterstics on urban, functional, social, economic and environmental aspect is related to both **first:** intensty of impact, **second:** type of impact. These two factors are considered as components for gated impact the first one is more related to the physical charachterstics.

quantitative impact (intensty factor) * qualitative impact (type factor)= typological impact

It is suposed to measure micro and macro community good urban form aspects, through feild study and GIS data, and deduce the correlation existing between gated communities physical urban form variables and good urban form aspects, By using scatter plot. This can be done by performing factor analysis for each good aspects variables category to reduce them into one variable to act as the dependent variable in regression analysis in the scatter plots.

but as a lack of gis data for gated communities, untill this moment[ii], Instead we will use A group of assumptions that can resemble gated communities urban, social, economic impact on micro ineer community. We can, as a temporary priliminary test tool, use these assumptions for measuring degree of impact of these urban, functional, social, economic, and environmental charachterstics. As long as pathes length increase its social, functional, social, economic and environmental impact will increase. In the same time, as long as paths parellel to wall increase its social,functional,social, economic and environmental impact will increase. And as no. Of pepindicular pathes increase its social,functional,social, economic and environmental impact will increase.

Because of sacrece of statistical data and for our purposes, we proposed a hypothetical spatial structure analysis[iii] model[iv] that can simulate the reiality of gated communities.. According to this model we can measure the intensty component, and measure its relation to gating physical charachterstics. We used this model to deduce the relation between each of varied physical charachterstics to gated impact, and then many cases were develpoed to make large amount of samples that combine varied altarnatives for varied physical charachteristics. To measure the overal impact of these factors. And determine the most affecting factor in micro and macro scale. The next part we intend to examine through these proposed measurements the corelation existed between social,functional,social, economic and environmental impact on both mico and macro urban form on one hand and varied physical charachterstics like, location, size,.....on the other hand. The following paragraph illustrate these relationship.

4. Internal pattern behaviour

4.1 Constraints and potintialities for micro community

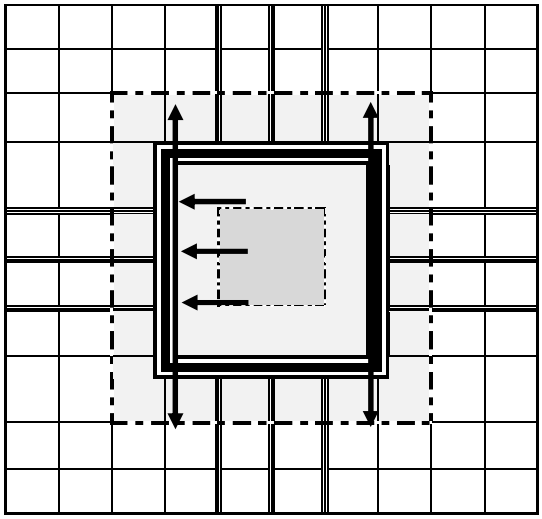
Aim of gateing: through gating a large areas of the city is turned into dead area that has no life, losing its interdependency and so losing its effeciency for functional, urban, economical, social usage and hense The developer through gating communities try to create a real community, that can satisfiy its custmers and confirm the criteria of good communities for its resedints in isolation from the city, Throgh self suffeceincy. This highlights a good questions, do gated communities is a real communities that confirm the Self suffeciency that can make the desired development? Does it sucseed to establish a community that can be isolated from the city?

4.2 Internal Micro Private Urban Pattern Behavior:

The purpose of the following paragrph is to explain the impact of gateing features on micro community urban pattern. to understand this impact, the following assumptions and senarious are put forward to simplyify the understanding of these relationships, how to make acommunity (real community can be self suffeciency) isolated from the city. Among critics of gated communities, it isolate its resedints from the city. To such critics integrated interdependance is a good tool for connecting, accissible, permiable urban fabric, increase urban and functional connectivity, improve social and economic situations. simillarly, in the absence of this aspects, no functional, urban, social and economic interaction. So it affect the micro communitiy effeciency, by reducing its services standards, Making this side need to ability of self suffeciency, or possibility for external dependency.

Assumption (1): **The Level of Self-Sufficiency approach of real community:** This approach intends to measure the value of gated communities impact on micro environment, through the ability of the physical requirements for urban, functional, social, economical self suffeciency. (measured in no. Of gated area and its density as factor of population

Assumption (2): **the level of external dependency approach:** This approach intends to measure the value of gated communities impact on micro environment, through measure the possibility of the physical requirements for urban, functional, social, economical for external dependency (measured in no. Of street network intersections and access points).



Proposed spatial hypothetical model

Assumption (3): **The degree of external connectivity approach:** this approach intends to measure the values of gated communities relation with external community through the deduction of no. Of access points in relevance to no. Of outer (joints). throgh the suposed closed pathes perpindicular to the wall.

Assumption (4): Affected area approach: this approach intends to measure the values of gating Impact through the deduction of affected area values. It depends mainly on impacts that are perpendiculer to the wall (Permeability, connectivity, Use inner services and amenities, interaction).

Assumption (5): affected parallel to wall pathes approach: this approach intends to measure the values of gating impact through the deduction of affected pathes parallel to the wall (boundaries) (Disposition of facelities, Modelities in urban spaces, Visual appearance of the wall, No. uses reduce economic effeciency)

Assumption (6): **Attaining the suitable economic value approach:** This approach intends to measure the value of gated communities economic effeciency in making the physical requirements for urban, functional, social, economical self suffeciency.

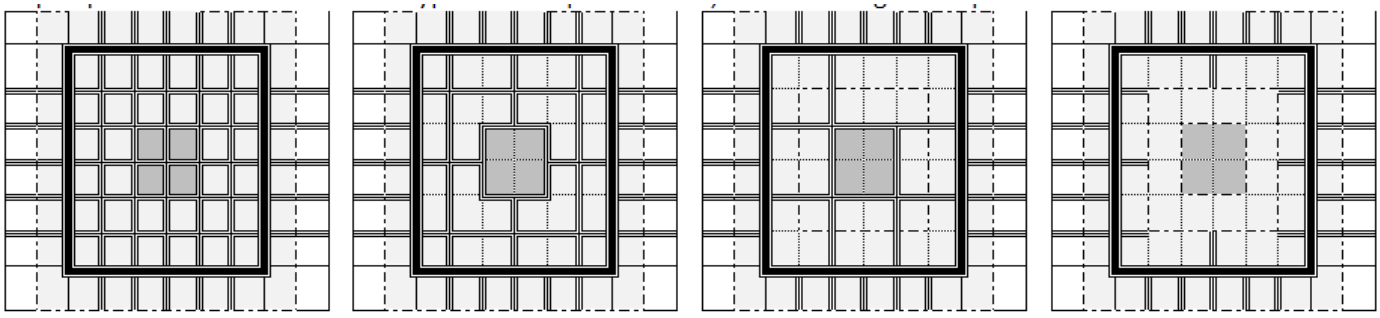
All of these assumption is resemble intensty commponent for gated impact, which we can measure through the proposed hypothetical model. Through these assumption we will measure the quantitative impact of gating in micro community. A group of assumptions that can resemble gated communities urban, social, economic impact on micro ineer community. We can, as a temporary priliminary test tool, use these assumptions for measuring degree of impact of these urban,functional,social,economic, and environmental charachterstics. As long as pathes length increase its social, functional, social, economic and environmental impact will increase. In the same time, as long as paths parellel to wall increase its social,functional,social, economic and environmental impact will increase. And as no. Of pepindicular pathes increase its social,functional,social, economic and environmental impact will increase. The next part we intend to examine through these proposed measurements the corelation existed between social, functional, social, economic and environmental impact and varied physical charachterstics like, location, size,.....

