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# **Crime and Urban Planning in Egypt**

## **Case Study: Greater Cairo**

**A Thesis Submitted in Partial Fulfillment of the Requirements of  
M.Sc. Degree in Architecture (Urban Planning)**

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**Heartily dedicated to:**

My late **grandmother**,

my beloved **parents**, and

my wonderful **sister**

**for their endless love, support and sacrifice throughout my life**

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## LIST OF ACRONYMS

<b>AKTC</b>	Aga Khan Trust for Culture.
<b>CAPMAS</b>	Central Agency of Public Mobilization and Statistics.
<b>CBD</b>	Central Business District.
<b>CG</b>	Center of Gravity.
<b>CMD</b>	Center of Minimum Distance.
<b>CPTED</b>	Crime Prevention Through Environmental Design.
<b>ECWR</b>	Egyptian Center for Women's Rights.
<b>GCER</b>	Greater Cairo Economic Region.
<b>GCMA</b>	Greater Cairo Metropolitan Area.
<b>GCPR</b>	Greater Cairo Planning Region.
<b>GCR</b>	Greater Cairo Region.
<b>GOPP</b>	General Organization for Physical Planning.
<b>ISDF</b>	Informal Settlement Development Facility.
<b>JICA</b>	Japan International Cooperation Agency.
<b>MOHUUD</b>	Ministry of Housing, Utilities and Urban Development.
<b>NUC</b>	New Urban Communities.
<b>NCSCR</b>	National Center for Social and Criminological Research.
<b>PSB</b>	Public Security Bureau.
<b>UNCHS</b>	United Nations Conference on Human Settlements.

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*Heba Adel Ahmed*

## ABSTRACT

This study discusses the relationship between crime and different elements of the urban environment within the Greater Cairo Region (GCR). It is worth mentioning that several researchers in the past have tried to understand this relationship at the level of different areas, in their forefront: Jane Jacobs (1961); who indicated that the feeling of safety could be achieved by increasing the number of people using a particular area, and Oscar Newman (1973); who introduced his new idea of “*Defensible space*” and contradicted Jacobs’ concept.

To achieve the purpose of this study, the researcher depended on social and physical analysis of the urban environment on both districts and neighborhoods levels and the extraction of the common factors that probably led to increasing crime rates as follows:

- For the districts level, the main agglomeration districts were investigated in detail; including both social and physical characteristics. Based on the correlation between crime rates as dependent variable and the social/spatial factors as independent variables, analysis showed that increasing socially deteriorated areas within a district helps in increasing the district’s criminals and the crimes committed within the adjacent ones. Analysis also showed that grid street network, weak or exaggerated natural surveillance are the key factors in increasing crime rates.
- For the neighborhoods level, the neighborhoods in which the Maadi’s serial killer committed his incidents were selected to be analyzed. Comparing the studied neighborhoods showed that the existence of grid street network, low population density, deficiencies in spaces’ hierarchy, linear tissues and high-rise buildings could enhance opportunities for crime.

Comparing the previous results showed that improving the physical environment through the good street layout which induces the natural movement, in addition to upgrading of population socio-economically; especially within the socially deteriorated areas, are the most informative tools in decreasing crime rates within the GCR.

Finally, the study recommends the need for cooperation among legislators, local governments, planners and designers, criminologists and organizations within different ministries in order to get a secured, well-planned environment with lower crime opportunities and the minimum number of criminals.

# Chapter One

# INTRODUCTION

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- 1.1. RESEARCH PROBLEM
- 1.2. RESEARCH HYPOTHESIS
- 1.3. RESEARCH IMPORTANCE
- 1.4. RESEARCH OBJECTIVES
- 1.5. RESEARCH BOUNDARIES
- 1.6. RESEARCH METHODOLOGY
- 1.7. RESEARCH STRUCTURE

## 1. Introduction

Crime is not considered a new phenomenon in our community, it is a part of any social system; defined as '*a pattern of social acts committed in violation of law*'.<sup>1</sup> Crime has been known by human communities since its origins. It differs from community to another, even within the one community as it doesn't occur in all places with the same rate and the same way. It also concentrates in some places than others, sometimes increases, sometimes decreases etc.

Previous researches have proved that crime rate has a significant correlation with different social factors such as levels of education (Adriano Balbi and Andre Michel Guerry, 1829), poverty rates (Marx and Engels, 1848) and the lack of social organization (Shaw and Mckay, 1942), while others have drawn the attention to its relation with the built environment (Jacobs, 1962; Newman, 1973; Hillier, 1984). They proposed that crime occurs in places where opportunities are available for criminals to commit their crimes in addition to the presence of criminals themselves. Here comes the role of this study to identify different urban circumstances which might be related to crime occurrence and the ways to reduce it either through decreasing the available opportunities for criminals (by giving them the feeling of being watched which in turn spells out potential trouble for those attempting to commit any criminal act) or facilitating their arrest if the crime has been already committed by giving them no chance to escape).

### 1.1. Research problem

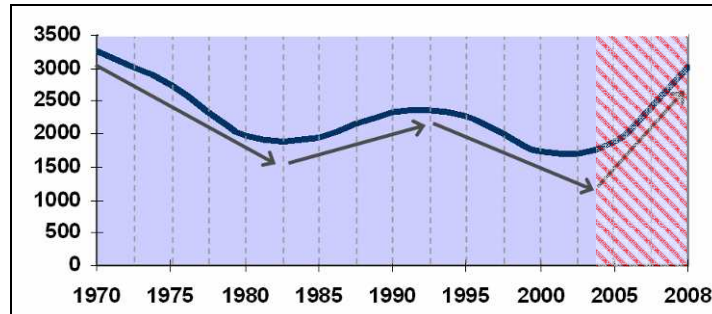
Statistics show that the total number of urban crimes<sup>2</sup> in Egypt has significantly increased in the last few years (2004-2008). According to the Public Security Bureau's reports, the number of those crimes during the early seventies till the mid-eighties showed a significant decrease, followed by a slight increase lasted till the early nineties. Shortly, a new decrease appeared and lasted until the beginning of the millennium. Since that time, there was a rapid increase in incidents numbers which reached its peak in 2008. Figure (1-1) shows the total number of urban crimes in Egypt during the mentioned period.

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<sup>1</sup> Dhimm, D., 2006, "*Identifying the relationship between crime and street layout using space syntax technology*", master thesis, University of Cincinnati,

<sup>2</sup> A criminal activity occurred in an urban space, usually in a public area, including homicide and attempted murder, assaults including battery with injury or death, kidnapping, sexual harassment, rape, robbery and arson.

Figure (1-1) The total number of urban crimes in Egypt during (1970-2008)



Source: values obtained from PSB's reports, recalculated by the author

Statistics also show that the greatest numbers of 2004-2008's urban crimes concentrate in Cairo (34.09%), Giza (15.39%) and Alexandria (15.34%). It is also notable that the governorates making up the most of the study area are located within the ten highest crime governorates (see figure 1-2).

## 1.2. Research hypothesis

As some crime factors are internal related to the criminal himself, others are external related to the surrounding environment, the research hypothesis is: Urban environment has an important role in encouraging crime or discouraging it. Therefore, it can help in providing safe environment for people.

## 1.3. Research importance

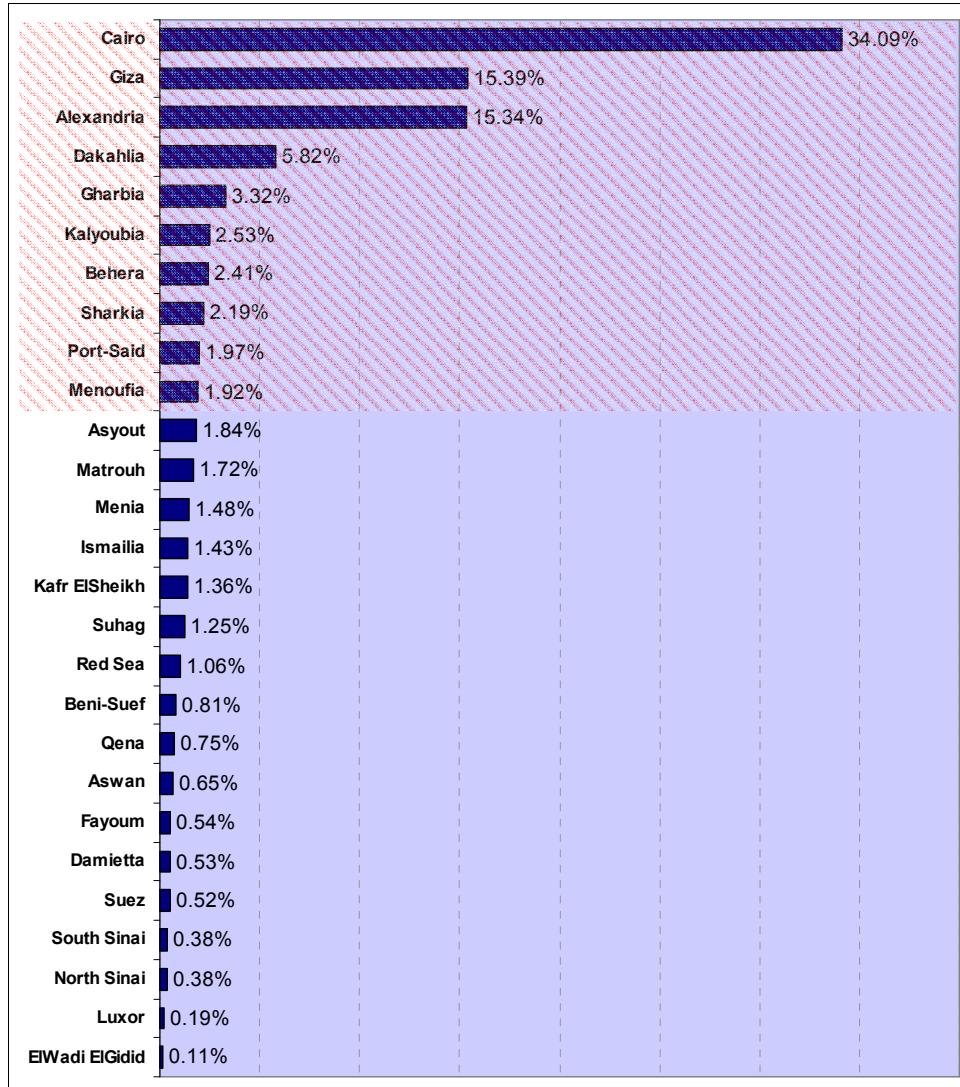
The importance of this research lies in studying the relationship between crime patterns in Egypt and different urban planning aspects, presenting recommendations at different levels and suggesting an action plan to the concerned authorities in order to reduce crime in Egypt.

## 1.4. Research objectives

The objectives of this research are:

- Increase the awareness of the relationship between urban planning and crime occurrence and how to consider this in planning.
- Investigate urban planning approaches in crime prevention.
- Understanding the relationship between crime patterns in Egypt and urban planning aspects.
- Suggest possible urban planning precautions/considerations in order to help in crime prevention; commensurate with the Egyptian environment.

Figure (1-2) The percentages of 2008's urban crimes over the Egyptian governorates



Source: values obtained from PSB's reports, recalculated by the author

### 1.5. Research Boundaries

Research was bounded in several ways, three of which are discussed here. First, due to the wide scope of the study, it was not possible to conduct the analysis to all of the region's districts, therefore the main agglomeration districts were selected to be analyzed. Second, the study period has been identified by five-years starting from 2004 till 2008 for the following reasons:

- The large number of urban crimes committed during this period.



- Crime statistics are available starting from 2003 till 2008; statistics before that period are difficult to obtain.
- Last census (2006) took place in the middle of the selected period, therefore, the resulting values can be considered as an average of the five years of the study.
- The proximity between the time of preparing the study, and the study period itself, therefore, a true perception can be given to the region during the study period.

Finally, the research studies crimes which are only related to geography and linked to specific physical environment, including:

- a. Crimes against persons: homicide and attempted murder, assaults including battery with serious injury or death, kidnapping, sexual harassment and rape.
- b. Crimes against property: robbery, arson, housebreaking shoplifting, rusting and car theft.

Other limitations and delimitations of this research are discussed throughout the thesis.

## **1.6. Research methodology**

The research adopts a three steps methodology as follows:

### **1.6.1 Theoretical method:**

This part focuses on different studies and theories that discussed crime at different scales through the following fields:

- Urban planning.
- Urban sociology.
- Social and criminal studies (criminology).

The findings of these studies and theories will be used then to determine the most important factors that help in crime occurrence on both district and neighborhood levels.

### **1.6.2 Descriptive method:**

This part provides a description of the study area through:

- Defining the study area boundaries and its main characteristics; including both social and physical ones.
- Analyzing crime statistics during the study period.
- Reviewing the earlier studies that discussed crime in Egypt –in general– and the study area –in particular.

### **1.6.3 Analytical method:**

In this part, analysis will be conducted on two levels: the district-level and the neighborhood-level. It is supposed that, comparing the results concluded from both levels gives a clearer definition of the most informative tools in decreasing crime rates within the study area.

#### **a. The districts level**

Due to the wide scope of the study area, the main agglomeration's districts will be selected for investigation. Analysis includes:

- o Social analysis.
- o Street network pattern analysis.
- o Land use analysis.

It is worth mentioning that the methodology used in the analysis depends on the correlation between crime rates of the selected districts and the rates obtained from different factors.

#### o Social analysis:

In this part, crime rates will be correlated with different social factors including: illiteracy rate, unemployment rate, internal migration rate, average family size, rate scramble and population density. Based on previous studies, these factors can be considered as an indicator of social deterioration within any society; which is primarily responsible for generating criminals and increasing crime rates.

#### o Street network pattern analysis :

Using the "*space syntax*" technique, street network analysis has to follow these steps:

- a- Taking maps of the selected case studies, drawing the longest and fewest axial lines to obtain the axial map.
- b- Analyzing the maps using UCL Depthmap software, calculating the integration, connectivity and intelligibility values.
- c- Checking the correlations between each of the former values and crime rates.

#### o Land use analysis:

In this part, crime rates will be correlated with different land uses which can be classified into activity uses (represented by commercial areas), idle uses (represented by cemeteries, deserts and military areas), and a mix of them (represented by industrial areas, in addition to the study of the residential areas themselves. Based on previous studies, land uses can provide a good

opportunity for criminals to commit their crimes by reducing movements and activities or exaggerating them.

**b. The neighborhoods level:**

Due to the lack of crime statistics at this level, the neighborhoods in which the “Maadi’s killer” committed his incidents will be selected to be analyzed. The methodology used in this part depends on the comparison between the studied neighborhoods in order to get the common factors that affect the commitment of crime. Analysis includes:

- Population density.
- Blocks’ scale.
- Street network pattern.
- Street design.
- Land use.
- Hierarchy of spaces.
- Urban fabric.
- Buildings height.
- Windows position.

Comparing the results obtained from both levels gives a clearer definition of the most informative tools in decreasing crime rates within the GCR

**1.7. Research structure**

The study is divided into six chapters, in addition to the bibliography and the appendices.

Chapter one, *Introduction*, is a brief introduction to the research. It identifies the research problem, states the hypothesis which the study seeks to test, discusses the study’s objectives, terms, scope and limitations, explains the used methodology and finally outlines the study’s structure.

Chapter two, *Literature review*, identifies different studies and theories that discussed crime classified into three categories including: social, environmental and physical theories, which were used then to determine the most important factors that help in crime occurrence at both urban and architectural levels. Finally, it discusses studies of criminals’ behavior, journey to crime, as well as the relationship between crime’s location and criminal’s base.

Chapter three, *The Greater Cairo Region*, provides a description of the GCR through defining its boundaries, describing its characteristics including: natural environment, social and physical features and analyzing crime statistics during the study period.

Chapter four, *Understanding crime at the district-level*, explains the procedures used for the analysis and how data was analyzed and interpreted in order to define the relationship between crime and different social and physical factors on the “districts level”. Due to the wide scope of the study, it was not possible to conduct the analysis to all of the region’s districts, therefore the main agglomeration districts were selected for the analysis because of the availability of data, accessibility, and the variety of socio-economic and physical conditions. It is worth mentioning that the methodology used in this chapter depends on the correlation between crime rate of each of the agglomeration’s districts and the rates obtained from different factors.

Chapter five, *Explaining crime at the neighborhoods scale*, explains the procedures used for the analysis and how data was analyzed and interpreted in order to define the relationship between crime and different social and physical factors on the “neighborhoods scale”. For this purpose, and due to the lack of crime statistics at this level, the neighborhoods in which the “Maadi’s killer” committed his incidents were selected to be analyzed. It is worth mentioning that the methodology used in this chapter depends on comparing between the studied neighborhoods in order to get the common factors that affect the commitment of crime.

Chapter six, *Conclusion and recommendations*”, gives a summary of the research, presents its key findings and outlines recommendations for different authorities to ensure a safe environment in the future.

## **Chapter Two**

# **LITERATURE REVIEW**

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## **2. Literature review**

### **2.1. Introduction**

This chapter reviews different studies and theories that discussed crime and crime prevention methodologies. It also demonstrates different crime factors at both urban and architectural levels. Finally, it discusses criminals' behavior and the different measures used in order to identify the relationship between the location of crimes and criminal's base.

### **2.2. Social aspects and crime distribution**

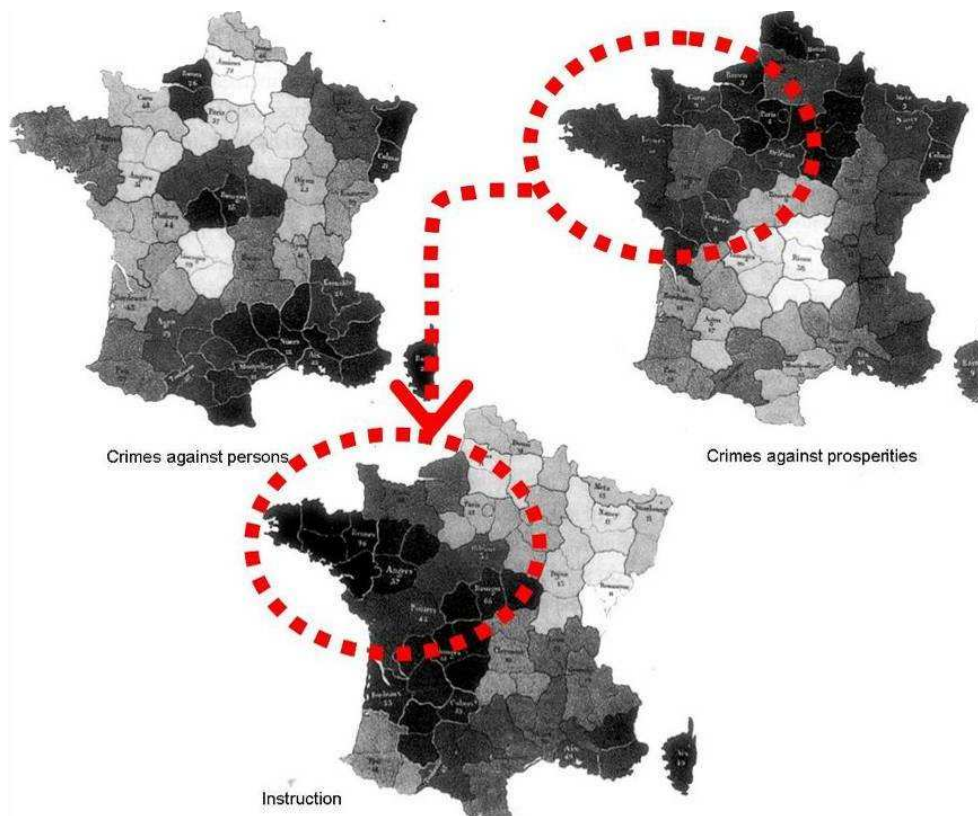
The earlier studies of crime and crime prevention started since 1800s as the industrial revolution changed the urban-rural relationship and reshaped the urban structure. This change ultimately caused many social problems. People, as a result, migrated from farms to cities -where jobs are provided- which led to population increase in urban areas. However, this didn't always match the increase in job opportunities. Many people were left jobless and thus, some of them had to rely on crime to be able to survive in the big busy city (Ou, Yu-Jui, 2005). Early sociologists focused on how the change of social structure leads to crime occurrence. Marx and Engels (1848) argued that poverty is the source of crime (Ou, Yu-Jui, 2005). Marx believed that there was a wide division between the very few wealthy and the majority of poor. He linked crime with the exploitation by the minority (wealthy) who controlled the economy and thus, created the opportunity for crime. Following scholars found other factors that might also lead to crime occurrence, such as Lombroso (1876) who proposed that high population density leads to a higher crime rate. High density makes cities full of targets and opportunities for offenders; hence, the crime rate increases (Ou, Yu-Jui, 2005).

As early as 1829, scholars began to focus on the relationship between the spatial distribution of different types of crime and other social factors ; Adriano Balbi and Andre-Michel Guerry (1829) created the first maps of "crime in France" using criminal statistics for the years 1825 to 1827 and demographic data. They developed maps of crimes against property, crimes against persons, and inhabitants' level of education. Comparing these maps, they found that the areas with more property crime were populated by people with higher levels of education (Weisburd, D. and McEwen, T., 1997). Figure (2-1) shows Balbia and Guerry maps comparing crime and

instruction.

In 1831, another scholar, Lambert-Adolph Quetelet published three maps dealing with the same themes but spreading across larger areas. Quetelet saw a correlation between crime and several variables including transportation routes, education levels, and ethnic and cultural variations (Weisburd, D. and McEwen, T., 1997).

Figure (2-1) Balbia and Guerry maps comparing crime and instruction



Source: Weisburd, D. and McEwen, T., 1997

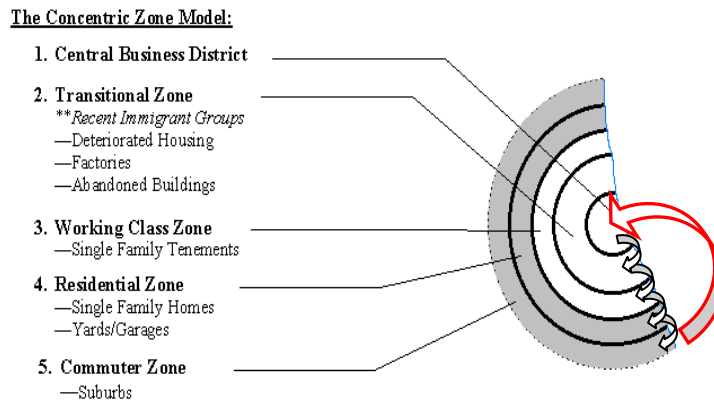
Later, using the spatial distribution of crime, Shaw and McKay (1942) discussed why the crime rate is higher in the inner cities. They applied the concentric zone model, where the organization of the city is illustrated by a series of concentric circles or zones –with areas of social and physical deterioration concentrated near the city centre and more prosperous areas located near the city's edge– as follows:

1. Central Business District.
2. Transitional zone (low class dwelling units).
3. Working class zone (low class residential use which is a little better than

the transitional zone). This area relieves the pressure of expansion in the second zone.

4. Residential zone (the middle class residential areas).
5. Commuter zone (suburb of high class residential areas).

Figure (2-2) The Concentric Zone Model



Source: Crimetheory, 1998; modified by the author

The concept of this model is “when a zone becomes more prosperous and desirable, people and businesses migrate into that zone and new residents take their place”. Shaw & McKay examined arrest rates of juveniles throughout the city of Chicago during the years 1900-1906, 1917-1923, and 1927-1933. These were years of high immigration, meaning that immigrant groups rapidly "migrated" from the inner city towards the suburbs, and more established immigrant groups were pushed along by the arrival of poorer immigrant groups who took their place in the center of the city . By comparing the rates from three different time periods, Shaw & McKay believed they could show whether delinquency was caused by particular immigrant groups or by the environment in which immigrants lived. That is:

- If high delinquency rates for particular immigrant groups remained high during their migration through different environments, then delinquency could be associated with their distinctive constitutional or cultural features;
- If delinquency rates decreased as immigrants moved through different environments, then delinquency could not be associated with the particular constitution of the immigrants, but must somehow be connected with their environment.



They came to the important conclusion that delinquency rates always remained high for a certain region of the city, which is the transitional zone (II), no matter what immigrant group lived there. They found that residential communities crossing that zone were altering into commercial or industrial areas. While high-income residents could move to the outer zones for a better residential environment, low-income people -who could not afford to move- had no choice but to stay in the transitional zone (Roh, S. and Choo, T., 2008).

Therefore, delinquency was not "constitutional" as Lombroso had argued, but must somehow be correlated with the particular environment in which it occurs. Shaw & McKay's eventual explanation of this correlation is their "social disorganization theory", that is high rates of residential mobility make it difficult for communities to avoid becoming socially disorganized, as nobody invests in community they are going to leave anyway, this social disorganization forces the residential condition to go down, and the crime rate goes up (Ou, Yu-Jui, 2005). They also assumed other traditional sources of social disorganization including: poverty and racial heterogeneity. They argued that poverty is never a cause of crime; it only facilitates crime as a result of deprivation of adequate resources. Moreover, they assumed that poverty areas tended to have high rates of residential mobility and racial heterogeneity which makes people isolate themselves and avoid meaningful interaction or common ground to share, therefore, it is difficult for communities in those areas to avoid becoming socially disorganized. These were also the ways in which "criminal traditions" got embedded into communities.

It is notable that suburban areas -zone v- had a lack of attention as a result of the assumptions that suburbs are stable and are crime-free. But in fact, the history of suburbs was divided into three eras (Roh, S. and Choo, T., 2008):

- 1- During the early urban-industrial era, suburban areas emerged as the result of rapid population increase in the central city. As poor immigrants rushed into cities and living conditions became deteriorated, many residents abandoning the inner city formed a new residential area, the "commuter zone". The early suburban areas were dominated by expensive houses owned by high class inhabitants.

- 2- In the 1950s and 1960s, as the late urban-industrial era began, suburban areas dramatically expanded. This expansion occurred while urban areas witnessed a substantial increase in social problems, including high crime

rates, unemployment, etc., therefore, many of middle class residents' moved to suburbs. This is known as suburbanization.

3- In the 1970s suburbs became residential areas for city workers when the central cities and their outer zones became combined into metropolitan areas. Manufacturers pursuing lower rents, taxes, and labor costs began to move from the inner city to suburban areas. As the suburbs provided both job opportunities and residences, more city dwellers moved to suburban areas. This enhanced racial/ethnic diversity, increased economic diversity and decreased residential stability. Therefore, a trend opposite of suburbanization was observed; the middle and upper class residents began to return to deteriorated areas of the central city. The Infusion of new capital into the housing marketing in that area resulted in higher property values, which in turn, displaced residents who couldn't afford to stay in it. This is known as gentrification.

Concerning the case of the GCR, central Cairo represents the transitional zone, as in the past two decades Cairo's population has been expanding at an average rate of 3.5% per year. The overall expansion of Cairo is taking place as a result of two different factors (Rose,C. and Boxberger, L., 2000):

- Firstly, the natural increase of the population of Cairo due to a lower infant mortality rate combined with a higher fertility rate and a lower overall death rate.
- Secondly, migrants from the rural areas and other towns in Egypt who come to Cairo. This trend of migration to the city began during World War (II), when the British and the other Allied forces used Cairo as a base for their troops, and the war in Europe created a need for locally produced goods. Many small craftsmen moved themselves and their families to Cairo in response, since prices were high and they were able to make a lot of money. After the war and the revolution, the level of migration remained very high, so that by 1960 the population of the city was nearly twice what it had been in 1947.

A rise in population means that there are more people, and all these people need to have places to live in. The city grew in three different directions:

- Outwardly: the city expanded across the agricultural land and then began to develop the surrounding desert. New developments, like Medinat Nasr, Mohandessin and Dokki were built to accommodate middle class families.

- Upwardly: In many sections of town, additional floors have been added to the existing structures, many of which were illegally added by squatters using scrap material.
- Inwardly: by taking older structures of the central area of the city and subdividing them into smaller units, so that more people can live there, and the addition of high-rise buildings next to or in place of the smaller and older dwellings.

Since 1960, the central districts have been losing population. This is partly a result of the transformation of its upper-income residential districts to commercial areas, and by the flight by low-income groups from old, badly maintained, crowded housing to the more comfortable and less dense quarters provided at the periphery. Therefore, most of those districts buildings became vacant (Antoniotti, J., Bianca, C., El-Hakim, S., Lewcoc, R., and Welbank, M., 1980).

Recently, the area has attracted attention because of the special location in addition to, its architectural and historical character which, in turn, drove the government to start developing it, in cooperation with different authorities, companies, etc. The development process includes several directions, the most important are:

- Developing informal settlements, especially the unsafe ones -not only those located within the central Cairo but also within all the Egyptian cities- through a time plan developed by The Informal Settlements Development Facility (ISDF) according to the settlement condition (more information are provided in the next chapter).
- Developing the old historical area by the Aga Khan Trust for Culture (AKTC) including:
  - The restoration of historic structures in addition to introducing appropriate new functions, i.e., the reuse of them, in order to generate income for the buildings and for the local community.
  - Social and economic development and the overall improvement of the quality of life in those areas. This requires the improvement of services and public open spaces, community rehabilitation, creation of employment opportunities and promotion of local crafts (The Aga Khan Trust for Culture (AKTC), 2001).

- Developing the rest of the central Cairo through the new established Al-Ismailia for real estate investments; a private company established in 2008 by a group of Egyptian and Gulf investors. They include Samih Sawiris, an Egyptian developer, and Sheikh Sulaiman Abanamay of Saudi Arabia. Two private equity firms, Beltone and Amwal al-Khaleej, are partners. The company's concept is to revive the whole of the central area architecturally, socially and culturally. It can be achieved by acquiring those old, fantastic buildings, with their beautiful French and Italian architecture, and investing in them (Saleh, H., 2009).

### **2.3. Environmental aspects and crime distribution**

Shaw and McKay's theory drew criminologists' attention to the important role that "place" plays in crime occurrence and they began to focus on the criminal event itself. Environmental Criminology introduces the concept of geography or the spatial dimension of crime and the criminal event. It is grounded on three theoretical perspectives; routine activity theory, crime pattern theory and rational choice theory. Together they tell us that opportunity causes crime and it is related to the environmental conditions as follows:

#### **2.3.1. The routine activity theory**

The routine activity theory started as an explanation of predatory crimes. Cohen and Felson (1979) assumed that for such crimes to occur there must be a convergence in time and space of three elements: a likely offender, a suitable target and the absence of a capable guardian against crime (Felson, M. and Clarke, R. V., 1998). They took the likely offender as given and focused on the other elements. The guardian was not usually a police officer or security guard but rather anyone/anything whose presence or proximity would discourage a crime from taking place (a neighbor, doorman, locks, fences, lighting, etc.). A target includes persons, objects or places. Moreover, four main elements influence a target's risk of criminal attack:

- Value: What the offender gains from the target.
- Inertia: The size or weight of an item.
- Visibility: How visible a target is.
- Access: If a target is easy to get to, this increases its suitability.

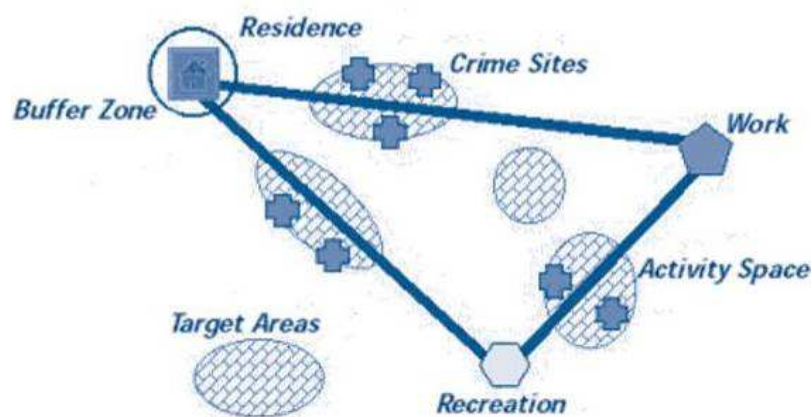
They also assumed that routine activities; the activities people undertake on a routine basis i.e. leave for school/work in the morning, lock up the store at

night, etc. affect the time of the criminal event. For example residential homes are burglarized during weekdays in the daytime, while commercial properties are burglarized during the weekend and night time hours.

### 2.3.2. The crime pattern theory

Crime pattern theory is closely linked to routine activities theory but works at a more local scale. Patricia and Paul Brantingham (1981) assumed that offenders are influenced by the daily activities and routines of their lives when searching for targets; they do not search at random. Starting with a triangle, they consider offenders going from home to work to recreation. Around each of these three nodes and along each of these three paths (excepting a buffer zone where they might be recognized) offenders look around for crime opportunity as they will be watching for targets that have no guardians or place managers. They may find these a little way off the path, but they usually do not go far beyond the area they know. This is because it is easier to commit crimes in the course of their daily routine than by making a special journey to do so (Clarke, R. V. and John E. E., 2005).

Figure (2-3) Crime pattern theory and the basic crime triangle



Source: Rossmo, K., 2000.

Later, Canter and Hodge, 2000 used the Kevin Lynch's approach to understand the criminals' 'mental maps'<sup>3</sup> of the locations in which they committed their crimes by asking them to draw a map of the general area

<sup>3</sup> Internal representations of the world that all individuals use to find their way around and to make choices on what they will do, and where (Canter & Hodge, 2000). The individual is assumed to carry a mental image of the physical area, an image that would change with his experience and which is likely to be reflection of the purposes of that individual. Kevin Lynch made an approach to study mental representations of individuals to those cities by asking them to draw a sketch map of their cities.

where they usually committed their crimes, to indicate the exact location of each different offence and where they were living at the time. Thus, Canter and Hodge revealed that the process of mapping criminals' mobility reflects their day-to-day life activities. In other words, where criminals go and where they choose to commit their crimes is influenced by the knowledge and the comprehension of their surroundings (Canter, D. and Hodge, S., 2000).

The Brantinghams also found that; in a walking culture -where people work and live closely- there may be a lot of criminal activity occurring between the nodes, but in a car culture -such as living in the suburbs and working downtown- criminal victimization will occur primarily at the nodes (Brantingham. P.J. and P.L. Brantingham, 1991).

They also used the term edges to refer to the boundaries of areas where people live, work, shop, etc. -like the transitional zone in Shaw & Mckay model. Some crimes are more likely to occur at these edges because this is where people from different neighborhoods who do not know each other come together. They also found that outsiders<sup>4</sup> find it safer to offend at the edges, while Insiders<sup>5</sup> usually commit crimes closer to their own neighborhoods (Felson, M. and Clarke, R. V., 1998).

So places are problematic in this theory because of their location and relationship to criminals' environment, but in routine activity theory places are problematic because of people's presence and absence from the location. Concerning the GCR, analysis of different incidents published in newspapers done by the author during the studied period showed that most criminals following this theory tend to commit their crimes within the workplace itself; they don't leave a buffer. It is also notable that this type is used particularly by new-born criminals, and the committed crimes are usually pre-planned.

### **2.3.3. The Rational Choice Theory**

The rational choice perspective focuses on the offender's decision making. Its main assumption is that offending is purposive behavior (Felson, M. and Clarke, R. V., 1998). Cornish and Clarke (1986) assumed that most offenders make a fairly rational decision to commit an offence (what are the rewards against the chances of getting caught?), when all other things are equal (such as risk of being caught, reward, etc.) criminals will always

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<sup>4</sup> Offenders coming from adjacent neighborhoods to offend

<sup>5</sup> Offenders living and offend from their neighborhoods

choose the option that requires the least amount of time and energy; for example it takes time, money and effort to go longer distances, thus crime generally occurs close to home.

The three previous theories explain the relationship between crime and place. They can be put in order according to where they give most attention, ranging from the larger society (routine activities) to the local area (crime pattern theory) to the individual (rational choice) (Felson, M. and Clarke, R. V., 1998).

In general, most crimes committed within the GCR can be interpreted by the three theories, especially, those committed within the gated communities which are usually segregated areas with a small number of residents (absence of guardians) and high standards of living (suitable targets). Crimes are usually committed by the communities' workers themselves (daily activity), as their work gives them some advantages such as getting in and out without any doubts, renewing their mental map of the place and requiring less money and effort to reach the target (rational decision). Examples of these crimes are provided in appendix A.

#### **2.4. Urban design theories and crime**

Urban design theories that study crime started in the 1960s with Jane Jacob's. Her book "The Death and Life of Great American Cities" was the first influential work to suggest that active street life could cut down opportunities for crime. She focused on the role that "eyes on the street" played in maintaining social control. Jacobs' thesis was simple: people, not police, are the guardians of the public space (Linden, R., 2007).<sup>6</sup> Her critique corresponded over the physical design of urban America, which emphasized high rise apartment buildings separated by public space without any specific guardianship. Office areas became vacant after supper; which led to a cessation of informal surveillance and to a reduction in the sense of community among residents. According to Jacobs, city streets were unsafe because they were deserted. She frequently cites New York City's Greenwich Village as an example of a vibrant urban community; and how well-used streets were more likely to be safe from serious crime. She found that natural surveillance was essential for the feeling of safety and that could

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<sup>6</sup> Linden, R., 2007, "Situational Crime prevention: its role in comprehensive prevention initiatives", IPC Review, Vol. 1, pp. 139-159

be achieved by increasing the number of people using a particular area through encouraging a diversity of uses and creating opportunities for positive social interactions (Jacob, J.,1961). Moreover, Jacobs outlined other three qualities that –according to her– any city neighborhood must have in order to be healthy and desirable to residents including: city blocks should be compact/short, buildings should be diverse in age, condition, and size, and finally neighborhood’s population should be dense.

The early 1970s saw a surge of studies depending on the previous work of Jane Jacobs. In 1971, Oscar Newman published a paper “Architectural Design for Crime Prevention”, and in 1973 he published a book “Defensible Space, Crime Prevention through Urban Design”. He argued that an area is safer when people feel a sense of ownership and responsibility for that part of a community. Newman studied crime rates in low-income housing projects in New York City. He observed the development of an eleven story, 2,740-unit public housing complex, named “Pruitt-Igoe”. The Pruitt-Igoe was supposed to be an ideal housing community for low-income families. The idea was to keep the grounds and the first floor free for community activity. Each building was given communal corridors on every third floor to house a laundry, a communal room and a garbage room. The outside areas of each building were also common areas. According to Newman, because all the grounds and common areas were disassociated from the units, residents could not feel the responsibility towards them and they became unsafe. The corridors, lobbies, elevators and stairs were dangerous places to walk, they became covered with graffiti and littered with garbage and human waste, and women had to get together in groups. The project never achieved more than 60% occupancy. The complex failed miserably and was demolished about 10 years later (Newman, O., 1996).

However, across the street from Pruitt-Igoe was an older, smaller, row-house complex occupied by an identical population called “Carr Square Village”. It remained fully occupied and trouble-free throughout the construction, occupancy, and the decline of Pruitt-Igoe. Figure (2-5) shows the Location of Pruitt-Igoe & Carr square village.

With the social variables constant in the two developments, Newman began to look into what physical factors were different between the two complexes



that would allow one complex to thrive while the other had to be torn down. One of the first things Newman looked at was building type. He noticed that:

- In a single-family housing; everybody feels the responsibility for their place. Residents know who belongs to the area; streets and sidewalks are usually only traveled by neighbors, therefore identifying strangers is possible.
- In walkups the number of people sharing the common areas is limited, only (2) families, giving them a sense of responsibility for their place. It is also easy to identify strangers due to the small number of residents.
- In high-rises, residents do not feel responsible for any of the common areas since they are shared with so many others. They can't identify strangers because of the amount of people that use the space.

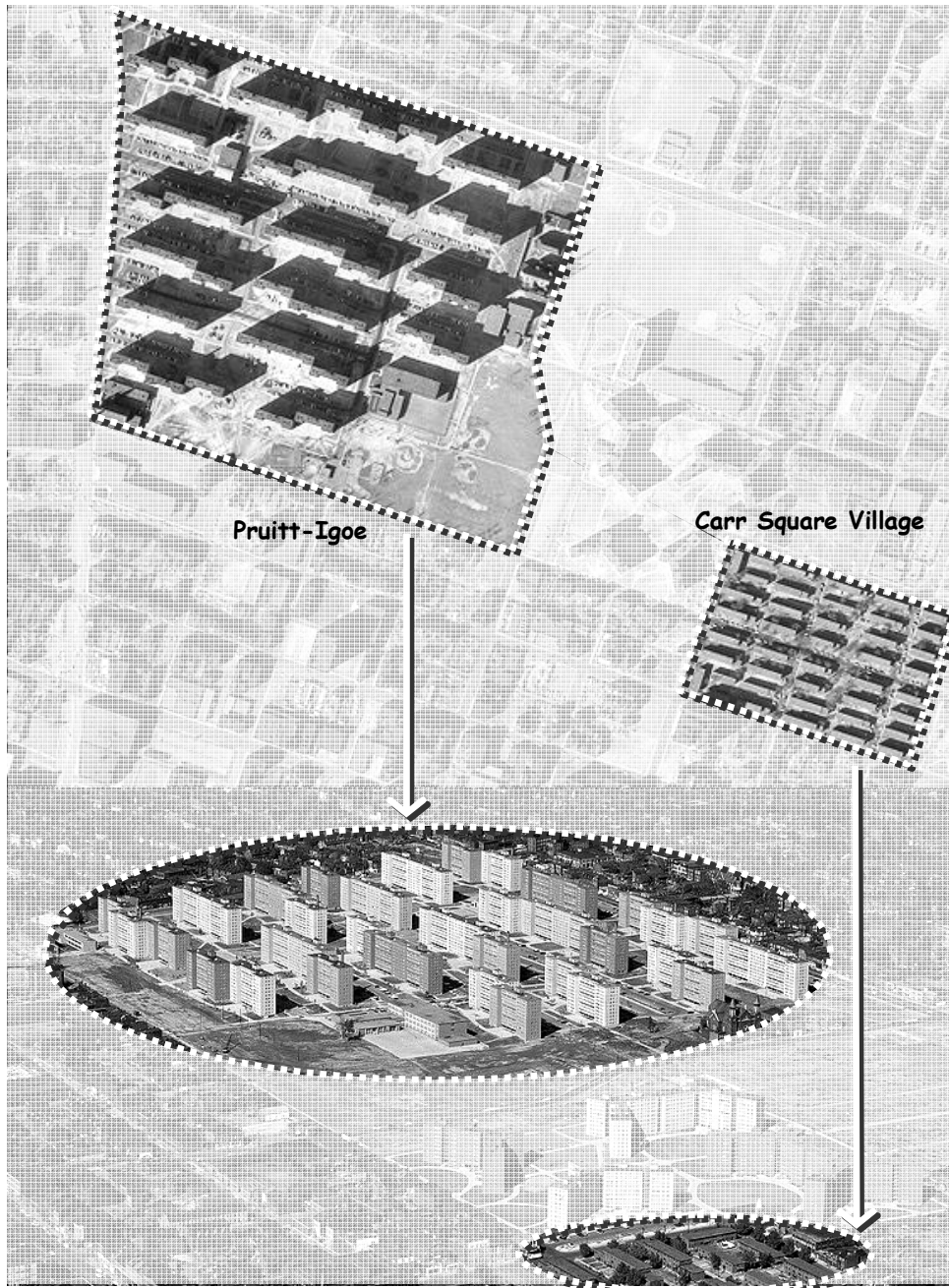
Figure (2-4) Architect's vision of communal corridor (on left) and Actual 3rd floor communal corridor of Pruitt-Igoe (on right)



Source: Newman, O., 1996, p. 10-11

Newman studied also the social and physical factors that create high crime rates. He found that the percentage of population receiving welfare is shown to be the most important factor, followed by building height which in turn correlates highly with the number of apartments sharing the entry to a building, as it affects the ability of residents to control their environment. In addition, the size of the housing project and the number of other projects in the area, as the larger low income projects surrounded by other low income projects suffer a higher crime rate than small or isolated projects (Newman, O., 1996).