4.3 Measuring Micro inner urban form (internal structure of gated communities)

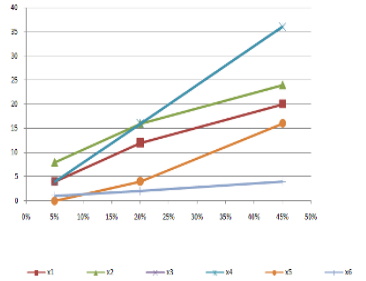
The purpose of the following paragraph is, throgh the previous assumptions, to explain the impact of gated features charachterstics on micro urban pattern. In Detailed plan output, Some central issues regarding micro urban form design concepts can usefully be discussed under the headings of Street network pattern, land use Pattern: (Degree of variation – variation – compaction), Housing type pattern: (Degree of variation – variation – compaction), Density, Size, X-y ratio, boundaries. Theses headings determine the physical, functional, social and economical aspects of the community. Limiting paper, not all the previous factors will be discussed, only charachterstics that has a spatial resamblance like gated size will be discussed in details and the other variables there conclusions will be added in the imperical analysis. The purpose of the following paragraph is to shed light on these factors, measuring its characteristics. And its impact on micro urban development.

4.3.1 Street network pattern

Worth in his book „streets shaping the city“, illustrated the way in which street to affect urban form, a mian concept in his illustration is the pattern of privatiezed streets. The Impact of privatizing urbanism is acritical each. According to this point of view, better connectivity leads to more walking and biking, fewer vehicle miles traveled, higher air quality, and greater sense of community among residents (Benfield et al., 1999). This echo appeared in two levels micro urban form, and micro macro relation ship. Our measures of connectivity involve the number of nodes and intersections and the distance between points of access into and out of the neighborhood. Internal connectivity measures transportation route options within a neighborhood; external connectivity measures route options between neighborhoods (Song, Yan, Knaap and Southworth). We developed worth (worth ....) teqnuiqe to suite our situation on hypothetical spatial model, for measuring street pattern network:



A B C D



	Gated Area per	Direct	Length of	No. Of	Populatio	Social and	No of	No. of	No. of access	Internal connectiv	External connectiv	Available economic
A	45 %	20	24	36	36	36	16	25	25	25	25	4
B	45 %	20	24	36	36	36	16	8	12	8	12	4
C	45 %	20	24	36	36	36	16	4	7	4	7	4
D	45 %	20	24	36	36	36	16	0	2	0	2	4

Effeciency of micro community (internal connectivity, external connectivity) IS affected inversely with increasing gated street network pattern. Through previous analysis its apparent that quality of micro comunity is related inversly to gated communities internal street ntwork pattern. and that more access and intersection one is petter and more internal and external connectivity.

the more streets are withdrawn from public use the higher the travel cost and travel time for all urban residents both residents and non residents of enclosed neighbourhoods.

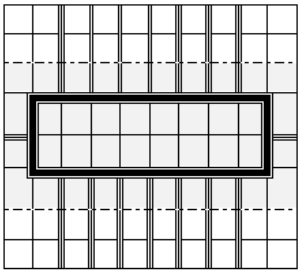
4.3.2 Boundaries

Among critics of gated communities, it contain another conceptual issue its pluring boundaries. To such critics, The clear boundaries defining a district territory enhance the development of functional and social

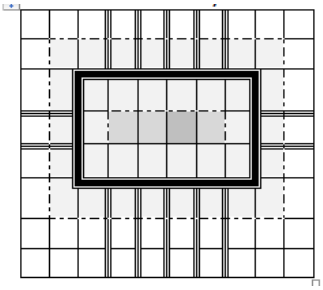
interaction, a sense of community, and identification with the area. (Jacobs ,1961, lynch 1980), Boundaries are usefully be discussed under the headings of access gates, fences, x-y ration, size, and parameter. Theses headings determine the physical, functional, social and economical aspects of the community. Moreover, access points is, **no. of access points**, of these relevant boundaries is a determinant in micro-macro connectivity we can measure it through median distance between (access gates) in feet; the greater the distance, the poorer the external connectivity. External connectivity is illustrated by the length of the line segment around the perimeter of gated community; this line represents the median length of the distance between points of access into or out of the gated communities.

4.3.3 x-y ratio

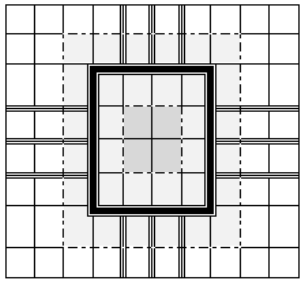
Among critics of gated communities,in micro Internal urban scale, it uses varied ratios. To such critics compact ratio is better, it reduce parametre hence reduce fences lenghth, and pattern area, and increase depth hence increase non affected area, distrbute servies equaly to all residents. So improve urban and functional situation of permiability, connectivity of micro community. Hense reduces increases ..... simillarly, in the absence of compact ration and using rectangle ratio, no. Of (restricted pathes, affected area, depth of connected not affected area) all increased. Which affect resedints life inside the community.



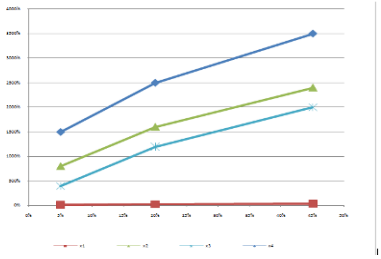
A



B



C



	Gated Area per total area	X-y ration	Direct Affected area per total area	Length of parameters	No. Of ristrected pathes	
A	20%	1-4	30%	20	16	
B	20%	1-2	25%	18	14	
C	20%	1-1	20%	16	12	

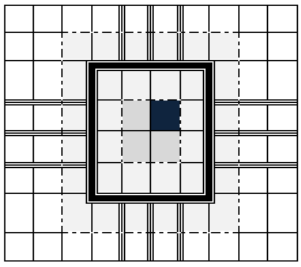
Effeciency of urban fabric (Accssebility-permiability-connectivity-visual appearance) are affected inversely with increasing gated area.
Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities x-y ratio, and that compact one is petter.

4.3.4 Size

Among critics of gated communities, it encourge reducing population size which use low density, small aea. To such critics no. Of residents of a communitiy, support viable range of services and facilities for self suffeciency, increase resedints interaction, which improve urban, functional, social, and economic economics simillarly, in the absence of heigh no. of residents, reduces interaction, self suffeciency, livability.

4.3.5 Population and density

Population of fixed area are directly proportional with increasing density, Theoretical relationship between residential density with independence applicability: (fixed area), In fixed gated area, increasing residential density will increase population, therefore increasing not only the demand for services and amenities, but also the visability of these servecice. Which affect also mix , variation, and compaction of uses.



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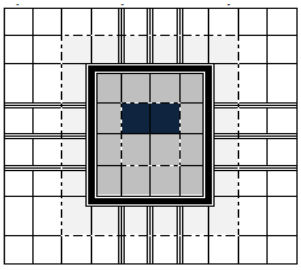

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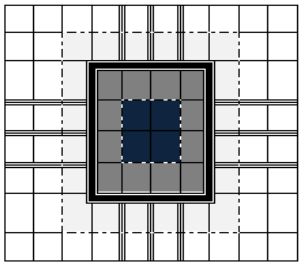

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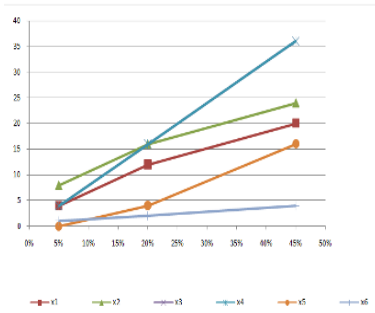
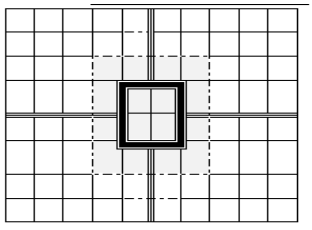


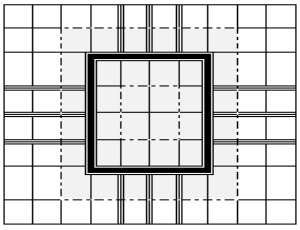
	Gated Area per	Direct Affected	Length of	No. Of units	Density - Populati	Social and economi	No of continou s not	Available economi c
A	20 %	12	16	16	16	16	4	1
B	20 %	12	16	16	32	32	4	2
C	20 %	12	16	16	64	64	4	4

Effeciency of micro community (SELF SUFFECIENCY) IS affected inversely with increasing gated DENSITY. Through previous analysis its apparent that quality of micro comunity is related inversly to gated communities size. and that compact one is petter.

4.3.6 Population and size



A



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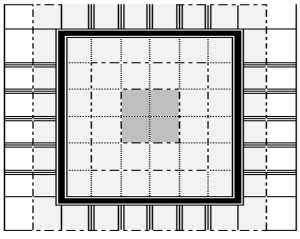

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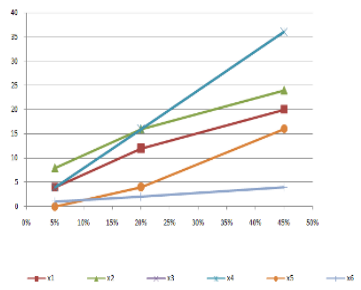
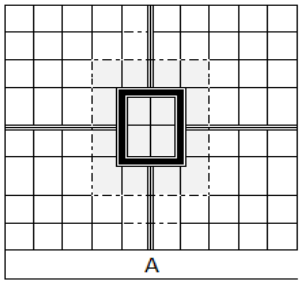
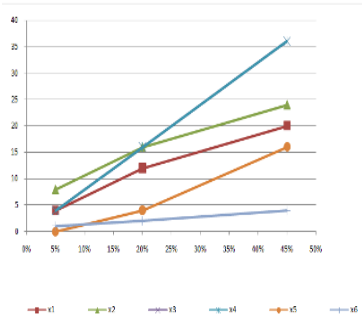


	Gated Area per	Direct Affected	Length of	No. Of units	Populati on –no.	Social and	No of continou	Availabl e economi c services
A	5%	4	8	4	4	4	-	1
B	20 %	12	16	16	16	16	4	2
C	45 %	20	24	36	36	36	16	4

Effeciency of micro community (SELF SUFFECIENCY) IS affected inversely with increasing gated size. Through previous analysis its apparent that quality of micro comunity is related inversly to gated communities size. and that bigger one is petter.

4.3.7 Population and size – density





	Gated Area per	Direct Affected	Length of parameter	No. Of units	density	Populatio n	Social and	No of continous	Available economic services and
A	5%	4	8	4	1	4	4	-	1
B	20 %	12	16	16	2	32	32	4	4
C	45 %	20	24	36	3	108	108	16	16

Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

On behalf of the previous factors, Gated micro community is also affected directly with mix and variation of uses and social groups, street network pattern. Limiting paper size only there conclusions will be added in the following imperical analysis. After defining, through theoritical hypothetical model analysis, the defferent factors that could explain impact of gating on micro Internal quality and development, in the following part through spatial structure software model we created varied senarios for gated communities. we will deal with all of these factors in combination with each other, and deduce the most affecting feature in its micro Internal utility and development. A regression analysis equation could be formulated to define internal quality according to these factors, and defining the dominnant affecting factor. Summary statistics for all these measures are provided in Table 1. We performed regression analysis for each of the factors resemble gated communitie impact, with all gated communities physical charachterstics, According to statistical analysis, We could conclud that Size of gating, no. Of acciss points, is the most affecting factor in micro internal community utility and development

5. External urban behaviour

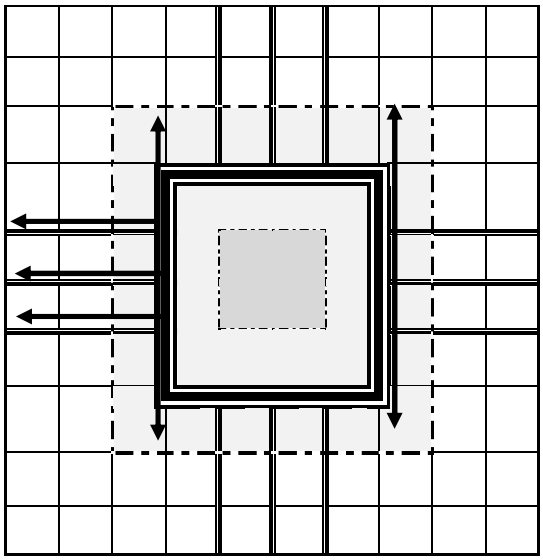
5.1 Constraints and potintialities for macro community

The problem of gating area is its functional, social, economic impact on direct area, pathes visual and urban appearance, acciss to inside, permiability to behind and connectivity with its neighbours. These proplems is reflected on macro utility reducing its effeciency. We need to measure this effeciency acoording to various variables.

5.2 External micro public urban fabric behavior:

To understand external micro urban fabric behaviour and dynamics through gated communities Impact, throgh studing and analysing gated communities pattern inside urban fabric, and its role of formulating its spillovers and costs on its context, the following assumptions and senarious are put forward to simplify the understanding of these relationships:

Among critics of gated communities, it first:create pokets that reduces urban permiability, connectivity, accissibility, second: it close perpindicular pathes, elminate relation with its neighbourhoods, third: it uses fences in it boundaries external pathes, elminating any use from it. To such critics first: integrated interdependance transit orinted development is a good tool for connecting, accissible, permiable urban fabric, increase urban and functional connectivity, improve social and economic situations, second: low porous blocks is a good tool for connecting, accisible, permiable urban fabric, increase urban and functional ability. third: making uses in this streets is a good tool for livable, sustainable urban fabric, increase urban ability. simillarly, in the absence of this aspects, first: no functional, urban, social and economic interaction, So it affect the direct neighbour, by excluding its interaction. Second: no functional, urban, social and economic effeciency, So it affect the functionality of urban fabric, by reducing it permiability, connectivity and accissbility. Third: Making these sides dead edges inside urban fabric, no functional, urban, social and economic effeciency. So it affect the effeciency of urban fabric, by reducing it livability.



Assumption (1):Affected area approach: this approach intends to measure the values of gating impact through the deduction of affected area values. It depends mainly on impacts that are perpendiculer to the wall (Permeability, connectivity, Use inner services and amenities, interaction).