Figure (2-5) Location of Pruitt-Igoe & Carr square village



Source: Newman, O., 1996, p. 10-11

Figure (2-6) Current situation in Pruitt-Igoe



Source: (Google Earth); modified by the author

Thus, Newman found that the safest neighborhoods have the following attributes:

- 1- Minimized common areas: the larger the number of people who share a communal space, the more difficult it is for people to identify it or to feel they have a right to control or determine the activity taking place within it,
- 2- Maximized private ownership: private yards were more defensible because the owners could know whether or not someone belonged to their yards,
- 3- Minimized permeability: the ease of entry to and exit from the neighborhood or housing area.

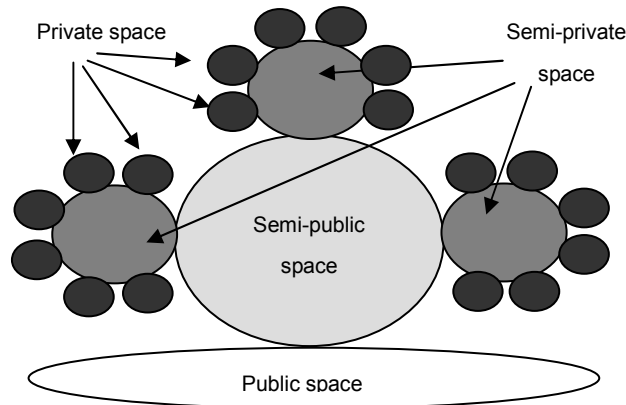
Newman broke down his concept “the defensible space” into four basic strategies as shown in the following table:

Table (2-1) The defensible space concepts

Strategies	Meaning	Ways to be achieved
Territorial control	The capacity of the physical environment to create a sense of neighborhood and encourage residents to exercise surveillance over their space.	Subdividing space from the most public (the street) to the most private (the inside of the dwelling). Between these extremes there would be semi-public space; clearly reserved for those who live or are visiting the dwellings for legitimate purposes, and semi-private space; that is space which clearly belongs to a single dwelling even though it is open to public access.
Access control	The capacity of design to enable residents to control entrances and exits.	Using physical designs such as entrance signs.
Natural surveillance	The capacity of design to enable residents to casually and continually survey a public area.	Juxtaposition of dwelling and placement of windows to allow residents naturally to survey these areas.
Image and maintenance	The capacity of design to improve the image of buildings, and to lessen or eliminate any stigma that may be attached to a given building or types of building.	Avoid the adoption of building forms , which in turn, avoids the isolation of a particular group of inhabitants

Source: Newman, O., 1972, modified by the author

Figure (2-7) Subdividing space to achieve the territorial control



Source: Newman, O., 1972, modified by the author

There has been considerable criticism of Newman's theory. Early critics such as Hillier argued that he happened to pick settings that supported his ideas and that nearby apartment complexes wouldn't have done so. It was argued that there exist complexes with high crime rates that embody his

defensible space principles and complexes with low crime rates that were not defensible in design (Hillier, B., 1973).

Another of Hillier's criticisms of Newman's work was about his concept of territoriality; he found that it is neither clearly defined nor realistic. Hillier argued that

*"The concept of territoriality has been offered as yet another 'behavioral universal'. Summarized roughly, it asserts that social space is the result of 'territorial' behavior by individuals, groups and whole societies, originating in the need to define and defend space in much the same way as animals [...]"*

*Hillier, 1973*

Later, the concept of defensible space provided the theoretical grounding for the development of "*Crime Prevention Through Environmental Design*" (CPTED). The basis of "CPTED" is that good design represented by intelligent layout and use of the built environment can reduce crime and its occurrence. This, in turn, leads to clear improvements in the quality of life. This can be achieved through a number of principles mentioned in table (2-2) (State of Western Australia, 2006).

In 1984, Bill Hillier and Julienne Hanson introduced the concept of "*Social logic of space*" by arguing that there are many physical factors apart from building height that have an effect on encouraging criminal activities. They argued that, on the contrary to Newman, segregation increases the fear of crime. Later, Hillier and his colleagues at the Bartlett School of Architecture and Planning, University College, London developed the theory of space syntax, based on the concept of social logic of space.

Space syntax has been used in research involving movement analysis in general and its implications include strategic issues such as retail locations, distribution of land uses and locations of crime (Salheen, M., 2001).<sup>7</sup> According to the theory, a good spatial layout generates automatic movement which increases the probability of interactions by unplanned encounters. The increased social interactions then increase the risk for a criminal to get caught and hence prevent him from committing the crime (Dhimn, D., 2006). The theory of space syntax will be explained in appendix B.

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<sup>7</sup> Salheen, M., 2001, "*A comprehensive Analysis of Pedestrian Environments: The Case of Cairo City Centre*", PhD thesis, Heriot-Watt University, p. 112.

Table (2-2) The CPTED principles

CPTED principles						
<b>Principles</b>	<p><b>Casual surveillance &amp; sight lines</b>  <b>Casual surveillance:</b>                      Involves the location and design of facilities to maximize visibility  <b>Sight lines :</b>                      The ability to see what is ahead along a route, or in a space.</p>	<p><b>Land use mix and activity generators</b>  <b>Activity generators:</b>                      Facilities that attract people, such as playground, benches, picnic areas and kiosks.</p>	<p><b>Definition of use and ownership</b></p>	<p><b>Lighting &amp; landscape</b></p>	<p><b>Way Finding</b>  <b>Way Finding:</b>                      The use of symbols, cues and signage helps navigation through areas.</p>	<p><b>Predictable routes &amp; entrapment locations</b>  <b>Predictable routes :</b>                      Capability of potential attackers to identify the route taken by users, these include paths, stairwells, corridors and underpasses</p>
<b>Objectives</b>	<ul style="list-style-type: none"> <li>-Encourage surveillance of spaces from surrounding buildings and land uses.</li> <li>-Improve surveillance by increasing the legitimate use of spaces.</li> </ul>	<ul style="list-style-type: none"> <li>-Promote extended surveillance by increasing legitimate activities of public spaces.</li> </ul>	<ul style="list-style-type: none"> <li>-Define ownership and the intended use of a space.</li> </ul>	<ul style="list-style-type: none"> <li>-Improve natural surveillance &amp; sightlines, by selecting appropriate landscaping and their positions.</li> <li>-Promote legitimate activity by users of public spaces after dark.</li> </ul>	<ul style="list-style-type: none"> <li>-Provide adequate, easily legible signage to assist pedestrians to find their way safely.</li> </ul>	<ul style="list-style-type: none"> <li>-Reduce the risk of attack by hidden persons.</li> <li>-Eliminate possible entrapment places.</li> </ul>
<b>Methodology</b>	<ul style="list-style-type: none"> <li>-Create building frontages that include a sense of activity.</li> <li>-Design pathways, underpasses and other spaces to minimize sudden changes of grade and blind corners, in order to maximize clear sightlines</li> <li>-Maximize the visibility of high risk areas such as car parks, stairwells and underpasses.</li> </ul>	<ul style="list-style-type: none"> <li>-Avoid strict separation of compatible land uses that may result in the isolation of some buildings or spaces.</li> <li>-Locate activity generators or seating around 'active edges' or fringes of a space to create casual surveillance of a space within</li> <li>-Encourage pedestrian passage through or activity in areas, at grade level, to promote casual surveillance.</li> </ul>	<ul style="list-style-type: none"> <li>-Use signage and cues to define intended use and ownership.</li> <li>-Use physical barriers (e.g. fences) and symbolic barriers (e.g. vegetation) to define use and ownership</li> <li>-Use environmental cues, such as changes in footpath material, change in grade or elevation, or level of lighting.</li> </ul>	<ul style="list-style-type: none"> <li>-Maximize the opportunities for penetration of natural light.</li> <li>-Use of multiple lights to provide consistent lighting levels.</li> <li>-Ensure all inset spaces, access and egress routes and signage are well lit.</li> <li>-Place lighting in a position that will not be blocked by mature vegetation.</li> <li>-Install lighting fixtures which are high mounted and vandal resistant.</li> </ul>	<ul style="list-style-type: none"> <li>-Signage should identify where assistance and key areas can be located e.g. telephones, toilets, taxi ranks and bus stops</li> <li>-Signage should be visible, concise and easily maintained, i.e., be identifiable from 20 meters as a general rule.</li> </ul>	<ul style="list-style-type: none"> <li>-Provide adequate sightlines and lighting where there is no alternative to predictable routes</li> <li>-Provide adequate distance between any potential concealment or entrapment locations to allow users adequate reaction time.</li> <li>-Ensure that predictable routes have good casual surveillance and provide for alternative access arrangements.</li> <li>-Identify alternative routes by signage.</li> </ul>

Source: State of Western Australia, 2006; modified by the author.

## **2.5. Crime factors**

After discussing different theories that handled crime, this part will discuss different crime factors which can be classified into:

- a. Social factors,
- b. Physical factors related to urban environment,
- c. Anthropological factors.

### **2.5.1. Social factors**

#### **a. Social disorganization**

Defined as a disturbance in the patterns and mechanisms of human relations. Shaw & Mckay's study showed that social disorganization happens as a result of residential mobility, but it can occur due to the lack of social homogeneity in a community. This homogeneity is affected by:

- Economic conditions, including median income, poverty level, and job availability.
- Cultural, educational, recreational, and religious characteristics.
- Family conditions with respect to divorce and family cohesiveness.
- Variations in composition particularly to youth concentration
- Population density <sup>8</sup> and the degree of urbanization.

The lack of social homogeneity makes community dividing into small homogeneous groups: economically, socially, psychologically, etc. Some of these groups may feel weak and resort to commit crimes to get their basic needs, feel force and dominant or revenge of the society in most cases.

#### **b. Attitude of residents towards crime and law enforcement**

A population that works closely with the police and is likely to report crimes can help in crime prevention. This referred to the culture of the community and their respect to laws, in addition to their confidence in the governmental system (Fahmy, M., 2006).

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<sup>8</sup> The relation between crime incidents and population density isn't clearly obvious. Researchers divided into 3 groups: some researchers found that crowded city streets and sidewalks could be effective deterrents to criminal behavior Jacobs, J., 1961, the second group found the opposite relationship (Newman, O., 1972), a third group found non relationships between the two variables (Radwan M., *et al.*, 2005). In their study they found that areas with high population density and high-rise buildings have high crime rates, while these rates are lower in areas that have the same population density and buildings with 4 stories maximum.

## 2.5.2. Physical factors

### a. Physical environment

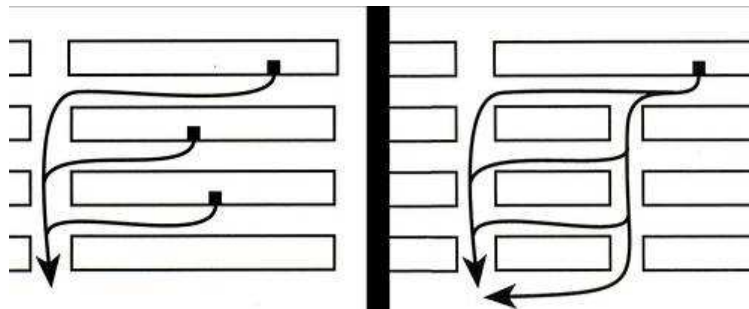
It can be classified at both urban and architectural scales as follows:

#### ➤ Urban scale

##### ▪ Blocks' scale:

According to Jacobs, people don't like walking down long blocks and will avoid them if at all possible. She noted that long blocks are used only by people who live or work on, while short blocks offer people more navigation options, therefore, the pedestrian distribution becomes more evenly and creates more viable locations (Jacobs, J., 1961).

Figure (2-8) Potential pedestrian paths on large blocks (left) vs. potential pedestrian paths on short blocks (right)



Source: Jacobs, J., 1961

In the same context, Radwan argued that short blocks can provide social interactions between users; therefore, strangers can be easily recognized. They showed that a block with 100-200 meter diameter and approximately 500 users can achieve that. (Radwan, M. *et al.*, 2005).

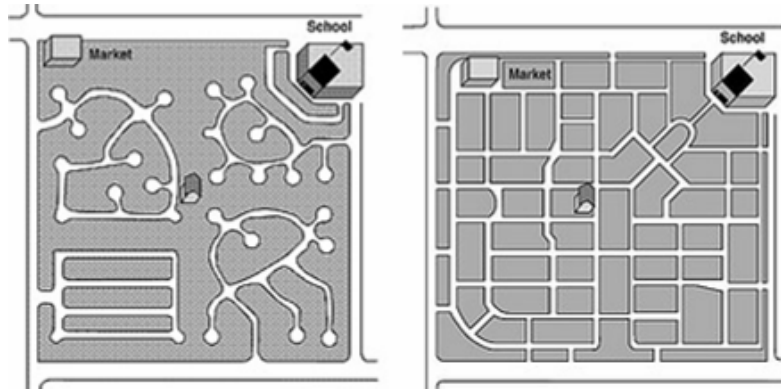
##### ▪ Street connectivity

Connectivity is a measure of how many of the streets are connected to each other and whether they provide direct pathways to nearby destinations (Goldberg, D., Chapman J., Frank, L., Kavage, S. and McCann, B., 2006). Studies showed that highly-connected street networks are more conducive to walking because the pedestrian has a greater number of route choices between any two trip ends. A more highly-connected and denser street network should provide a built environment with shorter street blocks, slower vehicular travel speeds, and shorter distances between land uses, all of which are hypothesized to increase the appeal of walking and create more viable locations. By contrast, a cul-de-sac street pattern has very long blocks



and many dead end streets. This pattern offers few route options; therefore, less movement is expected.

Figure (2-9) Cul-de-sacs street network (left) vs. well-connected street network (right)



Source: Goldberg, D., Chapman J., Frank, L., Kavage, S. and McCann, B., 2006

▪ Street network pattern

Studies showed that potential offenders find it easier to penetrate areas with predictable road networks. According to the Brantinghams, areas with grid street layouts are more predictable than areas with winding roads, cul-de-sacs, or dead ends; therefore, more potential offenders are expected. Moreover, grid pattern creates clearer and more direct pedestrian routes, therefore, more pedestrian are expected. Since more potential offenders will see more potential targets, grid streets tend to enhance certain crime opportunities (Brantingham, P.J. and P.L. Brantingham, 1991).

▪ Street design

Lighting, signage, landscaping, etc., can also encourage crime incidence as they can:

- Become climbing-aids to gain access into target places as a result of improper site positioning.
- Obstruct surveillance such as using high dense trees, placing street lighting without taking vegetation's future growth into account.
- Become misleaders; by using bright lights causing glare, using illegible signage (colors - fonts - directions...etc.).
- Be targets by insecurely fixing, locating at low places without protection from casual vandalism ... etc. (Department of Transport and Urban Planning, Government of South Australia, 2004).

- Land use

The presence of incongruous uses (such as residential area surrounded by military, industrial, etc.) usually reduce movements and activities which lead to a cessation of informal surveillance, especially at night, and therefore provides a good opportunity for offenders to commit their crimes. In addition, the existence of deteriorated and informal densely populated settlements can be a shelter for criminals hiding them away from the police (Fahmy, M., 2006); as it is sometimes impossible to find someone in the densely populated streets, which in turn endanger the adjacent areas to be victimized.

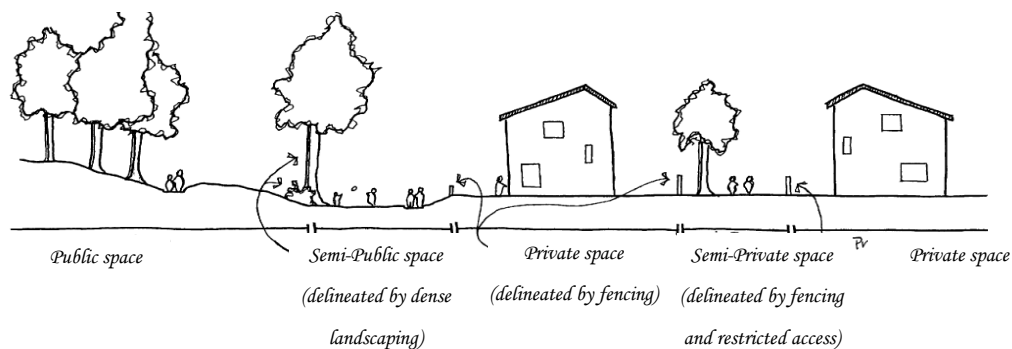
- Public areas:

It is an important element in crime prevention by creating opportunities for positive social interactions between insiders and outsiders, and create a vibrant space all over the day –especially when uses are intermingled– which increases the natural surveillance. It is notable that public spaces can provide protection –when designed properly– in two ways: the public areas themselves and the streets linking them (Radwan, M., *et al.*, 2005).

- Hierarchy of spaces

It can increase a sense of neighborhood and encourage surveillance by subdividing space from the most public (the street) to the most private (the inside of the dwelling). Between these extremes there would be semi-public space, clearly reserved for those who live, or are visiting the dwellings for legitimate purposes, and semi-private space, that is space which clearly belongs to a single dwelling even though it is open to public access (Newman, O., 1972).

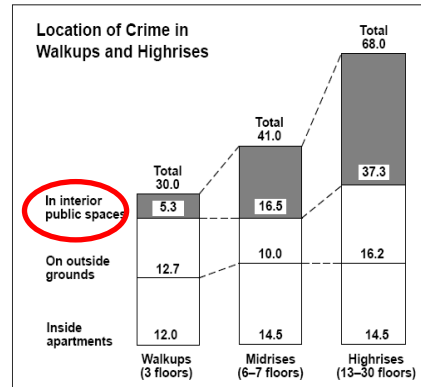
Figure (2-10) Hierarchy of spaces



- Buildings' heights

Some studies showed that crime rates increase with increasing buildings' height (more than 6 stories), since human becomes separated from the ground and lose his ability to control residential environment.

Figure (2-11) The relationship between the increase in crime and increased building height



Source: Newman, O., 1996

- Windows:

Windows which overlook public areas, entrances and pathways can facilitate surveillance and promote safety (Sarkissian, W. and Stewart, K., 2000).

- **Architectural scale**

- Building's entrance:

Building entrances that are far from the street, reached only after passing through curves can increase crime incidents; as they reduce natural surveillance, provide hiding places for criminals (Radwan, M., *et al.*, 2005).

- Building's lobby:

Also, Elevator lobbies that are far from the building entrance and the street, or those that are reached only after passing through a series of corridors, reduce natural surveillance. When indispensable tasks, such as waiting for an elevator and receiving mail, are not observable to passersby and other residents, crime can increase. A comparison of two housing projects in New York, one with a visible lobby (Highbridge houses) and one without (Bronxdale houses), revealed that the project with a visible lobby had a crime rate 33 percent below the New York City average while the other had a rate that was 52 percent higher than the average (Katyal, N.K., 2002). So, building lobbies have to be seen from outside, this can be achieved by either the lobby design itself, or by using transparent materials such as glass at the entrance.

- Building's common entry/corridor

Studies confirmed that there is a direct correlation between crime rates and the number of apartments sharing a common entry/corridor, the ideal is 2-5 apartments (Radwan, M., *et al.*, 2005).

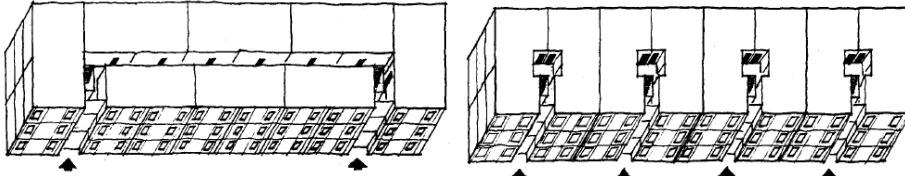
Newman in his book “Creating a defensible space” showed two ways to distribute apartments in a same building envelope; three-story walkup serving a total of 24 families. In the upper layout, all 24 families share 2 common entrances and 8 families share a common corridor on each floor. In the lower design, only 6 families share a common entry, and only 2 families share a common landing on each floor. The smaller number of families sharing an entry and landing allows the families to control the public spaces better: They can more readily recognize residents from strangers and feel that they have a say in determining accepted behavior (Newman, O., 1996).

Figure (2-12) Comparison of a visible lobby represented by Highbridge houses (top) and an invisible one represented by Bronxdale houses (bottom)



Source: Rawan, M., *et al.*, p.37

Figure (2-13) Comparison of two ways to subdivide the same building envelope to serve the same number of families (the design on the right is better than the upper one)



Source: Rawan, M., et al., p. 38.

- Entrapment spots

These are small physically confining spaces formed by barriers such as walls, landscaping, and the like which offenders can use to physically or psychologically surround and entrap people. Entrapment zones include; fire escape recesses, loading zones, left over spaces between buildings, clearings within landscaping, etc. These places are particularly dangerous when located close to well-traveled routes (Sarkissian, W. and Stewart, K., 2000).

**b. Natural environment**

- Weather variables

Empirical studies showed that different weather variables can affect in determining the causes of crime. For example higher temperature, often augmented by higher humidity, cause people to spend more time outside home. Time spent outside home, in line with routine activity explanations for crime, has been shown to increase the risk of criminal victimization for most types of crime (SIMON FIELD, 1992), this also applied to committed crimes type. Person crimes such as homicide, rape are more common on warm, sunny days than on cool or rainy ones. As people spend more time outside the home, more opportunities for communication, friction and aggression exist, thus large number of violent crimes are expected. Otherwise; financial crimes are more common on cool rainy ones; as the needs for food and clothing increase, and satisfying those needs requires money that may not be available for some people, which force them to commit crimes. This agrees with the result that hot countries are more vulnerable to person crimes, while cold countries are more vulnerable to property crimes (Fahmy, M., 2006).

- Geographic location

Another factor that also can affect on crime rates is the geographic location. Studies found that; for Europe the crimes against persons reach their

maximum in summer; while their minimum is in winter. The crimes against property reach their maximum in winter; the minimum in summer. In tropical countries the cycle are almost reversed (Sorokin, P. A., 1927).

▪ Topography:

Previous studies showed that there is a relationship between the topography of a place and the nature of its population (Fahmy, M., 2006); it was observed that flat land with fertile soil and abundant water have friendly, peaceful and sober population thus criminal tendencies decrease and less crime rates are expected, while high crime rates are expected in the mountains because of the primitive nature, roads roughness, frequent rainfall, the lack of natural resources, etc., which affect the nature of their population making it sharp, as well as the difficulty of tracing offenders and the ease of their escape.

**2.5.3. Anthropological factors**

According to Enrico Ferri,<sup>9</sup> they can be divided into:

**a. The organic constitution of the criminal**

Comprise all anomalies of the skull, the brain, the vital organs, the sensibility, and the reflex activity, and all the bodily characteristics taken together, such as the physiognomy, tattooing, and so on.

**b. The mental constitution of the criminal**

Comprise anomalies of intelligence and feeling -especially of the moral sense- and the specialties of criminal writing and slang.

**c. The personal characteristics of the criminal**

Comprise his purely biological conditions, such as race, age, sex; bio-social conditions, such as civil status, profession, domicile, social rank, instruction, education.

In addition to crime factors, there are factors that affect safety and security which can be summarized -according to Crowe, 1991- in three basic approaches:

- 1) A method of punishment which is based on punishing the offender with a degree of pain than the value obtained from committing the crime to deter him from repeating or doing other;
- 2) The abolition of the motives that causes the criminal behavior by improving social, economic and political life of society;

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<sup>9</sup> Ferri, E., 2007, "*Criminal Sociology*", England: The Echo Library, p.39

3) Reducing crime opportunities which are based on:

- Increasing awareness of the environment: The ability to see and to understand what is around and what is ahead, by the provision of adequate lighting, clear sightlines and the elimination or avoidance of confined and hidden areas.

- Increasing visibility by others: by reducing isolation, improvements to the mixture and intensity of land-use and intelligent use of activity generators.

- Finding help: The ability to escape, communicate, or find help by improving signage and legible design. (Department of Transport and Urban Planning, Government of South Australia, 2004).

### **2.6. Criminal's behavior: the relationship between crime's location and criminal's base**

Researches have demonstrated that crimes against person occur close to criminal's home, property crimes occur far from criminal's home, but overall criminals commit their crimes close to home due to less travel cost and knowledge of exit and escape routes. In 2003, Patricia and Paul Brantingham introduced some general characteristics about the journey to crime as follows:

- Most crimes are committed opportunistically as a result of the offender discovering the opportunity in the course of routine, non-criminal activities.
- Crime trips follow a distance-decay function, with the number of crime occurrences decreasing with distance from the offender's home. Canter and Hammond (2006) argued that offenders do not typically travel far from their homes to offend because of the increase in time, money and effort to travel further a field. In addition, they can feel most comfortable and most familiar.
- The length of crime trips relates to the type and complexity of the crime involved and, in property crimes, the magnitude of the expected reward. More complicated or elaborate crimes and larger expected rewards are associated with longer trips.
- Crime trips that leave an offender's home neighborhood frequently go to other similar neighborhoods or to some regional activity node such as malls.
- Crime trip distances tend to be short, but vary with the effective levels of the offender, the age of the offender (juvenile offenders

exhibit less mobility than adult offenders) and with social class (increasing as social class increases).

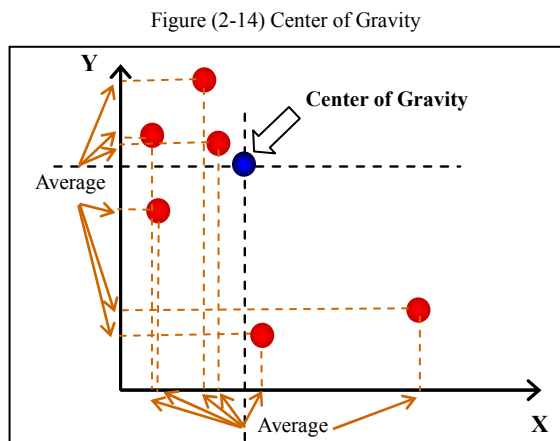
Patrecia and Paul Brantingham also found that the length of travel from criminal's home to the crime site is influenced by a number of factors including:

- The offender's socioeconomic status;
- The socioeconomic status of the offender's neighborhood;
- The road infrastructure and the transportation system;
- The specific transport methods available to the offender;
- The locations of legitimate activity centers and various social routines.

Studies showed different algorithms and measures used to analyze the dot pattern produced by the crime position to define criminal's base. According to Van Der Kemp, Van Koppen (2007) and Kent, J. (2003), these measures include:

#### Center of Gravity (CG)

This is also known as 'centroid' and 'the mean center'. It was developed in 1987 when a UK police investigator analyzed the locations of crime scenes of the Yorkshire Ripper and computed the "center of gravity" of the crime scenes, using average on X axis, and average on Y axis, to provide



Source: the author

indication of where a search for the Yorkshire Ripper's home location should begin. It turned out that the offender lived in the town that the investigator predicted (Canter, D., Coffey, T. and Huntley, M., 2000). It is the simplest of the statistics and has been calculated for years by analysts who plot their incidents on Cartesian planes.

#### Median center

The criminal's base is the intersection between the middle value of the distribution of the X-coordinates and Y-coordinates. Compared to the centroid, the median is less sensitive to extreme values; less sensitive to

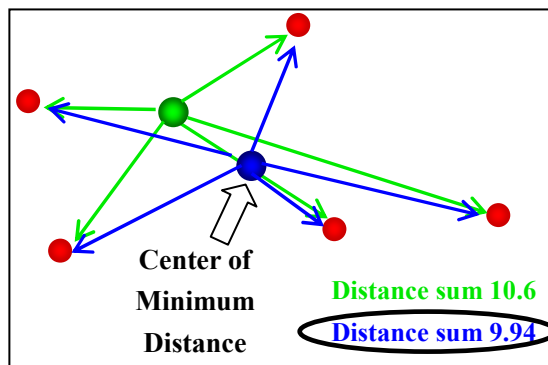


these one or two faraway crime sites, the offender may have chosen without any particular reason or because there happened to be a very attractive target.

### Center of Minimum Distance (CMD)

Based on the distance decay function, the criminal's base can be represented by the point where the sum of distances to all crime sites is the smallest.

Figure (2-15) Center of Minimum distance

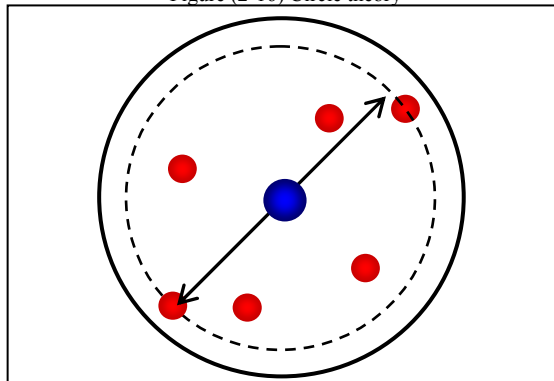


Source: the author

### Circle theory

Identifies the criminal's base by identifying the two crime locations furthest apart from each other. Using these locations as the diameter, a circle can be drawn including all the offences. The hypothesis is that the criminal will be found to live inside that circle, possibly close to the middle of it. Moreover, Canter and Larkin (1993) proposed two offence styles that represent different models of criminals' behavior.

Figure (2-16) Circle theory



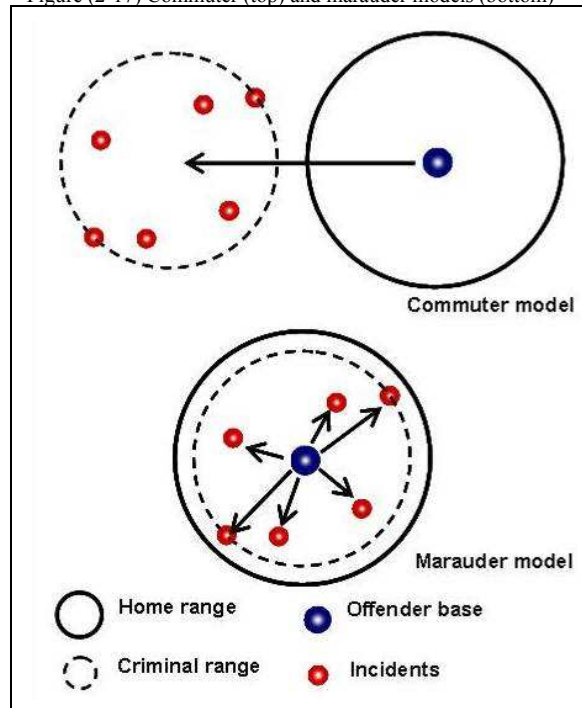
Source: the author

- The first style called the "Commuter model"; in which the offender travels from his home range into a distant area to commit his crimes. Thus, it is assumed that the Circle Theory is not applicable to the commuter model once the criminal operates from a base outside the circular area. Although the commuter travels away from his home to commit his or her crimes, according to Canter and Larkin (1993), this is not to suggest that the criminal range is unfamiliar to the offender, but that it is at an appreciable distance from the area in which he habitually operates as a non-offender.

- The second style called the “Marauder model” has a more direct relationship to the statement of the Brantinghams who have seen that the majority of serial offenders tend to commit most of their offences in an area near to their home base.

Canter and Larkin found that 86% of their United Kingdom sexual offender sample fit the marauder model, while the remaining 13% were commuters.

Figure (2-17) Commuter (top) and marauder models (bottom)



Source: the author

It is notable that the previous methods used in many series crimes, committed by the same single offender to produce a point for criminal’s base, which in the real world in most cases wasn’t far from it.

## 2.7. Conclusion

This chapter reviewed the most important theories and studies that discussed crime at different levels. Based on these theories, it was found that:

- In social terms: social disorganization and social heterogeneity are the key factors in generating criminals within particular areas and increasing crime rates within others.
- In physical terms: long blocks, grid networks pattern, incongruous uses, absence of spaces’ hierarchy, high-rise buildings and the lack of public areas and windows are the key factors in crime occurrence within the urban environment.
- In environmental terms: weather conditions and the number of dark hours during the day are the key factors in determining crime type and time.

**The next chapter provides a description of the Greater Cairo Region based on the different factors discussed in this chapter.**

# Chapter Three

## The Greater Cairo Region

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- 3.1. INTRODUCTION**
- 3.2. DEFINING THE GREATER CAIRO REGION**
- 3.3. POPULATION**
- 3.4. GOVERNANCE AND URBAN MANAGEMENT STRUCTURES**
- 3.5. NATURAL ENVIRONMENT**
  - 3.5.1. Geographic Location**
  - 3.5.2. Topography**
  - 3.5.3. Weather Conditions**
- 3.6. SOCIAL CHARACTERISTICS**
  - 3.6.1. Population Density**
  - 3.6.2. Rate Scramble**
  - 3.6.3. Educational Condition**
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  - 3.6.5. Internal Migration Rate**
- 3.7. PHYSICAL CHARACTERISTICS**
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    - a. Residential area
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    - a. Average crime incidents over Egypt
    - b. Average crime incidents over the GCR
    - c. Crime rates over the GCR
- 3.9 CONCLUSION**

### **3. The Greater Cairo Region Characteristics and Crime**

#### **3.1. Introduction**

This chapter provides a description of the GCR through defining its boundaries, describing its characteristics including: natural environment, social and physical features and analyzing crime statistics during the study period.

#### **3.2. Defining the Greater Cairo Region**

Before defining the study area, it should be noted that the term “Greater Cairo” is invariably applied in Egypt to describe different overlapping areas developed over years. Due to the lack of definitions, it is difficult to differentiate among those areas, but –in general– they can be identified as follows:

- In 1965, the High Committee for the planning of Greater Cairo was established by a presidential decree. Its main purpose was to plan for the whole area of urban Cairo, regardless of its administrative boundaries. The committee defined Greater Cairo boundaries with the following components:

- The city of Cairo and neighboring urban areas of Giza and Qaliubeya governorates.<sup>10</sup>
- The areas connected to central urban Cairo by socio-economic functions.
- The forecast areas of expansion during the next 50 years (United Nations Human Settlements Programme, 1993).

This area is usually known as the *Greater Cairo Planning Region (GCPR)*.

- In 1970, the *Greater Cairo Metropolitan Area (GCMA)* emerged; a continuous urbanized area includes the cities of Cairo, Giza, with their immediate suburbs, as well as the city of Shubra al Kheima (United Nations Human Settlements Programme, 1993).

- In 1977, the Republic was divided into 8 economic regions (they became 7 after merging the Matrouh region with Alexandria and Beheira), and the boundaries of the GCPR were extended forming the *Greater Cairo Economic Region (GCER)*; vibrant megalopolis comprises all of Cairo, Giza, Qalyobiya governorates at that time.

- In May 2008, The president announced that Helwan and 6th of October -suburbs were regarded as parts of Cairo and Giza governorates- will become two separate, independent governorates (Sabry, S., 2009), which in turn, made the Greater Cairo Economic Region divided between five governorates; Cairo, Giza, Qalyobiya, the newly established Helwan and 6th

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<sup>10</sup> Before establishing the new Helwan and 6<sup>th</sup> of October governorates

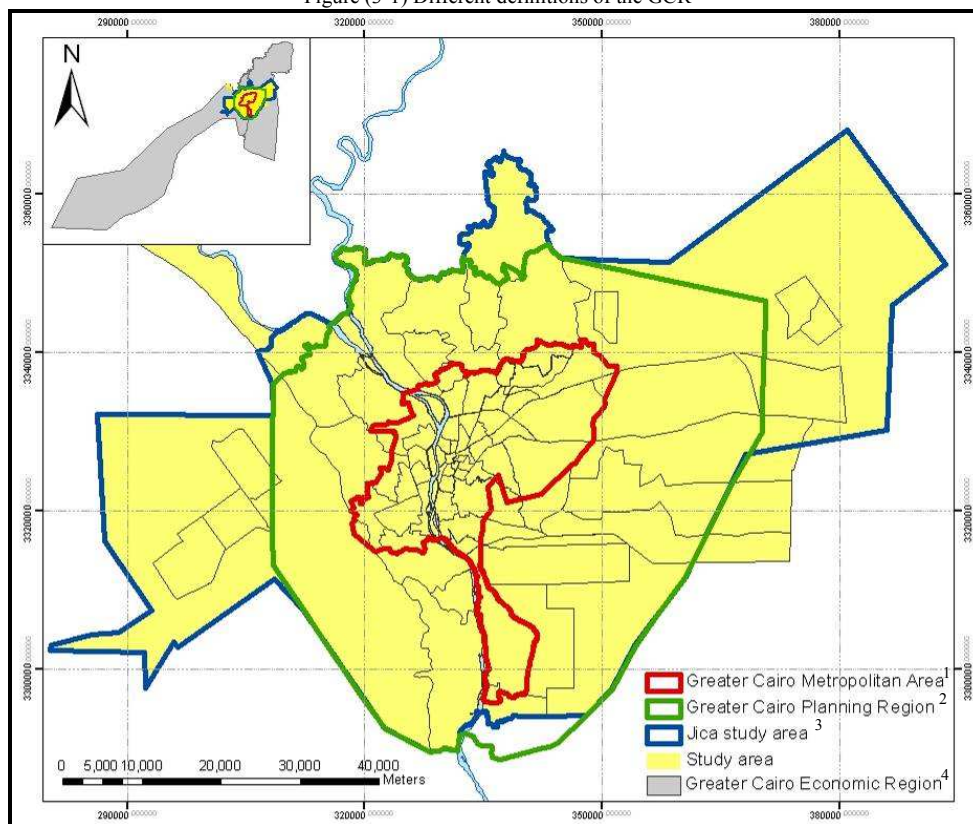
of October.

- Later, in July 2008, the Government of Japan, in response to a request of the General Organization for Physical Planning (GOPP) under the Ministry of Housing, Utilities and Urban Development (MOHUUD), updated the existing GCPR in order to implement “*the strategic urban development master plan study for sustainable development or the Greater Cairo Region in the Arab Republic of Egypt*” and entrusted the study to Japan International Cooperation Agency (JICA). This was done based on a review of related plans including the existing transportation master plan by JICA, a further analysis of current socio-economic conditions indicated by the latest census in 2006, and current urbanization shown in satellite images from 2007 (General Organization for Physical Planning (GOPP) and Japan International Cooperation Agency (JICA), 2008). This explains why the region’s boundaries exceeds the districts/aqşam boundaries defined by the Central Agency of Public Mobilization and Statistics (CAPMAS)(see figure 3-1). The new area includes the whole of Cairo and Giza, parts of Qalyobiya, Helwan, 6<sup>th</sup> of October governorates -depending on the quarters (shyakhat)- with the seven new urban communities surrounding it including: 6th of October, Al-Sheikh Zayed, 15th of May, New Cairo, Shrouk, Badr and Obour cities, in addition to, 10th of Ramadan city; which administratively belongs to Sharqiya governorate. Figure (3-1) shows the previously mentioned areas and the districts/aqşam which relied upon.

In addition to the lack of definitions of the areas mentioned before, there is a conflict between different authorities in defining the region. For example, the General Organization for Physical Planning (GOPP) refers to the region as the area updated by JICA depending on quarters, while the Central Agency of Public Mobilization and Statistics (CAPMAS) refers to it as the (GCER) -mentioned before- depending on districts. As for the Public Security Bureau (PSB), it has no definition of the region, but -like CAPMAS- they use districts to define each governorate not only those located within the region, but also over the whole of the Republic. As a result, the Greater Cairo Region, in this study, will include the area updated by JICA depending on districts, not on quarters. The existing districts can be classified into three categories:

- Main agglomeration districts including most of the GCMA districts, which are dominated by urban areas.
- Villages & small towns districts; including districts dominated by agricultural area, and located outside the main agglomeration.
- New Urban Communities districts (NUCs); containing the eight new urban communities classified by their 12 districts within the GCR.

Figure (3-1) Different definitions of the GCR



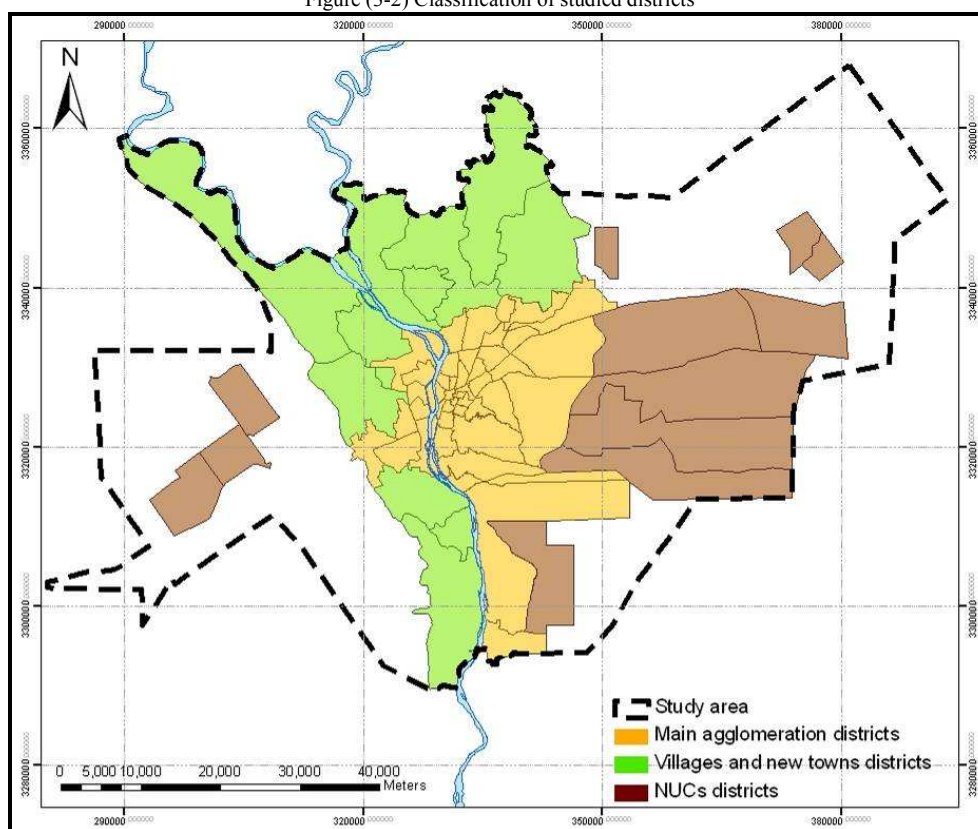
Source: 1 WAGIH, A., 1995.  
 2,3 General Organization for Physical Planning (GOPP) and Japan International Cooperation Agency (JICA), 2008.  
 4 CAPMAS

### 3.3. Population

According to 2006 census final results, the region is inhabited with approximately 16.4 million persons, representing 22.6% of the total population of Egypt.

Over the past three decades, the region has experienced rapid urban growth at an average annual growth rate of 2.51 percent as a result of the massive rural- urban migration. The population has risen from 10.9 million in 1986 to 13.2 million in 1996. According to the last census results (2006), this number reached 16.4 million. The average growth rate of its population between 1996 and 2006 was 2.45%, compared with 2.07% for the period between 1986 and 1996. Table (3-1) shows the number of districts, land area, inhabited area, population and population density in the GCR.

Figure (3-2) Classification of studied districts



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author

Table (3-1) No. of districts, land area, population, inhabited area and population density in the GCR

Governorate	No. of districts*	Land area (km <sup>2</sup> )*	Populated Area (km <sup>2</sup> )*	Population**			Annual growth rate		Population density 2006 (person/km <sup>2</sup> )
				1986	1996	2006	86/96	96/06	
Cairo	41	1,669	1,375	6,068,695	6,800,991	7,902,085	1.21	1.62	5,747
Giza	17	1,658	753	3,157,716	4,053,987	5,338,884	2.84	3.17	7,090
Qaliobeya	9	669	538	1,716,892	2,307,573	3,076,582	3.44	3.33	5,719
Sharkia	2	592	38	-	47,833	125,920	-	16.32	3,314
<b>Total</b>	<b>69</b>	<b>4,588</b>	<b>2,704</b>	<b>10,943,303</b>	<b>13,210,384</b>	<b>16,443,471</b>	<b>2.07</b>	<b>2.45</b>	<b>6,081</b>

Source: \* Calculated by the author

\*\* Census, CAPMAS, 2006

### **3.4. Governance and Urban Management Structures**

According to Law 43 (1979) and its executive regulations, there are five types of local administrations including:<sup>11</sup>

- Governorate: The governorate is the main service delivery unit of subcentral Egypt. It may be simple and completely urban (represented by Cairo governorate in the case of the GCR) or complex consisting of one or more urban and rural communities (represented by Helwan, 6<sup>th</sup> of October, Giza and Qaliobeya governorates in the case of the GCR).
- Markaz: The markaz is the next unit in the hierarchy below the governorate. It includes a capital city of the markaz and other cities, if they exist, as well as villages.
- City (Madina): The city exists in all governorates: as a one-city governorate (the capital of a governorate), a capital of a markaz, or as a constituent city in a markaz. Cities may be divided into districts if it is determined to be functionally necessary.
- District (qism/hayy): The district is the smallest local unit in urban communities. Districts are further divided into subdistricts or sections or neighborhoods called sheyakha to facilitate district management.
- Village (qariya): The village is the smallest local unit in rural communities. There are two types, villages that are considered local units (mostly the larger ones) and the smaller "satellite villages." The satellite villages, which are not considered local government units and thus have no public sector service role in the local administration system, are included in the jurisdiction of either a village or a markaz.