Assumption (2):Affected paths approach: this approach intends to measure the values of gating impact through the deduction of affected pathes parallel to the wall (boundaries) (Disposition of facelities, Modelities in urban spaces, Visual appearance of the wall, No. uses reduce economic effeciency)

Assumption (3): Accessibility to internal sevices and amenities approach: this approach intends to measure the value of gated communities impact through throgh the suposed closed pathes perpindicular to the wall.

Assumption (4): Attaining the suitable economic value: This approach intends to measure of gating impact throgh reduction of economic cost, reducing pathes length, hence reduce, fuel consumption and time consuming, and reduce car depenancy.

A group of assumptions that can resemble gated communities urban, social, economic impact on micro ineer community. We can, as a temporary priliminary test tool, use these assumptions for measuring degree of impact of these urban,functional,social,economic, and environmental charachterstics. As long as pathes length increase its social, functional, social, economic and environmental impact will increase. In the same time, as long as paths parellel to wall increase its social,functional,social, economic and environmental impact will increase. And as no. Of pepindicular pathes increase its social,functional,social, economic and environmental impact will increase.

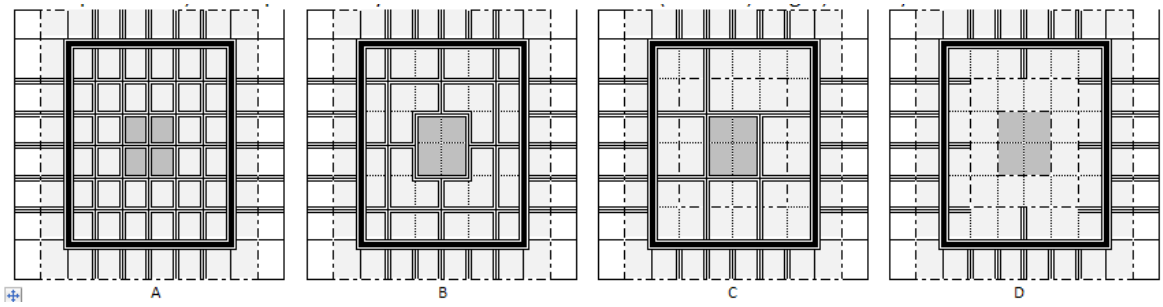
The folloeing paragraph illustrate these relationship. The next part we intend to examine, through these proposed spatial measurements, the varians and relation between social,functional,social, economic and environmental impact and varied physical charachterstics like, location, size,.....

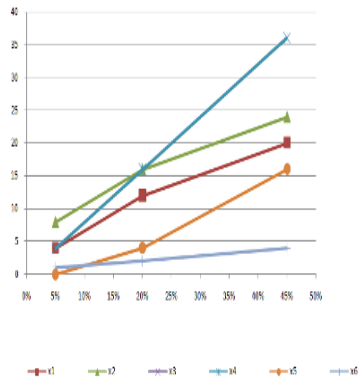
5.3 Measuring Micro external urban fabric (External structure of gated communities)

The purpose of the following paragraph is to explain the impact of gated features on macro context urban fabric. Detailed plan output, conssist of Some central issues regarding macro urban form design concepts can usefully be discussed under the headings of Size, X-y ratio, location, parameter pattern (use, height, fence type, gates type, gates distances, and number..), urban fabric pattern (street network pattern, land-use pattern, housing type pattern, services pattern) . Theses headings determine the physical, functional, social and economical aspects of the community. Limiting paper size, not all the previous factors will be discussed, only charachterstics that has a spatial resamblance like gated size, x-y ratio will be discussed in details and the other variables only there conclusions will be added in the imperical analysis. Throgh the previous assumptions, The purpose of the following paragraph is to shed light on these factors, measuring its characteristics, And its impact on micro urban development.

5.3.1 Boundaries

Among critics of gated communities, it contain another conceptual issue its pluring boundaries. To such critics, The clear boundaries defining a district territory enhance the development of functional and social interaction, a sense of community, and identification with the area. Determining the relevant boundary for any neighbourhood studied is, therefore, difficult, and applying the same size boundaries across different areas and to measure different issues is fraught with problems. Moreover, access points is, no. of access points, of these relevant boundaries is a determinant in micro-macro connectivity we can measure it through median distance between (access gates) in feet; the greater the distance, the poorer the external connectivity. External connectivity is illustrated by the length of the red line segment around the perimeter of the neighborhood; this line represents the median length of the distance between points of access into or out of the gated communities. Morover fences, among critics of gated communities in micro out scale, fence is a most affecting feature in urban form of public realm, To such critics, streets need to be fill of live through varity mix of activities, to make a continuous eye on street, hence enhance security and safty, visual appearance of street, rediscovering street as social space, simillarly, in the absence of varity and mix of uses in streets and to be just fences and wallsm, will cause public pathes bad appearance, harm security and afty, remove sense of belonging and identity. Which affect public life in the city. This impact is parallel to the parameter, and depend mainly on the nature of the fence (land use, height, nature)



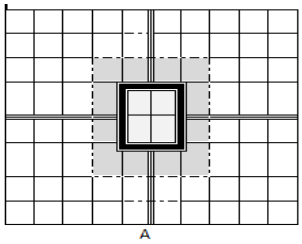


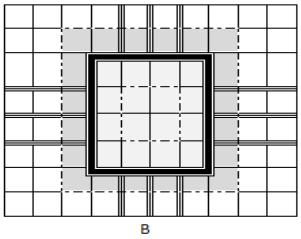
	X1:Gated Area per	X2:Direct	X3:Length of	X4:No of	X5:Ext.conn	X6: distance	X7: quality	No. of	No. of	Internal	External	No of continuus	Available economic
A	20 %	12	16	4	.25	4	.25	25	25	25	25	-	1
B	20 %	12	16	8	.5	2	.5	8	12	8	12	4	4
C	20 %	12	16	12	.75	1	.75	4	7	4	7	16	16
	20 %	12	16					0	2	0	2	16	16

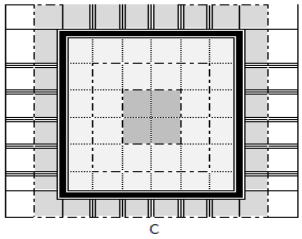
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

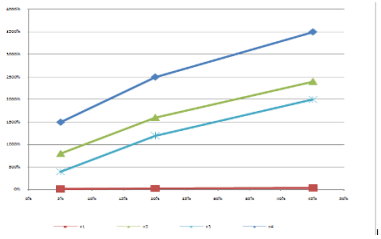
5.3.2 Size: The impact of gated communities size: (at other fixed parameters)

Among critics of gated communities, in micro external urban scale, it uses varied sizes small, midium, big size. To such critics small size is better, increase public spaces on behave of private one, reduce fences length, and reduce parameter and hence reduce affected neghbourhood area. improve urban and functional situation of permiability, connectivity of urban fabric. Hense reduces economic cost of time and feul consumption. simillarly, in the absence of small size and using large size, no. Of (restricted pathes, affected neighbourhood area, public pathes bad appearance) all increased. Which affect public life in the city.







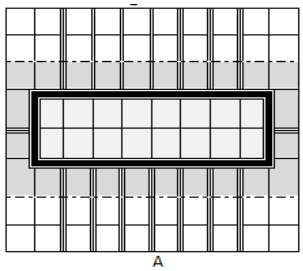


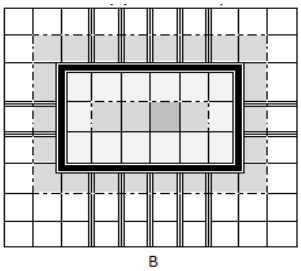
	Gated Area per total area	Direct Affected area per total area	Length of parameters	No. Of restrected pathes	
A	5%	15%	8	4	
B	20%	25%	16	12	
C	45%	35%	24	20	

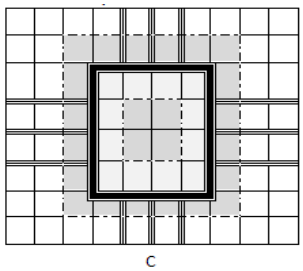
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

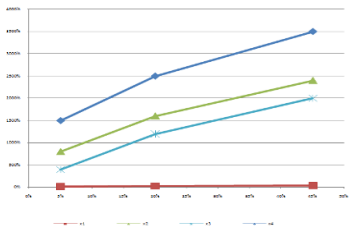
5.3.3 X-y ratio

Among critics of gated communities,in micro external urban scale, it uses varied ratio. To such critics compact ratio is better, it reduce parametre hence reduce fences lenght, and affected neghbourhood area. improve urban and functional situation of permiability, connectivity of urban fabric. Hense reduces economic cost of time and feul consumption. simillarly, in the absence of compact ration and using rectangle ratio, no. Of (restricted pathes, affected neighbourhood area, public pathes bad appearance) all increased. Which affect public life in the city.







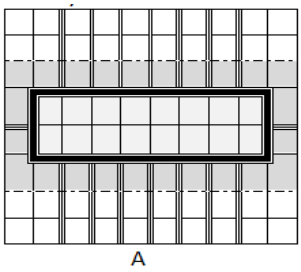


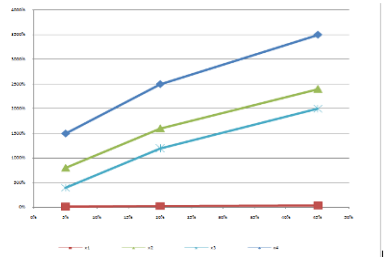
	Gated Area per total area	X-y ratio	Direct Affected area per total area	Length of parameters	No. Of ristrected pathes	
A	20%	1-4	30%	20	16	
B	20%	1-2	25%	18	14	
C	20%	1-1	20%	16	12	

Effeciency of urban fabric (Accssebility-permiability-connectivity-visual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities x-y ratio, and that compact one is petter.

5.3.4 Location

Among critics of gated communities,in micro external urban scale, location. To such critics external locations is better, reduces the double direction impact on the public releam, it also increase the size of connected public releam. improve urban and functional situation of permiability, connectivity of public urban fabric. Hense reduces economic cost of time and feul consumption. simillarly, in the using of central locations, increase the double direction impact on the public releam, it also divide the size of connected public releam. affect public life in the city.



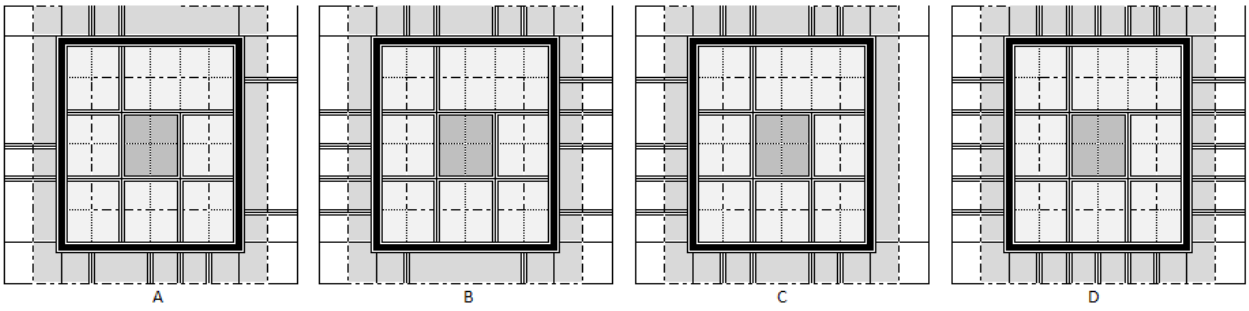


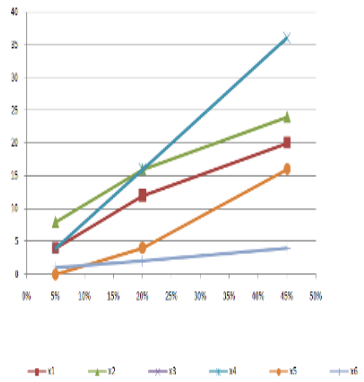
	Gated Area per total area	Direct Affected area per total area	Length of paramet ers	No. Of restrected pathes	
A	5%				
B	20%				
C	45%				

Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with location. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

5.3.5 External fabric

External fabric charachterstics is another echo in determining gated communities impact in urban fabric, the type of this fabric(.....,.....,.....), street network pattern(.....,.....,.....), landuse pattern(.....,.....,.....), housing type pattern (.....,.....,.....), height (....,.....,.....). all these features have to be tested.





	X1:Gated Area per total area	X2:Direct	X3:Length of	X4:No of access	X5:Ext.connectiv	X6: distance	X7: quality	No. of	No. of access	Internal	External	No of continous gnt affected area	Available economic
A	20 %	12	16	4	.25	4	.25	25	25	25	25	-	1
B	20 %	12	16	8	.5	2	.5	8	12	8	12	4	4
C	20 %	12	16	12	.75	1	.75	4	7	4	7	16	16
	20 %	12	16					0	2	0	2	16	16

Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

On behalf the previous factors, Gated micro community is also affected directly with parameter (use, height, fence type, gates type, gates distances, and number..), urban fabric (street network pattern, land-use pattern, housing type pattern, services pattern) . Limiting paper size, only there conclusions will be added in the following imperical analysis. After defining, through theoritical hypothetical model analysis, the defferent factors that could explain impact of gating on micro external quality and development, in the following part through spatial structure software model we created varied senarios for gated communities. we will deal with all of these factors in combination with each other, and deduce the most affecting feature in its External micro utility and development. A regresion analysis equation could be formulated to define External quality according to these factors, and defining the dominnant affecting factor. We performed regression analysis for each factor of gateing impact as an independent variable in relevance to all gated communities physical charachterstics as dependent variables. The conclusion are as follow: Through this analysis it is apparent that the first, second and third factor of gated impact on macro context are depending on gated area, x-y ratio, and that Size of gating and x-y ratio is the most affecting factor in micro external community utility and development.

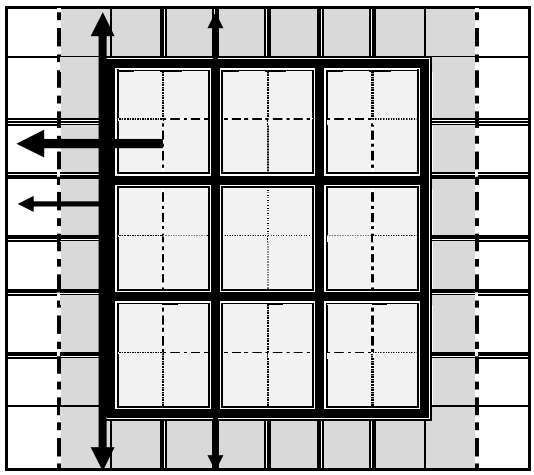
6. EXTERNAL MACRO URBAN FABRIC BEHAVIOR

6.1 Constraints and potintialities for macro community

The problem of gating area, on macro urban form, is its impact on the overal city, public-private distribution, pathes appearance, acciss, permiability, and connectivity, inside urban fabric. These proplems is reflected on macro utility reducing its effeciency. We need to measure this effeciency acording to various variables.