The local administration system can be classified in three levels for simple governorates and four levels for complex governorates. For simple governorates, the three levels are governorate, city, and district. For complex governorates, the four levels are governorate, markaz, city and village, and district (see figure 3-3).

### **3.5. Natural environment**

#### **3.5.1. Geographic location**

The region is situated between the 29°43 and 30°26 N latitudes and the 30°43 and 31°53 E longitudes with an area of 1.09 million Feddan.

#### **3.5.2. Topography**

The topography of the region is almost flat, bounded by hills to the east and west.

#### **3.5.3. Weather conditions**

The region is located in the subtropical climatic region with a dry climate. In

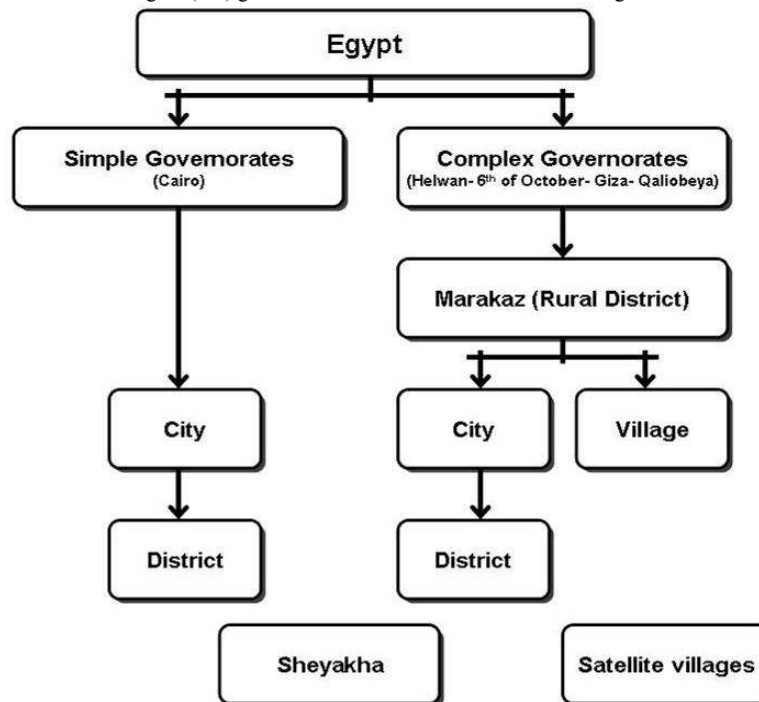
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<sup>11</sup> Amin, K. Z. and Ebel, R. D., 2006, "*Intergovernmental Relations and Fiscal Decentralization*", Egypt Public Expenditure Review, Policy Note 8, Washington: World Bank, p. 14.



winter (December to February) the general climate of the region is cold, moist and rainy with minimum mean temperature of 13°C, while during summer (June to August), it is hot, dry and rainless with maximum mean temperature of 28°C. In spring (March to May) and autumn (September to November) dust and sandstorms frequently blow (Robaa, S. M., 2003).

Figure (3-3) governance structure of the Greater Cairo region



Source: Amin, K. Z. and Ebel, R. D., 2006; modified by the author

### 3.6. Social characteristics

#### 3.6.1. Population density

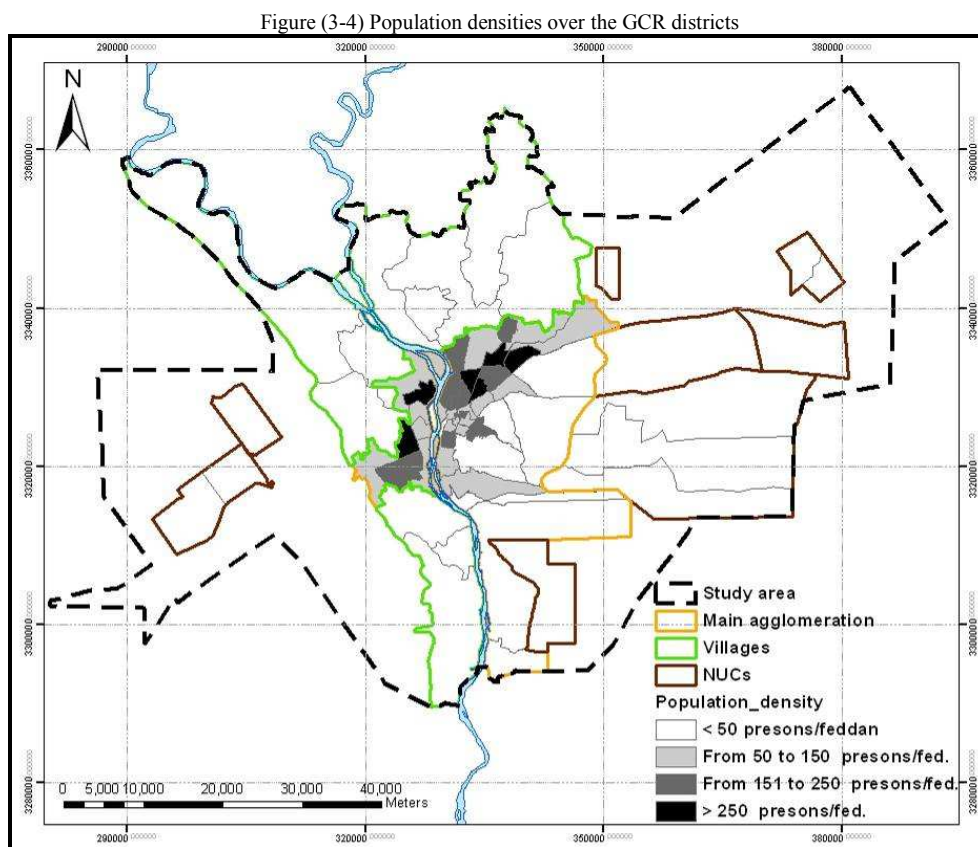
Using a “population per Feddan<sup>12</sup>” measure, the overall population density at the GCR -excluding desert areas- amounts to 84.6; the lowering of this number comes at no surprise due to the low densities at the level of the NUCs, villages & small towns districts, although their highness at the northern and central districts of the main agglomeration (more than 150 persons/Feddan).

For the NUCs, most of them are new and suffer from the slow population growth as a result of their distance from the populated area, which in turn

<sup>12</sup> Feddan = 4200 m<sup>2</sup>

affected the resultant density. 10<sup>th</sup> of Ramdan city, for example, is the oldest of the NUCs which are located within the region. It was established by Presidential Decree No. 149 in 1977 and expected to have a population of 500,000 people by the year 2000 (United Nations Conference on Human Settlements (UNCHS), 1993), yet by 2006, according to the last census, it has only 125,920 inhabitants; about 4343 person per year since established, which is too low for what was expected.

As for villages and small towns districts, population don't cover the whole districts due to the existence of large areas of agricultural lands. Since the density is calculated over the whole districts, population would be also distributed over the districts area resulting in low density. The following map shows population densities over the GCR districts.

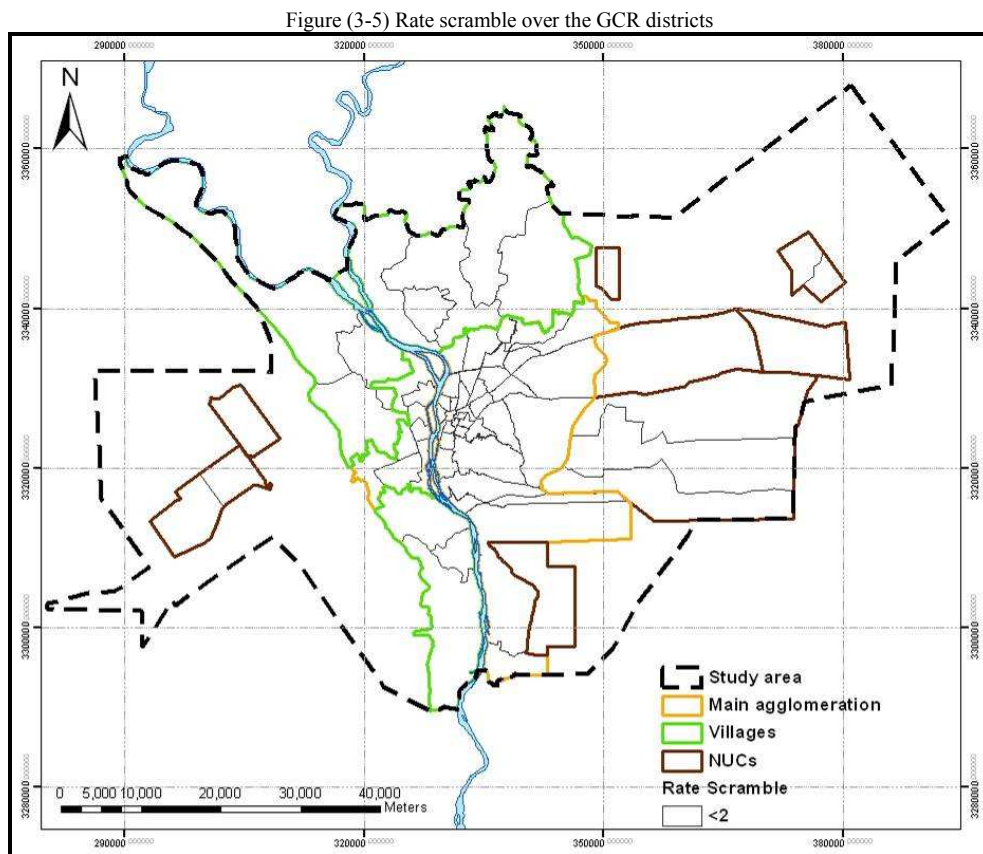


Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006).

### 3.6.2. Rate Scramble

Based on the last census results, scramble rates over the GCR districts range from 0.56 to 1.51 persons/room, compared with 1.11 over the region as a whole and 1.13 over Egypt. According to A.Halim, A., 2007, more than two persons per room results in more crime incidents. Studies showed that boys and girls whose homes are overcrowded and have no recreational facilities have little choice except to play in the streets and alleys. Gangs are formed as a result of the least supervision over children. They resort to crimes to improve their conditions; first they commit crimes in their area and gradually they go further.

Since rate scramble over the region doesn't exceed 2, it may be ineffective on crime incidents. The following map shows rate scramble over the studied districts.



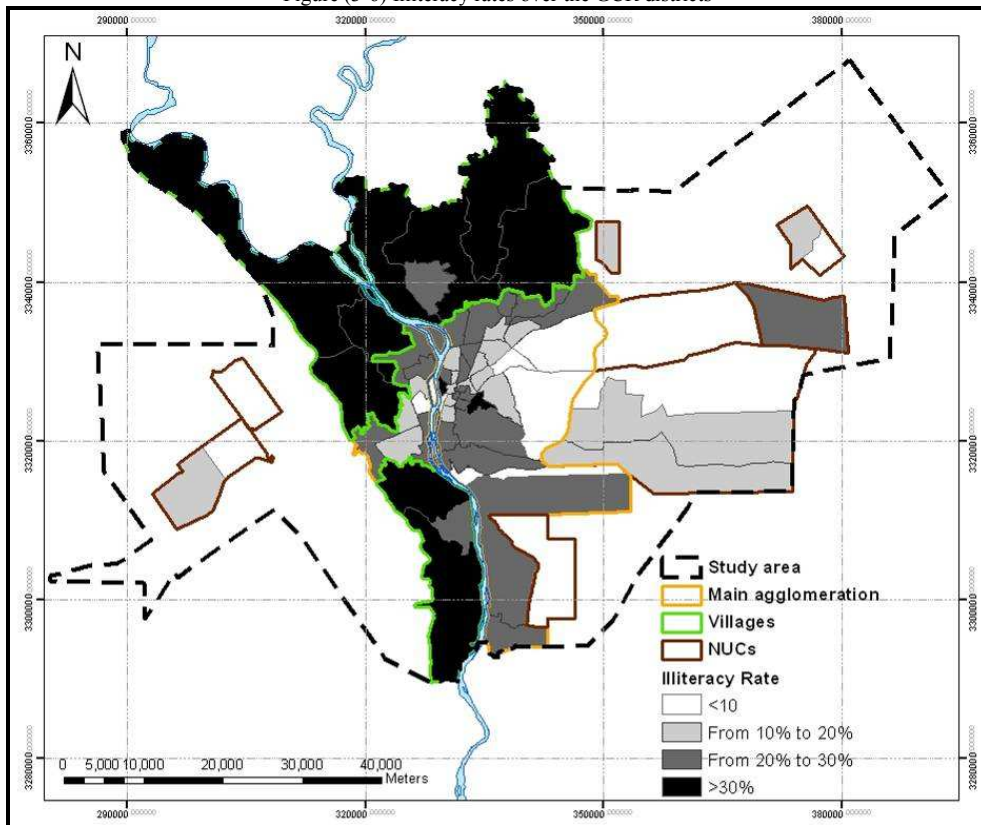
Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006)

### 3.6.3. Educational condition

Based on the last census results, the illiteracy rates of the adult population (more than 10 years) over the GCR districts range from 4.04% to 47.05%, compared with 22.64% over the region as a whole and 29.64% over Egypt. The highest illiteracy rates<sup>13</sup> concentrate in villages and small towns districts, in addition to Manshiat Nasser which is one of the most important informal settlements over the region, and Boulaq districts at the main agglomeration. The lowest rates concentrate in some of the “high living standard districts” including al-Nozha, Madinet Nasr, Misr Al-Gadida, Zmalek, Dokki and Maadi. Generally, most of the agglomeration districts have high illiteracy rates.

Concerning the NUCs, generally, they are considered to have low illiteracy rates except Badr city which is considered to have high rate (about 23.38%) compared with the prior district.

Figure (3-6) Illiteracy rates over the GCR districts



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006).

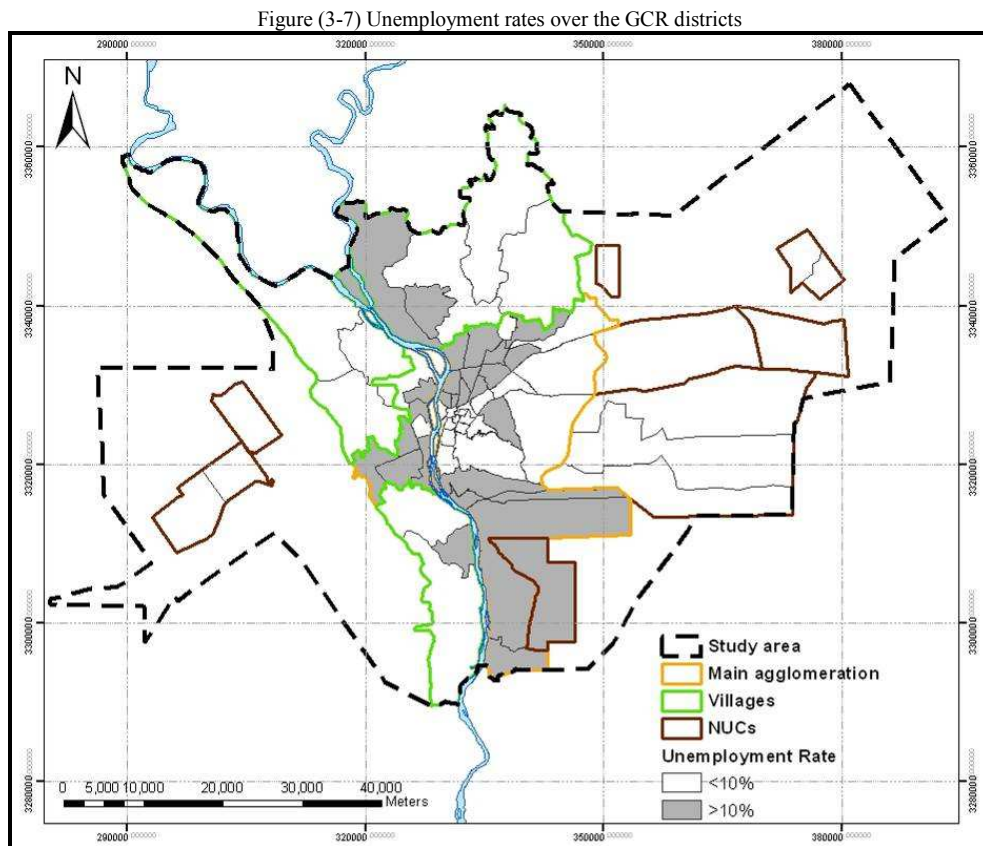
<sup>13</sup> High illiteracy rates were assumed to be higher than GCR's rate as a whole (22.64%).

### 3.6.4. Economic condition

Using the unemployment rates as a description of the economic condition of individuals, census results showed that over the GCR districts, unemployment rates range from 3.17% to 18.82% of the labor force volume, compared with 10.27% over the region as a whole and 9.72% over Egypt.

Concerning the main agglomeration, villages and small towns districts, there are no specific patterns or characteristics for the unemployment rates distribution except that the high rates<sup>14</sup> districts -over both- seemed to be semi-connected.

As for the NUCs, generally, they are considered to have low unemployment rates range from 3.17% to 10.58%; as most of them were established essentially to become “self-sufficient,” on the assumption that people who lived in, would also work there. The following map shows the unemployment rates over the studied districts.



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006).

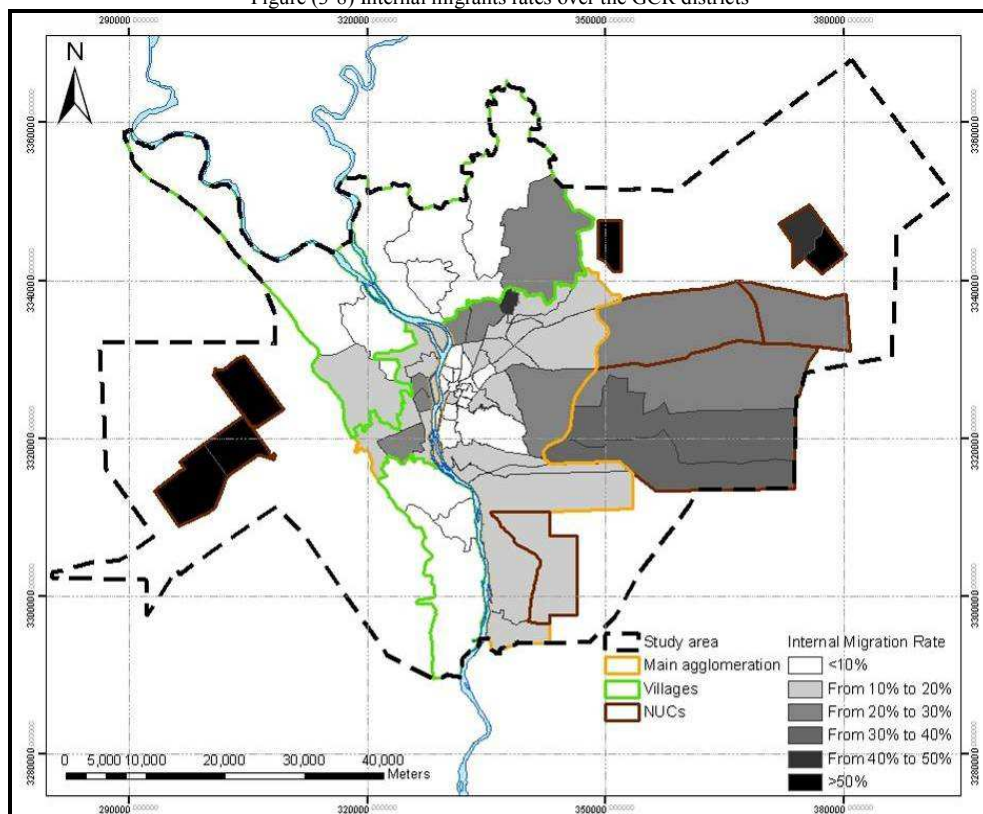
<sup>14</sup> High unemployment rates were assumed to be higher than the GCR's rate as a whole (10.27%).

### 3.6.5. Internal migration Rate

Based on the last census results, internal migration rates were calculated from the number of immigrants in each districts divided by the district's population. According to the calculations, internal migration rates over the GCR districts ranged from 0.78% to 86.88% compared with 15.7% over the region as a whole and 6.6% over Egypt. NUCs generally have the highest rates,<sup>15</sup> as the main purpose of establishing them was to draw population from overcrowded areas to the desert. The highest immigrants' rates -over the NUCs and the GCR as a whole- concentrate in El-Sheikh Zayed and Obour cities representing more than 80% of districts' population.

For the main agglomeration districts, the lowest rates concentrate in the center and gradually increase to the edges. This relation extends somewhat to a couple of the villages and small town districts; including Kerdasa and Al-Khanka districts, which are directly connected to the main agglomeration. Generally, villages and small towns have low internal migration rates.

Figure (3-8) Internal migrants rates over the GCR districts

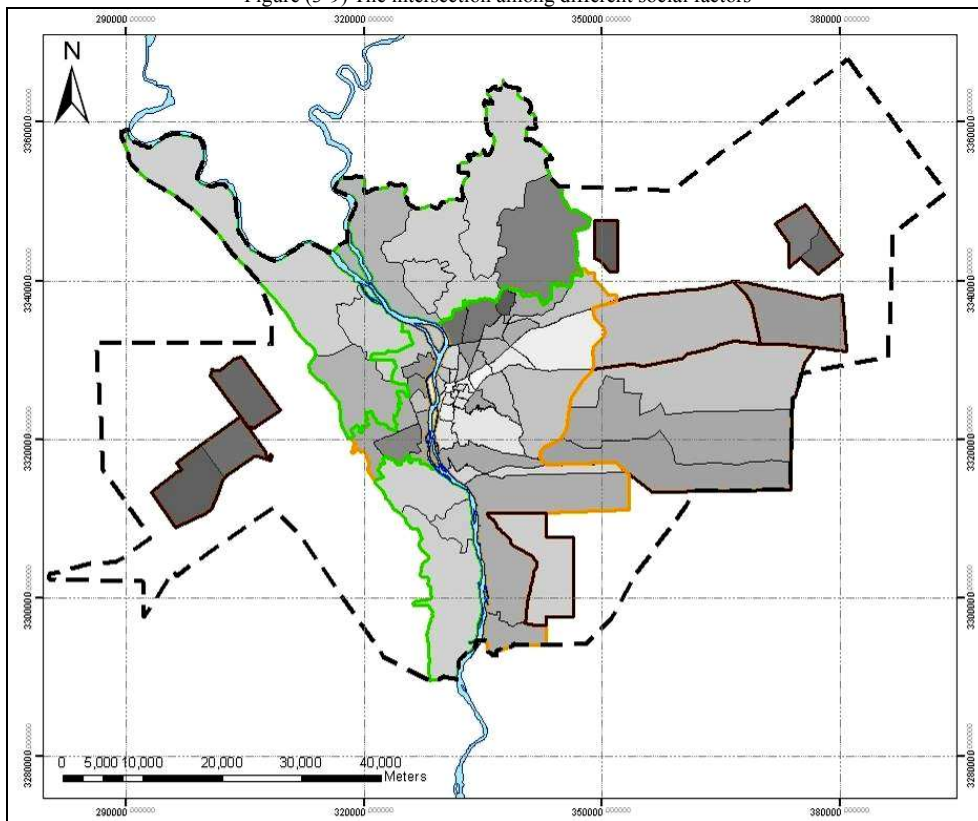


Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006).

<sup>15</sup> High internal migration rates were assumed to be higher than the GCR's rate as a whole (15.7%).

Figure (3-9) shows the intersection among different social factors, the darkest districts are supposed to have high crime rates. Analysis showed that the NUCs separated from the main area are socially deteriorated, while the adjacent ones are less deteriorated. As for the main agglomeration, it is notable that the deterioration increases at the edges and decreases inside. Otherwise, for villages and small towns, the deterioration decreases at the edges and increases inside. It is obvious that where urban and rural districts meet, high social deterioration is expected.

Figure (3-9) The intersection among different social factors



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the last census results (2006).

### 3.7. Physical characteristics

#### 3.7.1. Street network

As street networks can influence people move within an area and, consequently, the way in which offenders search for targets, they can be classified into four main types. Each district can have one or more of them, some have the four types together. According to Fahmy, M., Sharples, S. and Al-Kady, A. Wahab (2008), the four types include:

- a- Grid type: It is the most common pattern of street networks and usually links to the linear fabric. Grid networks have emerged basically to divide the agricultural land with two sets of streets in two different directions, usually orthogonal, each set usually has equally spaced, parallel or semi-parallel streets. Later, this type has been used in non-agricultural areas planning such as Madinet Nasr district.
- b- Radial type: It consists of three elements,
  - A hub junction, a center where high levels of activity exist.
  - A set of radial roads crossing or touching the hub, extending outwardly into other centers or routes.
  - Branches around the hub -usually are rings- connecting the radial lines.

This type appears clearly within the downtown districts, in addition to some modern districts such as Maadi and Misr al Gadida.

- c- Organic/irregular type: It is the most common pattern used in historical areas such as Gamaliya and Darb El-Ahmar to provide protection from external aggression. It can also be found within the unplanned areas. Irregular networks consist of dead-end routes, winding and narrow roads that have no direction or a fixed width.
- d- Curvilinear type: Used especially in recreational areas such as, shores and mountains. It follows the natural topography of the land by using curving roads. Within the GCR, this type can be found clearly in Zamalek district.

The following figure shows different types of street networks, Figure (3-11) shows examples of different types of street networks.

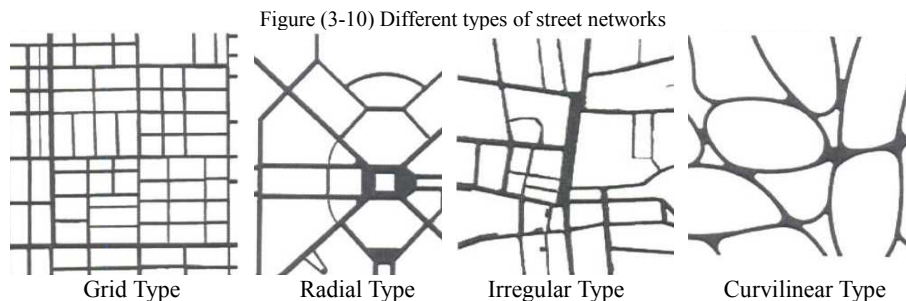




Figure (3-11) Examples of different types of street networks



### 3.7.2. The urban fabric/physical tissue

As an aspect of urban pattern, the urban fabric explains the relationship between solids (represented by built areas) and voids (represented by vacant lands, roads, open spaces<sup>16</sup>, etc). This relation can be analyzed through the use of the nolli maps (see figure 3-12) where solids are hatched, voids are blank.

Figure (3-12) Examples of nolli maps



Source: Tawfik, H. M., 2004

According to Tawfik (2004), urban fabrics in Egypt can be classified into:

- a- Dot shape pattern: It is the most commonly used pattern in the NUCs and modern districts such as Maadi, Nozha, Zamalek, etc., as buildings located in the same parcel are separated from each other and surrounded by spaces -whether public or private- from all sides. The resulting spaces are often used as green areas, internal-routes and pedestrian paths.

<sup>16</sup> Sometimes landscapes can be seen as an object in the space

Figure (3-13) Dot shape pattern in 6<sup>th</sup> of October district (left) and Nozha districts (right)



Source: Google Earth

- b- Linear shape pattern: It has emerged basically as a result of the rapid random sprawl over the agricultural land, which in turn led to the emergence of a regular road network such as Zaitoun, Mataria, Marg, etc. Later this pattern has been extended to non-agricultural areas, especially, in public housing areas, because of its ability to provide more buildings than the dot pattern as the buildings are connected together from one or two sides, the inner spaces are fewer and usually used as internal-routes and pedestrian paths.

Figure (3-14) Linear shape pattern of Mataria district (left) and Al-Abagia housing in Khalifa district (right)



Source: Google Earth

- c- Compact shape pattern: It is the most commonly used pattern in the old historic areas such as Gamalya and Darb Ahmar districts due to its ability to provide shadows and create a thermal suitable environment; as buildings are connected from two or more sides, the outer spaces disappear and are replaced by internal courts. Narrow winding roads that have no direction or a fixed width are widespread with alleys and dead end routes.

Later, the compact pattern has spread at some of unplanned areas such as Manshyet Nasser, because of its ability to accommodate a larger number of buildings. Therefore, higher population density is expected, which in turn makes it theoretically more vulnerable to crimes.

Figure (3-15) Compact shape pattern in Gamaleya district (left) and Manshiet Nasser district (right)



Source: Google Earth

### 3.7.3. Land use

As land uses can provide a good opportunity for criminals to commit their crimes by reducing movements and activities, the study focuses on the distribution of the main uses –which can be classified into activity uses (represented by commercial areas), idle uses (represented by cemeteries, deserts and military areas), and a mix of them (represented by industrial areas)– and their relationship to residential areas, in addition to the study of the residential areas themselves.

#### a. Residential area

Previous studies showed high crime rates within physically deteriorated residential areas and the adjacent ones as a result of either low population conditions, bad area conditions or even both (Wilson, R., Brown, T. and Schuster, B., 2009). Studies showed that low population conditions; such as high density, low income, unemployment, etc. make people commit crimes in order to get their basic needs (see page 25), while bad area conditions;

such as the presence of deserted, destroyed, unplanned areas, etc. can be a shelter of criminals keeping them out of the police, and gradually become places to commit crimes (Fahmy, M., 2006). The deteriorated residential areas within the GCR can be classified into two groups:

➤ **Some of the formal housing areas**<sup>17</sup> including the old deteriorated residential areas, public housing and shelter (El-EWAA) housing areas (Afifi, H., 1998).

1. The old deteriorated residential areas; old residential areas deteriorated due to the transfer/migration of their original inhabitants to new modern districts such as Nasr City, Misr al-Gadida. As a result of high rent/ sale values; in addition to the old age of these areas and lack of maintenance, most of these areas were deserted. Figure (3-16) shows districts with old deteriorated residential areas.

It's remarkable that most of these areas are located in the downtown. The study of Serag, 2003, proves the existence of a remarkable percentage of vacant housing stock downtown by using different research techniques, such as measuring illumination of residential units at night to estimate their vacancy rate. He proposed that to overcome these vacancies, rental laws must be reformed in order to improve the quality of urban spaces and to make the existing housing stock more affordable and, at the same time, more liveable. This contributes to decreasing the fear of crime and crime rates at those places.<sup>18</sup>

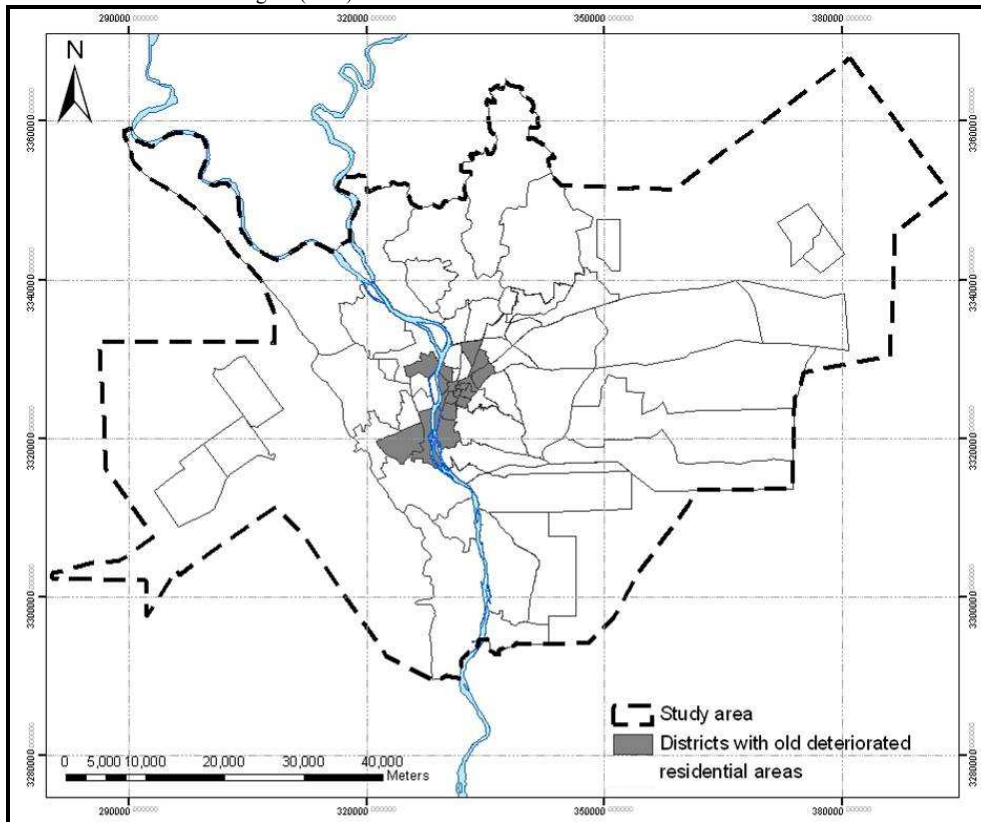
2. The public housing areas; including the housing built by the government in the 1950's to solve the problem of low-income housing. Due to lack of maintenance for those buildings, the low income and high density of population, most of these areas have deteriorated; there are no street lightings, vacant lands and green areas turned to places of solid wastes, etc. which contributed to crime increasing. This is consistent to some extent with Newman's example.

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<sup>17</sup> housing which is constructed by the government; including ministries, authorities, real estate banks, public sector companies and the governorates. It also includes private sector's housing which is constructed by individuals, companies and housing associations, on an official land division and under the building permits (Afifi, H., 1998).

<sup>18</sup> Serag, Y., "Urban Gaps in Cairo: The Case of the Vacant Housing Stock Downtown", In: The Katholieke Universiteit Leuven, 2003, "Post graduate Centre Human Settlements Newsletter", Available at: <http://www.asro.kuleuven.be/new/uploads/docs/asro/centra/NewsletterPGCHS2003.pdf>

Figure (3-16) Districts with old deteriorated residential areas



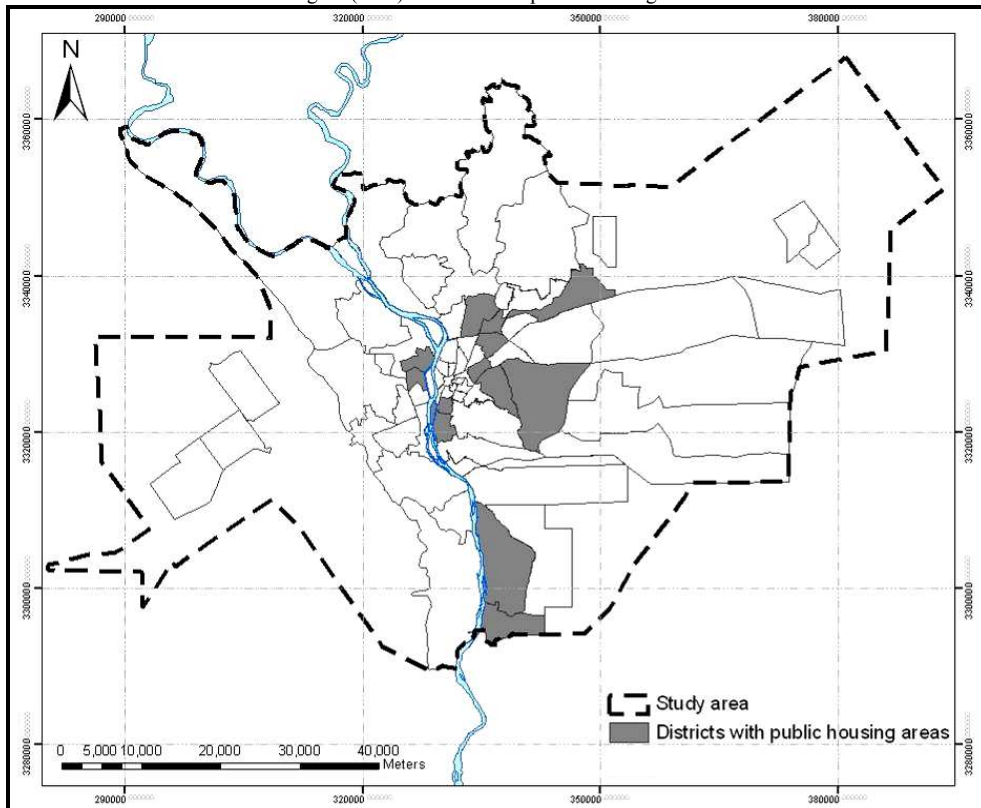
Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to Afifi, H., 1998.

Figure (3-17) Old deteriorated residential areas in the downtown



Source: The author

Figure (3-18) Districts with public housing areas



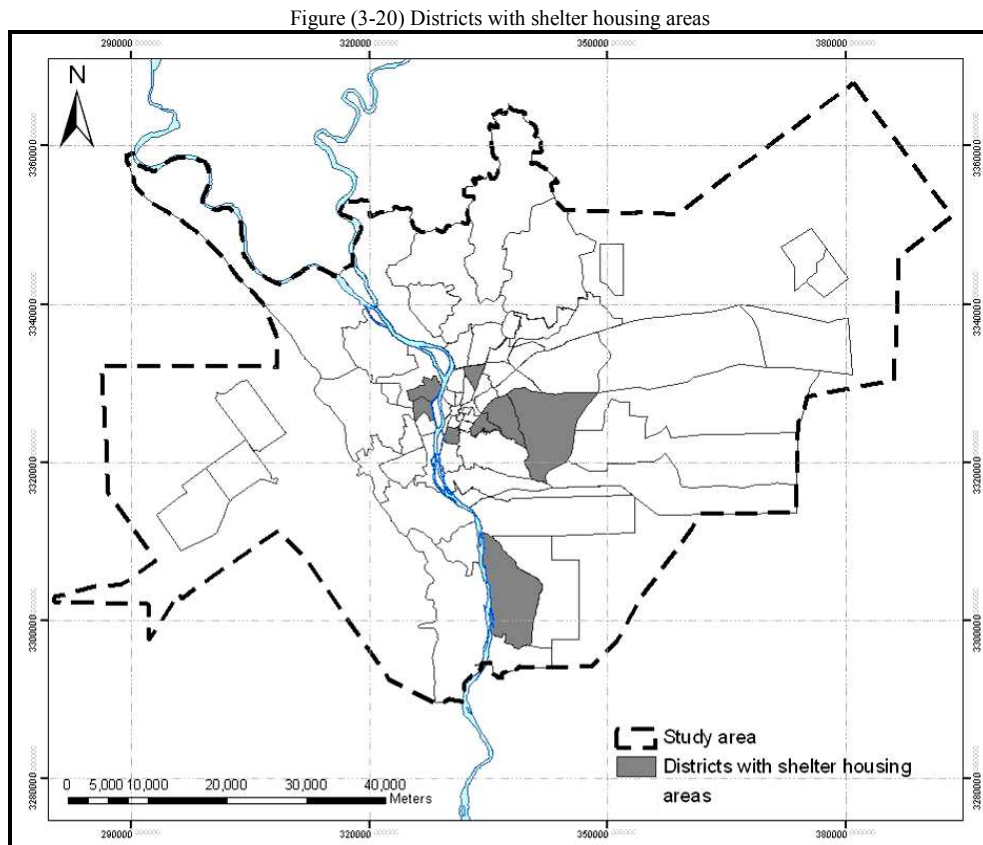
Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to Afifi, H., 1998.

Figure (3-19) Public housing in Misr El-Qadima district



Source: The author

3. Shelter housing areas, it is also known as “El-Ewaa” or “legal slum” housing as they both suffer from the bad living conditions, except that the shelter housing is provided by the government. There are many forms of this type of housing that differ from one area to another. For example, in Katameya they take the form of hangers made from corrugated iron, but in Zawya El-Hamra they’re built as a low-income housing. Figure (3-20) shows districts with shelter housing areas.



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to Afifi, H., 1998.

Figure (3-21) Shelter housing in Manshyet Nasser District



Source: The author

➤ **The informal housing areas**

In 2008, The Informal Settlements Development Facility (ISDF) was established by presidential decree in order to Improve the slums dwellers' lives and to ensure safe housing for them<sup>19</sup>. Its first task was to survey those areas by dividing them into two categories;

1. Unplanned areas including;

- Informal residential developed *on agricultural privately owned land*. The pattern of the old irrigation system usually defines the main and secondary streets in an informal housing settlement on former agricultural land.
- Informal residential developed *on governmental/privately owned lands*
- Informal residential developed *within different housing types' blocks; especially the blocks of the public housing*.

The first is known as semi-informal housing, while the others are known as squatter housing (Soliman, A., 2004).

Figure (3-22) Example of an informal residential developed on privately owned land (Arab El-Hesn, Al-Mataria district)



Figure (3-23) Example of an informal residential developed on an agricultural land (Ezbet El-Asal, Shobra district)



Source: Google Earth

<sup>19</sup> The Informal Settlements Development Facility website, Available on <http://isdf.info/> [accessed on April 2010].



2. Unsafe areas; informal areas where loss of life can occur because residents live in rocky areas or flood plains, with unsafe buildings made of ad-hoc materials, where buildings are unprotected, and where there is lack of potable water and high-level congestion.