6.2 External macro public urban fabric behavior

To understand external macro urban fabric behaviour and dynamics through gated communities Impact, Throgh studing and analysing gated communities pattern inside urban fabric and its role of formulating its spillovers and costs on its context, the following assumptions and senarious are put forward to simplify the understanding of these relationships:



Assumption (1):Affected area approach: this approach intends to measure the values of gated communities impact through the deduction of affected area values and its affecting features. It depends mainly on impacts perpendiculer to the wall, (Permeability, connectivity, Use inner services and amenities)

Assumption (2):Affected paths approach: this approach intends to measure the values of gated communities impact through the deduction of affected pathes parralel to the wall (boundaries) (Disposition of facelities, Modelities in urban spaces, Visual appearance of the wall, No. uses reduce economic effeciency)

Assumption (3): No. Of left continuous not connected area:

Assumption (4): Attaining the suitable economic value: This approach intends to measure of gating impact throgh reduction of economic cost, reducing pathes length, hence reduce, fuel consumption, time consuming, and reduce car depenancy.

A group of assumptions that can resemble gated communities urban, social, economic impact on micro ineer community. We can, as a temporary priliminary test tool, use these assumptions for measuring degree of impact of these urban,functional,social,economic, and environmental charachterstics. As long as pathes length increase its social, functional, social, economic and environmental impact will increase. In the same time, as long as paths parellel to wall increase its social,functional,social, economic and environmental impact will increase. And as no. Of pepindicular pathes increase its social,functional,social, economic and environmental impact will increase.

The folloeing paragraph illustrate these relationship. The next part we intend to examine through these proposed measurements the varians and relation between social,functional,social, economic and environmental impact and varied physical charachterstics like, location, size,.....

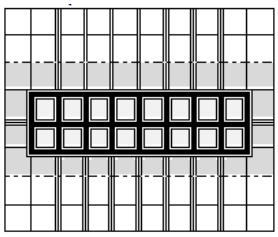
6.3 Measuring Micro external urban fabric (External structure of gated communities)

The purpose of the following paragraph is to explain the impact of gated features on macro context urban fabric. Detailed plan output, conssist of Some central issues regarding macro urban form design concepts can usefully be discussed under the headings of (size, x-y ratio, location) of collected units , fabric street

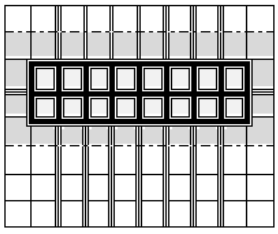
network pattern. Theses headings determine the physical, functional, social and economical aspects of the community. formulate a model to study of gated communities location problems, and impact on accessibility, connectivity, (cost of travel and time of travel) the impact of gated features on deferent patterns, (which are controlled by .....

6.3.1 Location inside urban fabric:

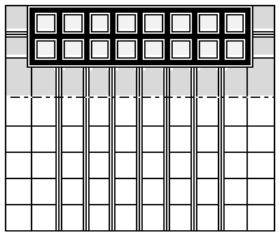
Among critics of gated communities,in micro external urban scale, location. To such critics external locations is better, reduces the double direction impact on the public releam, it also increase the size of connected public releam. improve urban and functional situation of permiability, connectivity of public urban fabric. Hense reduces economic cost of time and feul consumption. simillarly, in the using of central locations, increase the double direction impact on the public realm, it also divide the size of connected public releam, affect public life in the city.



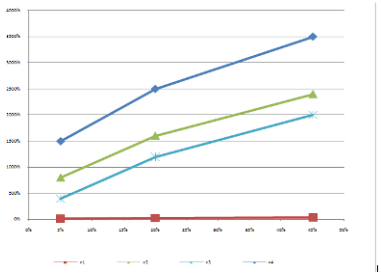
A



B



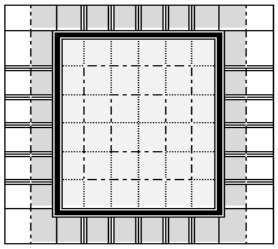
C

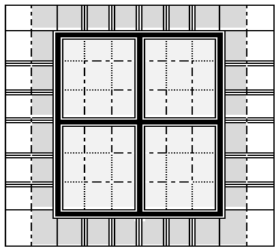


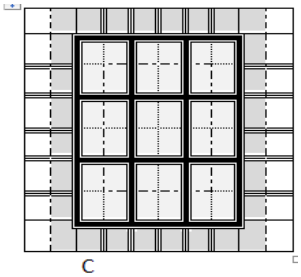
	Gated Area per total area	Direct Affected area per total area	Affected pathes approach		No. Of restricted pathes	No of continous not affected area
			Length of all parameters	Length of collected parameters		
A	16	24	42	20	16	20
B	16	24	42	20	16	30
C	16	14	36	12	9	50

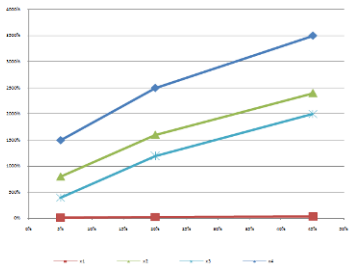
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities collected location.

6.3.2 Size of collected units:





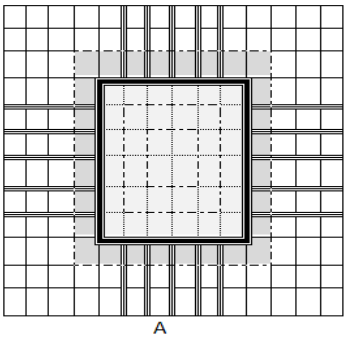


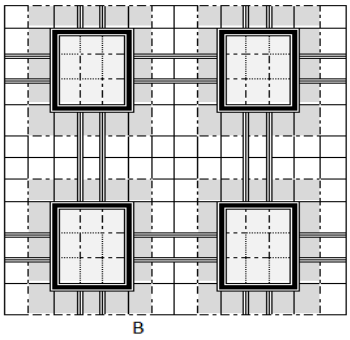


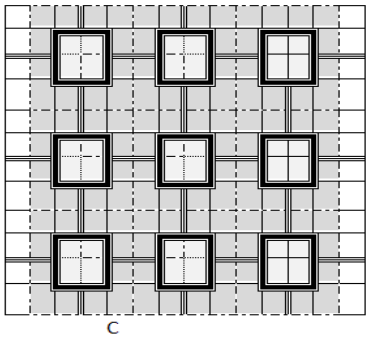
	Gated Area per total area	Direct Affected area per total area	Affected pathes approach		No. Of restricted pathes	No of continous not affected area
			Length of all parameters	Length of collected parameters		
A	36	28	24	24	20	
B	36	28	36	24	16	
C	36	28	48	24	12	

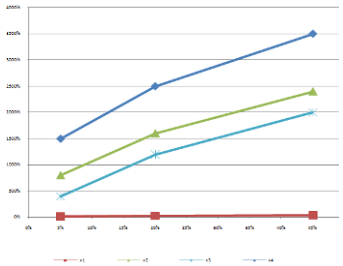
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

6.3.3 Continuous or distrected:





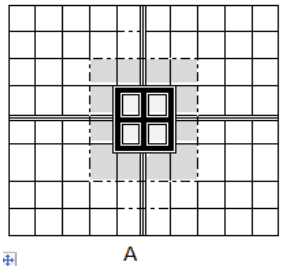


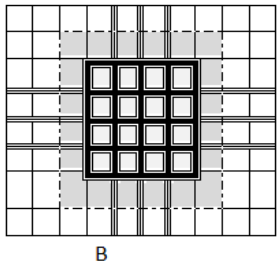


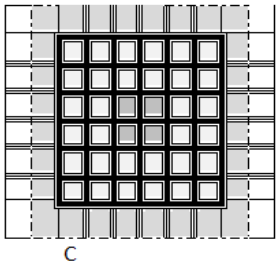
	Gated Area per total area	Direct Affected area per total area	Affected pathes approach		No. Of restricted pathes	No of continous not affected area
			Length of all parameters	Length of collected parameters		
A	36	28	24	24	20	104
B	36	64	48	48	32	68
C	36	81	72	72	32	24

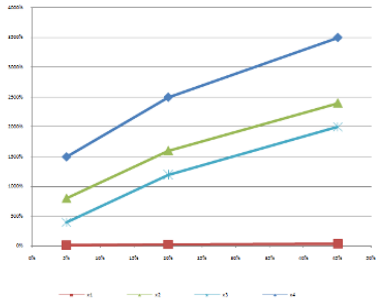
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with distrecting gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities distriction.

6.3.4 Size of collection:


A


B

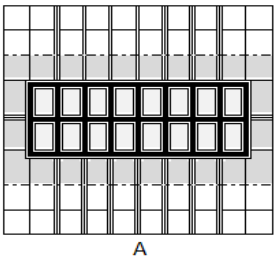

C

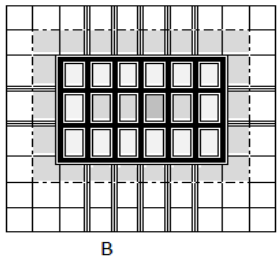


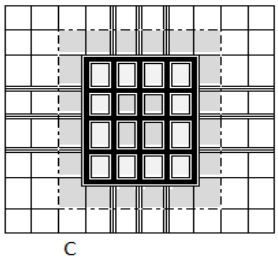
	Gated Area per total area	Direct Affected area per total area	Affected pathes approach		No. Of restricted pathes	No of continous not affected area
			Length of all parameters	Length of collected parameters		
A	4	12	12	4	4	
B	16	20	50	16	12	
C	36	28	72	36	20	

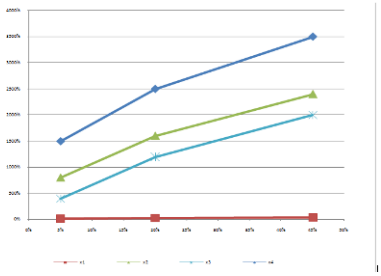
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area. Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities size.

6.3.5 Ratio of collection inside urban fabric:


A


B


C



	Gated Area per total area	Direct Affected area per total area	Affected pathes approach		No. Of restricted pathes	No of continous not affected area
			Length of parameter	total parameters		
A	16	24	20	42		
B	16	22	18	45		
C	16	20	16	40		

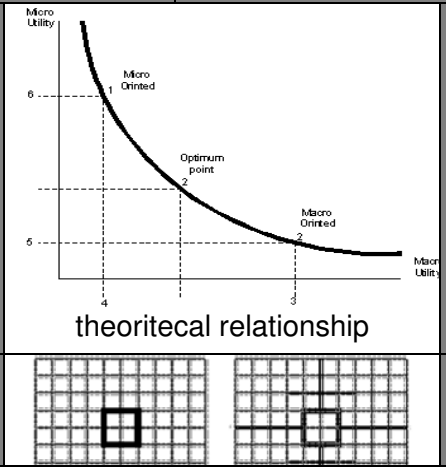
Effeciency of urban fabric (Accssebility-permiability-connectivity-vitual appearance) are affected inversely with increasing gated area.

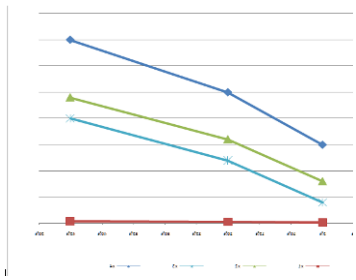
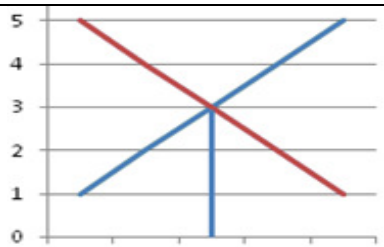
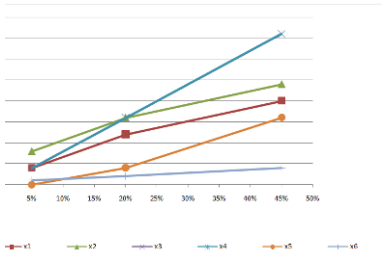
Through previous analysis its apparent that quality of urban fabric is related inversly to gated communities collection size.

on behalf the previous factors, Gated micro community is also affected directly with (patterns of spatial distribution, nature of urban fabric, ... Limiting paper size, only there conclusions will be added in the following imperical analysis. After defining, through theoritical hypothetical model analysis, the deferent facrtors that could explain impact of gating on external quality and development, in the following part throgh spatial structure software model we created varied senarios for gated communities collection inside hypothetical city urban fabric. we will deal with all of these factors in combination with each other, and deduce the most affecting feature on micro utility and development. A regreesion analysis equation could be formulated to define macro quality according to these factors, and defining the dominnant affecting factor. We could conclud that Size of gating is the most affecting factor in micro external community utility and development Comparison between the factor scores resulting from the micro urban pattern utitlty and that factor scores resulting from macro urban form charachterstics.

7. An equilibrium model between gating micro impact and gatig macro impact

In the last part we have first: deduce the relation between gated communities physical variables, and good urban form aspects for each scale, second: make aregression analysis to deduce the most important factor affecting utilty aspects in each scale, third: deduced the correlation between micro and macro urba form utility, throgh factor analysis for both micro urban form aspects, and macro urban form aspects. This part examins the equilibrium of community utility of micro private urban pattern and communitiy utility of macro public urban fabric. The purpose of the following paragraphs is to define and formulate Equilibrium analysis between internal micro and external macro urban form relationship, for achieving equilibrium between internl force seeking to increase its independence increasing its effects on its urban context, and external force seeking to reduce these spillovers. As mentioned in previous theoritical parts gated communities make two opposite forces the first side make its utility on one side on the expense and cost of many spillovers on the other side. Micro macro Equilibrium sugests the suitable suggested charachteristics for each component to achieve this equilibrium. In this part, we will concentrate on size as the most common gated physical feature that has double impact, and is the most affecting factor in micro- macro impact, it will be tested for equilibrium. Throgh utility Functions, we will discuss defferent points of view of gated communities size, is the large size better or the small size.