Figure (3-24) Unsafe area in a landslide area- Manshiat Nasser district



Figure (3-25) Buildings made of ad-hoc materials (Ezbet el-Haggana – Madinet Nasser district)



Source: The author

According to the ISDF’s survey, the number of informal settlements in the GCR was estimated at 233 settlements, on a surface area of 53.71 km<sup>2</sup> distributed as follows:

Table (3-2) informal settlements within the study area

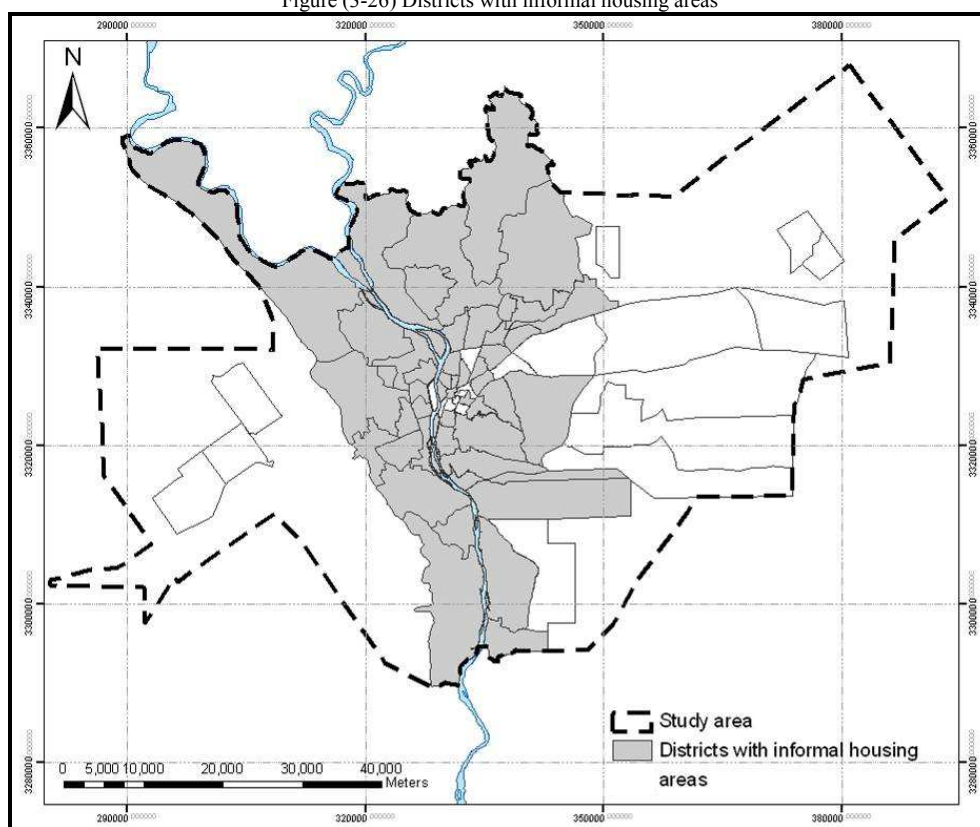
Governorates	Informal settlements*		populated area (KM2)	% of informal settlements
	No. of areas	Area (km2)		
Cairo	125	34.67	1,375	2.52
Giza	56	6.37	753	0.85
Qaliobeya	52	12.67	538	2.36
Sharkia	-	-	38	-
<b>Total</b>	<b>233</b>	<b>53.71</b>	<b>2,704</b>	<b>1.99</b>

Source: \* The Informal Settlements Development Facility

Among the four governorates, Cairo has the largest area of informal settlements (about 64.6% of the total informal settlements area, representing around 2.52% of the governorate inhabited area), followed by Qaliobeya

(about 23.6% of the total informal settlements area, representing around 2.36% of the governorate inhabited area) and Giza (about 11.8% of the total informal settlements area, representing around 0.85% of the governorate inhabited area).

Figure (3-26) Districts with informal housing areas



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to the Informal Settlements Development Facility's (ISDF) data.

**b. Non-residential areas including:** <sup>20</sup>

➤ Commercial areas: classified into three types including:

- CBD locates in downtown area; mixed use buildings established in old ages and partly accommodate shops and stores.
- Subcenters, mostly located in the main agglomeration including Shobra, Abasia, Zamalek, Misr Al-Gadida, Nasr city, Maadi in Cairo governorate and Mohandeseen, Dokki, Giza in Giza governorate.
- Shopping malls; a large size commercial containig commercial complex

<sup>20</sup> General Organization for Physical Planning (GOPP) and Japan International Cooperation Agency (JICA), 2008, "THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT-Final Report", Vol. 1, Available at: [http://www.cairo2050.gov.eg/Uploads/StudyUpload/52/Executive\\_Summary.pdf](http://www.cairo2050.gov.eg/Uploads/StudyUpload/52/Executive_Summary.pdf)

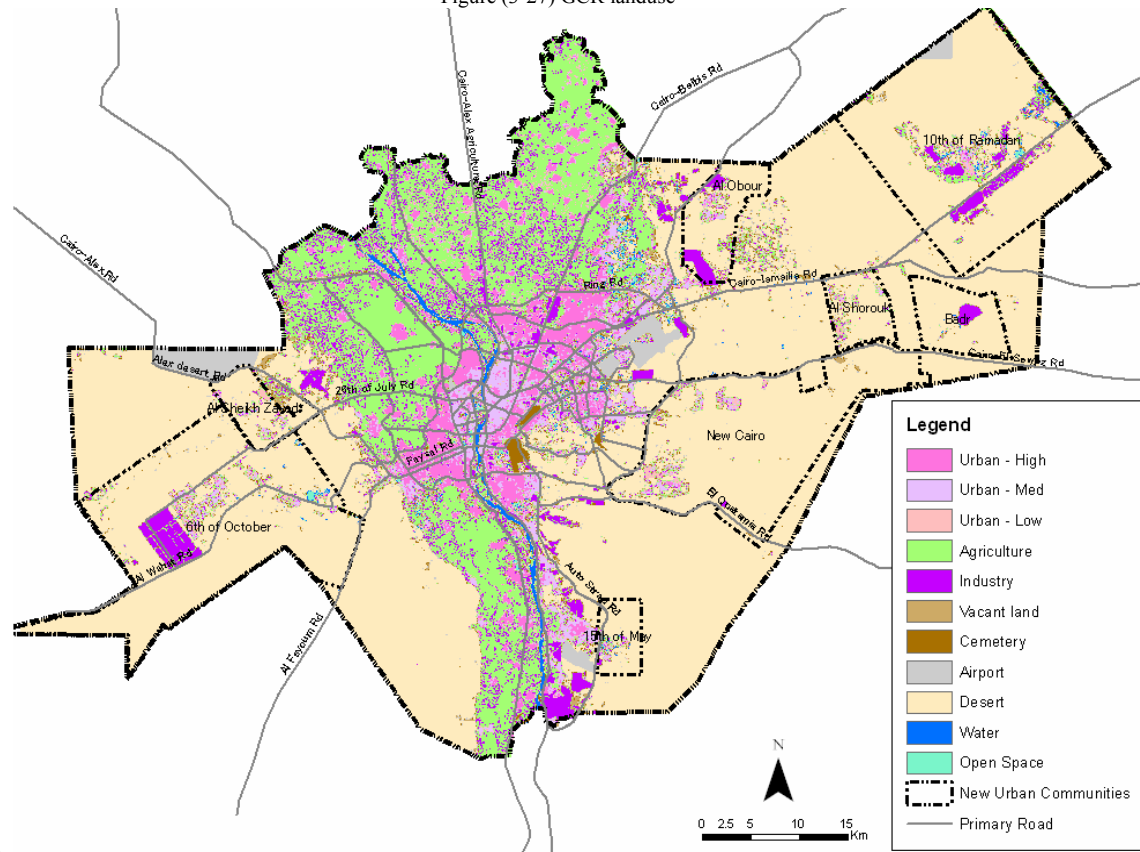
with a movie theater, restaurants, retail shops, and sufficient parking space or parking building attached. The suburban type of shopping malls is mainly located in Nasr city, Heliopolis city, Maadi, Shobra, and Giza.

➤ Industrial areas concentrate in the northern and the southern part of the main agglomeration such as Shobra, Shobra El Kheima, south of Helwan, in addition to some of the NUCs including 6<sup>th</sup> October, 15<sup>th</sup> May, Badr, Obour and 10<sup>th</sup> Ramadan. It is noted that some residential areas are located near industrial areas.

➤ Cemetery areas locate in the central part of the main agglomeration and are surrounded by urban area. They started at the edge of the urban area, which expanded over time to surround the cemeteries.

➤ Military areas, like cemeteries, started on the edge of the city at the beginning of the twentieth century, but now they are located in the central part of the main agglomeration.

Figure (3-27) GCR landuse



Source: GOPP and JICA, 2008

### **3.8. Crime rates**

In this part, crime rates will be studied over Egypt –in general– and the GCR –in particular– through reviewing the findings of earlier studies, analyzing crime statistics during the study period and understanding the relation between both.

#### **3.8.1. Earlier studies of crime**

Despite the lack of studies examining the relationship between the physical environment and crime in Egypt, enough studies were conducted to study the crime itself. One of the most important studies in this field is the study conducted by the National Center for Social and Criminological Research (NCSCR) in 2006 about the development of crime studies in the Egyptian society during 1952-2002 (Hegazi, A. 2006). According to this study, during the mentioned period, crimes against persons<sup>21</sup> come in the first grade with an average of 2106.8 crimes per year, followed by crimes against public money<sup>22</sup>, with an average of 500 crimes per year and crimes against property<sup>23</sup> with an average of 478 crimes per year. The study also showed that political changes during the study period have affected significantly the number of incidents. In order to prove that, the study period has been divided into four sub-periods including:

1. Revolution period (1952-1960),
2. Socialist transformation period (1961-1973),
3. Economic openness period (1974-1990), and
4. Economic restructuring period (1991- 2002).

Results showed that the average crime between the first and second periods declined greatly as a result of the economic refreshment which occurred after a long period of occupation and the monarchy in Egypt. The decline was less between the second and third periods in spite of the latter is a period of economic openness. According to Hegazi, this openness deviated from its main goal –which was development and production–to consumption, which in turn created new opportunist categories looking to get rich in any way, one of these ways was crime. As for the third and fourth periods, the decline was limited as the government has promoted the process of development to the private sector, but as a result of the privatization of public sector, companies has become a centrifugal force of labor, therefore increasing unemployment in the community which led to widespread of theft and fraud. Finally, the study has concluded that crime incidents over Egypt are decreasing gradually, but at a low rate.

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<sup>21</sup> Including homicide and attempted murder, battery with serious injury, battery resulted to death, kidnapping, sexual harassment and rape.

<sup>22</sup> including corruption, embezzlement, counterfeiting and forgery

<sup>23</sup> Including theft, arson, plantation destruction and poisoning in cattle

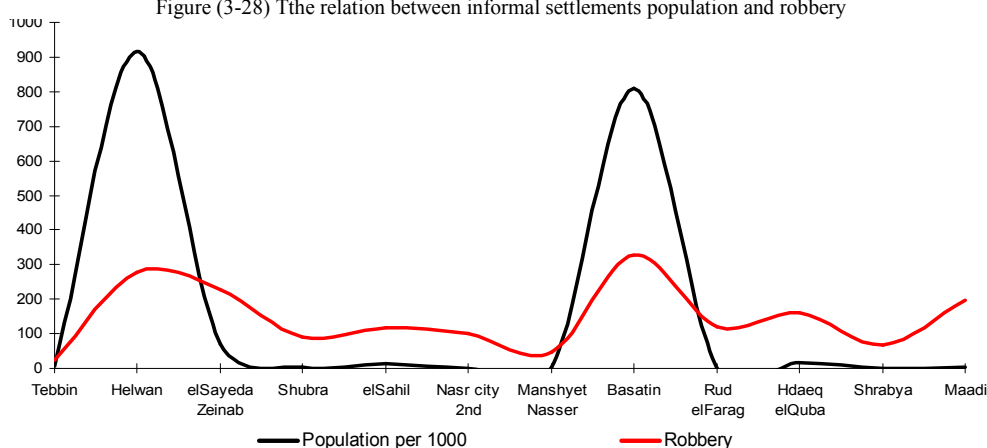
Table (3-3) Average crime incidents over Egypt during (1952-2002)

	Crime against persons		Public money crimes		Crimes against property		Total	
	Count.	Average	Count.	Average	Count.	Average	Count.	Average
1 <sup>st</sup> period	33537	3726.3	4610	512.2	9135	1015.0	47282	5253.6
2 <sup>nd</sup> period	32278	2482.9	9945	765.0	3958	304.5	46181	3552.4
3 <sup>rd</sup> period	26161	1538.9	5910	347.6	5321	313.0	37392	2199.5
4 <sup>th</sup> period	13365	1215.0	4513	410.3	5485	498.6	23363	2123.9
<b>Total</b>	<b>105341</b>	<b>2106.8</b>	<b>24978</b>	<b>499.6</b>	<b>23899</b>	<b>478.0</b>	<b>154218</b>	<b>3084.4</b>

Source: Heagzi, A., 2006

As for crime over the republic governorates, a study was conducted by Fahmy in (2006) to compare the number of incidents in six governorates –representing rural and urban environments– during (1998-2003). The selected governorates are Gharbia, Dakahlia (as rural governorates), Asyut, Minya (representing Upper Egypt governorates), Cairo and Alexandria (as urban governorates). Results showed that the highest crimes against person exist in Upper Egypt and rural governorates more than the urban ones. He explained that due to the widespread of vendettas between their families. On the other hand, money crimes exist in urban governorates more than Upper Egypt and the rural ones as a result of the high standard of living in cities, which, in turn, forces some people to commit crimes in order to get their basic needs. He also discussed that widespread of sexual crimes in urban governorates refers to the high standard of living and the housing crisis; which are the main causes of marriage delay in cities and makes some people turn to satisfy their sexual needs illegally (Fahmy, M., 2006). Fahmy also showed that districts (aqsam) which have informal settlements with high population, have high crime rates, especially robbery. He argued that bad living conditions in informal settlements lead to decreasing the sense of loyalty for their population, contributing to the reluctance of residents to report the suspects/criminals. This reluctance leads to the widespread of depravity and crimes.

Figure (3-28) Tthe relation between informal settlements population and robbery



Source: adopted from Fahmy, M., 2006

Concerning crime rates over Cairo, another study was conducted also by the National Center for Social and Criminological Research (NCSCR) in collaboration with the Max Planck Institute for Foreign and International Criminal Law in 14 countries –the most were represented by their capitals– in addition to Egypt –represented by Cairo governorate– through (1986-1991) by a sample of 1000 person representing different socio-economic levels of the society (El-Miligy, A., 2000). The study showed that, among the studied categories of crime in Cairo, contact crimes<sup>24</sup> rate was the highest over both the five years and the last year of the study, followed by property crimes<sup>25</sup> and burglary including attempts. As for the rank of Cairo among the study’s participating countries, it is located within the lower-ranked countries in respect of property crimes and burglary including attempts, while it comes to the fore in respect of contact crimes, separated from Spain (2<sup>nd</sup> position) by about 16%, and from the U.S.A (3<sup>rd</sup> position) by about 19.3 %. The following table shows the crime rates and the order of Egypt among the participated countries. The study showed also that -over the five years of the study- total crimes’ rate in Cairo comes to the fore with an average rate of 65% as a result of the high rate of contact crimes (35.9%) especially, robbery and sexual incidents. However, it comes at the 3<sup>rd</sup> position over the last year crime rates (27.8%) after the U.S.A (28.8%) and Canada (28.1%). It is also noticed that the differences between rates are very small and do not give a conclusive result.

Table (3-4) Crime rates over the five years of El-Miligy study

	Property crimes		Burglary including attempts		Contact crimes	
	Rate	Rank	Rate	Rank	Rate	Rank
England	33.7	<b>10</b>	13.6	<b>6</b>	10.9	<b>13</b>
Scotland	30.7	<b>13</b>	13.1	<b>7</b>	9.3	<b>14</b>
Northern of Ireland	24.4	<b>14</b>	6.9	<b>12</b>	8.8	<b>15</b>
Holland	50.4	<b>1</b>	15.9	<b>4</b>	16	<b>5</b>
Germany	42.6	<b>5</b>	8.8	<b>10</b>	15.7	<b>6</b>
Switzerland	37.2	<b>8</b>	5.6	<b>13</b>	13.4	<b>11</b>
Belgium	36.6	<b>9</b>	12.7	<b>8</b>	15.2	<b>9</b>
France	40.5	<b>6</b>	16.6	<b>3</b>	15.6	<b>7</b>
Spain	38.8	<b>7</b>	10.9	<b>9</b>	20.1	<b>2</b>
Norway	31	<b>12</b>	4.8	<b>14</b>	12.9	<b>12</b>
Finland	31.3	<b>11</b>	3.7	<b>15</b>	15.3	<b>8</b>
USA	46.3	<b>2</b>	21.6	<b>2</b>	19.3	<b>3</b>
Canada	43.2	<b>3</b>	15.5	<b>5</b>	14.5	<b>10</b>
Australia	43	<b>4</b>	23.3	<b>1</b>	18.7	<b>4</b>
<b>Egypt- Cairo</b>	<b>20.9</b>	<b>15</b>	<b>8.2</b>	<b>11</b>	<b>35.9</b>	<b>1</b>

Source: adopted from El-Miligy, A., 2000, with modifications

<sup>24</sup> Including robbery, theft of personal property, sexual incidents and assaults threats

<sup>25</sup> Including theft from cars, vandalism to cars, theft of motorcycles and theft of bicycles theft of cars

Table (3-5) Crime rates over the last year of El-Miligy study

	Property crimes		Burglary including attempts		Contact crimes	
	Rate	Rank	Rate	Rate	Rank	Rate
England	14.1	<b>8</b>	3.5	<b>7</b>	4.2	<b>11</b>
Scotland	13.5	<b>9</b>	3.9	<b>6</b>	3.1	<b>14</b>
Northern of Ireland	11.1	<b>14</b>	1.8	<b>12</b>	3.6	<b>13</b>
Holland	20.5	<b>2</b>	4.7	<b>4</b>	6.1	<b>6</b>
Germany	16.5	<b>6</b>	2.7	<b>10</b>	6	<b>7</b>
Switzerland	12	<b>12</b>	1.1	<b>13</b>	3.9	<b>12</b>
Belgium	12.8	<b>10</b>	3.5	<b>8</b>	4.6	<b>10</b>
France	14.2	<b>7</b>	4.7	<b>5</b>	3	<b>15</b>
Spain	16.9	<b>5</b>	3.3	<b>9</b>	8.4	<b>3</b>
Norway	12.3	<b>11</b>	1	<b>14</b>	4.8	<b>8</b>
Finland	12	<b>13</b>	0.8	<b>15</b>	4.8	<b>8</b>
USA	19.9	<b>3</b>	7.5	<b>1</b>	8.3	<b>4</b>
Canada	20.9	<b>1</b>	5.3	<b>3</b>	6.9	<b>5</b>
Australia	18.8	<b>4</b>	7.3	<b>2</b>	8.6	<b>2</b>
<b>Egypt- Cairo</b>	<b>9.8</b>	<b>15</b>	<b>2.2</b>	<b>11</b>	<b>15.8</b>	<b>1</b>

Source: adopted from El-Miligy, A., 2000, with modifications

Table (3-6) Crime rates over the five years, last year of El-Miligy study

	crimes rate over five years		crimes rate over the last year	
England	46	<b>11</b>	19.4	<b>9</b>
Scotland	41.4	<b>12</b>	18.6	<b>10</b>
Northern of Ireland	33.4	<b>15</b>	15	<b>15</b>
Holland	60.4	<b>2</b>	26.8	<b>5</b>
Germany	51.3	<b>8</b>	21.9	<b>7</b>
Switzerland	47.1	<b>10</b>	15.6	<b>13</b>
Belgium	48.3	<b>9</b>	17.7	<b>11</b>
France	52	<b>6</b>	19.4	<b>8</b>
Spain	51.6	<b>7</b>	24.6	<b>6</b>
Norway	38.9	<b>14</b>	15.5	<b>14</b>
Finland	40.1	<b>13</b>	15.9	<b>12</b>
USA	57.6	<b>3</b>	28.8	<b>1</b>
Canada	53	<b>5</b>	28.1	<b>2</b>
Australia	57.2	<b>4</b>	27.8	<b>3</b>
<b>Egypt- Cairo</b>	<b>65</b>	<b>1</b>	<b>27.8</b>	<b>3</b>

Source: adopted from El-Miligy, A., 2000, with modifications

### 3.8.2. Public Security Bureau (PSB) statistics

For the study period (2004- 2008), crime statistics were collected from the Public Security Bureau reports. Before going on the PSB's reports, the classification of crimes' data must be explained. According to the author's interview with major-general Mohamed Khalil; the director of the criminal statistics department, Public Security Bureau, Ministry of Interior, crimes' data in Egypt can be classified into:



1. Real crimes including reported and unreported crimes. This way may be more comprehensive, but the findings can't be valid or accurate. This is because unreported crimes' counting depends on surveys conducted by either different authorities or researchers; they depend on samples in their surveys. On the one hand, victims may forget relevant incidents, make offences up, and may conceal crimes because of loyalty, guilt, fear or embarrassment. On the other hand, samples can't cover all the unreported crimes.
2. Unclassified crimes: including all of the reported crimes.
3. Classified crimes: including all of the reported crimes classified by the public prosecution into three categories;<sup>26</sup>
  - Felonies; which are punishable by death, perpetual servitude, penal servitude for a term, and reclusion.
  - Misdemeanours: which are punishable by imprisonment, a fine that exceeds 100LE or both.
  - Contraventions: Which are punishable by a fine not exceeding 100 L.E.

According to Khalil, the PSB's reports use the third type of data, including only the important Felonies and Misdemeanours that affect the commonweal as follows:

- 1- Homicide and Attempted murder.
- 2- Kidnapping.
- 3- Sexual assault including statutory rape and rape.
- 4- Robbery.
- 5- Arson.
- 6- Serious assaults including battery with serious injury or death.
- 7- Money counterfeiting.
- 8- Other misdemeanours including resistance to a lawful authority, theft of wires/cables, plantation destruction and poisoning in cattle.
- 9- Drugs offences.
- 10- Burglary including housebreaking – shoplifting and rusting.
- 11- Car theft.
- 12- Fraud.
- 13- Other felonies including Fire caused by accident or ordinary carelessness, Manslaughter, Suicide and attempted suicide.

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<sup>26</sup> JurisPedia, 2007, "Classification of crimes (eg)", Available at: [http://en.jurispedia.org/index.php/Classification\\_of\\_crimes\\_\(eg\)](http://en.jurispedia.org/index.php/Classification_of_crimes_(eg)) [accessed 11 April 2010].

It is notable that, although the accuracy and systematization of this operation, there is some criticism to the reports including:

- The exaggeration of some reported crimes, while others end with reconciliation, but still counted as incidents in the reports (A.Halim, A., 2007).
- According to the major-general Mohammed Khalil, the time taken to refer cases' papers from different police stations to the public prosecution office may be responsible for delaying some incidents a year in the reports. He also commented that the judicial holiday can do so.
- The difference between statistics done over the Republic governorates as a whole, and those done over each governorate districts. For example, burglaries as a one crime-type at the first were divided into four subdivisions over the governorates districts; including housebreaking, shoplifting, rusting and pickpocketing. Serious assaults were found as a crime over the Republic governorates and were ignored over districts.
- The difference between districts/aqsam defined by CAPMAS and those mentioned within the reports. For example, Zamalek and Qasr El-Nil were defined as a two districts (qismin) by CAPMAS, while both were defined as one district/qism called Zamalek within the PSB's reports; this also applied to Helwan and Tora districts. The opposite were found in Zawya El-Hamra and El-Salam districts; each was defined as a one district/qism by CAPMAS, while defined by two districts (qismin) within the PSB's reports (Zawya El-Hamra, Al-Amireya for the first, Awal El-Salam, Thani El-Salam for the second).

Concerning to studied crimes, they can be classified as shown in the following table.

Table (3-7) GCR's studied crimes

Crimes against person	Crimes against property
- Homicide and Attempted murder. - Assaults including battery with serious injury or death. - Kidnapping. - Sexual harassment and Rape. .	- Robbery - Arson. - Burglary including housebreaking – shoplifting and rusting. - Car theft.

Source: the author

#### a. Average crime incidents over Egypt

According to the previous classification statistics showed that, contrary to El-Miligy and Hgazi, crimes against property come in the first grade with an average of 17466 crimes per year, followed by crimes against persons with an average of 1288 crimes/ year. It is also remarkable that crimes against person keep rising over the five years of the study, while crimes against

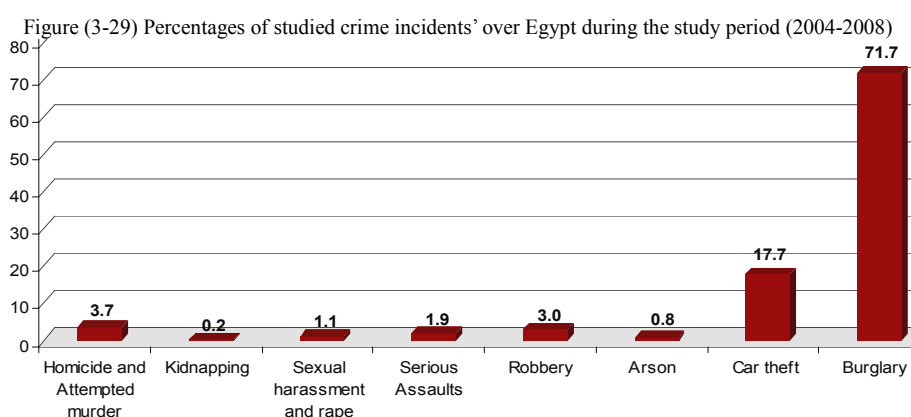
property showed a gradual decline during 2004-2006, then started increasing in 2007 and 2008. The following table shows the numbers and percentages of the studied crimes over the study period.

Table (3-8) Numbers and percentages of crimes during the study period (2004-2008)

Crime type		2004	2005	2006	2007	2008	Total	Average
Crimes against person	Homicide and Attempted murder	504	528	642	726	1,035	3,435	687.0
	Kidnapping	21	18	29	36	47	151	30.2
	Sexual harassment and rape	145	179	202	232	281	1,039	207.8
	Serious Assaults	222	261	368	412	552	1,815	363.0
	Total	892	986	1,241	1,406	1,915	6,440	1,288.0
	%	13.85	15.31	19.27	21.83	29.74	100	
Crimes against property	Robbery	435	435	529	631	747	2,777	555.4
	Arson	96	99	162	158	202	717	143.4
	Car theft	2,784	3,047	3,145	3,533	4,113	16,622	3,324.4
	Burglary	13,401	12,697	12,307	13,531	15,280	67,216	13,443.2
	Total	16,716	16,278	16,143	17,853	20,342	87,332	17,466.4
	%	19.14	18.64	18.48	20.44	23.29	100	
<b>Total</b>	<b>17,608</b>	<b>17,264</b>	<b>17,384</b>	<b>19,259</b>	<b>22,257</b>	<b>93,772</b>	<b>18,754.4</b>	
<b>%</b>	<b>18.78</b>	<b>18.41</b>	<b>18.54</b>	<b>20.54</b>	<b>23.74</b>	<b>100</b>		

Source: data collected from the public security reports and recalculated by the author

Comparing the studied crimes showed that burglaries represent more than 70% of the committed crimes during the study period, followed by car thefts with approximately 17.7%. The high percentage of burglaries can be referred to the existence of subdivisions including housebreaking, shoplifting, rusting and pickpocketing, which haven't been separated and set as a one-type crime as mentioned before.

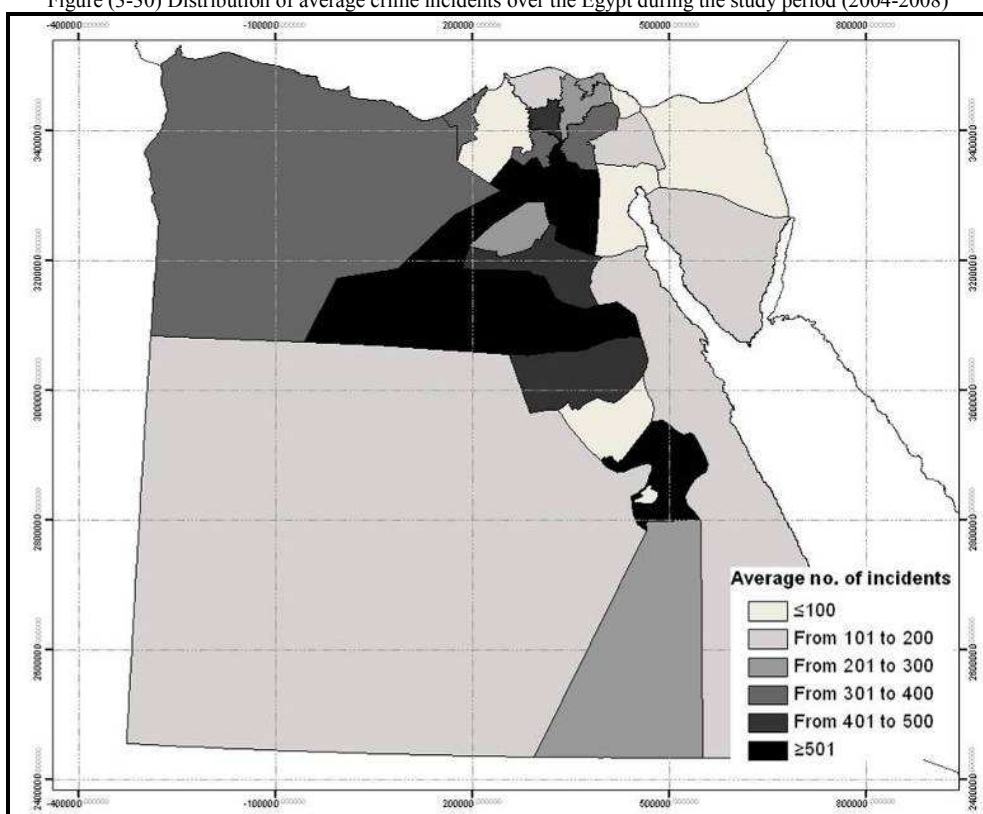


Source: The author according to the Public Security Bureau's statistics.

Statistics also showed that the highest crime incidents concentrate in Cairo, Giza, Alexandria governorates while the lowest crime incidents concentrate

in El-Wadi El-Gidid, Luxor, North and south Sinai governorates. It is noted that most of crime incidents are located in the northern, central part of Egypt. The following map shows the distribution of crimes over the Egyptian governorates.

Figure (3-30) Distribution of average crime incidents over the Egypt during the study period (2004-2008)



Source: The author according to the Public Security Bureau's statistics.

According to CAPMAS classification, statistics showed that -corresponding with the study conducted by Fahmy (2006) - crimes against person concentrate in rural and upper Egypt governorates, while crimes against property concentrate in urban governorates. Table (3-9) shows average incidents numbers crimes against person and crimes against property over the four-type governorates during the study period.

#### b. Average Crime incidents over the GCR

During the study period, Public security statistics showed that the highest crime incidents are located in Cairo governorate, followed by Giza, Kalyoubia and Sharkia governorates. This may depend significantly on the number of districts in each governorate within the studied area, so these numbers doesn't represent the governorates themselves.

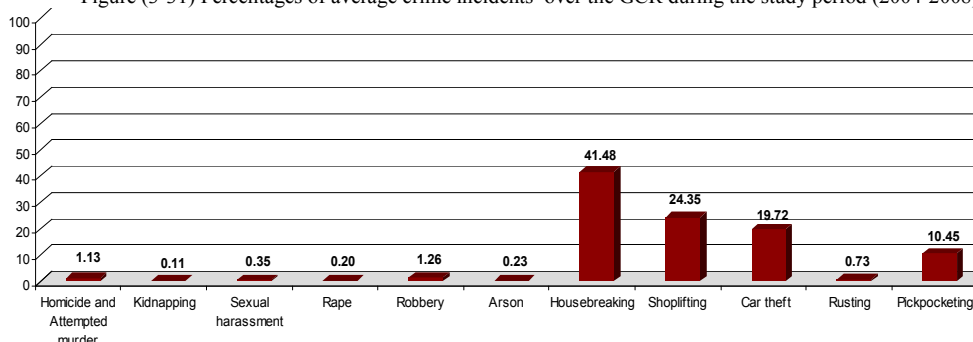
Table (3-9) Average incidents numbers and ranks over Egypt's governorates during the study period (2004-2008)

	Governorate	Crimes against person		Crimes against property		Total	
		No.	Rank	No.	Rank	No.	Rank
<b>Urban governorates</b>	Cairo	136.00	1	6258.20	1	6394.20	1
	Alexandria	70.80	7	2805.40	2	2876.20	3
	Port-Said	24.20	20	345.80	9	370.00	9
	Suez	12.40	22	84.40	20	96.80	23
	<b>Total</b>	<b>243.40</b>		<b>9493.80</b>		<b>9737.20</b>	
<b>Upper Egypt governorates</b>	Giza	86.00	4	2801.00	3	2887.00	2
	Beni-Suef	44.40	14	107.20	18	151.60	18
	Fayoum	35.20	15	66.40	23	101.60	21
	Menia	76.20	5	201.40	15	277.60	13
	Asyout	117.60	2	228.40	14	346.00	11
	Suhag	61.60	10	173.00	16	234.60	16
	Qena	58.00	11	83.20	21	141.20	19
	Aswan	26.00	18	95.80	19	121.80	20
	Luxor	4.00	26	31.00	26	35.00	26
<b>Total</b>	<b>509.00</b>		<b>3787.40</b>		<b>4296.40</b>		
<b>Rural governorates</b>	Damietta	19.00	21	79.80	22	98.80	22
	Dakahlia	72.20	6	1019.60	4	1091.80	4
	Sharkia	64.20	8	346.80	8	411.00	8
	Kalyoubia	57.00	12	416.80	6	473.80	6
	Kaff ElSheikh	25.80	19	230.00	13	255.80	15
	Gharbia	102.60	3	520.00	5	622.60	5
	Menoufia	45.40	13	315.40	10	360.80	10
	Behera	63.80	9	388.00	7	451.80	7
	Ismailia	33.00	16	235.40	12	268.40	14
	<b>Total</b>	<b>483.00</b>		<b>3551.80</b>		<b>4034.80</b>	
<b>Frontier governorates</b>	Red Sea	26.20	17	172.00	17	198.20	17
	ElWadi ElGidid	1.60	27	19.40	27	21.00	27
	Matrouh	8.40	24	315.00	11	323.40	12
	North Sinai	10.00	23	61.60	25	71.60	25
	South Sinai	6.40	25	65.40	24	71.80	24
<b>Total</b>	<b>52.60</b>		<b>633.40</b>		<b>686.00</b>		

Source: Recalculated and classified by the author according to Public Security Bureau's (PSB's) statistics and the Central Agency for Public Mobilization And Statistics (CAPMAS) classification.

But in general, house breaking, shoplifting, car theft and pickpocketing represent the highest crime incidents within the GCR with percentages 41.48, 24.35, 19.72 and 10.45% of the committed crimes which is an indicator of high property crimes. Figure (3-31) shows the percentages of studied crime incidents' over the GCR.

Figure (3-31) Percentages of average crime incidents' over the GCR during the study period (2004-2008)



Source: The author according to the Public Security Bureau's statistics.

It is also remarkable that, like over Egypt, crimes against person keep rising over the five years of the study while crimes against property showed a gradual decline during 2004-2006 then started increasing in 2007 and 2008. The following table shows the numbers and percentages of the studied crimes over the study period.

Table (3-10) Numbers and percentages of GCR crimes during the study period (2004-2008)

Crime type		2004	2005	2006	2007	2008	Total	Average
Crimes against person	Homicide and Attempted murder	55	74	99	130	175	533	106.60
	Kidnapping	4	9	7	14	18	52	10.40
	Sexual harassment	10	24	18	59	52	163	32.60
	Rape	1	13	8	28	42	92	18.40
	Total	70	120	132	231	287	840	168.00
	%	8.33	14.29	15.71	27.50	34.17	100	
Crimes against property	Robbery	56	107	111	138	180	592	118.40
	Arson	10	14	24	25	35	108	21.60
	Housebreaking	3958	3815	3462	3976	4283	19494	3898.80
	Shoplifting	2256	2278	2110	2356	2442	11442	2288.40
	Car theft	1634	1676	1609	2040	2307	9266	1853.20
	Rusting	85	68	66	67	56	342	68.40
	Pickpocketing	1016	1019	913	983	979	4910	982.00
	Total	9015	8977	8295	9585	10282	46154	9230.80
%	19.53	19.45	17.97	20.77	22.28	100		
<b>Total</b>	<b>9085</b>	<b>9097</b>	<b>8427</b>	<b>9816</b>	<b>10569</b>	<b>46994</b>	<b>9398.80</b>	
<b>%</b>	<b>19.33</b>	<b>19.36</b>	<b>17.93</b>	<b>20.89</b>	<b>22.49</b>	<b>100</b>		

Source: Recalculated and classified by the author according to Public Security Bureau's statistics.

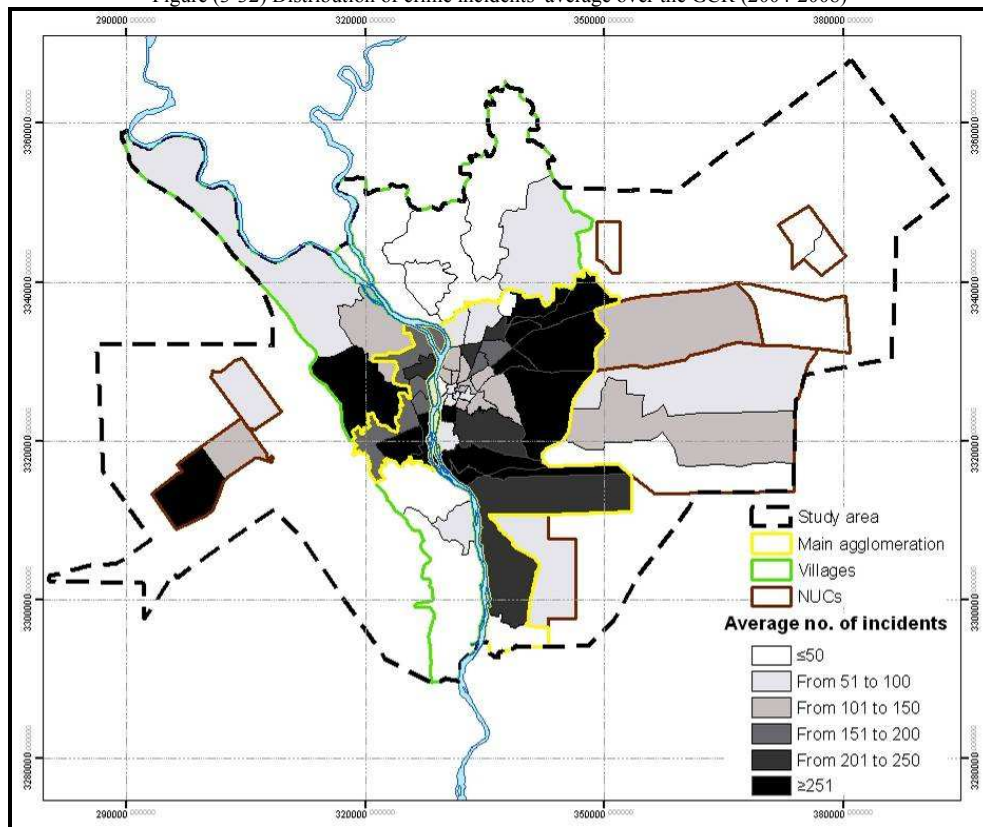
As for districts, the statistics showed that:

1. Most of the main agglomeration districts have high crime rates except a few located at the northern and southern edges. It is also noted that most of high crime districts<sup>27</sup> are crossed by or bounded with the ring road.

<sup>27</sup> High crime districts were assumed to have average crimes more than the GCR's average as a whole (140.3 crimes/year)

2. Rural districts showed low crime incidents but some of them –which are adjacent to high crime districts-, have also high crimes.
3. The NUCs showed low crime incidents, except sixth of October. Analysis showed that these districts have low population density due to either their newness or slow population growth in addition to their distance from the inhabited areas. It is noted that -according to Public Security statistics- the New Cairo 3<sup>rd</sup> district has separated from New Cairo 2<sup>nd</sup> district in 2006, so all crime incidents before that year in the 3<sup>rd</sup> district (2004 - 2005) were categorized as crimes occurred in the 2<sup>nd</sup> district; which explains the higher crime incidents in the latter; the same in Badr and Shrouk districts. As for Sheikh Zayed, Sixth of October 1<sup>st</sup> and 2<sup>nd</sup> districts. Analysis showed that the further going away from the main area, the more crimes occur, therefore, 6<sup>th</sup> of October 2<sup>nd</sup> district has the highest crime incidents among the studied NUCs.

Figure (3-32) Distribution of crime incidents' average over the GCR (2004-2008)



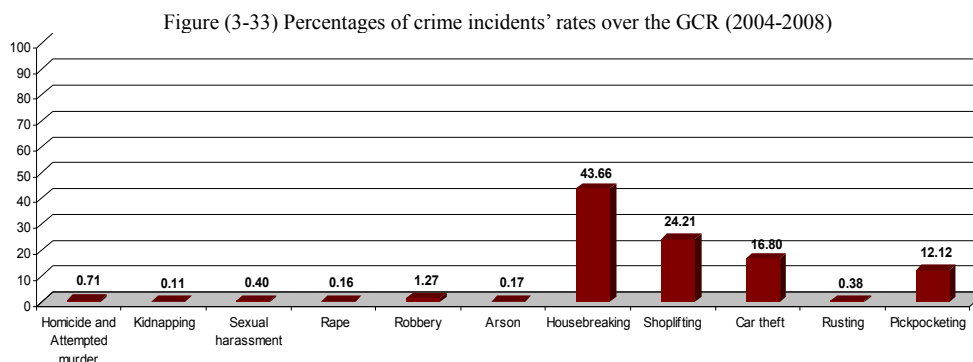
Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author.

### c. Crime rates over the GCR

As the study explains the relation between crime and social-physical characteristics of community, and the latter links up directly to population, it

is necessary to link the crime data with population as well. This can be done through calculating the crime rate, which is the ratio of crimes in an area to the population of that area. Over the studied districts, crime rate in each was calculated as the ratio of the average crimes of the district to its 1,000,000 populations. It is notable that crime rate is inversely proportional to population.

Results showed that the highest crime rates concentrate in Cairo governorate followed by Giza, Kalyoubia and Sharkia governorates. This also applied to person and property crime rates. As for the committed crime types, housebreaking, shoplifting, car theft and pickpocketing represent the highest crime incidents' rates within the GCR with percentages 43.66, 24.21, 18.8 and 12.12% of the committed crimes; which is an indicator of high property crimes. Figure (3-33) shows the percentages of studied crime incidents' over the GCR. Full data exists in appendix C.



Source: The author according to the Public Security Bureau's statistics.

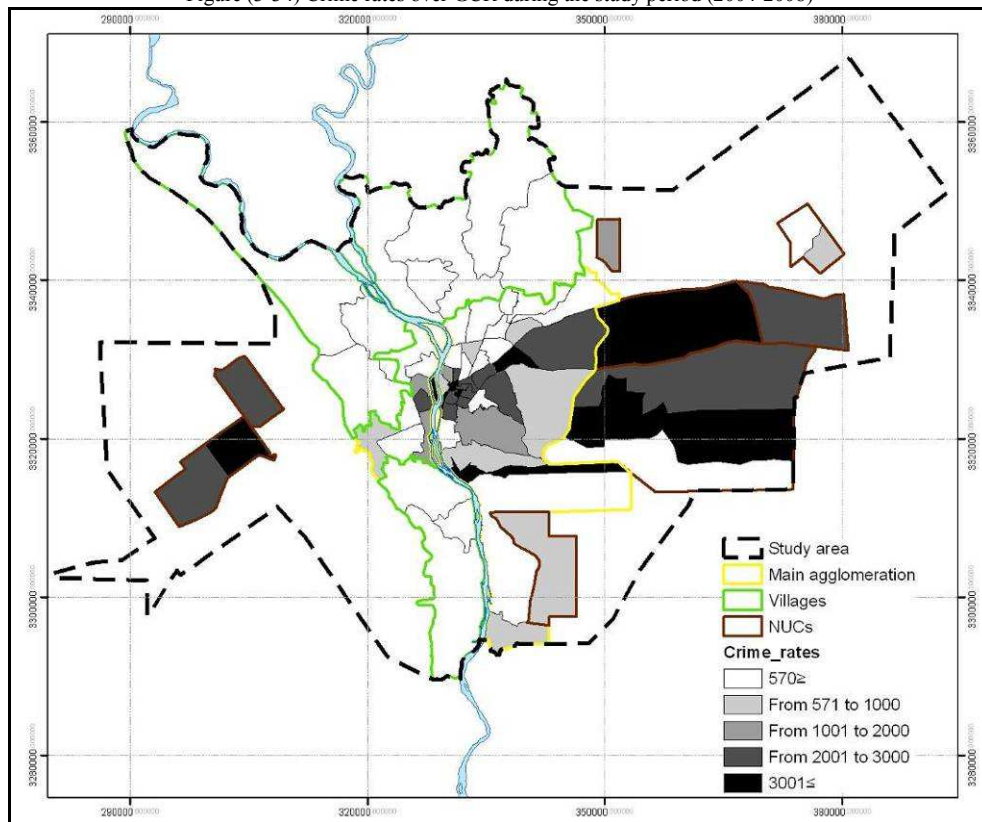
As for districts, the statistics showed that:

1. Most of the main agglomeration districts have high crime rates<sup>28</sup> except a few located at the northern and southern edges. It is also noted that most of high crime districts are either crossed by or bounded with the ring road.
2. Rural districts showed low crime rates.
3. Most of the NUCs showed high crime rates, although few of incidents, this refers to their low population densities as mentioned before (see pages 42-43). Otherwise, 15<sup>th</sup> of May, 10<sup>th</sup> of Ramadan 1<sup>st</sup> and 2<sup>nd</sup> districts and New Cairo 3<sup>rd</sup> district showed low crime rate as a result of low population density, and few number of incidents as well. The following map shows the distribution of crime rates over GCR.