Micro impact						Macro impact							
Gated Area per total area	X1: Direct Affected area per total area	X2: Length of parameters	X3: No. Of restrected pathes		theoritecal relationship	Gated Area per total area	X1: Direct Affected area per total area	X2: Length of parameters	X3: No. Of units	X4: Population	X5: Social and economic power of resedints	X6: No of continous not affected area	services and facilities
5%	15%	8	4	7		15%	4	8	4	4	4	-	1

20%	25%	16	12	13		12	20%	12	16	16	16	16	4	2
45%	35%	24	20	19		6	45%	20	24	36	36	36	16	4
8. LOW URBAN, FUNCTIONAL, SOCIAL, ECONOMIC POWER						**9. LOW AFFECTED AREA APPROACH, AFFECTED PATHES APPROACH, AFFECTED PERPINDICULAAR APPROACH**								
10. MIDIUM URBAN, FUNCTIONAL, SOCIAL, ECONOMIC POWER						**11. MIDIUM AFFECTED AREA APPROACH, AFFECTED PATHES APPROACH, AFFECTED PERPINDICULAAR APPROACH**								
12. HEIGH URBAN, FUNCTIONAL, SOCIAL, ECONOMIC POWER						**13. HEIGH AFFECTED AREA APPROACH, AFFECTED PATHES APPROACH, AFFECTED PERPINDICULAAR APPROACH**								
					 Inverse relationship between micro utility and macro utility in relevance to size as a dependent variable									

14. INCREASING SIZE AFFECT: **15. EFFICIENCY OF COSTS FOR FACILITIES AND SERVICES, TRANSPORTATION COSTS, BECAUSE OF ECONOMICS OF SIZE .** **16. EFFICIENCY OF LANDUSE ARRANGEMENT.** **17. IT OFFERS HEIGHR QUALITY LIVING ENVIRONMENT IN TERMS OF BOTH SERVICES AND PHYSICAL ENVIRONMENT.** **18. IT OFFERS A BETTER MEANS OF ACHIEVING ECONOMIC AND RACIAL INTEGRATION** **19. IT OFFER MORE SOCIAL INTERACTION WHICH INCREASE SOCIAL IDENTITY**	So we can reach the optimization point under micro and macro impact constraints $R_{macro} = R_{micro}$ $\alpha_I+\beta_{I1}x_1+ \beta_{I2}x_2+ \beta_{In}x_n = \alpha_E+\beta_E x_1+ \beta_{E2}x_2+ \beta_{En}x_n$	**20. INCREASING SIZE AFFECT:** **21. STREET VISUAL APPEARANCE** **22. EFFICIENCY OF LANDUSE ARRANGEMENT** **23. IT OFFERS LOWER QUALITY LIVING ENVIRONMENT IN TERMS OF BOTH SERVICES AND PHYSICAL ENVIRONMENT.** **24. IT OFFERS A LOWER MEANS OF ECONOMIC AND RACIAL INTEGRATION** **25. IT REDUCES SOCIAL INTERACTION WHICH ILMINATE MACRO SOCIAL IDENTITY.**

8. Conclusion

gated communities are not a holistic approach for urban development, and it has a bad urban, functional, social, economic, and environmental impact on both micro internal community and macro external community. So when we try to determine gated communities physical features characteristics we need to put in mind both of these impacts, to make a degree of some holistic solutions for urban development. And that it has highlighted many debatable echoes that explored the division between internal private urban pattern preferences and external public urban fabric preferences one on the cost of the other. We could conclud that, there is an inverse relation between micro utility and macro utility, and that The most affecting factors are gated area Size and location.

Throgh this relation we can determine the most domenant factor affecting the phenomena in micro macro scale is size, and we determied the range of this size according to both micro force and macro force. We proposed a model that can measure and compare both micro and macro impact. The proposed frame work outlined before helps telling the planner try defferent development proposals. Each time the model returns by showing the planner the micro and macro impact of his assumptions. Also for authority they can judge throgh land subdivision and plans approval the proposed plans by showing the planner the micro and macro impact of this proposals. Including land subdivision size and location, gated physical charachterstics for micro and macro community, on the equilibrium achievement. The model is a predictive tool that

answers "what if" questions related to gated communities size, location,…. . for exaple, a developer intersted in maximizing micro community utility, will increase its size, systematically, external utility costs with this objective in mind, to find the suitable solusion for macro community. Another developer, intersted in small size communities, this is subjected to a cot in micro community, to be in mind. The advantage of the model that it generates alternatives quickly, and hence it becomes fesible….the model supplies the planner with the information to find out the impact of gated features, such as size , allows the planner to determine the gated communities physical charachterstics.

Notes:

[i] Optimization is to find the best compromise among several often conflicting requirements here in our case between micro and macro utility. And it requires the representation of the problem in a mathematical model where the decision variables are the parameters of the problem.

Indifference

[ii] Now we are doing a survey for these charachterstics to be analysed in relevance to gated communities physical charachterstics as a primary way for deducing the relation between micro and macro gated impact as a common dominant factors we have to put in mind when using this pattern of urban development inside greater cairo region new city.

[iii] Spatial analysis is the process of extracting or creating new information about a set of geographic features, if the results depend on both attributes and locations of objects being analyzed. it is useful for evaluating suitability and capability, for estimating and predicting, and for interpreting and understanding. These systems allow the spatial visualization of variables. The emphasis of Spatial Analysis is to measure properties and relationships, taking into account the spatial localization of the phenomenon under study in a direct way. That is, the central idea is to incorporate space into the analysis to be made.

[iv] A model is an abstraction and Data representation of reality, it is the process of simulation, prediction, or description it is structured as a set of rules and procedures to derive new information that can be analyzed to aid in problem solving and planning. Depending on a data base.

9. References

Ghonimi, I, (2010) „ Against the great divide between theory and practice: gated communities versus urban livieability", corp 2010.

Southworth, M. (1997). Walkable suburbs? An evaluation of neotraditional communities at the urban edge. Journal of American Planning Association, 63, 28-44.

Song, Y. and G.J. Knaap. 2004. Measuring Urban Form: Is Portland Winning the War on Sprawl? Journal of American Planning and Association, Vol. 70, No. 2 (2004) 210 - 225.

Bayoumi, W.N.A. (2009) The Tale of the Unsettled New Cairo City-Egypt: A Review for the Implications of the Adopted Privatization and Laissez- Fair Policies on Excluding the Poor from its Housing Market, Young Academics Network Vienna.

Blandy, S., Lister, D., Atkinson, R. and Flint, J. (2004) Gated communities in England Final report of the Gated Communities in England 'New Horizons' Project.

Calthorpe, P. (1993). The Next American Metropolis: Ecology, community and the American dream. Princeton Architectural Press: New York, USA.Karina lynman (2004) "Gated communities in South Africa:Comparison of four case studies in Gauteng".

Grant, gill ( ) "two sides of a coin?? New urbanism and gated communities".

Kuppinger, P. & College, M. (2004) 'Exclusive Greenery: new gated communities in Cairo', City & Society, vol. 16,

Lang R and Danielsen K (1997) Gated communities in America: Walling out the world? Housing Policy Debate.

Lynch, Kevin. 1981. A theory of good city form. Cambridge: MIT Press.

Yousry, A.M. (2009) „The Privatization of Urban Development in Cairo: Lessons Learned from the Development Experience of Al Rehab Gated Community" International Conference on Developing the New Urban Communities Policies and Priorities, Alexandria-Egypt.

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Afurther research is being done, using real world collected GIS data from GCR new towns and its containg gated communities, to confirm the objectivity of the previous hyposis.

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