<sup>28</sup> High crime rates districts assumed to be higher than the rate of the GCR as a whole (571.58 incidents per 1,000,000 populations per year).



Figure (3-34) Crime rates over GCR during the study period (2004-2008)



Source: Digital map of districts' administrative boundaries obtained from the GOPP and reconstructed by the author according to Public Security Bureau's statistics.

### 3.9. Conclusion

This chapter reviewed the definition of the GCR, classification of its districts, and the main characteristics at each type. It should be noted that there is a wide variety in socio-economic and physical conditions among the main agglomeration districts compared to new urban communities, villages & small towns' districts; this variety has extended also to crime rates. This can be traced to the difference of districts numbers within each type; the highest number concentrates in the main agglomeration.

The next two chapters deal with the study area analysis at both districts and neighborhoods levels in order to identify the relationship between crime and different social and physical factors.

**Chapter Four**  
**UNDERSTANDING CRIME**  
**AT THE DISTRICTS LEVEL**

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- 4.1. INTRODUCTION**
- 4.2. IDENTIFYING THE STUDIED DISTRICTS**
- 4.3. SOCIAL ANALYSIS**
- 4.4. PHYSICAL ANALYSIS**
  - 4.4.1. Street Network**
  - 4.4.2. Land Use**
    - a. Residential areas
    - b. Other land uses
- 4.5. CONCLUSION**

## 4. Understanding crime at the district-level

### 4.1. Introduction

This chapter discusses the analysis methods used and the results obtained with reference to literature reviewed in order to define the relationship between crime and the urban environment on the districts level. It is worth mentioning that the focus will be on the main agglomeration districts. The first part of this chapter discusses the main reasons to study the agglomeration districts rather than the new urban communities, villages & small towns' districts. The second and third parts deal with the agglomeration's social and physical factors and their relation to crime rates over the study period. The last part refers to the most important factors that proved to have an effect on crime within the region.

### 4.2. Identifying the studied districts

To explore the relation between the urban environment and crime occurrence, crime rates should be correlated to different social and physical factors. But due to the wide scope of the study, it was not possible to conduct the analysis to all districts. Therefore, the main agglomeration districts were selected for study due to the availability of data, accessibility, and the variety of socio-economic and physical conditions as follows:

- Comparing rates of change between the highest and lowest values of different social factors showed that there is a wide variety in socio-economic conditions of the main agglomeration districts compared to new urban communities, villages & small towns' districts. It is notable that the main agglomeration districts have the highest rates of change in illiteracy, unemployment, average family size, rate scramble and population density. As for the internal migration, the highest rate of change can be found among the new urban communities districts. On the other hand, this variety can be referred to the number of districts within each category; it is noted that as the number of districts increases, a wider variety exists. Table (4-1) shows the rates of change between the highest and lowest values of different social factors among the three districts categories.

Table (4-1) Rates of change between the highest and lowest values of different social factors according to the last census results (2006)

	No.of districts	Illiteracy rate	Unemployment rate	Internal Migration rate	Average Family size	Rate Scramble	Population Density
Main agglomeration	44	9.7	3.4	11.0	0.8	1.7	28.8
New urban communities	12	4.8	2.3	4.0	0.2	0.5	25.6
Villages and small towns	11	0.5	1.1	27.2	0.1	0.2	2.7

Source: Calculated from the last census results (2006)

- The comparison also showed that there is a wide variety in physical conditions of the main agglomeration districts. Observations showed that street network patterns within villages & small towns' districts are almost the same; they were all established on agricultural land (grid type), passed through canals and waterways (curvilinear type) -whether piled or not- and have some of unplanned pockets (organic type). This also applied to new urban communities' districts; since all of them were established on desert and planned in grids. As for the main agglomeration districts, they are a combination of the previous two types -some were established on agricultural land such as Boulaq al Dakrou, Mataria and Marg, others were established on desert lands and planned in different ways<sup>29</sup> such as Misr al Gadida and Madinat Nasr- in addition to others established on historical areas (organic type); such as Darb Ahmar and Gamalia, and topographic areas (curvilinear type) such as parts of Manshyet Nasser and Moqattam, etc. These results also applied to the urban tissues; due to its association to street networks (see pages 50-52).
- As for the land uses, data was available only for the main agglomeration districts.

According to the previous reasons, the main agglomeration districts were selected to be analyzed.

### 4.3. Social analysis

The main purpose of this analysis is to identify the relationship between different social factors and crime rate. The methodology used to understand this relation depends on the correlation between the latter and the rate of each of these factors within the studied districts.

A correlation, is a statistical technique that describes the degree of linear association between two variables. The value of a correlation -correlation coefficient "r"<sup>30</sup>- ranges from (-1, thru 0, to +1); a value of 0 means there is no linear association between the two variables, while a value of (-1 or +1) means there is a perfect linear association between the two variables. The difference being that (-1) indicates a perfect inverse relationship while (+1) a perfect positive relationship. To examine whether "r" is significant or not,

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<sup>29</sup>Although being established within desert lands, they are differing in their network patterns; contrary to the new urban communities' districts. For example Misr el Gadida has a radial pattern with some grids and curvilinear streets, while Madinat Nasr was planned on a strict orthogonal grid pattern with limited curvilinear streets and unplanned (organic) pockets.

<sup>30</sup> The formula was used in determining the correlation coefficient is

$$r = \frac{\sum(X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum(X_i - \bar{X})^2 \sum(Y_i - \bar{Y})^2}}$$

the “t-test” was employed; especially when the sample size is small (less than 30). The determined “t” values<sup>31</sup> are compared to the critical values with Degrees of Freedom<sup>32</sup> at the levels of significance: (0.05), (0.01) and (0.00). If the calculated value is larger than the critical values, there is a significant correlation between variables, otherwise “r” is statistically not different from zero (Bernstein, S. and Bernstein, R., 1999).

According to the mentioned methodology, results showed that total crimes rate was significantly and negatively correlated with all studied social factors except the internal migration rate; where a negative but not significant correlation exists. This also applied to person and property crimes. So, it can be concluded that districts with high socially deteriorated residents have low crimes rate, which is inconsistent with all social theories mentioned previously (see chapter two). The following table shows the correlation and “t” values over the agglomeration districts (full data are provided within appendix D).

Table (4-2) The correlation between crime and different social factors according to the last census results (2006)

		Illiteracy rate	Unemployment rate	Internal Migration rate	Average Family rate	Rate Scramble	Population Density
Total crimes	r=	-0.4411*	-0.3559*	-0.3349	-0.7217**	-0.6478**	-0.3900
	t=	-1.9837	-1.7011	-1.6259	-2.7167	-2.5477	-1.8184*
Crimes against person	r=	-0.4227*	-0.4673*	-0.2138	-0.7520**	-0.6728**	-0.4784*
	t=	-1.9254	-2.0639	-1.1415	-2.7816	-2.6065	-2.0970
Crime against property	r=	-0.4398*	-0.3534*	-0.3352	-0.7189**	-0.6453**	-0.3877*
	t=	-1.9796	-1.6922	-1.6268	-2.7105	-2.5417	-1.8105

Significant at level  
 0.000\*\*\* Critical value 3.551  
 0.01\*\* 2.423  
 0.05\* 1.684

Source: The author

This result can be explained in two directions. On the one hand, the increase of socially deteriorated residents within a district is considered an indicator of increasing the district’s poverty rate. Since most criminals search for high standards of living areas to commit their crimes, these socially deteriorated districts become less vulnerable to crimes and the adjacent ones with low socially deteriorated residents become more vulnerable to crimes.

<sup>31</sup> The formula was used in determining the correlation coefficient is

$$t = \frac{r}{\sqrt{\frac{(1-r)^2}{n-2}}}$$

<sup>32</sup> Degrees of Freedom (df) =n -2

where n is the sample size

On the other hand, most of these districts help in creating criminals -due to their bad living conditions- than being places of crimes. Since most criminals leave a buffer around their residence where they might be recognized according to the crime pattern theory (see chapter two, page 15), they may tend to commit their crimes within the adjacent districts. Thus, these socially deteriorated districts become less vulnerable to crimes.

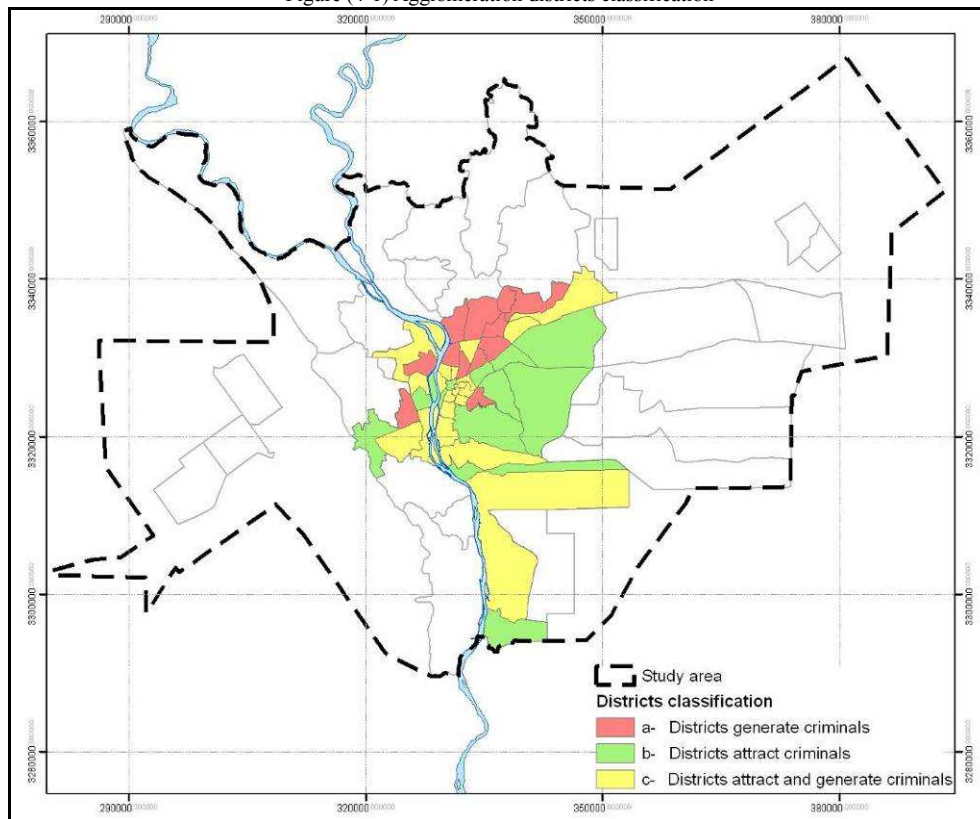
Based on the previous explanation, a conceptualization of "districts attracting criminals" and "districts generating criminals" has been proposed by comparing districts' social conditions with their crime rates through:

- Ranking values within each of the studied factors in groups, for example:
  - values  $\geq 0$ ,  $< 10$  have rank= 1,
  - values  $\geq 10$ ,  $< 20$  have rank= 2,
  - values  $\geq 20$ ,  $< 30$  have rank= 3 etc.,and summing up the resulted ranks over each district;
- Identifying high socially deteriorated districts by calculating the region's rank; higher rank values are considered an indicator of high socially deteriorated districts.
- Identifying high crime rates districts by calculating the region's crime rate; higher values are considered an indicator of high crime rates districts.

According to that, the main agglomeration's districts were classified according to the following figure into three types (full data are provided within appendix D):

- Districts generating criminals rather than being vulnerable to crimes; including socially deteriorated districts with low crime rates.
- Districts attracting criminals rather than generating them; including socially developed districts with high crime rates.
- Districts attract and generate criminals at the same time; including both socially deteriorated districts with high crime rates and socially developed districts with low crime rates. It should be noted that criminals of this type of districts may not be those who commit crimes within. It is possible that these districts attract criminals from outside and expel their criminals outside at the same time; as higher risks of detection and apprehension exist within their residence districts (see the crime pattern theory, chapter two, page 15).

Figure (4-1) Agglomeration districts classification



Source: The author

#### 4.4. Physical analysis

##### 4.4.1. Street network

Based on the assumption that criminals always choose places that require the least amount of time and energy to commit their crimes (see the rational choice theory, chapter two, page 17), a sample of the first and second districts types was selected to be analyzed.<sup>33</sup> This involved the selection of districts that are socially and spatially different from each other so that, any relationships between crime and space across the areas are unlikely to be due to social factors. The selected districts include: Al-Mataria, Manshyet Nasser and Boulaq Al Dakroul as districts generating criminals, corresponded with Masr Al Gadida, Madinat Nasr 2<sup>nd</sup> and Dokki as districts attracting criminals. Table (4-3) indicates social characteristics of the districts being investigated and their crime data.

As for The third type, which includes districts attract and generate criminals at the same time, it was difficult to identify whether criminals are insiders or

<sup>33</sup> A sample was selected due to the large number of districts within each of the main agglomeration districts types.

outsiders, especially that most of these districts located within the downtown which attracts people from different areas; whether criminals or not. Thus the third type was ignored.

Table (4-3) Social characteristics of the selected districts and their crime data during the study period (2004-2008)

	District	Illiteracy rate	Unemployment rate	Internal migration rate	Average family size	Rate scramble	Population density	Crime rates	Crime against person	Crime against property
Districts generating criminals	Mataria	19.29	13.69	10.94	3.93	1.18	80077	411.50	7.62	403.88
	Manshyet Nasser	47.05	4.31	11.99	3.91	1.51	47183	507.54	7.63	499.90
	Bolaq AlDakrou	18.87	12.22	13.86	3.92	1.15	61717	327.81	7.03	320.79
Districts attracting criminals	Masr AlGadida	6.31	8.48	16.48	3.31	0.83	12411	2737.41	26.41	2711.01
	Madinat Nasr 2nd	12.33	13.85	17.74	3.91	1.14	4387	1730.84	13.17	1717.67
	Dokki	6.37	6.76	22.95	3.23	0.80	18427	1843.68	23.45	1820.24

Source: Social characteristics recalculated by the author according to the last census results, Crime data recalculated by the author according to Public Security Bureau's (PSB's) statistics

To identify the relationship between street networks and crime rates, space syntax analysis has been used. The theory of space syntax is provided within appendix B.

#### a. Drawing methodology

As axial models depend on visibility, therefore, achieving the natural surveillance, some elements have to be taken into account while drawing. Based on surveys done by the author within the selected districts, these elements include:

1. Middle islands: according to surveys, they can be classified into:
  - a. Wide planted fenced islands, with low-rise fences, shrubs, and trimmed trees.
  - b. Non-fenced wide planted islands with low-rise shrubs and trimmed trees.
  - c. Narrow islands.

Figure (4-2) Example of wide planted middle islands, Khalifa Ma'mon st., Misr elGadida district



Source: The author



Figure (4-3) Example of narrow middle islands, Sudan st., Dokki district



Source: The author

It is notable that most of them are easily passable and don't impede vision, therefore, they can be considered as spaces.

2. Nodes and open spaces: most of them are non-fenced containing simple sculptures, fountains, shrubs, seats, etc. Figure (4-4) shows examples of nodes and open spaces within the selected districts.

Figure (4-4) Examples of nodes and open areas, Roxy square- Misr El-Gadida district (above) and Galaa square-Dokki district (below)



Source: The author

It is notable that those sculptures, fountains, shrubs, seats, etc. don't impede vision, so they were ignored while drawing the axial maps; and considered as spaces.

3. Some private vacancies including:

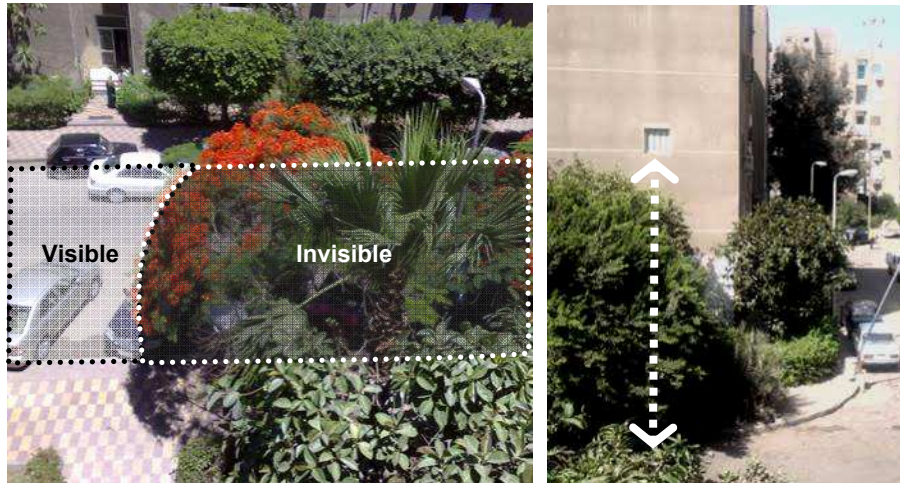
- a. Fenced areas (such as Military uses, private lands, etc.): the majority of these lands have high-rise fences that impede vision; as their main purpose is to secure the space surrounded by, thus they can be considered as objects. Figure (4-5) shows an example of fenced areas within the selected districts.
- b. Non-fenced areas which can be classified into:
  - I. Buildings' intermediate spaces: these spaces –especially within the districts attracting criminals– are usually used as building entrance, garage entrance and in some cases used as storage areas while a small percentage have been used as internal routes or open spaces, therefore, they can be considered as objects.
  - II. Buildings' open spaces: usually are planted, but the lack of maintenance of these plants makes them grow thicker and impede visibility for residents. Therefore, they can also be considered as objects although, some are passable.

Figure (4-5) Example of Fenced private areas, Madinet Nasr 2<sup>nd</sup> district



Source: The author

Figure (4-6) Example of Building open spaces that impede visibility, Emtdad Ramsis buildings -Madinet Nasr 2<sup>nd</sup> district



Source: The author

So it can be concluded that, in order to study the effect of natural surveillance and movement on crime, middle islands, nodes and open areas are considered as spaces, while all private vacancies are considered as objects.

#### **b. Space syntax analysis**

Depending on the selected sample, two questions need to be answered. The first is: “Are there spatial differences between districts generating criminals and those attracting criminals that affect crime rates?”. The second is: “Are there particular street patterns attract criminals?”. Therefore, there were two primary types of variables used extensively in the analysis: the values obtained through Space Syntax analysis as the independent variable, and crime rates as the dependent variables. The values obtained through space syntax were: Global Integration, Local Integration  $R=3$ , Local Integration  $R=10$  and Connectivity. The relationship between each of these values and crime rate was explored to examine their effects on crime occurrence in the selected districts.

Figures (4-7) to (4-12) demonstrate the selected districts axial maps of Global Integration  $R=n$ , Integration  $R=10$ , Integration  $R=3$  and Connectivity respectively. The color coding is based on red representing high integration, blue being low and transitional stages starting with orange, yellow, green, and cyan.



Figure (4-7) Spatial analysis of Mataria district

1- Global integration (R=n) 2- Local integration (r=10) 3- Local integration (r=3) 4-Connectivity

Source: The author

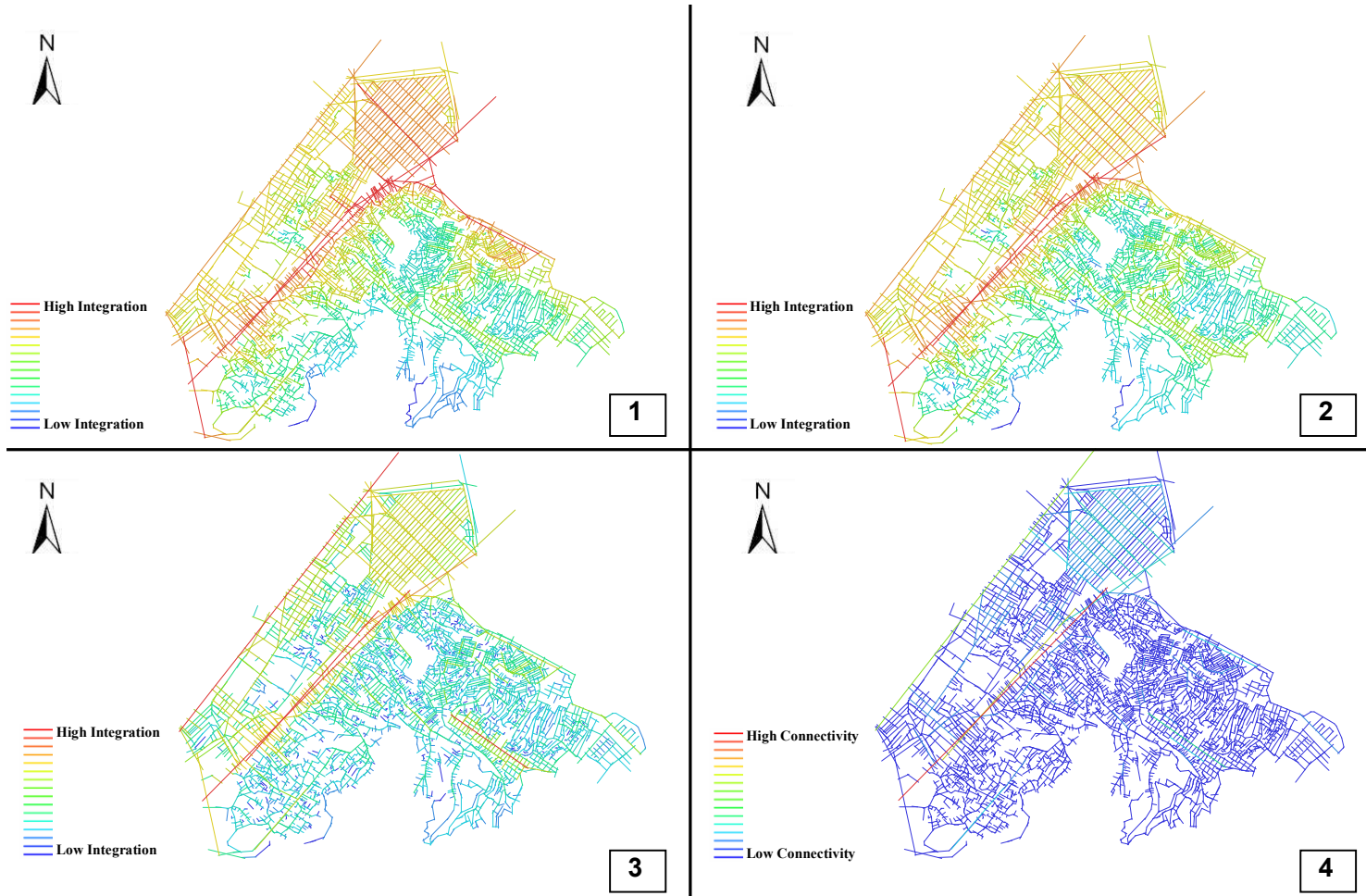


Figure (4-8) Spatial analysis of Manshyet Nasser district  
 1- Global integration (R=n) 2- Local integration (r=10) 3- Local integration (r=3) 4-Connectivity

Source: The author

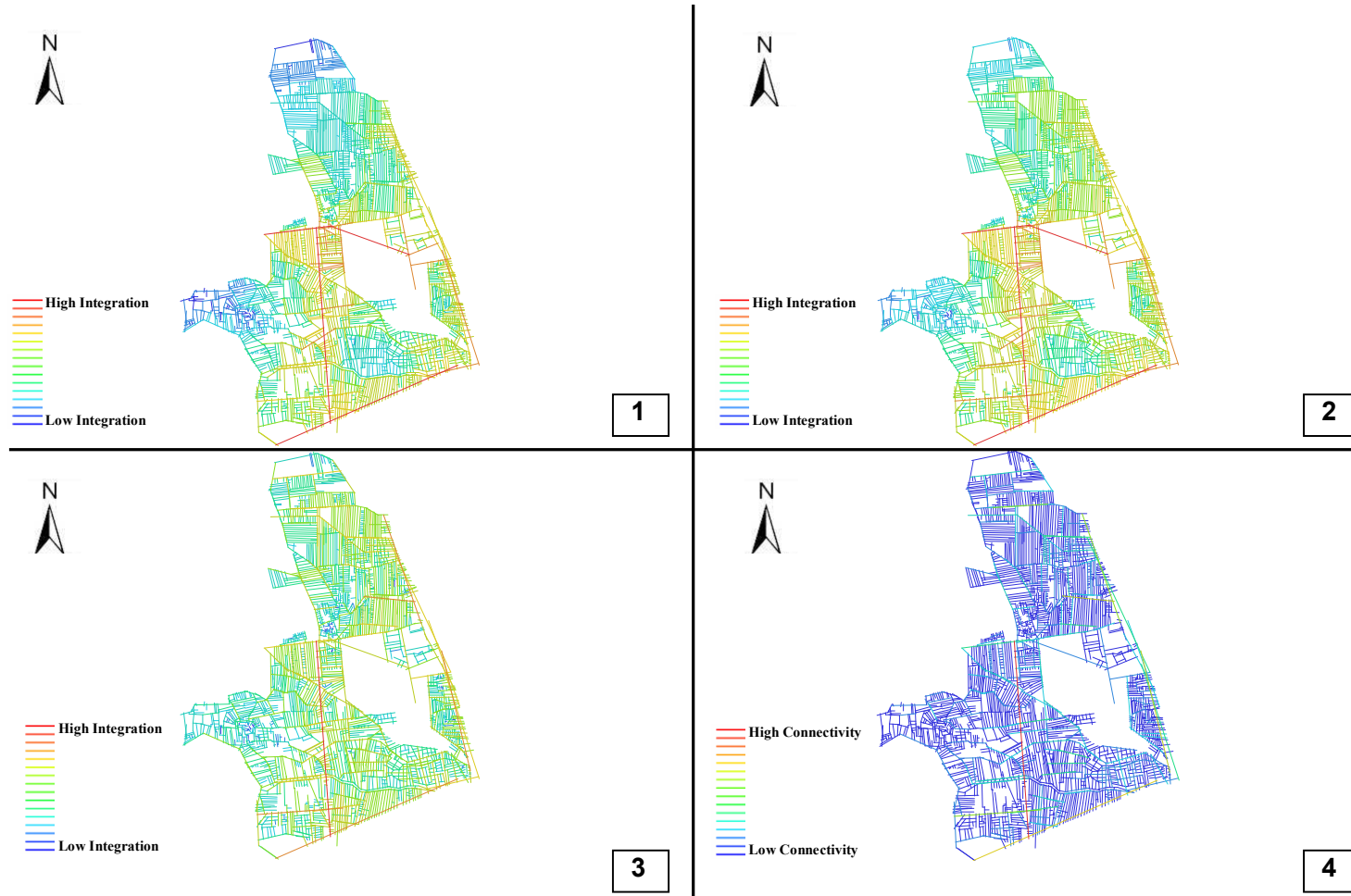


Figure (4-9) Spatial analysis of Boulaq Dakrou district

1- Global integration (R=n) 2- Local integration (r=10) 3- Local integration (r=3) 4-Connectivity

Source: The author



Figure (4-10) Spatial analysis of Misr el Gadida district  
 1- Global integration ( $R=n$ ) 2- Local integration ( $r=10$ ) 3- Local integration ( $r=3$ ) 4-Connectivity

Source: The author

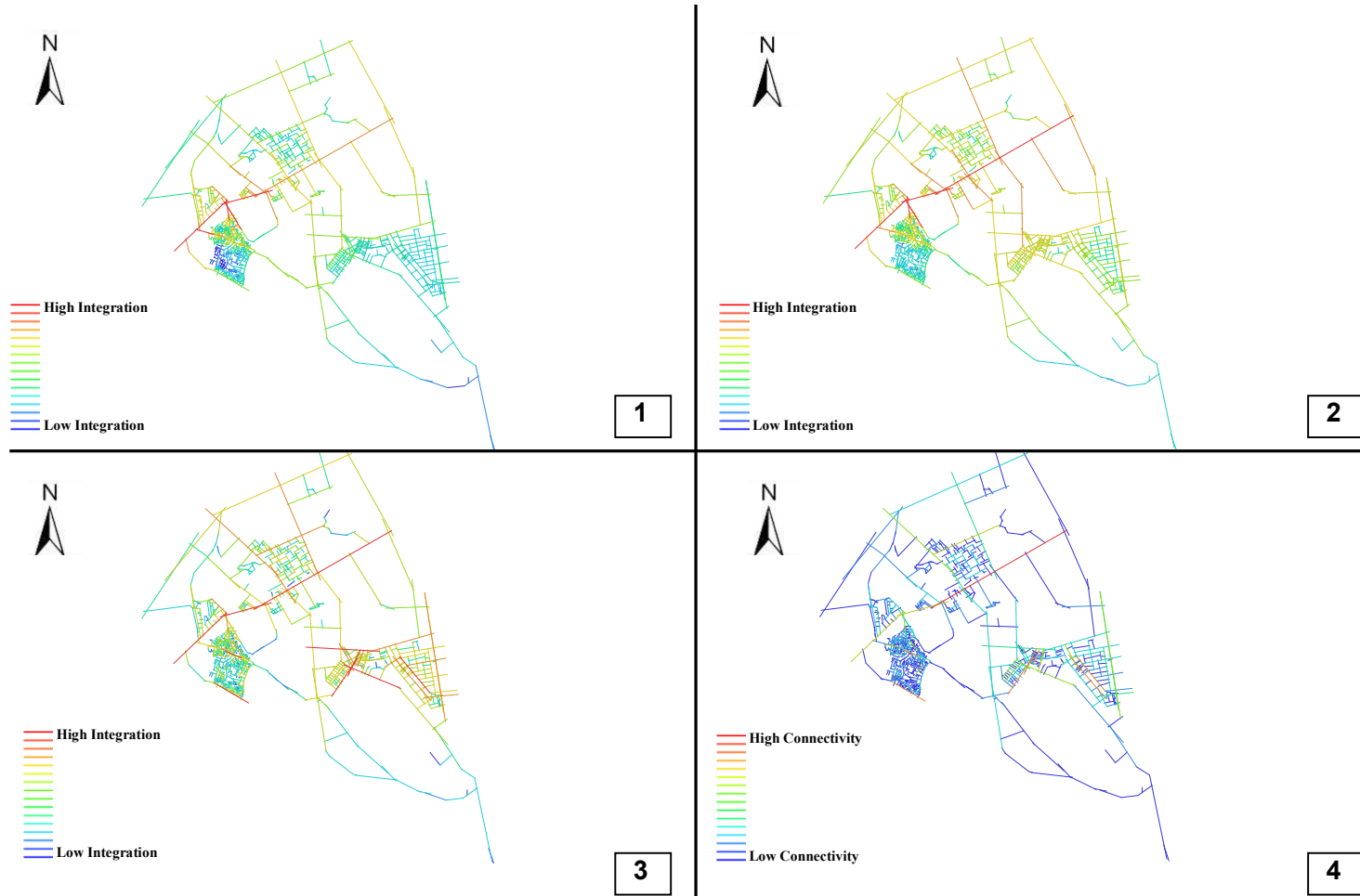


Figure (4-11) Spatial analysis of Madinat Nasr 2<sup>nd</sup> district  
 1- Global integration (R=n) 2- Local integration (r=10) 3- Local integration (r=3) 4-Connectivity

Source: The author



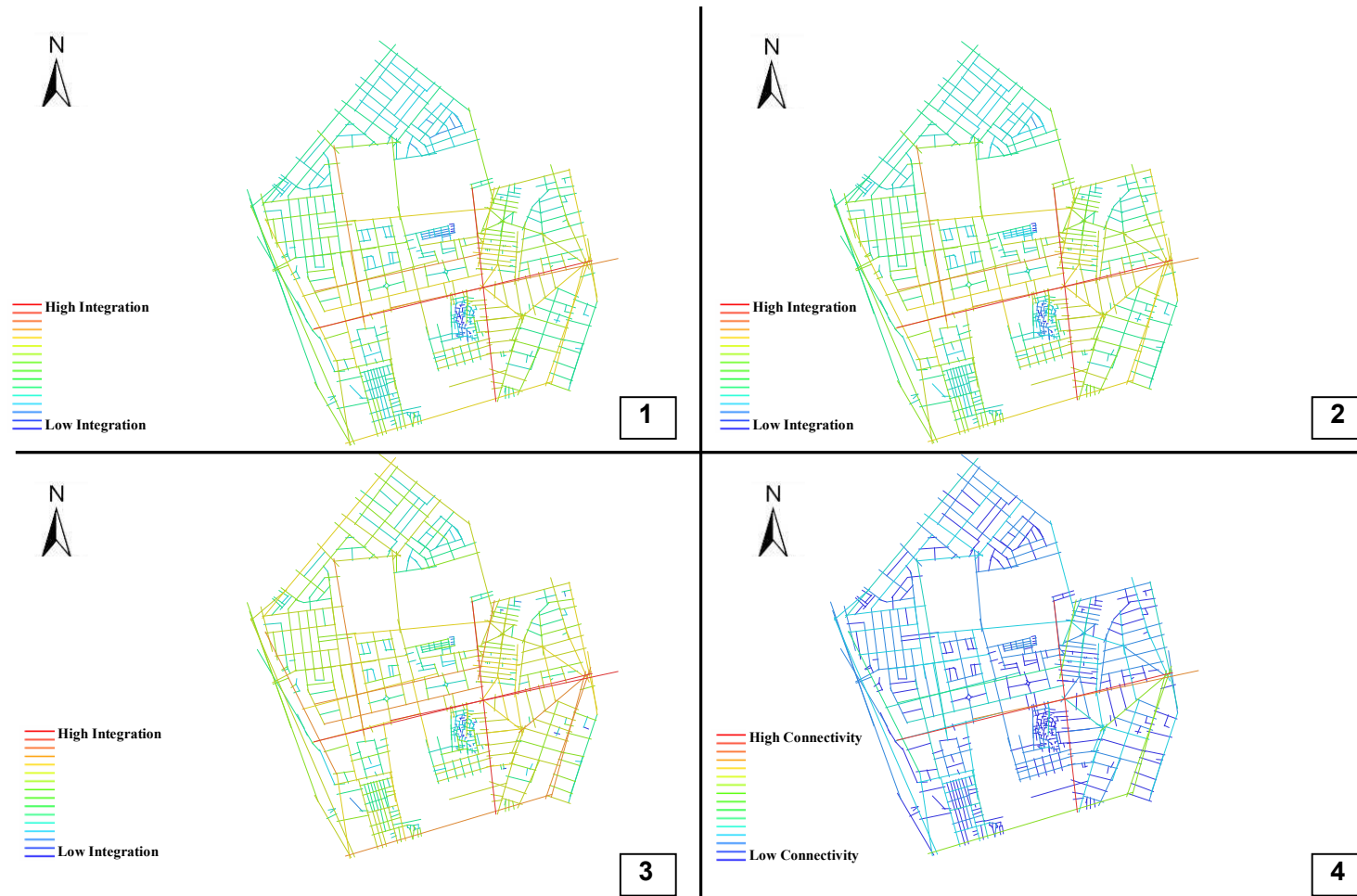


Figure (4-12) Spatial analysis of Dokki district

1- Global integration (R=n) 2- Local integration (r=10) 3- Local integration (r=3) 4-Connectivity

Source: The author

As the analysis was to determine whether or not spatial properties enhanced the capability to commit crimes within each type of the selected areas, the correlation between each of values obtained through space syntax and crime rate were calculated. Results showed that:

- Districts generating criminals

The total crime rates was negatively –though not significantly- correlated with all the spatial factors which mean that, crime rates decrease with increasing the global integration, local integration R=3, R=10 and connectivity values, and vice versa (see table 4-4). This also applied to both crime against person and crime against property rates.

Results support that the presence of more people appears to provide higher risks of detection and apprehension to potential criminals. Higher Integration values, as well as Integration R=3 and Integration R=10, are usually associated with higher levels of movement at different scales—pedestrian and vehicular. Consequently, more people—and eyes—are present which in turn, spell potential trouble for those attempting to commit any criminal act. These findings agree with Jacob’s thesis through the presence of high density neighborhoods characterized by strong social interactions as mentioned previously.

Table (4-4) Correlation values between space syntax measures and crime rates within districts generating criminals during the study period (2004-2008)

		Global Integration	Integration R=3	Integration R=10	Connectivity
Mataria		1.2140	2.2324	1.3544	4.7314
Manshyet Nasser		0.6157	1.6170	0.9960	3.3198
Bolaq Al Dakrou		1.1348	2.2441	1.3122	4.2582
Total crimes	r =	-0.8219	-0.8926	-0.8299	-0.6826
	t =	-0.4511	-0.4716	-0.4535	-0.4057
Crimes against person	r =	-0.4063	-0.5285	-0.4192	-0.2036
	t =	-0.2889	-0.3458	-0.2954	-0.1691
Crimes against property	r =	-0.8230	-0.8935	-0.8310	-0.6840
	t =	-0.4515	-0.4719	-0.4538	-0.4062

Source: The author

Significant at level	0.000*	Critical value	636.619
	0.01**		31.821
	0.05***		6.314

The results also showed that although higher connectivity values provide more escape routes, lower incidents occurred. This agrees with the rational choice theory where criminals, in general, compare between the risk of being caught –or being recognized by the insiders–<sup>34</sup> and escaping with rewards gained; it is obvious that the probability of escaping with rewards is less. This means that either those areas have low standards of living, or high natural surveillance exists, or may be both.

- Districts attracting criminals

The total crime rates were positively and significantly correlated at (0.05) level with the integration and connectivity values which means that the crime rates increase with increasing the global integration, local integration R=3, R=10 and connectivity values, and vice versa (see table 4-5). This also applied to crime against person, crime against property rates at 0.000 and 0.05 levels respectively.

Table (4-5) Correlation values between space syntax measures and crime rates within districts attracting criminals during the study period (2004-2008)

		Global Integration	Integration R=3	Integration R=10	Connectivity
Masr Al Gadida		1.7721	2.4021	1.7723	5.3157
Madinat Nasr 2nd		0.7874	1.6219	0.9913	3.3833
Dokki		1.4723	2.0799	1.4848	4.5362
Total crimes	r =	0.8001	0.8671*	0.8406	0.8617
	t =	4.0034	6.5271	5.2754	6.2298
Crimes against person	r =	0.9962**	0.9783**	0.9876**	0.9805**
	t =	265.3883	45.1300	79.6578	50.3207
Crimes against property	r =	0.7950	0.8629	0.8360	0.8573
	t =	3.8785	6.2935	5.0985	6.0101

Source: The author

Significant at level	0.000***	Critical value	636.619
	0.01**		31.821
	0.05*		6.314

Contrary to criminals-generating districts, results support that the presence of more people appears to provide higher risks of being exposed to crimes.

<sup>34</sup> Offenders living and offend from their neighborhoods

Higher integration values provide overcrowded areas with a larger number of potential targets especially, that most of these spaces are desirable locations for retail and other public services because of their high accessibility. Criminals find it easier to commit their crimes in crowd and escape using crowds to impede victims and blending into them.

Results also showed that higher connectivity values provide more escape routes, therefore, higher crimes occur, so it can be interpreted that criminals find the probability of escaping with rewards is higher than being caught -or being recognized by the insiders. This doesn't mean that there is no eyes on streets, but it can be said that crowd, the existence of a larger number of victims including; residents and strangers and the diversity between them, the lack of social interactions between residents, etc., dominate the eyes on street which makes these areas more vulnerable to crimes.

These findings agree partially with Newman's defensible space theory; both share the idea of minimizing the permeability -including the ease of entry to and exit from the area- to control the numbers of people using the space, while the idea of creating isolated neighborhoods from strangers to achieve territoriality is unacceptable for the studied cases. Newman assumed that it is more difficult for residents to control or determine the activity taking place in mixed-use areas, so it is better to isolate these areas from strangers, while results showed that crimes one could face in an isolated area could be much more, as it would possibly be more dangerous such as rape.

These results are consistent with Hillier and Sahbaz, 2005. They concluded:

*“Overall, we can say that urban integration, and the increase in movement and levels of activity that it brings has a double effect; it can produce more natural surveillance and safety in numbers and so reduce crime; and it may mean that potential criminals also use integrated streets, and so make more accessible locations more dangerous. Both effects undoubtedly exist, and a key variable is the degree to which there is a residential culture in more active areas. Where it exists, crime risk is reduced, where it does not, risk is increased. But these benefits do not seem to pass through the intervening variable of community formation. They seem to be much simpler: effects of the ordinary co-presence of people that everyday movement and activity brings. A residential culture, it might be conjectured, is first a culture of civilised co-presence, and only second, and after due time, a culture of*

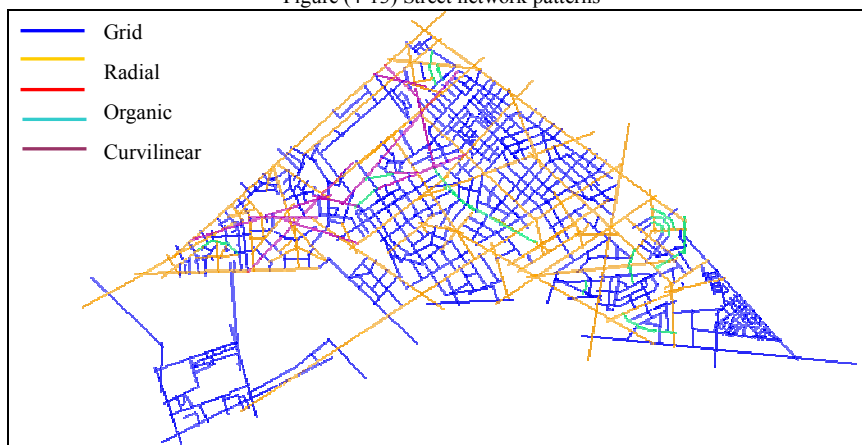
*community formation. This, perhaps, is what made historic cities, which always brought heterogeneous population into dense patterns of contact, the civilised places they seemed to be. As both Jane Jacobs and Oscar Newman observed, a society which does not civilise its streets cannot be civilized”.*

➤ **Crime and network pattern**

As for the second question, which relates to the various network patterns and their relation to crime, streets within each of the attracting criminals’ districts were classified to include linear, radial, organic and curvilinear patterns. Figure (4-13) shows network classification of selected districts. Taking integration and connectivity values into account, results showed that person crimes were positively correlated at (0.01) level with grid and radial patterns, while there is no correlation with property crimes. Table (4-6) shows correlation results between crimes and network patterns.

Results also showed that most crimes committed within grid and radial patterns include: homicide, sexual harassment; representing 86.1% of person crimes, robbery, arson and housebreaking; representing 36.2% of property crimes, while most crimes committed within curvilinear patterns include: kidnapping; representing 2.8% of person crimes, shoplifting and car theft; representing 56.8% of property crimes. As for most crimes committed within organic patterns include pickpocketing; representing 7% of property crimes.

Figure (4-13) Street network patterns





Source: The author

Table (4-6) Correlation values between street patterns and crime rates during the study period (2004-2008)

		Masr Al Gadida	Madinat Nasr 2nd	Dokki	Total crimes		Crimes against person		Crimes against property	
					r =	t =	r =	t =	r =	t =
Global Integration	grid	1.7139	0.8374	1.5311	0.7346	2.7680	0.9999***	8054.1958	0.7288	2.6877
	Radial	2.1342	0.0000	1.9170	0.6584	1.9272	0.9925**	133.1170	0.6520	1.8733
	organic	0.0000	0.7471	1.1290	-0.9041	-0.4748	-0.3888	-0.2800	-0.9077	-0.4758
	curve	1.8699	0.8669	0.0000	0.8342	5.0313	0.2539	0.3403	0.8388	5.2052
Integration R=3	grid	2.3014	1.8379	2.1724	0.7826	3.6005	0.9983**	592.9196	0.7773	3.4909
	Radial	3.0891	0.0000	3.0510	0.5946	1.4670	0.9793**	47.2163	0.5878	1.4261
	organic	0.0000	1.4567	1.4480	-0.9953	-0.4988	-0.6769	-0.4037	-0.9961	-0.4990
	curve	2.5091	1.8917	0.0000	0.6127	1.5819	-0.0704	-0.0658	0.6194	1.6272
Integration R=10	grid	1.7142	1.0984	1.5450	0.7804	3.5529	0.9985***	675.1323	0.7750	3.4450
	Radial	2.1342	0.0000	1.9196	0.6575	1.9198	0.9924**	130.6467	0.6511	1.8661
	organic	0.0000	0.9151	1.1401	-0.9583	-0.4893	-0.5234	-0.3436	-0.9606	-0.4900
	curve	1.8699	1.0780	0.0000	0.7556	3.0919	0.1263	0.1446	0.7611	3.1866
Connectivity	grid	4.2596	3.6316	4.3130	0.5275	1.1164	0.9596*	23.7568	0.5203	1.0845
	Radial	12.0000	0.0000	12.4750	0.5584	1.2646	0.9693*	31.5923	0.5514	1.2290
	organic	0.0000	2.8435	2.6050	-0.9996	-0.4999	-0.7271	-0.4210	-0.9998	-0.5000
	curve	7.2857	5.1408	0.0000	0.6531	1.8823	-0.0183	-0.0180	0.6594	1.9364

Source: The author

Significant at level	0.000***	Critical value	636.619
	0.01**		31.821
	0.05*		6.314

#### 4.4.2. Land use

##### a. Residential areas

###### ➤ Formal housing areas

Due to lack of information on old deteriorated, public and shelter housing areas, the methodology used to understand the relationship between those areas and crime rates depends on the correlation between the latter and the existence of those areas -each separately- within each of agglomeration districts. This can be done by giving each of the studied districts the values of (1) if any of those areas exists, (0) for not. (See Appendix D).

Results showed that total crime rates were positively and significantly correlated with the existence of old deteriorated housing areas with correlation coefficient of 0.3227, but, negatively correlated with public and shelter housing areas -but not significant- with correlation coefficient of (-0.2229) and (-0.0915) respectively. This also applied to crime against person, crime against property rates. Table (4-7) shows the correlation values and their significance.

Results also showed that - according to districts classification mentioned before (see page 78)- most crimes committed within districts attracting criminals, and those attracting and generating criminals at the same time - including property and person crimes- are supposed to be committed within old deteriorated housing areas; where significance at level of 0.05 was shown. As for districts generating criminals, no significant correlation was found which means that most of crime incidents committed within those districts are located outside those areas.

Table (4-7) Correlation between the existence of studied formal housing areas and crimes rate during the study period (2004-2008)

		The existence of old deteriorated housing areas	The existence of public housing areas	The existence of shelter housing areas
Total crimes	r=	0.3227**	-0.2229	-0.0915
	t=	3.0882	-1.1813	-0.5431
Crimes against person	r=	0.3225**	-0.1799	-0.2017
	t=	3.0842	-0.9884	-1.0876
Crime against property	r=	0.3216**	-0.2227	-0.0899
	t=	3.0727	-1.1802	-0.5344

Source: The author

Significant at level	0.000***	Critical value	3.551
	0.01**		2.423
	0.05*		1.684

As for most crimes committed within each districts' type, analysis showed that kidnapping, rape, sexual harassment, robbery and pickpocketing are more likely to be within the old deteriorated housing of the districts attracting criminals, while only rape and pickpocketing, in addition to

shoplifting are more likely to be in attracting and generating criminals at the same time. Concerning districts generating criminals, although no significant correlation was found over crime rates as a whole, results showed that robbery, car theft and pickpocketing incidence probability increases within.

➤ **Informal housing areas**

Due to lack of information on the informal housing, the area of each was calculated as an indicator of their demographic status such as population, population density, etc. The methodology used to understand the relationship between those areas and crime rates depends on the correlation between the latter and the percentages for those areas according to districts limits.

Results showed that total crime rates were negatively and significantly correlated with informal areas ratios with correlation coefficient of (-0.3546) which means that, as the percentage of the informal housing increases, crime rate decreases. This also applied to crime against person -though not significant- and crime against property rates. Table (4-8) shows the correlation values and their significance.

This result is considered a logical consequence, although increasing of informal housing areas within a district was supposed to increase the district's criminals; thus more crimes are expected. Analysis showed that the increase of these areas increases their district's poverty rate. Since most criminals search for high standards of living areas to commit their crimes, districts with larger informal housing areas become less vulnerable to crime.

Table (4-8) Correlation between the existence of informal housing areas and crime rates during the study period (2004-2008)

		The existence of informal areas	The percentages of informal areas
Total crimes	r=	-0.5670*	-0.3546*
	t=	-2.3450	-1.6966
Crimes against person	r=	-0.4954*	-0.2242
	t=	-2.1469	-1.1870
Crime against property	r=	-0.5659*	-0.3549*
	t=	-2.3421	-1.6977

Source: The author

Significant at level	0.000***	Critical value	3.551
	0.01**		2.423
	0.05*		1.684

According to districts classification, the same results were applied to districts attracting criminals and those generating and attracting criminal at the same time, though not significant. As for districts generating criminals, there was positive and significant correlation between person crimes and the



percentage of informal districts' housing due to the increase of rape incidents within those areas, helped by the high rates of poverty, the inability to bear the cost of marriage, in addition to, the nature of those areas which provides opportunities to commit those types of incidents, and the position of buildings themselves which don't provide privacy to its residents, especially for women (full data are provided in appendix D).

**b. Other land uses**

The methodology used to understand the relationship between specific land uses and crime rates depends on the correlation between the latter and the percentages of each of these uses within the studied districts. Studied land uses include residential, commercial, industrial, cemetery, vacant lands, agriculture lands and deserts.

Results showed that total crime rates were positively correlated with commercial areas and deserts with correlation coefficient of (0.2208) and (0.2502) respectively, and negatively correlated with residential, industrial, cemetery areas, vacant and agricultural land with correlation coefficients of (-0.3638), (-0.3230), (-0.0533), (-0.3408) and (-0.3067) respectively; significant correlations at (0.05) level were obtained only in residential, commercial uses and deserts. This also applied to crime against person, crime against property rates. The following table shows the correlation values and their significance.

Table (4-9) Correlation between studied land uses and crime rates during the study period (2004-2008)

		Residential	Commercial	Industrial	Cemetery	Vacant lands	Agriculture	Desert
Total crimes	r=	-0.3638*	0.2208*	-0.3230	-0.0533	-0.3408	-0.3067	0.2502*
	t=	-1.7286	1.8369	-1.5821	-0.3280	-1.6472	-1.5210	2.1622
Crimes against person	r=	-0.3616*	0.2429*	-0.2140	-0.0263	-0.1385	-0.2159	0.1129
	t=	-1.7209	2.0788	-1.1425	-0.1752	-0.7886	-1.1507	0.8250
Crime against property	r=	-0.3625*	0.2198*	-0.3231	-0.0541	-0.3420	-0.3067	0.2509*
	t=	-1.7244	1.8261	-1.5827	-0.3324	-1.6515	-1.5211	2.1708

Source: The author

Significant at level	0.000***	Critical value	3.551
	0.01**		2.423
	0.05*		1.684

Results also showed that -according districts classification mentioned before- most of the “districts attracting criminals” crimes -including property and person crimes- are supposed to be committed within their commercial areas; where significance at level of 0.05 was shown. As for districts generating criminals, most of person crimes are supposed to be committed within their industrial and agricultural areas, where significance at level of 0.05 was shown, while property crimes results did not show any significance with the studied uses. This supports space syntax results, as

criminals offending within the first type find it easier to commit their crimes in crowd and escape using crowds to impede victims and blending into them., while those offending within the second type find the presence of more people provide higher risks of detection and apprehension and they tend to commit their crimes within segregated areas.

As for districts generating and attracting criminals at the same time, most of person crimes are supposed to be committed within their commercial areas and cemeteries, where significance at level of 0.05 was shown, while property crimes results did not show any significance with the studied uses. This confirms that this type of districts contains a mixture of the other two types; as crimes tend to occur in both crowd and deserted areas (see appendix D).

#### **4.5. Conclusion**

From the above analysis, it is evident that most criminals search for more accessible places, easier to move through and that provide higher opportunities for escape to commit their crimes; compared with their residence districts. It is also evident that the agglomeration's districts can be classified into three types based on their social characteristics and crime rates including;

##### **- Districts generating criminals**

Analysis showed that the presence of more people in those districts appears to provide higher risks of detection and apprehension to potential criminals, therefore most criminals commit their crimes within segregated areas. Analysis showed that those segregated areas include old deteriorated housing, industrial and agricultural areas and the most crimes committed within are homicide, robbery, kidnapping and rape. It is also noted that other crimes tend to occur within overcrowded areas including sexual harassment, arson, car theft and pickpocketing.

##### **- Districts attracting criminals**

Analysis showed that the presence of more people in those districts appears to provide higher risks of being exposed to crimes; therefore most criminals commit their crimes within overcrowded areas. Analysis also showed that those overcrowded areas include commercial areas with grid networks. It is obvious that grid networks provide clearer and more direct and predictable routes; therefore attract more potential offenders, while the existence of commercial uses helps in attracting more potential targets. Since more potential offenders will see more potential targets, more crime opportunities will be provided. As for the most crimes committed within those areas, they include kidnapping, sexual harassment, robbery, and pickpocketing. It is also noted that others tend to occur within segregated areas including homicide, rape, arson and housebreaking.

- **Districts generating and attracting criminals**

Results showed that those districts are a mix of the previous two types; therefore incidents occur within both overcrowded and segregated areas almost with the same proportions.

**Chapter Five**

**EXPLAINING CRIME AT THE  
NEIGHBORHOOD SCALE**

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- 5.1. INTRODUCTION**
- 5.2. SELECTING THE NEIGHBORHOODS USED IN THE STUDY**
- 5.3. IDENTIFYING INCIDENTS' LOCATIONS**
- 5.4. THE RELATIONSHIP BETWEEN INCIDENTS' LOCATIONS AND  
CRIMINAL'S BASE**
- 5.5. IDENTIFYING INCIDENTS' NEIGHBORHOODS, ANALYSIS AND  
FINDINGS**
- 5.6. CONCLUSION**

## **5. Explaining crime at the neighborhoods scale**

### **5.1. Introduction**

This chapter discusses the analysis methods used and the results obtained with reference to literature reviewed in order to define the relationship between crime and the urban environment on the neighborhoods scale. The focus will be on the main agglomeration neighborhoods as mentioned before in chapter four. The first part of this chapter defines the studied incidents and their locations. The second part deals with different factors that may enhance crime opportunities over each neighborhood. The third part compares between the studied neighborhoods and refers to the most important factors that affect on crime over them.

### **5.2. Selecting the neighborhoods used in the study**

Due to the lack of crime statistics at the neighborhoods scale, the study has relied onto the incidents published in different newspapers –during the study period– in order to identify some incidents’ locations and their relating neighborhoods. Amongst the published incidents, the neighborhoods in which the Maadi’s serial killer committed his incidents were selected to be analyzed for the following reasons:

- The danger of the event itself and the panic occurred in some areas consequently,
- The clear definition of incidents’ locations, although some locations were not assigned an exact street address,
- All incidents are located within the main agglomeration limits,
- The diversity among the committed incidents locations –crowded and isolated places, some were within the police range others were not...etc.

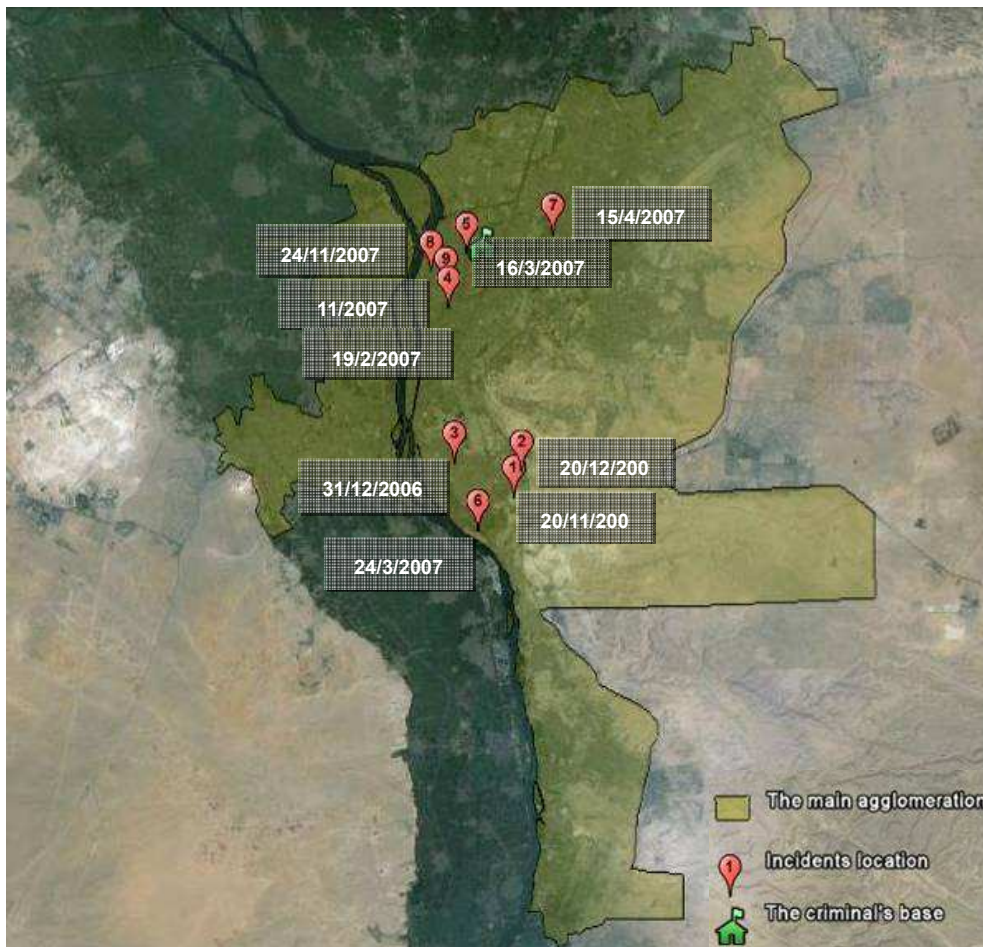
### **5.3. Identifying incidents’ locations**

During 2006-2007, the incidents committed by whom newspapers named “the Maadi’s killer” has raised horror and panic inside Egyptian homes, especially, girls and women who became chased everywhere by the killer.

Police investigations have revealed that the accused is 20 years old, lives in Shrabia district and works as a barber in Agouza district. The story began when he was looking for a work in Maadi district, where he saw girls and women wearing attires differing from those worn within his popular district. He started going frequently to the district at holidays watching those women and girls. Later he began committing his incidents by slashing them with a

knife in the lower back part of their bodies to rape them. He continued doing so till he heard about the deployment of police forces in an attempt to arrest the person who commits those incidents, he decided no to go to Maadi again and started committing his incidents in other districts including Sahel, Rod el Farag, and Zaytun. Due to being stalker in several incidents, either by residents or the police, he stopped his activity for a year till he was arrested<sup>37</sup>. The following map shows the incidents locations.

Figure (5-1) Potential incident sites



Source: Data collected from Desouky, F. and mapped by the author

It is worth mentioning that the criminal's physical characteristics agree partially with Lombroso's description concluded from his surveys in prison. Lombroso found that sex offenders have strong jaws, glinting eyes, thick

<sup>37</sup> Desouky, F., Maadi's killer confession, Al-Ahram Newspaper, 07 March 2009, p.7

lips, lots of hair and protruding ears. The criminal's images showed all of those features except the strong jaws (see figure 5-2). This does not mean that the common features can be generalized to all sexual offenders, especially that this theory fall under extensive criticism even after Lombroso's death.

Figure (5-2) Similarities between Lombroso's description (left) and the criminal's physical characteristics (right)



Source: Lombroso, C., 1895<sup>38</sup> - Farouk, A.<sup>39</sup>

#### **5.4. The relationship between incidents' locations & criminal's base**

Although previous researches have demonstrated that crimes against person occur close to criminal's home (see page 33), analysis showed that only half of the incidents were committed close to the criminal's home. It is also notable that his start was far away from his home as the first three incidents were in Basatine district –two of them were in Maadi Gadida, that's why he was named as Maadi's killer. Then, he decided to change his destination when he heard about the deployment of police forces in Maadi streets in order to arrest the person who committed the three previous incidents. Accordingly, he committed his 4<sup>th</sup> and 5<sup>th</sup> incidents in Azbakeya and Sahel districts respectively. Shortly, he went back to Maadi to commit his 6<sup>th</sup> incident; he might have wanted to check about the deployment of the police and to know whether he was compromised. It is obvious that the result were not in his favor, so he stayed away from Maadi permanently and committed the rest of his incidents in Zaytun, Rod el Farag and Shobra districts. Figure (5-3) shows a closer look of incidents locations and crime trip directions.

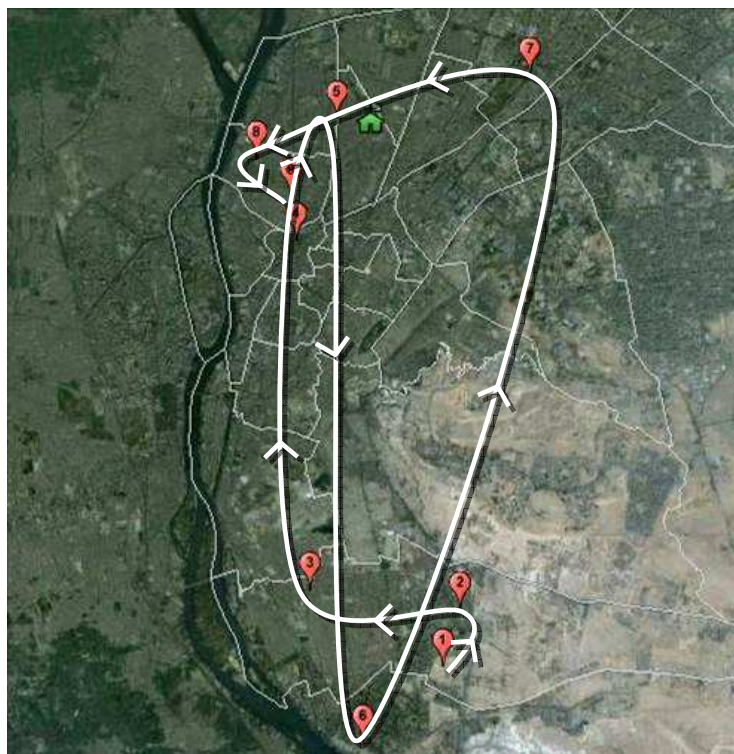
Analysis also show that on the one hand -agreed partly with Patrecia and Paul Brantingham, 1981- the idea of the crime itself started

<sup>38</sup> Lombroso, C., 1895, "*L'Homme Criminel*", Felix: Alcan.

<sup>39</sup> Farouk, A., The reality of the Maadi's killer between his confession and his family's defence, Al-Ahram Newspaper, 14 February 2009, p.7

opportunistically in the course of routine as he was looking for work in Maadi, where he saw girls and women wearing attires differing from those worn in his popular district, which prompted him to think of rape in those places. On the other hand –contrary to Patrecia and Paul Brantingham, 1981– his first incidents didn't follow the distance decay function; as he lives in Shrabia district and started committing crimes in Basatine and Maadi districts. That may refer to the mental images he formed while he was visiting those districts looking for work, which in turn, increased his determination to carry out his crimes in the same areas. It is also notable that he didn't go to areas similar to his neighborhood; even after leaving Basatine and Maadi, instead, he went to completely different neighborhoods. This also refers to his previously formed mental images and his desire to find new similar places with similar targets.

Figure (5-3) Crime trips direction



Source: The author

It is also noticeable that some incidents occurred in the context of residential neighborhoods, while others took place within the primary streets separating them. Analysis showed that the criminal committed his first three incidents within residential neighborhoods. Then, he turned to an underground station



to commit his 4<sup>th</sup> incident where he was very close to be caught by the victim's relatives. May be that was the reason to commit his 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> incidents within primary streets, but again he turned back to a residential neighborhood to commit his 8<sup>th</sup> incident. Later to a primary street for his last incident. Therefore, there is a clear chain of incidents' locations which follows a series of (3 -1-3-1-1).

As for the relation between the dot pattern produced by incidents and the criminal's base (see pages 34-36), analysis showed that it can be represented by the circle theory. It is found that both criminal's home and the place of his arrest are located inside the circle represented by the furthest two crime locations, but not close to its center point. It is notable that the closest point obtained from the median center, the resulted point is located in Bab al Sharia district and lies about 1.1 km away from the place of his arrest in Shobra and 2.7 km from his home in Sharabia district. Figure (5-4) shows different points obtained and its relation to the criminal's base.

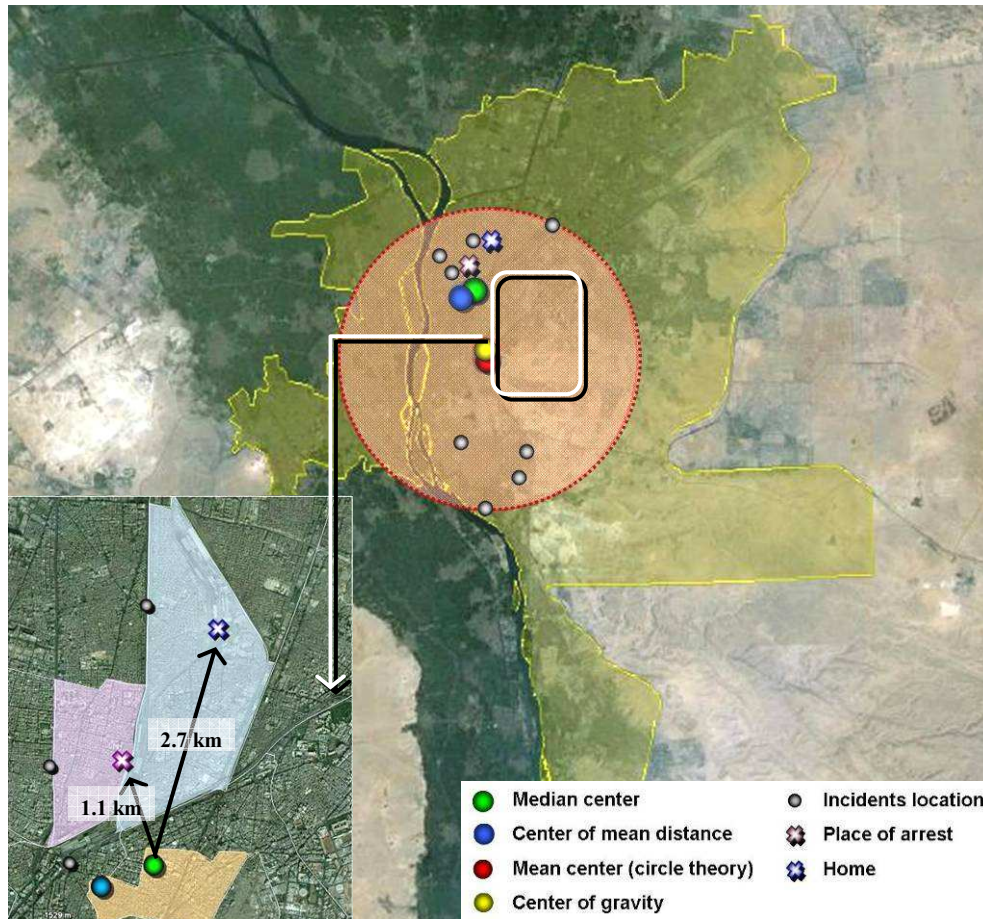
### **5.5. Identifying incidents' neighborhoods, analysis and findings**

In order to review the role of urban environment in those incidents, eight of them have been studied in detail, while one was neglected because of its location. The selected incidents can be classified into two groups:

- Incidents occurred in the context of residential neighborhoods, including 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 8<sup>th</sup> incidents.
- Incidents took place within the primary streets separating neighborhoods, including 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup> incidents.

Previous studies indicated that there is mutual influence between incidents and the neighborhood in which they are located. In other words, on the one hand, the neighborhood's conditions can facilitate the occurrence of the incident. On the other hand, the impact of the incident itself extends to the entire neighborhood, and may extend also to the district in which the incident is located, and in some cases, to the whole governorate. Based on that concept, the neighborhoods in which incidents are located have been studied as a whole. Defining different neighborhoods borders relied on identifying the main streets. It is worth mentioning that the criteria of identifying the main streets depended on streets width, length and their traffic flow. It is notable that each of the first group incidents is located in one neighborhood, while it requires two neighborhoods in each of the second group incidents.

Figure (5-4) Methods used to define the relationship between incidents and the criminal's base



Source: The author







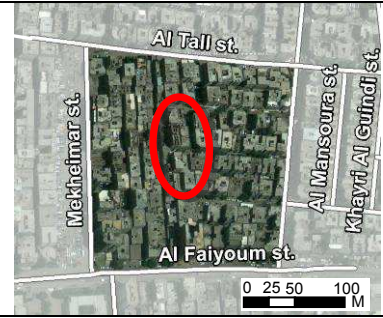
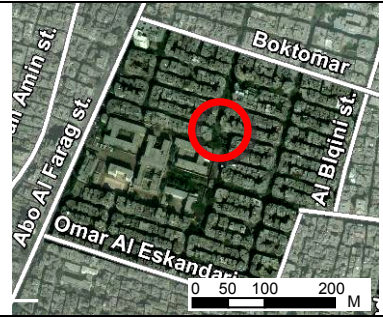
As for defining the physical characteristics of each neighborhood, the study concentrated on the neighborhoods condition at incidents' time. This has been achieved through the "historical imagery" tool in Google Earth software, version 6. The tool is represented by a slider showing the dates of different imagery available for a selected location. By moving back or forward, you can see how places have changed over time. For the current study, the selected incidents occurred during 11/2006 and 11/2007, while the imagery taken during that period dates back to 12/2006, 2/2007 and 7/2007. The 7/2007 imagery was selected because of its clearness.

The following tables show the social and physical factors of the selected neighborhoods and the criteria developed through previous studies, identify the defective neighborhoods for each factor, and finally, define the common factors that may be responsible for incidents occurrence.




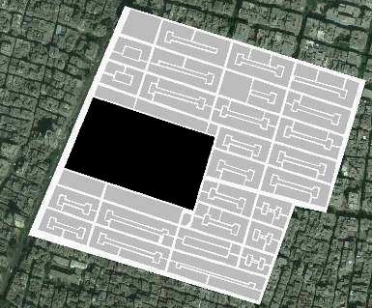
## **5.6. Conclusion**



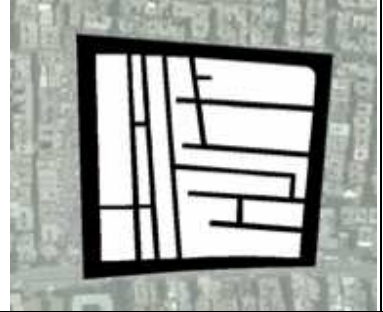
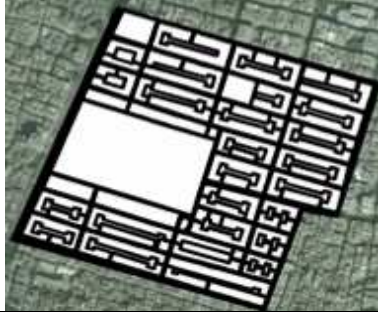
From the above analysis, it is evident that incidents occurred within quiet and crowded, large and small, planned and unplanned, limited and mixed-uses neighborhoods with high and low population density. It is also evident that grid street network is an important factor in increasing crime rates; as it was a common factor to all the studied neighborhoods. It is proven, in this case study, that grid networks attract more potential offenders and targets, therefore, enhance crime opportunities. Analysis also showed other factors that can play a role in decreasing crime rates including; population density, hierarchy of spaces, fabric pattern, and building heights. It is notable that low population density, deficiencies in spaces' hierarchy, linear fabrics and more than 6 stories buildings enhanced incidents opportunities in three-quarters of the studied neighborhoods. As for the diversity of uses, its impact has emerged on the second group which contains incidents took place in main interval streets, while the first group was suffering from the lack of uses. This can be explained as diversity of uses has a role in decreasing crime opportunities within the neighborhood itself; however, it increases crime opportunities on the surrounding streets at the same time.

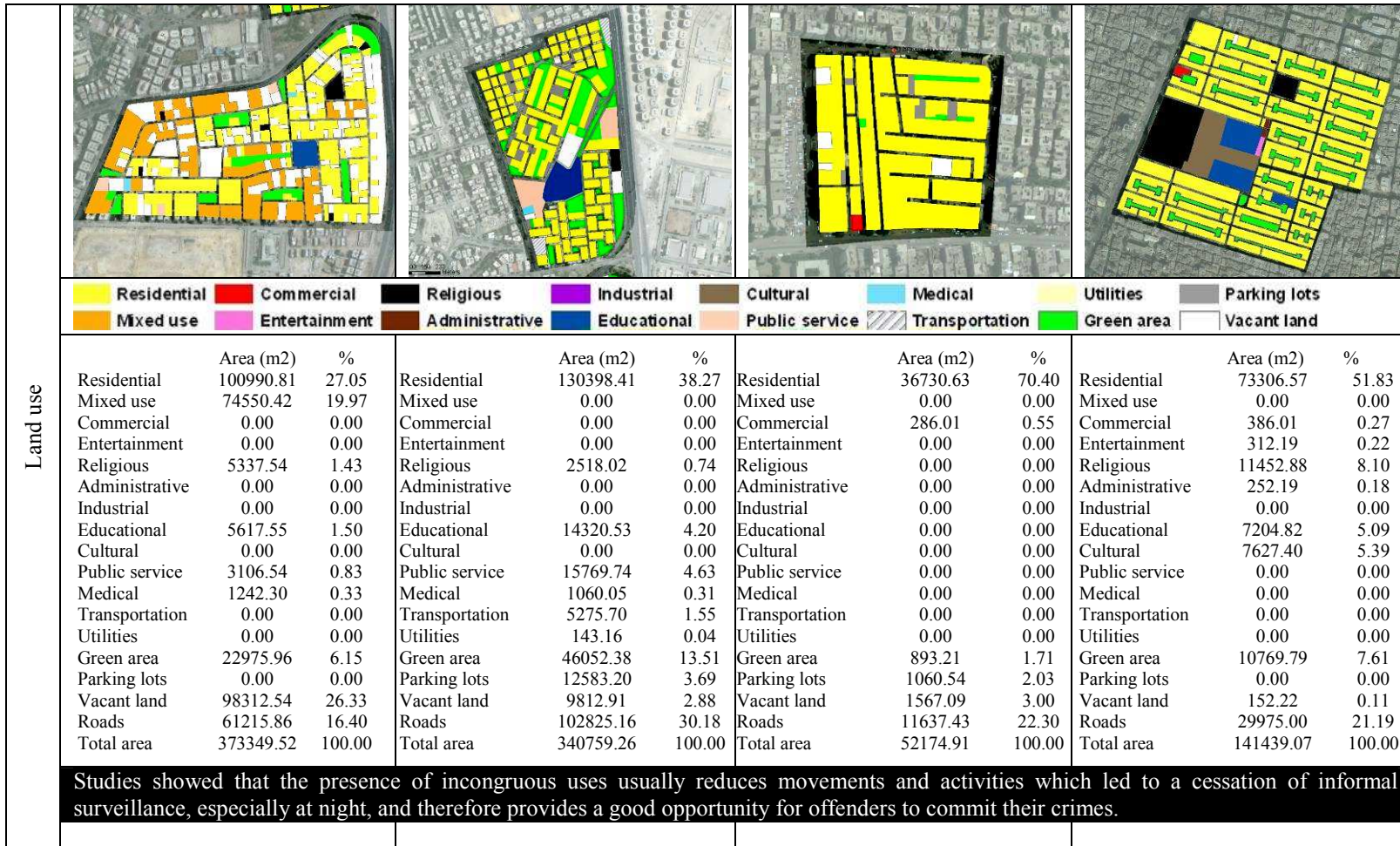
Table (5-1) The social and physical factors of the first neighborhoods group

	1 <sup>st</sup> incident neighborhood	2 <sup>nd</sup> incident neighborhood	3 <sup>rd</sup> incident neighborhood	8 <sup>th</sup> incident neighborhood
Neighborhood's location				
	Located in the southern section of Al-Basatine district – representing about 1.3% of its total area– and bounded by: Al Nasr street to the north, Ahmed Kamel street to the south, Autostorad road to the east and Al Lasilki street to the west.	Located in the heart of Al-Basatine district –representing about 1.1% of its total area– and bounded by: Al-Bahs Al-Genaea street and Saqr Quraish housing to the north, Palestine street to the south, Autostrade road to the east and street No.306 to the west.	Located in the northwest section of Al-Basatine district – representing about 0.2% of its total area– and bounded by: Al-Tall street to the north, Al-Faiyoum street to the south, Al-Shaheed Hamdi Gouda street to the east and Mekheimer street to the west.	Located in the northern section of Rod El-Farag district– representing about 5.5% of its total area– and bounded by: Boktomar street to the north, Omar Al-Eskandari street to the south, Gameaa Khedr and Al-Blqini streets to the east and Abo Al-Farag street to the west.
Incident's location				
	Behind a petrol station in No.306 st.	Within Al-Zobbat housing area	In front of the victim's home, Mohamed Najeeb st.	Beside Al-Azraa church



Incident time	20/11/2006 Noon	20/12/2006 Noon	31/12/2006 Night	24/11/2007 Morning
Neighborhood scale	It is about 373349.52 m2, with a maximum length of 590 meters and a maximum width of 890 meters.	It is about 340759.26 m2, with a maximum length of 490 meters and a maximum width of 765 meters.	It is about 52174.91 m2, with a maximum length of 210 meters and a maximum width of 220 meters.	It is about 141439.07 m2, with a maximum length of 390 meters and a maximum width of 390 meters.
Neighborhood description	New established neighborhood with a large number of vacant lands and apartments.	New established neighborhood mediated by public services, which can divide it into two separated parts.	An informal settlement developed on agricultural land.	A neighborhood consists of a number of residential blocks closed on itself and separated from each other by secondary streets.
Planning	Planned	Planned	Unplanned	Planned




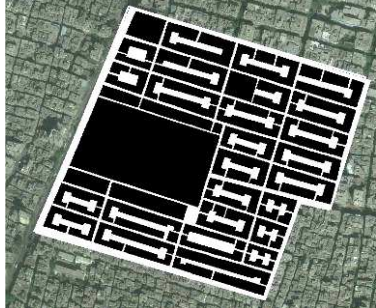
Population density	Low (less than 100 persons/ feddan).	Low (less than 150 persons/ feddan).	High (more than 150 persons/ feddan).	Low (less than 150 persons/ feddan).
	Researchers divided into 3 groups: the first found that crowd could be a facilitator to criminal behavior, the second found the opposite relationship while the third found no-relationship between the two variables. Now, the second group's point of view will be taken as a criteria; since three of the four areas have low densities.			
Blocks' scale	<b>X</b>	<b>X</b>		<b>X</b>
				
	<b>Short blocks</b> ■ <b>Long block</b>			
	- Short blocks with a maximum length of 190 meters and a maximum width of 195 meters. - Long blocks with a maximum length of 210 meters and a maximum width of 280 meters.	- Short blocks: ▪ about 500 m2 (25m*20m) with approximately 20 units, ▪ about 900 m2 (45m*20m) ▪ with a maximum length of 160 meters and a maximum width of 75 meters. - Long blocks with a maximum length of 300 meters and a maximum width of 220 meters.	- Short blocks with a maximum length of 165 meters and a maximum width of 130 meters. - Long blocks with a maximum length of 225 meters and a maximum width of 20 meters.	- Short blocks: ▪ about 1350 m2 (45m*30m) with approximately 70 units, ▪ about 2100 m2 (70m*30m) with approximately 90 units, ▪ about 2850 m2 (95m*30m) with approximately 130 units - Long blocks with a maximum length of 215 meters and a maximum width of 115 meters.
According to Jacobs (1961), people don't like walking down long blocks, they walk only along the blocks on which they live or work. She found that short blocks offer people more navigation options, therefore, creating more viable spaces. Studies showed that an area with a maximum diameter of 200 meters can achieve that (Radwan, et al., 2005).				
	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

Street network				
	Grid	Grid	Grid, dead-end streets	Grid
	Studies showed that grid pattern creates clearer and more direct routes, therefore, more potential targets expected. According to Brantingham's (1991), potential offenders find it easier to penetrate areas with predictable road networks. They found that areas with grid street layouts are more predictable than areas with winding roads, cul-de-sacs, or dead ends, therefore, more potential offenders expected. Since more potential offenders will see more potential targets, grid pattern tends to enhance crime opportunities.			
	x	x	x	x
Street design	-Lack of landscaping. -Lighting and signage are sufficiently provided only on primary streets.	-Trimmed landscaping. -Good lighting and signage.	-Lack of landscaping, signage and lighting.	-Heavy landscaping obstructs residents' surveillance -Lack of signage and lighting.
	Landscaping, Lighting and signage can encourage crime as they can obstruct surveillance, become misleaders, be targets or means of crime.			
	x x		x x	x x x













	<p>Studies also asserted that lack of uses –especially those attract different groups of people– creates free-of-people areas, especially at night, and therefore provides a good opportunity for offenders to commit their crimes (Jacobs, 1961).</p>			
		<b>X</b>	<b>X</b>	<b>X</b>
	<p>Studies also showed that the existence of wide vacant lands, green areas and parking lots within residential areas can affect negatively on the latter, since residents' ability to watch what is happening within those pockets decreases. Researchers found that decreasing the depth of those pockets increases residents' surveillance, therefore, decreases crime rates.</p>			
	<b>X</b>			
Public spaces	Streets	Streets	Streets	Streets
	<p>Studies showed that lack of public spaces –which create opportunities for positive social interactions between insiders and outsiders– decreases the natural surveillance, therefore increasing crime rates.</p>			
	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Hierarchy of spaces				
	<p> <span style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black; margin-right: 5px;"></span> <b>Public spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black; margin-left: 10px; margin-right: 5px;"></span> <b>Semi-public spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black; margin-left: 10px; margin-right: 5px;"></span> <b>Semi-private spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: gray; border: 1px solid black; margin-left: 10px; margin-right: 5px;"></span> <b>Private spaces</b> </p>			
	<p>Analysis showed the absence of spaces' hierarchy of in some areas. It is noted that a few of semi-private spaces are directly connected to public spaces, a few of private spaces are directly connected to semi-public spaces.</p>	<p>Analysis showed the absence of spaces' hierarchy in some places. It is noted that a few of private spaces are directly connected to either public or semi-public spaces, in addition, those private spaces aren't defined well.</p>	<p>There are few spaces but still hierarchical. This illustrated in primary streets as public spaces, secondary streets as semi-public spaces, local streets and green areas as semi-private space, while private spaces are absent.</p>	<p>Analysis showed the absence of spaces' hierarchy in some areas. It is noted that a few of semi-private spaces are directly connected to public spaces, private spaces are directly connected to public and semi public spaces.</p>

	Studies showed that the absence of spaces' hierarchy decreases the sense of neighborhood and discourages surveillance. According to Newman (1996), this hierarchy can be achieved by subdividing spaces from the most public to the most private. Between these extremes there would be semi-public space and semi-private space.			
	<b>x</b>	<b>x</b>		<b>x</b>
Urban fabric				
	Dot	Dot, linear patterns	Linear, compact patterns	Linear
Buildings height	6 to 8 stories	6 to 8 stories	4 to 6 stories	7 to 10 stories
	Studies showed that crime rates increase clearly with increasing buildings' height (more than 6 stories), since human becomes separated from the ground and lose his ability to control residential environment.			
Windows	<b>x</b>	<b>x</b>		<b>x</b>
	Windows provide a good surveillance for internal spaces and outer roads.	Windows provide a good surveillance for internal spaces. As for outer roads, the diagonal position of some buildings obstructs residents' surveillance.	Windows provide a good surveillance for internal spaces and outer roads.	Windows provide a good surveillance for internal spaces. As for the outer roads, heavy landscaping obstructs residents' surveillance.
	Studies showed that decreasing windows which overlook public areas, entrances and pathways can facilitate crime, since residents' surveillance and their ability to control over what is happening in those areas decrease.			
		<b>x</b>		<b>x</b>

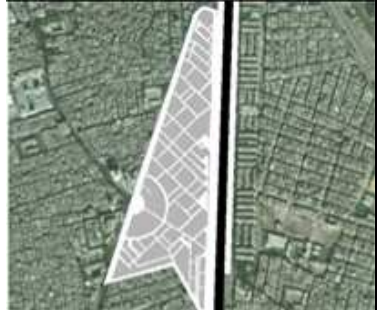



Incident's location analysis	Mixed uses are available at the neighborhood's edges, which in turn limits the entry of outsiders. According to Newman, this helps residents to control their environment. Due to the newness of the neighborhood, lack of residents and the large number of vacant apartments, outsiders' entry into the region became usual; they come as workers, apartment finders...etc. and the criminal may be one of them as happened in this case.	Although they aren't wide, the land budget analysis showed that roads occupy the second rank; representing more than 30% of the total neighborhood area. This refers to the large number of streets, which can be interpreted as a plenty of escape routes. It is also notable that public services intermediate the neighborhood and allow the entry of outsiders, while the criminal may be one of them as happened in this case.	Analysis showed lack of uses that attract people. This can work in two directions; on the one hand, limits the entry of outsiders, on the other hand, makes the neighborhood deserted most of the time. In that case it is obvious that abandonment of the neighborhood was the main reason for the incident's occurrence.	As mentioned before, the neighborhood consists of a number of residential blocks closed on itself and separated from each other by heavy landscaped secondary streets. It is difficult to control what is happening within those outer streets, therefore, facilitate crime occurrence. This applies to the committed incident place.
General comments	<p>All of the four neighborhoods have:</p> <ul style="list-style-type: none"> <li>- Long blocks</li> <li>- Grid street network</li> <li>- Lack of public spaces</li> </ul> <p>All of the four neighborhoods don't have :</p> <ul style="list-style-type: none"> <li>- Incongruous uses</li> </ul>			
	<p>Three of the four areas have:</p> <ul style="list-style-type: none"> <li>- Population density less than 150 persons/ Feddan.</li> <li>- Lack of signage and lighting.</li> <li>- Lack of mixed uses.</li> <li>- Deficiencies in spaces' hierarchy</li> <li>- Linear fabric.</li> <li>- Buildings height more than 6 stories.</li> </ul> <p>Three of the four areas don't have:</p> <ul style="list-style-type: none"> <li>- Heavy landscaping obstructs surveillance</li> <li>- Wide vacant lands, green areas or parking lots.</li> </ul>			


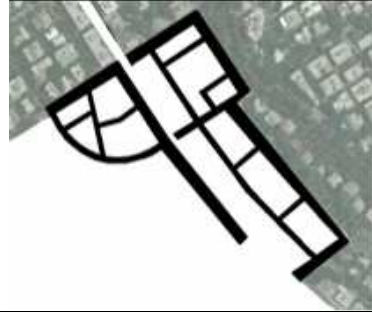

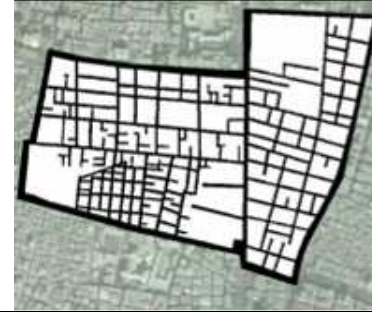
Source: The author

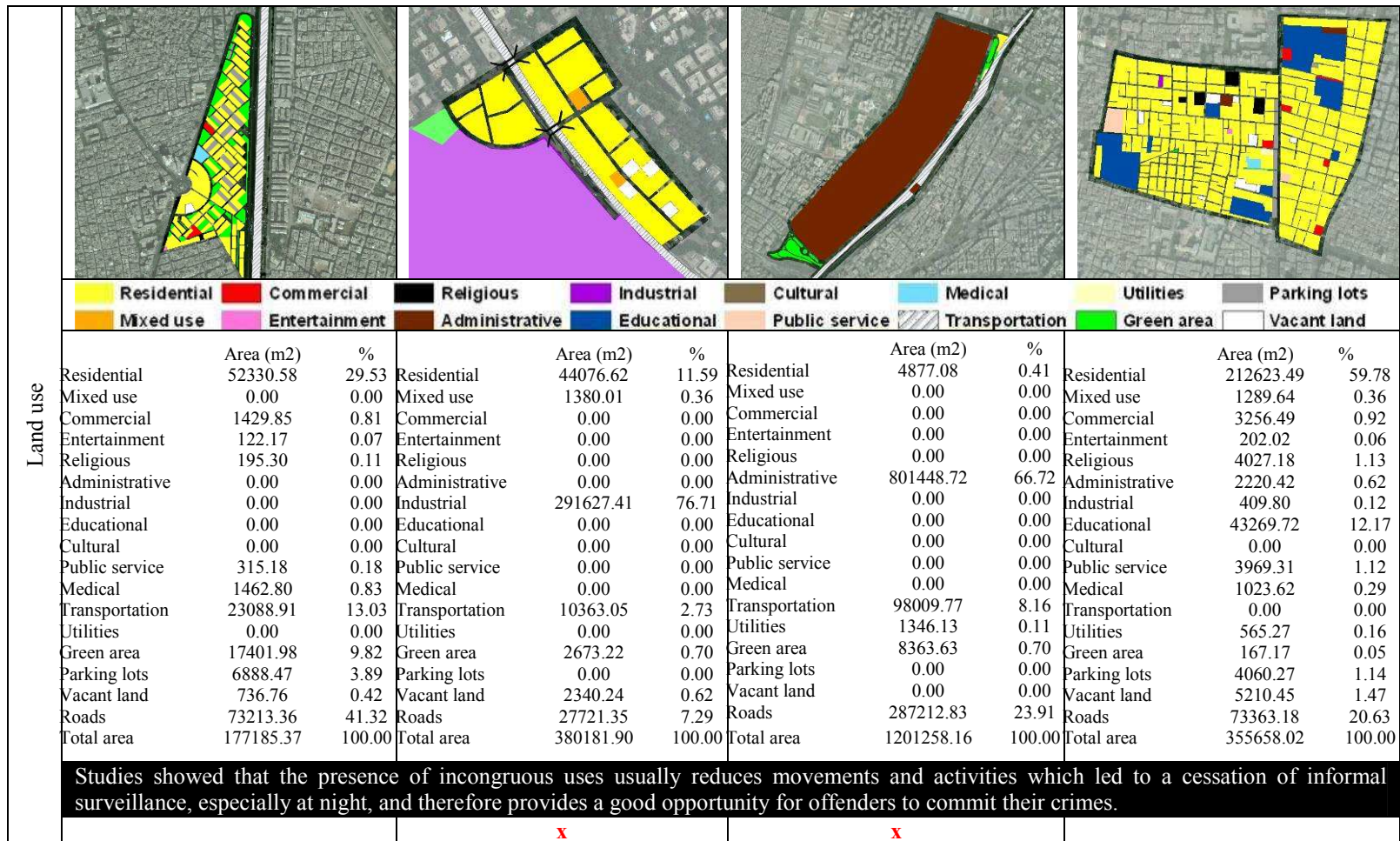
Table (5-2) The social and physical factors of the second neighborhoods group

	5 <sup>th</sup> incident neighborhood	6 <sup>th</sup> incident neighborhood	7 <sup>th</sup> incident neighborhood	9 <sup>th</sup> incident neighborhood
Neighborhood's location	 <p>Located in Al-Sahil and Al-Sharbiya districts –representing about 1.9 percent of their total area– and bounded by: Abo Wafia street to the east, Al-Tiraa Al-Boulaqia street to the west and Gameyat Badawi and Al-Mazlaqan streets to the south.</p>	 <p>Located in the southwest section of Al-Maadi district – representing about 1.5 percent of its total area– and bounded by: street No.84 to the north, street No.87 to the south, No.10 and Al-Hadaek streets to the east and street No.6 to the west.</p>	 <p>Located in the southern section of Al-Zaytoon district – representing about 14.6 percent of its total area– and bounded by: Abd Al-Kader Al-Kilani street to the north, Abdel Majeed Silim street to the south Mahatet El-Qobba to the east and Mataria street to the west</p>	 <p>Located in Rod El-Farag and Shobra districts –representing about 9.1 percent of their total area– and bounded by : Al-Masara street to the north, Ibn El-Kawarni street to the south, Al-Tiraa Al-Boulaqia street to the east and Badee street to the west.</p>
Incident location	 <p>Ahmed Helmi street, near Vectoria square.</p>	 <p>Beside Sakanat El-Maadi underground station.</p>	 <p>Teraat El-Qobba street, in front of Qasr El-Qubba.</p>	 <p>Shopra street, in front of Lycee El-Horia school.</p>

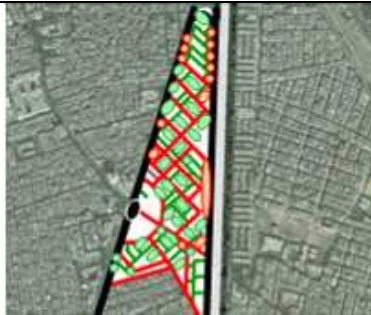
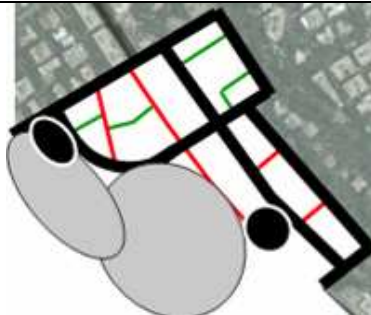
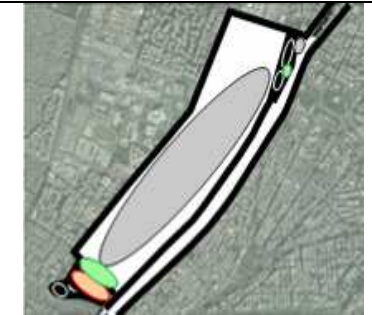

Incident time	16/3/2007 Night	24/3/2007 Noon	15/4/2007 Night	11/2007 Morning
Neighborhood scale	It is about 101173.04 m2, with a maximum length of 910 meters and a maximum width of 335 meters.	It is about 65837.97 m2, with a maximum length of 445 meters and a maximum width of 280 meters.	It is about 1070512.72 m2, with a maximum length of 2500 meters and a maximum width of 750 meters.	It is about 324486.08 m2, with a maximum length of 670 meters and a maximum width of 750 meters.
Neighborhood description	An area with two aspects, the first is a quiet neighborhood with few pedestrian and more cars, the second is a vibrant neighborhood with mixed uses that attract pedestrian.	New established neighborhood divided by the underground line into two parts, and connected to each other by two pedestrian bridges.	An administrative area which is rarely frequented by pedestrian. As for the pass by cars, they are speeding and drivers can't give attention to pedestrian.	A day-vibrant area consists of two residential neighborhoods with a large number of schools.
Planning	Planned	Planned	Planned	Planned




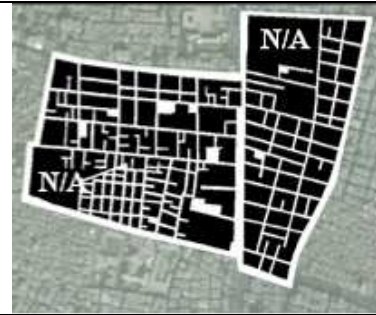
Population density	Low (less than 150 persons/feddan).	Low (less than 150 persons/feddan).	Low (less than 100 persons/feddan).	High (more than 150 persons/feddan).
	<p>Researchers divided into 3 groups: the first found that crowd could be a facilitator to criminal behavior, the second found the opposite relationship while the third found no-relationship between the two variables. Now, the second group's point of view will be taken as a criteria; since three of the four areas have low densities.</p>			
Blocks' scale	<b>x</b>	<b>x</b>	<b>x</b>	
				
	<p>■ Short blocks   ■ Long block</p>			
	<p>- Short blocks with a maximum length of 145 meters and a maximum width of 50 meters. - Long blocks represented by the metro line.</p>	<p>- Short blocks with a maximum length of 100 meters and a maximum width of 75 meters. - Long blocks with a maximum length of 1185 meters and a maximum width of 600 meters, in addition to the metro line.</p>	<p>- Short blocks with a maximum length of 175 meters and a maximum width of 35 meters. - Long blocks with a maximum length of 2050 meters and a maximum width of 425 meters, in addition to the metro line.</p>	<p>- Short blocks with a maximum length of 175 meters and a maximum width of 165 meters. - Long blocks with a maximum length of 220 meters and a maximum width of 153 meters.</p>
<p>According to Jacobs (1961), people don't like walking down long blocks, they walk only along the blocks on which they live or work. She found that short blocks offer people more navigation options, therefore, creating more viable spaces. Studies showed that an area with a maximum diameter of 200 meters can achieve that (Radwan, et al., 2005).</p>				
<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	
<p>It is worth mentioned that the four incidents took place beside the long blocks</p>				

Street network				
	Grid, radial patterns	Grid, dead-end streets	Grid, curvilinear patterns	Grid, dead-end streets
	Studies showed that grid pattern creates clearer and more direct routes, therefore, more potential targets expected. According to Brantinghams (1991), potential offenders find it easier to penetrate areas with predictable road networks. They found that areas with grid street layouts are more predictable than areas with winding roads, cul-de-sacs, or dead ends, therefore, more potential offenders expected. Since more potential offenders will see more potential targets, grid pattern tends to enhance crime opportunities.			
	x	x	x	x
Street design	-Trimmed landscaping. -Lighting and signage are sufficiently provided on primary streets, while they are limited on secondary and local streets.	-Heavy landscaping obstructs residents' surveillance. -Good lighting and signage.	-Trimmed landscaping. - Good lighting and signage.	-Lack of landscaping - Lighting and signage are sufficiently provided on primary streets, while they are limited on secondary and local streets.
	Landscaping, Lighting and signage can encourage crime as they can obstruct surveillance, become misleaders, be targets or means of crime.			
	x x	x		x x





	Studies also asserted that lack of uses –especially those attract different groups of people– creates free-of-people areas, especially at night, and therefore provides a good opportunity for offenders to commit their crimes (Jacobs, 1961).			
				x
	Studies also showed that the existence of wide vacant lands, green areas and parking lots within residential areas can affect negatively on the latter, since residents’ ability to watch what is happening within those pockets decreases. Researchers found that decreasing the depth of those pockets increases residents’ surveillance, therefore, decreases crime rates.			
	Streets and squares	Streets, the underground station and green areas	Streets, squares and green areas	Streets
	Studies showed that lack of public spaces –which create opportunities for positive social interactions between insiders and outsiders– decreases the natural surveillance, therefore increasing crime rates.			
				x
Public spaces				
	<span style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black; margin-right: 5px;"></span> <b>Public spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black; margin-left: 10px; margin-right: 5px;"></span> <b>Semi-public spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black; margin-left: 10px; margin-right: 5px;"></span> <b>Semi-private spaces</b> <span style="display: inline-block; width: 15px; height: 15px; background-color: grey; border: 1px solid black; margin-left: 10px;"></span> <b>Private spaces</b>			
	Analysis showed the absence of spaces’ hierarchy in some areas. It is noted that a few of semi-private spaces are directly connected to public spaces. It is also notable that private spaces are absent.	Analysis showed the absence of spaces’ hierarchy in some areas. It is noted that a few of semi-private and private spaces are directly connected to public spaces.	Analysis showed the absence of spaces’ hierarchy in some areas. It is noted that all streets are public. It is also notable that private spaces are directly connected to public spaces.	Analysis showed the absence of spaces’ hierarchy in some areas. It is noted that a few of semi-private spaces are directly connected to public spaces.

	Studies showed that the absence of spaces' hierarchy decreases the sense of neighborhood and discourages surveillance. According to Newman (1996), this hierarchy can be achieved by subdividing spaces from the most public to the most private. Between these extremes there would be semi-public space and semi-private space.			
	x	x	x	x
Urban fabric				
	Linear	Dot, linear patterns	Dot, linear patterns	Linear, compact patterns
Buildings height	8 to 10 stories	3 and 7 stories	1 and two stories	8 to 10 stories
	Studies showed that crime rates increase clearly with increasing buildings' height (more than 6 stories), since human becomes separated from the ground and lose his ability to control residential environment.			
Windows	x	x		x
	Windows provide a good surveillance for internal spaces. As for the outer roads, the diagonal position of some buildings obstructs residents' surveillance.	Heavy landscaping obstructs residents' surveillance in some areas, others –like the area between the industrial area and the metro line– lack of windows was observed.	Few windows are provided.	Windows provide a good surveillance for internal spaces and outer roads.
	Studies showed that decreasing windows which overlook public areas, entrances and pathways can facilitate crime, since residents' surveillance and their ability to control over what is happening in those areas decrease.			
	x	x	x	

Incident's location analysis	The neighborhood has two aspects, the first is a quiet neighborhood with few pedestrian and more cars (Ahmed Helmi street), the second is a vibrant one with mixed uses that attract pedestrian (Vectoria square). It is notable that the incident happened on the quiet side, helped by the diagonal position of buildings, in addition to the absence of surveillance from the other side of the road.	The neighborhood is divided by the underground line into two parts connected to each other by two pedestrian bridges which are rarely used. Over those bridges, human becomes separated from the ground which makes him more vulnerable to crime. It is also notable that the one where the incident occurred overlooking on a walled industrial area, therefore, lack of surveillance provided.	Despite the presence of policemen, the neighborhood suffers from the lack of surveillance, as the existed uses are walled and don't attract people, therefore, a few of pedestrian are provided, the pass by cars are speeding and drivers can't give attention to pedestrian. According to that, the neighborhood's nature has facilitated the incident's occurrence significantly.	Public services are distributed over the two neighborhoods which in turn allow the entry of outsiders. The first place collecting outsiders is the street separating the neighborhoods – Shopra street– where outsiders appear in large numbers, then they distribute over secondary and local streets in fewer numbers to inform their destination. Therefore, the possibility of criminal existence on main streets is higher.
General comments	<p>All of the four neighborhoods have:</p> <ul style="list-style-type: none"> <li>- Long blocks</li> <li>- Grid street network</li> <li>- Deficiencies in spaces' hierarchy</li> <li>- Linear fabric</li> </ul> <p>All of the four neighborhoods don't have :</p> <ul style="list-style-type: none"> <li>- Wide vacant lands</li> </ul>			
	<p>Three of the four areas have:</p> <ul style="list-style-type: none"> <li>- Population density less than 150 persons/ Feddan.</li> <li>- Mixed uses.</li> <li>- Buildings height more than 6 stories.</li> <li>- Lack of windows especially on surrounding roads.</li> <li>- Passed by metro line.</li> </ul> <p>Three of the four areas don't have:</p> <ul style="list-style-type: none"> <li>- Heavy landscaping obstructs surveillance.</li> </ul>			

Source: The author

**Chapter Six**  
**CONCLUSION AND**  
**RECOMMENDATIONS**

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- 6.1. INTRODUCTION**
- 6.2. CONCLUSION**
- 6.3. RECOMMENDATIONS**
  - 6.3.1. Improving The Urban Environment**
  - 6.3.2. Upgrading Of Population**
- 6.4. FUTURE STUDIES**

## **6. Conclusion and recommendations**

### **6.1. Introduction**

This chapter gives a summary of the study, presentation of its key findings and recommendations.

### **6.2. Conclusion**

This study has shown that crime can be deterred through different elements of the urban environment, which opens new doors for a variety of studies that can investigate crime in the Egyptian environment. For the purposes of this study, analyses were applied on both districts and neighborhoods levels.

For the districts level analysis, the main agglomeration's districts were selected for investigation because of the availability of data, accessibility, and the variety of socio-economic and physical conditions. It is worth mentioning that the methodology used in the analysis was the correlation between the crime rate of each of the selected districts and the rates obtained from different factors.

The social analysis has concluded that the increasing of socially deteriorated areas within a district makes it less vulnerable to crimes –although it is supposed to increase the district's criminals. The study showed that, on the one hand, the increasing of socially deteriorated areas within a district is considered an indicator of increasing the district's poverty rate. Since most criminals search for high standards of living areas to commit their crimes, these socially deteriorated areas become less vulnerable to crimes, therefore, increasing of socially deteriorated areas decreases the district's crime rate. On the other hand, although most of these districts help in creating criminals, most of the latter leave a buffer around their residence where they might be recognized. Therefore, increasing of socially deteriorated areas within a district increases the district's criminals, in addition to the increase of crimes committed within the adjacent ones.

Based on the previous explanation, the agglomeration districts have been classified as follows:

- Districts generating criminals rather than being vulnerable to crimes; including socially deteriorated districts with low crime rates.
- Districts attracting criminals rather than generating them; including socially developed districts with high crime rates.

- Districts attract and generate criminals at the same time; including both socially deteriorated districts with high crime rates and socially developed districts with low crime rates.

The physical analysis concluded that most criminals search for more accessible places, easier to move through and that provide higher opportunities for escape to commit their crimes; compared with their residence districts. In order to prove that, the study has concentrated on three of the "districts attracting criminals" including: Masr Al Gadida, Madinat Nasr 2<sup>nd</sup> and Dokki districts, and their corresponding in "districts generating criminals" including: Mataria, Manshyet Nasser and Bolaq Al Dakrour districts. The determination of syntactic values was reached using the UCL Depthmap software which was developed by Professor Bill Hillier and his colleagues at The Bartlett, University College London (UCL). The values derived were Global Integration, Integration R=3, Integration R=10, Connectivity, and Control. Based on the assumption that the higher integration values are associated with higher levels of movement –and eyes– at different scales, higher connectivity provide more escape routes, the correlation between the obtained syntactic variables and crime data showed that:

- The presence of more people within the “districts attracting criminals” appears to provide higher risks of being exposed to crimes. However, it appears to provide higher risks of detection and apprehension to potential criminals within the “districts generating criminals”. It can be concluded that the presence of people in general, provides safer places, while increasing their number in an exaggerated manner makes them more vulnerable to crimes especially that most criminals find it easier to commit their crimes in crowd and escape using crowds to impede victims and blending into them; this depends significantly on the residential culture.

This result has supported the findings of the previous researches that increasing movement and levels of activity has a double effect; it can produce more natural surveillance and safety in numbers and so reduce crime; and it may mean that potential criminals also use integrated streets, and so make more accessible locations more dangerous (Hillier, B. and Sahbaz, 2005).<sup>133</sup>

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<sup>133</sup> Hillier, B. and Sahbaz, O., 2005, *High resolution analysis of crime patterns in urban street*

- Correlations also showed that most crimes committed within the selected “attracting criminals districts” tend to occur within grid street patterns. This supports the assumptions that grid street layouts are more predictable than areas with winding roads, “cul-de-sacs”, or “dead ends”; therefore, more potential offenders are expected. Moreover, grid pattern creates clearer and more direct pedestrian routes, therefore more pedestrians are expected. Since more potential offenders will see more potential targets, grid streets tend to enhance certain crime opportunities (Brantingham, P.J. and P.L. Brantingham, 1991).<sup>134</sup>

The physical analysis also concluded that crime occurrence was affected by the existence of old deteriorated areas especially within districts attracting criminals and those attract and generate criminals at the same time. As for to the Informal housing areas, as an example of socially deteriorated areas, analysis showed that increasing of these areas within a district is considered an indicator of increasing the district’s poverty rate. Since most criminals search for high standards of living areas to commit their crimes, these areas become less vulnerable to crimes. But this doesn’t prevent the occurrence of certain crimes in those areas such as rape, helped by the high rates of poverty, the inability to bear the cost of marriage, In addition to the nature of those areas, which –on the one hand– provide opportunities to commit those types of incidents in some areas, and on the other hand, the position of buildings themselves don’t provide privacy to its residents, especially for women.

Concerning land uses, analysis concluded that most of the “districts attracting criminals” crimes are committed within their commercial areas, corresponded to industrial and agricultural areas for those “generating criminals”. These results have supported those obtained from space syntax analysis. On the one hand, it is obvious that commercial areas within the “districts attracting criminals” increases the number of people using the space, therefore, makes them more vulnerable to crime. On the other hand, industrial and agricultural uses within the “districts generating criminals” became vacant most of the day –especially at night, which leads to a

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*networks: an initial statistical sketch from an ongoing study of a London borough*", Proceedings of Fifth International Space Syntax Symposium, Netherlands, Delft: The Bartlett, UCL.

<sup>134</sup> Brantingham. P.J. and P.L. Brantingham, 1991, "Notes on the Geometry of Crime", In: P.J. Brantingham and P.L. Brantingham (eds.), “*Environmental Criminology*”, Prospect Heights. IL: Waveland Press.

cessation of informal surveillance; therefore, users of those places are more vulnerable to crime.

As for “districts generating and attracting criminals at the same time”, most of their crimes are committed within their commercial areas and cemeteries. This confirms that this type of districts contains a mixture of the other two types; as crimes tend to occur in both crowd and deserted areas.

For the neighborhoods scale analysis, the neighborhoods in which the Maadi’s serial killer committed his incidents were selected to be analyzed for the following reasons:

- The danger of the event itself and the panic occurred in some areas consequently,
- The clear definition of incidents’ locations, although some locations were not assigned an exact street address,
- All incidents are located within the main agglomeration limits,
- The diversity among the committed incidents locations (i.e. crowded and isolated places, some were within the police range others were not, etc.).

It is worth mentioning that the methodology used in the analysis depends on comparing the studied neighborhoods in two groups and extracting the common characteristics among them.

The study concluded that the incidents occurred within quiet and crowded, large and small, planned and unplanned, limited and mixed-uses neighborhoods with high and low population density. It is also evident that grid street network is an important factor in increasing crime rates. Analysis also showed that other factors can play a role in decreasing crime rates including population density, hierarchy of spaces, urban tissue, and building heights; it is notable that low population density, deficiencies in spaces’ hierarchy, linear tissues and more than 6 stories buildings enhanced incidents opportunities in three-quarters of the studied neighborhoods. As for the diversity of uses, its impact has emerged on the second group which contains incidents took place in main interval streets, while the first group was suffering from the lack of uses. This can be explained as diversity of uses has a role in decreasing crime opportunities within the neighborhood itself; however, it increases crime opportunities on the surrounding streets at the same time.

Comparing the results concluded from both districts and neighborhoods levels showed that improving the physical environment through good street



layout which induces the natural movement, in addition to, upgrading of population socio-economically (especially within the socially deteriorated areas) are the most informative tools in decreasing crime rates in the region.

### **6.3. Recommendations**

According to the findings of this research, recommendations –in order to provide a secured environment– have to cover two different processes: the first is to improve the urban environment, while the second includes the upgrading of population especially in the socially deteriorated districts.

#### **6.3.1. Improving the urban environment**

The researcher recommends that this process can be achieved through a set of parties which have to work with each other within the whole system. Those parties include:

##### **- Legislators**

Legislators -represented by the members of the People's Assembly and the Shura Council- need to work in two directions:

- a. The amendment of the existing laws or the enactment of new ones -whether related to the criminals themselves or the urban environment where those crimes were committed- in order to increase the effort of crime.
- b. Allocating more resources of the general budget to deliver public services and utilities to underserved areas especially, street lighting. Here comes the role of local governance as will be shown in the next point.

##### **- Local governance**

Local governance at different levels (governorates, markez, cities, districts and villages) has the responsibility to distribute those resources within their jurisdiction. It is recommended that this distribution covers three basic tasks:

- a. Survey areas suffering from bad living conditions and classify them according to their physical, social, economic conditions, etc.
- b. The establishment and management of all public services\utilities within socially\physically deteriorated areas.
- c. The quick removal of informal housing areas and their replacement with formal ones.

It is notable that the mentioned tasks depend on planners and designers significantly as will be shown in the next point.

- **Planners and designers**

They are the key factors for crime reduction through their cooperation with local governance and legislators. The result of this cooperation appears in identifying different design principles\measures to be adopted in laws or regulations, therefore secure the urban environment of future projects. It is worth mentioning that analysis of this research has recommended a set of principles\ measures which can be summarized as follows:

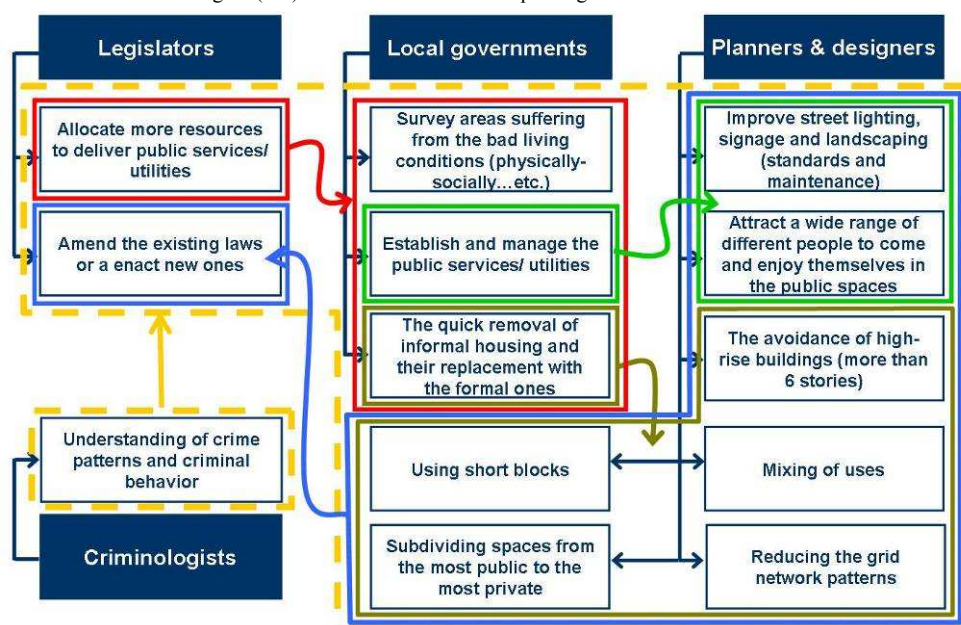
- a. Activating the role of both insiders and outsiders in maintaining natural surveillance through:
  - Mixing of uses in order to pool different groups of people at different times of the day, create opportunities for positive social interactions between insiders and outsiders; taking into account the avoidance of incongruous uses.
  - Subdividing spaces from the most public to the most private, and using different features such as planting, gateways and fences to promote territorial reinforcement. Designers also need to think more about how to attract a wide range of different people to the public spaces. One way of achieving this is simply through making such places beautiful which will draw people out of their homes to occupy and enjoy a sense of well-being in public urban spaces.
  - Using short blocks in order to provide more navigation options, therefore, creating more viable spaces.
  - Reducing the grid network patterns in both limited and exaggerated movement areas.
- b. Activating the role of insiders in maintaining natural surveillance through:
  - The avoidance of high-rise buildings (more than 6 stories).
  - Selecting appropriate types of landscaping, lightings, fences and their positions in order to enable surveillance.
- c. The fixation of lightings, electrical boxes, seats or any of street's furniture in the outer third of the pavement so as not to become climbing-aids.
- d. Provide adequate, easily legible signage to assist pedestrians –especially strangers– to find their way safely.

- **Criminologists**

Criminologists have to provide decision makers with a snapshot of criminality and criminal behavior which provide them with an understanding of crime patterns and trends. Without this understanding of both crime patterns and criminal behavior, people who have to make decisions that affect the safety and security of communities will not have access to the vital, synthesized information essential to good planning and strategy.

Figure (6-1) shows the recommended parties for improving the urban environment and their tasks.

Figure (6-1) Recommendations for improving the urban environment



Source: The author

**6.3.2. Upgrading of population**

The researcher recommends that this process can be achieved through organizations within different ministries by strengthening the sense of belonging and citizenship in the community, increasing social interactions among residents at different levels in addition to, building their capacity. This includes:

- **Ministry of education:**

- a. Strengthening the concepts of belonging and citizenship through the development of education curriculum in schools.

- b. Focusing on the role of the school in the process of education so as not to be restricted to curriculum issues and to be extended to monitor students' behavior in addition to, strengthening the relationship between home and school.
  - c. Giving attention to schools' activities -especially in summer- in order to reduce juvenile crimes and delinquency.
- **National council for youth**
    - a. Raising youth awareness about citizenship and the legal system through targeted programs.
    - b. The establishment of youth centers and sports clubs -in the underserved areas- to highlight the talents of young people and their abilities, in addition to strengthening social relationships among them.
    - c. Conducting training courses for youth employment through improving their skills and abilities; such as computer skills.
  - **Ministry of social solidarity:**
    - a. Raising families' awareness about citizenship and the legal system through targeted programs.
    - b. Encouragement of volunteer work as a mean of strengthening social relationships within community.
    - c. Conducting training courses for employment through improving residents' skills and abilities; such as crafts making, tailoring, etc.
- Finally, for both processes, organizations within ministry of interior have to:
- a. Improve law enforcement
  - b. Develop new strategies for crime reduction and present them to the legislative authorities.

#### **6.4. Future studies**

This work sheds light on the physical context and the socioeconomic factors that affect crime in the Greater Cairo Region in. This study has made an attempt to explore the issue that crime rate depends on social as well as physical factors. However, it may be premature to confirm this relationship, as the analysis didn't cover the entire region due to its wide scope.

This study has opened the door for variety of studies that can investigate crime in the Egyptian environment. For the future, a more detailed study is recommended with precise locations of incidents. Future research may also be conducted in the new urban communities' districts, villages and small

towns' districts or even other Egyptian cities and comparison can be made which may strengthen the findings of this study or may contradict it. Also more detailed study can be done by dividing the crime further by types, location and time, which will give a more detailed understanding of the crime patterns.

## Glossary

### Crime

Crime -as a word- originates from the Latin word *crīmen* meaning "charge (in law), guilt, accusation".<sup>1</sup> Generally, it is a term used for describing several behaviors and actions as follows:

- In legal terms, it is '*an act committed in violation of law*' (Dhimn, D., 2006).
- In social terms, it is '*breaking social norms*' (Elhatemy, 2007).
- In physical/architectural terms, it is '*an activity occurring usually in a public area,<sup>2</sup> damaging the physical environment; which, in turn, affects individuals, groups and communities*' (Radwan, M. et al., 2005,).

### Urban planning

It can be defined as the branch of architecture that deals with the organization of the city or other urban environment in terms of its physical, social, legal, economical, visual and environmental elements (Sensagent Dectonary, 2011).

### Urban environment

Studies define the urban environment as '*a mix of areas that have different physical prosperities and uses*' (Marzluff, J. M., 2008). Yet the urban environment is not only a physical environment; it is -first of all- a human environment built for humans by humans. Therefore, the urban environment can be defined according to the study as: the system that links society with the physical environment; including different social groups living in different conditions.

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<sup>1</sup> [Oxford English Dictionary](#), 2nd edition, 1989.

<sup>2</sup> Public area is the place which offers unrestricted accessibility to all humans in society (Salheen, M., 2001).

**Appendix A**  
**Example of Serious Crimes**  
**Occurred within The GCR**

➤ **Example of Serious Crimes Occurred within The GCR**

- October 2006, Incidents of sexual harassment at Cairo streets. During Eid Al-Fitr in central Cairo, large groups of men attacked several women in the street.
- December 2006, there was Maadi's killer or slayer, as newspapers named, who was choosing his victims from that quiet area and slashing them with a knife in the lower back part of their bodies to rape them then, disappear without being identified by anyone. His victims were teenage girls in the preparatory and secondary stages except the last victim who was in the 30s/40s.
- June 2008, a driver harassed a filmmaker, Noha Roushdy- 27 years old, in El- Khalifa El-Ma'moun Street, a vibrant street in Misr El-Gadida district, Cairo- before trying to drive away. She jumped onto the boot of his car and with the help of bystanders, forced him to go to a police station. In October 2008, Noha's case was the first sexual harassment case in the history of Egyptian courts which resulted in three-year prison sentence for the driver.

As a result of Noha's incident, The Egyptian Centre for Women's Rights surveyed a sample of 2021 Egyptian about sexual harassment on Egyptian streets; divided equally between male and female Egyptians (1010 females including 109 foreign women living or traveling in Egypt for different purposes and 1011males) distributed as follows:

Table (A-1) The ECWR sample

	Cairo		Giza		Qalyubia		Total
	Ain Shams	Shubra Masr	Imbaba	Dokki	Shubra	Banha	
<b>Male</b>	168	168	168	169	168	170	1011
<b>Female</b>	168	169	168	170	167	168	1010

Source: Shoukry, A. and Hassan, R. M., 2008

- According to the results of the study (Shoukry, A. and Hassan, R. M., 2008),
- 83% of Egyptian women reported exposure to harassment, while 98% of foreign women stated they had been sexually harassed while in Egypt:
    - 91.5% of Egyptian women and 96.3% of foreign women faced sexual harassment on the street, 57.6% and 58.9% on public transportation, 21.5%, 60.7% in malls and markets, 18.4%, 3.7% in educational institutions, 10.7%, 22.4% on beaches, 7.4% , 18.7% in parks and coffee shops, and 5.7%, 7.5% in the workplace.
    - 43.2 % of Egyptian women and 41.1% of foreign women didn't get help from people who witnessed the harassment incident.
  - 62.4% of the males surveyed confirmed that they committed and/or



continue to commit one or more of forms of harassment, and the majority of these incidents take place in public places:

- 69% on the streets, 49.1% on public transportation, 42.4% in parks and coffee shops, 29% in educational institutions, 19.8% on beaches, and 6.2% in the workplace.

ECWR recommended an increase in awareness of sexual harassment, better documentation of sexual harassment complaints and an easy method for women to report incidents in order to decrease the sexual harassment in Egyptian streets. Therefore, ECWR implemented, in cooperation with NiJeL (community based mapping organization), a mapping system for reporting incidences of sexual harassment via SMS messaging, called HarassMap. This tool will give women a way to anonymously report incidences of sexual harassment as soon as they happen, using a simple text message from their mobile phone. By mapping these reports online, the entire system will act as an advocacy, prevention, and response tool, highlighting the severity and pervasiveness of the problem. The main goal of using this system is to provide security police with data on "hotspots" for sexual harassment so that, they can increase their presence in these areas, thereby reducing the incidence of public sexual harassment and better protect citizens (The Egyptian Centre for Women's Rights (ECWR) and NiJeL, 2009).

- September 2008, Attempted murder of Ayten El-Mougy, a TV presenter, in her apartment in one of Sixth of October city's compounds by her building's guard; although his main purpose was stealing. According to Ayten's interview in a TV program, the building in which her apartment is located has two entrances and it wasn't inhabited at that time except her apartment which occupies the third floor and the roof. She explained that, the guard stepped from the secondary entrance to the service rooms in the roof, jumped over to the adjacent apartment roof then to hers; they are separated by a low wall. Then, he got into the apartment through the feeble roof door. Because of the guard's work, he knows a lot about, or in another word he has fresh mental maps of the apartments he secures, which in turn facilitated going directly to the master bedroom searching for money or jewelry. During his search, Ayten woke up scared so he assaulted her in the face with a sharp tool and broke the bones of her face entirely.
- November 2008, Heba and Nadine, two university students, were murdered at Nadine's villa in one of 6<sup>th</sup> October City's compounds. The murderer, who was working at the compound as a blacksmith, broke into the house to steal valuables and did not expect to find anyone inside. The most important observation was the way he used to enter the villa. He jumped on an electricity box beside the villa's fence, he waited for an hour

and a half in the backyard of the house before climbing through the partially open living room window via a tree and sewer pipes; the quietness of the place helped him to get in without being seen.

According to Dr. Mohamed Abdel Moneim Shalaby, an expert at the National Center for Social and Criminological in Egypt and a specialist in the sociology of futures, commented that gated communities are like someone who wants to maintain his health in spite of living in contaminated environment, wants to eat healthy food and breathe clean air, although the ocean around is full of microbes and germs and pollutants, etc. It is useless to have gated communities, and there are millions of surrounded people suffering from poverty and hunger. He also commented that in spite of trying to protect themselves in these isolated communities, those people need services' workers, such as an electrician, a plumber, a maid, etc. from these surrounded communities. So the idea of isolation is impossible. He also referred to the weak social relationships between residents in all neighborhoods, not in gated communities only. He supposed that's because people are afraid from each other. They can't expect the reactions while intervention, and may be that's why neighbors didn't help Heba and Nadine although hearing them screaming.

**Appendix B**  
**The Theory of Space Syntax**

### ➤ **Introduction**

Space syntax is a set of techniques for the analysis of spatial configurations of all kinds especially where spatial configuration seems to be a significant aspect of human affairs. It was developed by Professor Bill Hillier and his colleagues at The Bartlett, UCL in the 1980s as a tool to help architects simulate the likely effects of their designs. It has since grown to become a tool used around the world in a variety of research and areas and design applications. It has been extensively applied in the fields of architecture, urban design, planning, transportation and interior design. Space syntax has also been widely used for pedestrian modeling, crime analysis, traffic pollution control, and way-finding processes.<sup>1</sup>

The software is available for academic use only, but provided free of charge. Researchers must register and submit evidence of academic affiliation. The verification process may take up to 3 weeks depending on the accuracy of the details provided. There are currently three software packages available:

1- Confeego: runs inside the MapInfo Professional GIS, version (6.5) or higher, to facilitate three analytical tasks: calculating point depth, integration and associated measures, and graphically exploring relationships between spatial maps and associated statistical plots.

2- UCL Depthmap: a standalone application that runs on Windows (2000 and XP), but also functions on (95/98/NT) to perform visibility analysis of architectural and urban systems, generation and analysis of axial maps, as well as, segment analysis.

3- Macintosh Bundle: contains the classic space syntax standalone applications for Macintosh.

### ➤ **Concept and methodology**

It was built on the theory of the social logic of space (Hillier and Hanson, 1984) which presents a general theory of how people relate to space in built environments and the impact of space on social behavior and relationships. Since that time, Space syntax was developed depending on two formal ideas which try to reflect both the objectivity of space and our intuitive engagement with it (Hillier, B. and Vaughan, L., 2007):

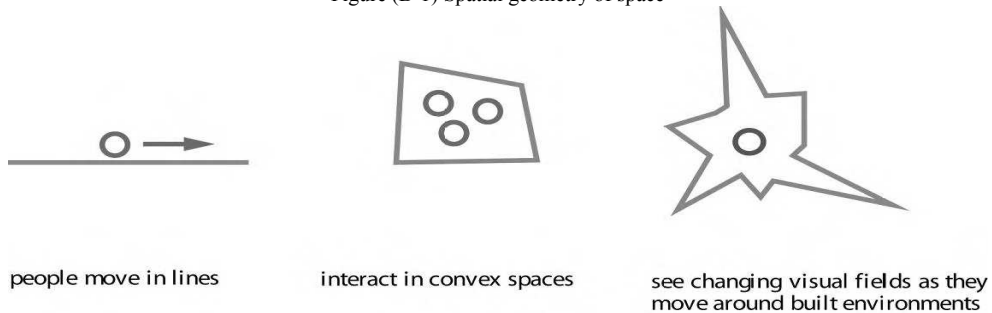
1- The first is that we should think of space not as the background to human activity, but, as an intrinsic aspect of everything human beings do in the

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<sup>1</sup> Space Syntax Laboratory website, Available at <http://www.spacesyntax.org> [accessed on 20 January 2010].

sense that moving through space, interacting with other people in space, or even just seeing ambient space from a point in it, all have a spatial geometry: movement is essentially linear, interaction requires a convex space in which all points can see all others, and from any point in space we see a variably shaped, often spiky, visual field called an isovist.

Figure (B-1) Spatial geometry of space

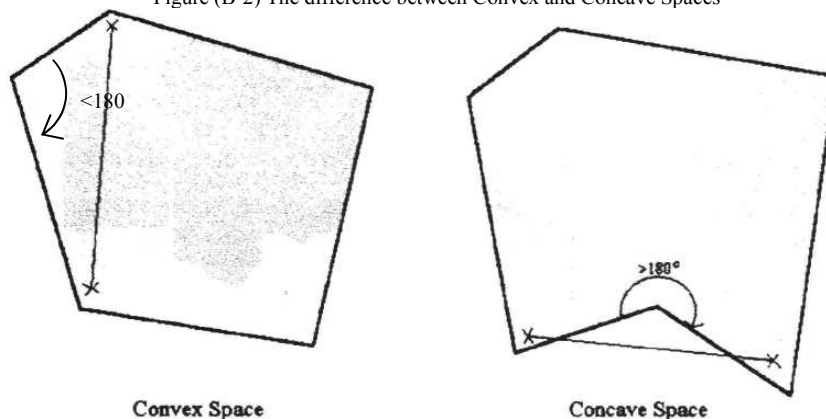


Source: Hillier, B. and Vaughan, L., 2007

#### a- Convex space

A convex space is a space describing where you are in the system, within which all points are directly visible and accessible from all other points. There are no hiding places; meaning that all the points within the space can be joined to all the others without passing outside the boundary of the space. In other words it is an area outlined by a border of straight lines each with interior angles of less 180 degrees (Dhimn, D., 2006). If an angle exceeds than 180 degrees or the joining line passing outside, the space must be concave and must be divided into the least possible number of convex spaces. Figure (B-2) illustrates the difference between convex and concave spaces. A convex map is a set of fattest and fewest convex spaces covering the system (Lam, K. S., 2007).

Figure (B-2) The difference between Convex and Concave Spaces



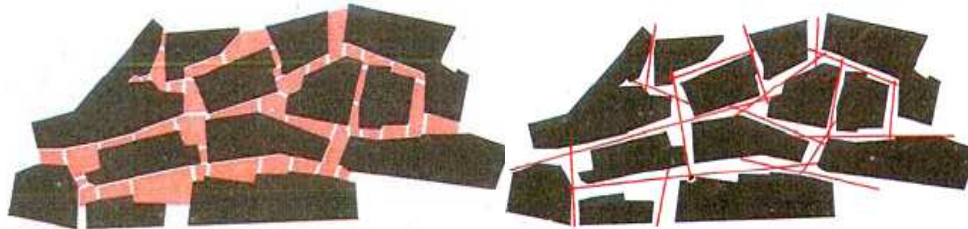
Source: Dhimn, D., 2006, p.26

### b- Axial line

An axial line is identified as the longest possible straight line that penetrates at least one convex space and gives information about where you might be going. It is the most globalized space because it extends as long as there is at least one point visible and directly accessible, while a convex space is the most localized since it extends only so far as is consistent with every point being visible and directly accessible to every other point.

An axial map is a set of longest and fewest straight lines that go through all convex spaces and make all axial links, so to pass from each line to any other line you must pass through a minimum number of intervening lines (Lam, K. S., 2007). Figure (B-3) shows an example of convex and axial maps.

Figure (B-3) Example of convex map (left) and axial map (right)

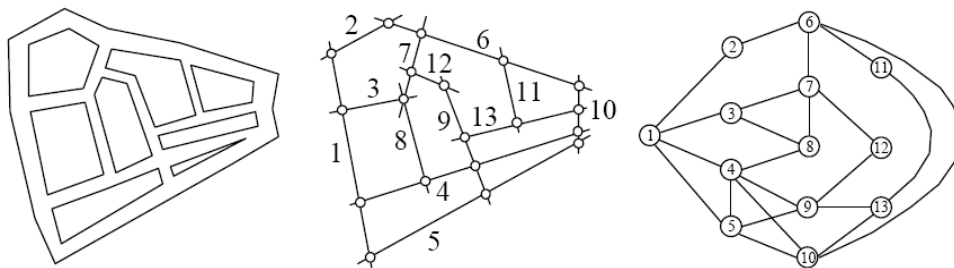


Source: Lam, K. S., 2007, p. 5

In this thesis, axial maps will be used to identify the relationship between networks pattern and crime rate.

2- The second idea is that human space is not just about the properties of individual spaces, but about the interrelations between the many spaces that make up the spatial layout of a building or a city. These interrelations can be presented by a justified graph, in which each circle is an axial line, and each linking line is a connectivity relation. The graph is aligned upwards by placing a circle representing a specific line of the system on an imaginary baseline, then aligning all the other lines on levels above. The justified graph then leads to the measure of depth.

Figure (B-4) Urban system with Plan (on left), axial map (center), and Graph (right) showing relationship between configured space



Source: Dhimm, D., 2006, p.27

Depth as a syntax measure is defined as the least number of syntactic steps that are needed to reach from one line to another; the number of steps refers

to changes in direction. The mean depth can be calculated from the justified graph by multiplying the number of lines on a level by the level number, summing across levels and dividing by the number of levels in the system. This value reflects the integration value for a line; the least the number shows shallower in the graph and more integrated, whereas larger the number indicates deeper in the graph and tends more segregated.

In addition to the Depth, Syntax also applies other measures<sup>2</sup> including (Dhimm, D., 2006):

- Integration: the most important global measure which reflects the mean depth of every line from each line in the system. The integration value is inversely related to the mean depth and is often associated with “easy to get to” in terms of accessibility/proximity. It can be measured on two levels:

1. Global integration: measures the relationship of every line to all other lines in the system no matter how far they go as long as they are connected forming a web of axial lines. In general, towns are arranged in such a way as to privilege certain spaces with respect to each other; a town square or main street is generally more accessible than other isolated areas and hence, has higher integration value.
2. Local integration: measures the relationship of every line to all other lines that are within specified steps or levels away from the lines being measured. It is mainly used for pedestrian movement (R=3) that is three changes in the direction of movement in order to reach the destination, and for vehicular movement (R=10), which also represents a localized picture of integration but at a larger scale, closer to global integration.

The concept of integration became a central point in all implications of the theory and methodology of space syntax. For example, integrated sites became desirable locations for retail and other public services due to their high accessibility, while segregated sites are likely to become potential places for crime due to their low accessibility (Salheen, M., 2001). However that shouldn't mean that segregation is always negative and should be avoided. This will be explained in the next point.

- Connectivity: a local measure often associated with escape routes. It can be identified as the number of lines which are only one step away from each line in the system. In other words, it is the number of lines directly intersects with each line. It is notable that connectivity is always a positive real number that is (1) or more.

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<sup>2</sup> Measures used within this thesis, others are available but not mentioned.

### ➤ **Space syntax and crime**

In the past decade, researchers have begun to devote attention to the effect of configurational properties on crime. Such studies found correlations between measures of Space Syntax, and crime in residential neighborhoods. Hillier and Shu, 2000, investigated burglary incidents' location and space syntax measures of three areas in the UK selected to be socially and spatially different from each other, so that any relationships between crime and space across the areas are unlikely to be due to social factors. Results confirmed that most crimes occurred in visually broken-up and spatially relatively segregated spaces. In 2003, Shu and Huang investigated the influence of spatial configuration on the distribution of burglary of residential neighborhoods in Taiwan. Their findings showed that segregated areas, allowing fewer passers-by to enter the areas, turned out to be more vulnerable than integrated ones. This is particularly pronounced in the middle and low-income areas.

However, not all space syntax research has supported these findings. Nubani and Wineman, 2005, on their study of Ypsilanti, a city located within the Metropolitan Detroit area in Michigan, found that, unlike previous studies by Hillier & Shu, both local integration and connectivity were highly associated with overall crime counts, thus, street spaces that had low integration values were safer. They commented that neighborhoods that offered highly accessible routes to their residents apparently also offered criminals easy routes of escape.

In the same year, 2005, Hillier and Sahbaz<sup>3</sup> published a paper of their study of residential burglary and street robbery in the street network of a London borough. They explained that urban integration and the increase of movement has a double effect: it can produce more natural surveillance and safety in numbers and so reduce crime, and it may mean that potential criminals also use integrated streets and so make more accessible locations more dangerous. They also mentioned that this effect depends on the residential culture.

### ➤ **Advantages and disadvantages**

According to Hillier, 2002, there are several reasons why space syntax is the right instrument for investigating urban crime patterns including;

- It gives a pretty reliable indication of movement potentials, thus it can be use it as a surrogate to investigate the likely effect of movement on crime.
- It can be used to give spatial variables the same numerical status as non-spatial social and economic variables; in this way we can compare the

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<sup>3</sup> Hillier, B. and Sahbaz, O., 2005, "*High resolution analysis of crime patterns in urban street networks: an initial statistical sketch from an ongoing study of a London borough*", Proceedings of Fifth International Space Syntax Symposium, Netherlands, Delft: The Bartlett, UCL.



effect of space and the effect of socio-economic variables. Therefore, space can be an equal partner in multivariate analysis.

- Space syntax allows us to investigate not only the differences between areas, but also the micro-patterns of differences within areas, using the same methodology. Since the latter is much less likely to be susceptible to social processes than the former, if we find comparable spatial effects at both levels, they are not likely to be social effects in disguise.

As for using the space syntax itself, away from its methodology, the main advantages lie in:

- The software is provided free of charge.
- It can generate automatic axial maps, or it can be imported from a drawing file (dxf, ntf, gml or cat format), a text file (txt format), or MapInfo map (mif format).
- The map can be edited after importing into the program, or even after being generated by the program itself.
- Data can be exported in two formats, either as a text file, or a MapInfo (MIF/MID) file combination. The (txt format) can be converted through ArcGIS into (dxf, dwg, shp, etc.) formats.

But this does not preclude the presence of some disadvantages, which include;

- The software is available for academic use only. Researchers must register and submit evidence of academic affiliation. The verification process may take up to 3 weeks depending on the accuracy of the details provided.
- The automatic generation of axial maps requires a closed border map and it may be preferred for simple plans, while complex plans take too long to be generated, and hand-drawing may be easier.
- Handwriting procedure isn't accurate as there is no snapping. It is difficult to guarantee that two axial maps by two different people (or one person at different times) are the same. This imposes a significant doubt on its validity for various applications.
- After editing, the analysis measures must be reanalyzed to find the new values; measures not updated.

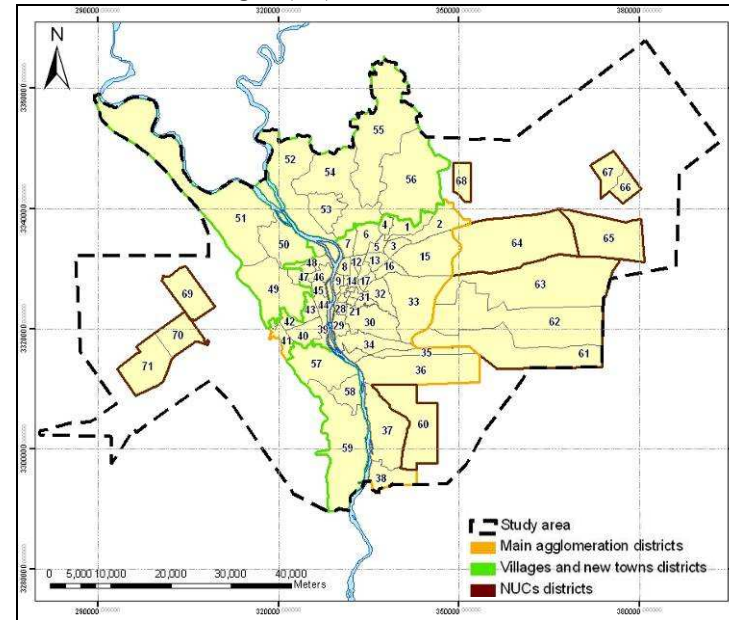
**Appendix C**

**THE GREATER CAIRO REGION DATA**

Table (C-1) GCR districts

#	Qism	#	Qism		
1	Al-Marg	Cairo	37	Helwan	
2	Al-Salam	Cairo	38	Al tebin	Helwan
3	Ain Shams	Cairo	39	Giza-Qism	Giza
4	Al-Khsos	Qaluibyea	40	Al-Omrania	Giza
5	Al Mataria	Cairo	41	Al-Ahram	Giza
6	Shobra Al Khaima 2 <sup>nd</sup>	Qaluibyea	42	Al-Ahram	6th of October
7	Shubra Al Khaima 1 <sup>st</sup>	Qaluibyea	43	Bolaq Al dakrour	Giza
8	Al Sahel	Cairo	44	Dokki	Giza
9	Rod Al-Farag	Cairo	45	Al-Aagouza	Giza
10	Shobra	Cairo	46	Imbaba-Qism	Giza
11	Sharabia	Cairo	47	Al waraq	6th of October
12	Al-Zawya Al Hamra	Cairo	48	Al waraq	Giza
13	Al Zaitoun	Cairo	49	Kerdasa	6th of October
14	Hadayeq Al Qoba	Cairo	50	Ausim	6th of October
15	Nozha	Cairo	51	Imbaba-Markaz	6th of October
16	Masr Al Gadida	Cairo	52	Al qanater Al khairia	Qaluibyea
17	Al Wayli	Cairo	53	Qalube Qism	Qaluibyea
18	Al Zaher	Cairo	54	Qalube Markaz	Qaluibyea
19	Bab Al-Shairia	Cairo	55	Shibin Al Qanater	Qaluibyea
20	Al gammalia	Cairo	56	Al Khanka	Qaluibyea
21	Al-Darb Al-Ahmar	Cairo	57	Giza-Markaz	6th of October
22	Al-Mouski	Cairo	58	Al-Hawamdia	6th of October
23	Al-Azbakeya	Cairo	59	Al-Badrashin	6th of October
24	Bolaq	Cairo	60	15th of May	Helwan
25	Zamalik	Cairo	61	New cairo 3 <sup>rd</sup>	Helwan
26	Qasr Al-Niel	Cairo	62	New cairo 1 <sup>st</sup>	Helwan
27	Abdin	Cairo	63	New cairo 2 <sup>nd</sup>	Helwan
28	Al-Sayeda Zainab	Cairo	64	Alshrouk	Helwan
29	Masr Al-Qadima	Cairo	65	Badr	Helwan
30	Al-Khalifa	Cairo	66	10th of Ramadan 1 <sup>st</sup>	Sharkia
31	Monshat Naser	Cairo	67	10th of Ramadan 2 <sup>nd</sup>	Sharkia
32	Madinat Nasr 2 <sup>nd</sup>	Cairo	68	Al Obour	Qaluibyea
33	Madinat Nasr 1 <sup>st</sup>	Cairo	69	Al-Sheikh Zayed	6th of October
34	Al-Basatine	Cairo	70	6th of October 1 <sup>st</sup>	6th of October
35	Al-Maadi	Helwan	71	6th of October 2 <sup>nd</sup>	6th of October
36	Tora	Helwan			

Figure (C-1) GCR districts



**Table (C-2) Social characteristics**

#	Qism	Social characteristics							
		Illiteracy	Unemployment	Internal Migration	Average Family	Rate Scramble	Population	Area	Population Density
1	Al-Marg	22.47	10.19	13.94	4.00	1.14	507035	16756130.28	30259.67
2	Al-Salam	20.39	9.05	13.39	3.94	1.21	548458	31013801.42	17684.32
3	Ain Shams	14.46	12.23	12.53	3.92	1.12	525034	8327858.29	63045.50
4	Al-Khsos	26.43	4.95	47.12	3.92	1.10	291242	5841045.26	49861.28
5	Al Mataria	19.29	13.69	10.94	3.93	1.18	498663	6227312.44	80076.76
6	Shobra Al Khaima 2 <sup>nd</sup>	22.36	11.83	25.55	4.00	1.16	461689	10491886.89	44004.38
7	Shubra Al Khaima 1 <sup>st</sup>	24.94	11.67	24.26	4.04	1.20	563880	17233404.39	32720.17
8	Al Sahel	15.78	13.07	7.64	3.52	1.04	305322	5521895.17	55292.97
9	Rod Al-Farag	20.68	11.31	7.94	3.40	1.05	144510	2582122.98	55965.58
10	Shobra	19.26	12.44	8.43	3.40	1.05	71118	1338737.70	53123.18
11	Sharabia	27.75	14.29	8.99	3.78	1.29	215595	3691147.96	58408.66
12	Al-Zawya Al Hamra	23.02	14.65	11.46	3.94	1.19	315465	4951875.73	63706.16
13	Al Zaitoun	13.40	13.20	12.30	3.69	1.07	322317	8206638.59	39275.15
14	Hadayeq Al Qoba	18.86	13.72	11.29	3.68	1.13	289758	3947568.27	73401.64
15	Nozha	4.98	8.04	15.53	3.31	0.87	161946	59031624.01	2743.38
16	Masr Al Gadida	6.31	8.48	16.48	3.31	0.83	113611	9154341.63	12410.61
17	Al Wayli	14.66	6.11	7.89	3.40	0.99	77649	4977615.57	15599.64
18	Al Zaher	10.16	9.91	8.70	3.44	0.95	64009	1970042.62	32491.18
19	Bab Al-Shairia	24.30	7.30	4.43	3.61	1.13	54084	979240.66	55230.55
20	Al gammalia	27.08	7.83	3.93	3.60	1.18	49834	2041764.19	24407.32
21	Al-Darb Al-Ahmar	22.86	8.55	4.72	3.71	1.12	60488	1862374.99	32478.96
22	Al-Mouski	27.17	8.16	6.38	3.40	1.05	22294	810342.23	27511.83
23	Al-Azbakeya	14.62	7.77	6.07	3.19	0.93	28033	1438320.65	19490.09
24	Bolaq	31.54	5.94	6.12	3.31	1.27	62470	2295669.09	27212.11
25-26	Qasr Al-Niel +Zamalik	4.39	5.76	14.63	2.42	0.56	27400	3951917.80	6933.34
27	Abdin	14.47	5.94	10.41	3.13	0.92	42223	1687723.20	25017.73
28	Al-Sayeda Zainab	18.37	9.33	6.72	3.47	1.08	132249	3690040.21	35839.45
29	Masr Al-Qadima	28.97	9.61	8.27	3.52	1.13	217390	10122156.44	21476.65
30	Al-Khalifa	22.60	6.64	9.96	3.75	1.21	239549	38877302.68	6161.67
31	Monshat Naser	47.05	4.31	11.99	3.91	1.51	262050	5553957.06	47182.58
32	Madinat Nasr 2 <sup>nd</sup>	12.33	13.85	17.74	3.91	1.14	75917	17303732.19	4387.32
33	Madinat Nasr 1 <sup>st</sup>	6.75	9.14	21.84	3.69	1.00	501597	73762349.42	6800.18

34	Al-Basatine	21.67	11.83	10.69	3.96	1.17	822513	29786831.80	27613.31
35	Al-Maadi	7.43	10.44	13.09	3.32	0.87	78122	25055735.46	3117.93
36-37	Tora + Helwan	20.84	13.97	13.37	3.91	1.18	743678	160551375.42	4632.03
38	Al tebin	25.50	18.82	16.31	4.36	1.33	68897	25650771.18	2685.96
39	Giza-Qism	25.05	11.99	11.59	3.82	1.14	251596	11255011.38	22354.13
40	Al-Omrania	14.83	11.09	25.50	3.86	1.09	726384	17525590.29	41447.05
41-42	Al-Ahram	22.50	11.83	19.16	3.97	1.12	302922	20097574.72	15072.56
43	Bolaq Al Dakroul	18.87	12.22	13.86	3.92	1.15	569227	9223171.21	61717.06
44	Dokki	6.37	6.76	22.95	3.23	0.80	93834	5092196.13	18427.02
45	Al-Agouza	12.32	10.77	29.23	3.43	0.91	160003	5266755.92	30379.80
46	Imbaba-Qism	21.73	10.07	19.34	3.98	1.19	598882	8377157.35	71489.88
47-48	Al waraq	28.84	8.78	19.18	3.96	1.17	509129	25556979.19	19921.33
49	Kerdasa	31.14	9.01	19.28	4.11	1.17	511446	75423408.51	6781.00
50	Ausim	33.72	6.59	4.07	4.32	1.29	275059	52920336.01	5197.60
51	Imbaba-Markaz	38.10	9.01	0.79	4.13	1.15	391363	204702871.41	1911.86
52	Al qanater Al khairia	32.22	10.31	6.06	4.19	1.19	383102	100434696.16	3814.44
53	Qalube Qism	27.99	13.06	1.44	3.90	1.09	107303	27980653.27	3834.90
54	Qalube Markaz	35.73	6.68	8.09	4.05	1.14	365892	94080864.85	3889.12
55	Shibin Al Qanater	31.35	7.69	2.12	4.28	1.14	423783	142674126.63	2970.29
56	Al Khanka	30.31	8.18	22.25	4.08	1.15	436091	122176023.04	3569.37
57	Giza-Markaz	39.04	8.41	7.95	4.23	1.23	241506	56335240.25	4286.94
58	Al-Hawamdia	27.13	11.98	6.23	4.19	1.18	140408	19798183.59	7091.96
59	Al-Badrashin	40.40	6.13	1.45	4.20	1.13	383610	117103334.91	3275.82
60	15th of May	7.91	10.58	17.55	4.18	1.27	90740	80734672.38	1123.93
61	New cairo 3 <sup>rd</sup>	14.52	8.93	30.54	4.14	1.30	54344	116800215.65	465.27
62	New cairo 1 <sup>st</sup>	12.49	8.02	39.73	3.72	0.98	27990	168687881.07	165.93
63	New cairo 2 <sup>nd</sup>	4.04	6.39	23.29	3.55	1.00	40005	178969971.36	223.53
64	Alshrouk	8.27	7.26	26.67	3.91	1.20	22570	159811298.54	141.23
65	Badr	23.38	7.84	28.40	3.98	1.38	17158	79287366.63	216.40
66	10th of Ramadan 1 <sup>st</sup>	9.80	7.35	69.10	4.37	1.20	58986	15709911.46	3754.70
67	10th of Ramadan 2 <sup>nd</sup>	11.53	5.48	42.31	4.02	1.20	66934	22708543.22	2947.53
68	Al Obour	10.81	6.20	86.52	3.98	1.17	43600	17158561.55	2541.01
69	Al-Sheikh Zayed	8.09	3.17	86.88	3.55	1.01	29422	39100271.03	752.48
70	6th of October 1 <sup>st</sup>	7.91	7.53	64.08	3.51	0.95	38791	32609508.53	1189.56
71	6th of October 2 <sup>nd</sup>	12.01	7.16	68.69	3.90	1.22	115302	52867197.88	2180.97

Modified according to the PSB's reports (see pages 166, 167)

**Table (C-3) Average crime incidents “over Egypt”**

#	Governorates	Crimes against person					Crimes against property					Total
		Homicide and Attempted murder	Kidnapping	Sexual harassment and Rape	Serious Assaults	Total	Robbery	Arson	Car theft	Burglary	Total	
1	Cairo	41.2	7.6	37.6	49.6	136.0	76.2	13.4	1188.4	4980.2	6258.2	6394.2
2	Giza	50.0	2.0	10.6	23.4	86.0	33.6	9.2	541.2	2217.0	2801.0	2887.0
3	Kalyoubia	32.2	1.2	3.2	20.4	57.0	17.6	1.0	165.2	233.0	416.8	473.8
4	Alexandria	26.2	1.6	6.8	36.2	70.8	28.0	6.6	510.6	2260.2	2805.4	2876.2
5	Matrouh	5.8	0.6	1.6	0.4	8.4	1.4	0.4	12.6	300.6	315.0	323.4
6	Behera	44.8	1.0	2.8	15.2	63.8	16.2	1.0	140.4	230.4	388.0	451.8
7	Kafr ElSheikh	14.0	0.2	3.6	8.0	25.8	9.2	3.4	31.8	185.6	230.0	255.8
8	Gharbia	43.6	5.2	19.8	34.0	102.6	122.8	27.8	126.2	243.2	520.0	622.6
9	Menoufia	25.4	0.2	9.2	10.6	45.4	15.6	10.4	46.8	242.6	315.4	360.8
10	Damietta	6.4	0.4	4.0	8.2	19.0	5.4	1.8	33.4	39.2	79.8	98.8
11	Dakahlia	36.0	1.4	14.8	20.0	72.2	38.4	7.8	125.2	848.2	1019.6	1091.8
12	Sharkia	29.2	1.4	9.0	24.6	64.2	12.4	7.0	158.4	169.0	346.8	411.0
13	Port-Said	5.8	0.4	6.6	11.4	24.2	11.8	3.0	43.4	287.6	345.8	370.0
14	Ismailia	17.0	2.0	7.2	6.8	33.0	42.2	5.4	52.2	135.6	235.4	268.4
15	Suez	6.0	0.2	4.0	2.2	12.4	9.8	2.2	29.8	42.6	84.4	96.8
16	North Sinai	7.6	0.0	1.8	0.6	10.0	6.6	0.6	10.2	44.2	61.6	71.6
17	South Sinai	2.8	0.4	3.2	0.0	6.4	2.8	0.4	3.4	58.8	65.4	71.8
18	Fayoum	21.4	1.0	4.4	8.4	35.2	16.0	4.2	13.8	32.4	66.4	101.6
19	Beni-Suef	24.8	0.6	8.8	10.2	44.4	12.0	2.8	6.8	85.6	107.2	151.6
20	Menia	52.2	0.6	4.6	18.8	76.2	21.4	5.8	14.4	159.8	201.4	277.6
21	Asyout	94.0	1.0	5.6	17.0	117.6	17.2	10.8	19.2	181.2	228.4	346.0
22	ElWadi ElGidid	0.8	0.0	0.6	0.2	1.6	0.2	0.8	0.6	17.8	19.4	21.0
23	Suhag	42.0	0.8	6.6	12.2	61.6	15.4	3.8	10.6	143.2	173.0	234.6
24	Qena	41.4	0.0	4.2	12.4	58.0	8.0	6.2	15.2	53.8	83.2	141.2
25	Aswan	11.8	0.0	5.8	8.4	26.0	8.8	5.2	13.8	68.0	95.8	121.8
26	Red Sea	3.4	0.4	20.8	1.6	26.2	5.6	2.0	7.0	157.4	172.0	198.2
27	Luxor	1.2	0.0	0.6	2.2	4.0	0.8	0.4	3.8	26.0	31.0	35.0
	Total	687.0	30.2	207.8	363.0	1288.0	555.4	143.4	3324.4	13443.2	17466.4	18754.4

**Table (C-4) Average crime incidents “over the GCR”**

#	Qism	Crimes against person					Crimes against property								Total
		Homicide and attempted murder	Kidnaping	Sexual harassment	Rape	Total	Robbery	Arson	House-breaking	Shop-lifting	Car theft	Rusting	Pickpocketing	Total	
1	Al-Marg	3.2	0.4	0.2	0.4	4.2	2.4	0.0	154.0	68.8	38.6	0.8	17.0	281.6	285.8
2	Al-Salam	3.6	0.2	0.6	1.0	5.4	2.2	0.2	82.0	68.4	72.0	2.2	30.2	257.2	262.6
2	Al-Salam 2 <sup>nd</sup>	0.4	0.6	0.8	0.4	2.2	1.4	0.0	4.4	3.8	2.0	0.0	0.0	11.6	13.8
3	Ain Shams	2.2	0.2	0.8	0.6	3.8	3.4	1.0	178.4	111.0	65.0	1.0	40.2	400.0	403.8
4	Al-Khsos	0.8	0.0	0.0	0.2	1.0	1.2	0.0	15.6	5.6	10.2	0.4	1.2	34.2	35.2
5	Al Mataria	1.2	0.0	1.0	1.6	3.8	1.6	0.6	98.6	55.6	10.8	0.2	34.0	201.4	205.2
6	Shobra Al Khaima 2 <sup>nd</sup>	4.2	0.0	0.2	0.0	4.4	1.8	0.4	9.8	5.0	14.6	0.0	23.6	55.2	59.6
7	Shubra Al Khaima 1 <sup>st</sup>	5.4	0.4	0.2	0.0	6.0	3.0	0.0	6.0	3.6	25.2	0.0	10.0	47.8	53.8
8	Al Sahel	0.6	0.0	0.6	0.2	1.4	0.8	0.4	49.8	19.6	19.8	0.0	18.4	108.8	110.2
9	Rod Al-Farag	1.0	0.2	0.8	0.2	2.2	0.4	0.2	79.4	29.4	17.8	0.2	10.2	137.6	139.8
10	Shobra	0.2	0.4	0.2	0.0	0.8	1.6	0.4	72.2	22.0	10.6	0.0	18.0	124.8	125.6
11	Sharabia	0.6	0.0	0.2	0.2	1.0	0.2	0.0	64.8	43.8	5.8	0.0	7.2	121.8	122.8
12	Al-Zawya Al Hamra	0.2	0.2	0.4	0.2	1.0	0.0	0.2	100.6	72.8	13.8	0.6	12.8	200.8	201.8
12	Al-Ameria	0.8	0.0	0.2	0.2	1.2	0.2	0.0	18.0	13.0	7.0	0.0	2.6	40.8	42.0
13	Al Zaitoun	1.2	0.0	0.6	0.0	1.8	1.4	1.0	51.0	26.0	66.6	0.2	21.4	167.6	169.4
14	Hadayeq Al Qoba	1.0	0.4	0.4	0.2	2.0	1.8	0.4	55.6	37.8	43.6	0.2	22.4	161.8	163.8
15	Nozha	1.4	0.6	0.8	0.4	3.2	5.2	0.4	77.0	21.8	126.8	0.0	20.6	251.8	255.0
16	Masr Al Gadida	1.4	0.2	1.2	0.2	3.0	5.2	0.4	99.6	69.0	119.8	0.0	14.0	308.0	311.0
17	Al Wayli	0.4	0.4	0.6	0.4	1.8	2.4	0.0	49.0	35.0	26.8	0.4	22.8	136.4	138.2
18	Al Zaher	0.6	0.0	0.6	0.0	1.2	1.4	0.6	37.4	33.2	18.8	0.6	15.2	107.2	108.4
19	Bab Al-Shairia	0.2	0.0	0.0	0.4	0.6	1.4	0.8	31.0	44.8	6.8	0.2	14.6	99.6	100.2

20	Al gammalia	0.4	0.2	0.2	0.4	1.2	0.4	0.0	16.4	34.2	3.4	0.0	21.2	75.6	76.8
21	Al-Darb Al-Ahmar	0.6	0.4	0.2	0.0	1.2	0.6	0.0	31.4	44.8	4.2	0.4	18.6	100.0	101.2
22	Al-Mouski	0.0	0.2	0.0	0.2	0.4	2.2	0.0	8.0	31.6	3.8	0.0	33.0	78.6	79.0
23	Al-Azbakeya	0.2	0.4	0.8	0.0	1.4	1.2	0.2	7.8	14.2	15.0	0.0	38.6	77.0	78.4
24	Bolaq	0.4	0.2	0.2	0.0	0.8	0.4	0.2	14.8	11.2	10.6	0.2	6.4	43.8	44.6
25-26	Qasr Al-Niel +Zamalik	0.4	0.0	1.0	0.2	1.6	1.4	0.0	37.2	16.8	12.2	0.0	16.6	84.2	85.8
27	Abdin	0.2	0.0	0.2	0.2	0.6	0.4	0.0	12.2	30.6	11.8	0.0	17.2	72.2	72.8
28	Al-Sayeda Zainab	0.2	0.4	0.2	0.6	1.4	1.6	0.4	122.2	90.4	27.2	1.4	51.2	294.4	295.8
29	Masr Al-Qadima	1.8	0.0	1.0	1.0	3.8	3.4	0.0	38.2	17.0	21.6	0.6	3.6	84.4	88.2
30	Al-Khalifa	2.4	0.4	1.8	0.8	5.4	5.2	1.0	105.6	49.8	31.8	0.2	42.4	236.0	241.4
31	Monshat Naser	0.8	0.4	0.2	0.6	2.0	1.2	0.4	63.0	39.0	7.8	0.0	19.6	131.0	133.0
32	Madinat Nasr 2 <sup>nd</sup>	0.0	0.0	0.6	0.4	1.0	0.6	0.0	41.4	35.8	41.2	0.0	11.4	130.4	131.4
33	Madinat Nasr 1 <sup>st</sup>	3.2	0.2	1.6	1.6	6.6	7.2	1.4	79.4	76.6	166.0	0.2	18.0	348.8	355.4
34	Al-Basatine	2.8	0.4	2.2	1.4	6.8	7.0	1.8	204.2	178.2	47.8	1.6	24.8	465.4	472.2
35	Al-Maadi	1.4	0.0	0.4	0.0	1.8	2.4	0.6	154.8	86.0	29.0	1.6	8.6	283.0	284.8
36-37	Tora + Helwan	2.8	0.4	0.4	0.8	4.4	3.2	0.4	120.4	58.8	27.2	2.0	9.6	221.6	226.0
38	Al tebin	0.4	0.0	0.0	0.0	0.4	0.2	0.0	17.0	15.6	3.2	0.6	4.6	41.2	41.6
39	Giza-Qism	2.4	0.2	0.6	0.0	3.2	3.6	0.8	82.4	47.6	61.2	4.4	73.2	273.2	276.4
40	Al-Omrania	3.4	0.4	0.2	0.2	4.2	0.8	0.4	118.4	55.8	68.0	1.8	13.0	258.2	262.4
41-42	Al-Ahram	4.8	0.0	0.0	0.0	4.8	1.6	0.8	87.4	21.8	57.2	2.4	4.0	175.2	180.0
43	Bolaq Al dakrour	2.8	0.4	0.4	0.4	4.0	1.4	0.4	81.0	40.2	44.8	2.0	12.8	182.6	186.6
44	Dokki	1.2	0.0	1.0	0.0	2.2	5.2	0.4	67.8	32.8	49.2	0.0	15.4	170.8	173.0
45	Al-Aagouza	1.6	0.0	0.6	0.0	2.2	1.4	0.2	55.6	27.2	79.8	0.0	21.0	185.2	187.4
46	Imbaba-Qism	3.6	0.0	0.4	0.0	4.0	3.0	0.2	73.0	42.2	46.8	0.8	32.6	198.6	202.6



47-48	Al waraq	2.0	0.2	0.2	0.2	2.6	1.2	1.2	94.2	33.2	17.6	3.8	3.6	154.8	157.4
49	Kerdasa	4.4	0.0	0.0	0.0	4.4	2.2	0.6	128.0	58.4	26.4	3.4	40.0	259.0	263.4
50	Ausim	1.6	0.0	0.6	0.0	2.2	1.6	0.6	51.0	22.4	9.4	7.6	9.4	102.0	104.2
51	Imbaba-Markaz	1.8	0.0	0.2	0.0	2.0	0.4	0.0	27.4	11.6	7.6	8.6	4.6	60.2	62.2
52	Al qanater Al khairia	2.2	0.2	0.2	0.6	3.2	0.6	0.0	8.0	7.2	10.8	0.4	6.0	33.0	36.2
53	Qalube_Qism	1.0	0.0	0.2	0.2	1.4	0.2	0.0	2.6	6.2	8.4	0.8	2.8	21.0	22.4
54	Qalube_Markaz	1.0	0.0	0.0	0.0	1.0	1.2	0.2	0.8	0.8	4.0	0.2	0.2	7.4	8.4
55	Shibin Al Qanater	2.8	0.2	0.0	0.0	3.0	0.4	0.0	3.8	1.8	10.8	2.6	4.6	24.0	27.0
56	Al Khanka	6.8	0.0	0.0	0.6	7.4	2.4	0.0	12.2	6.0	19.8	1.6	2.4	44.4	51.8
57	Giza-Markaz	2.2	0.4	0.8	0.2	3.6	1.2	0.6	23.8	5.6	6.8	4.6	0.6	43.2	46.8
58	Al-Hawamdia	1.4	0.0	0.8	0.2	2.4	1.8	0.2	20.0	11.4	8.2	0.8	7.6	50.0	52.4
59	Al-Badrashin	4.2	0.0	0.8	0.0	5.0	1.8	0.8	15.4	8.2	4.6	4.0	7.2	42.0	47.0
60	15th of May	0.4	0.0	0.0	0.0	0.4	1.0	0.0	28.6	16.8	7.8	0.6	0.6	55.4	55.8
61	New cairo 3 <sup>rd</sup>	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
62	New cairo 1 <sup>st</sup>	1.4	0.2	0.2	0.4	2.2	1.6	0.2	75.8	8.2	22.6	0.4	0.4	109.2	111.4
63	New cairo 2 <sup>nd</sup>	1.0	0.0	0.2	0.2	1.4	0.6	0.2	46.4	5.4	10.0	0.0	0.2	62.8	64.2
64	Alshrouk	0.0	0.0	0.4	0.0	0.4	0.4	0.0	78.2	15.6	8.8	0.0	1.0	104.0	104.4
65	Badr	0.0	0.0	0.2	0.2	0.4	1.0	0.0	27.4	7.8	3.0	0.0	1.2	40.4	40.8
66	10th of Ramadan 1 <sup>st</sup>	0.4	0.0	1.4	0.0	1.8	0.6	0.0	13.8	17.0	11.0	0.0	3.2	45.6	47.4
67	10th of Ramadan 2 <sup>nd</sup>	0.0	0.0	1.0	0.0	1.0	0.6	0.0	10.8	8.0	7.2	0.0	0.2	26.8	27.8
68	Al Obour	0.8	0.0	0.2	0.0	1.0	1.2	0.0	23.2	7.6	16.0	0.4	0.0	48.4	49.4
69	Al-Sheikh Zayed	1.2	0.0	0.2	0.0	1.4	0.6	0.2	39.2	8.0	6.0	0.0	2.6	56.6	58.0
70	6th of October 1 <sup>st</sup>	0.4	0.2	0.0	0.0	0.6	0.2	0.0	72.2	23.0	16.6	0.2	6.8	119.0	119.6
71	6th of October 2 <sup>nd</sup>	1.0	0.2	0.4	0.0	1.6	1.0	0.2	122.2	110.0	16.6	1.2	3.0	254.2	255.8

Modified according to the PSB's reports (see pages 166, 167)

**Table (C-5) Crime rate “over the GCR”**

#	Qism	Crimes against person					Crimes against property								Total
		Homicide and Attempted murder	Kidnaping	Sexual harassment	Rape	Total	Robbery	Arson	House-breaking	Shop-lifting	Car theft	Rusting	Pickpocketing	Total	
1	Al-Marg	6.3	0.8	0.4	0.8	8.3	4.7	0.0	303.7	135.7	76.1	1.6	33.5	555.4	563.7
2	Al-Salam	7.3	1.5	2.6	2.6	13.9	6.6	0.4	157.5	131.6	134.9	4.0	55.1	490.1	504.0
3	Ain Shams	4.2	0.4	1.5	1.1	7.2	6.5	1.9	339.8	211.4	123.8	1.9	76.6	761.9	769.1
4	Al-Khsos	2.7	0.0	0.0	0.7	3.4	4.1	0.0	53.6	19.2	35.0	1.4	4.1	117.4	120.9
5	Al Mataria	2.4	0.0	2.0	3.2	7.6	3.2	1.2	197.7	111.5	21.7	0.4	68.2	403.9	411.5
6	Shobra Al Khaima 2 <sup>nd</sup>	9.1	0.0	0.4	0.0	9.5	3.9	0.9	21.2	10.8	31.6	0.0	51.1	119.6	129.1
7	Shubra Al Khaima 1 <sup>st</sup>	9.6	0.7	0.4	0.0	10.6	5.3	0.0	10.6	6.4	44.7	0.0	17.7	84.8	95.4
8	Al Sahel	2.0	0.0	2.0	0.7	4.6	2.6	1.3	163.1	64.2	64.8	0.0	60.3	356.3	360.9
9	Rod Al-Farag	6.9	1.4	5.5	1.4	15.2	2.8	1.4	549.4	203.4	123.2	1.4	70.6	952.2	967.4
10	Shobra	2.8	5.6	2.8	0.0	11.2	22.5	5.6	1015.2	309.3	149.0	0.0	253.1	1754.8	1766.1
11	Sharabia	2.8	0.0	0.9	0.9	4.6	0.9	0.0	300.6	203.2	26.9	0.0	33.4	564.9	569.6
12	Al-Zawya Al Hamra	3.2	0.6	1.9	1.3	7.0	0.6	0.6	376.0	272.0	65.9	1.9	48.8	765.9	772.8
13	Al Zaitoun	3.7	0.0	1.9	0.0	5.6	4.3	3.1	158.2	80.7	206.6	0.6	66.4	520.0	525.6
14	Hadayeq Al Qoba	3.5	1.4	1.4	0.7	6.9	6.2	1.4	191.9	130.5	150.5	0.7	77.3	558.4	565.3
15	Nozha	8.6	3.7	4.9	2.5	19.8	32.1	2.5	475.5	134.6	783.0	0.0	127.2	1554.8	1574.6
16	Masr Al Gadida	12.3	1.8	10.6	1.8	26.4	45.8	3.5	876.7	607.3	1054.5	0.0	123.2	2711.0	2737.4
17	Al Wayli	5.2	5.2	7.7	5.2	23.2	30.9	0.0	631.0	450.7	345.1	5.2	293.6	1756.6	1779.8
18	Al Zaher	9.4	0.0	9.4	0.0	18.7	21.9	9.4	584.3	518.7	293.7	9.4	237.5	1674.8	1693.5
19	Bab Al-Shairia	3.7	0.0	0.0	7.4	11.1	25.9	14.8	573.2	828.3	125.7	3.7	270.0	1841.6	1852.7
20	Al gammalia	8.0	4.0	4.0	8.0	24.1	8.0	0.0	329.1	686.3	68.2	0.0	425.4	1517.0	1541.1

21	Al-Darb Al-Ahmar	9.9	6.6	3.3	0.0	19.8	9.9	0.0	519.1	740.6	69.4	6.6	307.5	1653.2	1673.1
22	Al-Mouski	0.0	9.0	0.0	9.0	17.9	98.7	0.0	358.8	1417.4	170.4	0.0	1480.2	3525.6	3543.6
23	Al-Azbakeya	7.1	14.3	28.5	0.0	49.9	42.8	7.1	278.2	506.5	535.1	0.0	1376.9	2746.8	2796.7
24	Bolaq	6.4	3.2	3.2	0.0	12.8	6.4	3.2	236.9	179.3	169.7	3.2	102.4	701.1	713.9
25-26	Qasr Al-Niel +Zamalik	14.6	0.0	36.5	7.3	58.4	51.1	0.0	1357.7	613.1	445.3	0.0	605.8	3073.0	3131.4
27	Abdin	4.7	0.0	4.7	4.7	14.2	9.5	0.0	288.9	724.7	279.5	0.0	407.4	1710.0	1724.2
28	Al-Sayeda Zainab	1.5	3.0	1.5	4.5	10.6	12.1	3.0	924.0	683.6	205.7	10.6	387.1	2226.1	2236.7
29	Masr Al-Qadima	8.3	0.0	4.6	4.6	17.5	15.6	0.0	175.7	78.2	99.4	2.8	16.6	388.2	405.7
30	Al-Khalifa	10.0	1.7	7.5	3.3	22.5	21.7	4.2	440.8	207.9	132.7	0.8	177.0	985.2	1007.7
31	Monshat Naser	3.1	1.5	0.8	2.3	7.6	4.6	1.5	240.4	148.8	29.8	0.0	74.8	499.9	507.5
32	Madinat Nasr 2 <sup>nd</sup>	0.0	0.0	7.9	5.3	13.2	7.9	0.0	545.3	471.6	542.7	0.0	150.2	1717.7	1730.8
33	Madinat Nasr 1 <sup>st</sup>	6.4	0.4	3.2	3.2	13.2	14.4	2.8	158.3	152.7	330.9	0.4	35.9	695.4	708.5
34	Al-Basatine	3.4	0.5	2.7	1.7	8.3	8.5	2.2	248.3	216.7	58.1	1.9	30.2	565.8	574.1
35	Al-Maadi	17.9	0.0	5.1	0.0	23.0	30.7	7.7	1981.5	1100.8	371.2	20.5	110.1	3622.5	3645.6
36-37	Tora + Helwan	3.8	0.5	0.5	1.1	5.9	4.3	0.5	161.9	79.1	36.6	2.7	12.9	298.0	303.9
38	Al tebin	5.8	0.0	0.0	0.0	5.8	2.9	0.0	246.7	226.4	46.4	8.7	66.8	598.0	603.8
39	Giza-Qism	9.5	0.8	2.4	0.0	12.7	14.3	3.2	327.5	189.2	243.2	17.5	290.9	1085.9	1098.6
40	Al-Omrania	4.7	0.6	0.3	0.3	5.8	1.1	0.6	163.0	76.8	93.6	2.5	17.9	355.5	361.2
41-42	Al-Ahram	15.8	0.0	0.0	0.0	15.8	5.3	2.6	288.5	72.0	188.8	7.9	13.2	578.4	594.2
43	Bolaq Al dakrour	4.9	0.7	0.7	0.7	7.0	2.5	0.7	142.3	70.6	78.7	3.5	22.5	320.8	327.8
44	Dokki	12.8	0.0	10.7	0.0	23.4	55.4	4.3	722.6	349.6	524.3	0.0	164.1	1820.2	1843.7
45	Al-Aagouza	10.0	0.0	3.7	0.0	13.7	8.7	1.2	347.5	170.0	498.7	0.0	131.2	1157.5	1171.2
46	Imbaba-Qism	6.0	0.0	0.7	0.0	6.7	5.0	0.3	121.9	70.5	78.1	1.3	54.4	331.6	338.3
47-48	Al waraq	3.9	0.4	0.4	0.4	5.1	2.4	2.4	185.0	65.2	34.6	7.5	7.1	304.0	309.2

49	Kerdasa	8.6	0.0	0.0	0.0	8.6	4.3	1.2	250.3	114.2	51.6	6.6	78.2	506.4	515.0
50	Ausim	5.8	0.0	2.2	0.0	8.0	5.8	2.2	185.4	81.4	34.2	27.6	34.2	370.8	378.8
51	Imbaba-Markaz	4.6	0.0	0.5	0.0	5.1	1.0	0.0	70.0	29.6	19.4	22.0	11.8	153.8	158.9
52	Al qanater Al khairia	5.7	0.5	0.5	1.6	8.4	1.6	0.0	20.9	18.8	28.2	1.0	15.7	86.1	94.5
53	Qalube_Qism	9.3	0.0	1.9	1.9	13.0	1.9	0.0	24.2	57.8	78.3	7.5	26.1	195.7	208.8
54	Qalube_Markaz	2.7	0.0	0.0	0.0	2.7	3.3	0.5	2.2	2.2	10.9	0.5	0.5	20.2	23.0
55	Shibin Al Qanater	6.6	0.5	0.0	0.0	7.1	0.9	0.0	9.0	4.2	25.5	6.1	10.9	56.6	63.7
56	Al Khanka	15.6	0.0	0.0	1.4	17.0	5.5	0.0	28.0	13.8	45.4	3.7	5.5	101.8	118.8
57	Giza-Markaz	9.1	1.7	3.3	0.8	14.9	5.0	2.5	98.5	23.2	28.2	19.0	2.5	178.9	193.8
58	Al-Hawamdia	10.0	0.0	5.7	1.4	17.1	12.8	1.4	142.4	81.2	58.4	5.7	54.1	356.1	373.2
59	Al-Badrashin	10.9	0.0	2.1	0.0	13.0	4.7	2.1	40.1	21.4	12.0	10.4	18.8	109.5	122.5
60	15th of May	4.4	0.0	0.0	0.0	4.4	11.0	0.0	315.2	185.1	86.0	6.6	6.6	610.5	614.9
61	New cairo 3 <sup>rd</sup>	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
62	New cairo 1 <sup>st</sup>	50.0	7.1	7.1	14.3	78.6	57.2	7.1	2708.1	293.0	807.4	14.3	14.3	3901.4	3980.0
63	New cairo 2 <sup>nd</sup>	25.0	0.0	5.0	5.0	35.0	15.0	5.0	1159.9	135.0	250.0	0.0	5.0	1569.8	1604.8
64	Alshrouk	0.0	0.0	17.7	0.0	17.7	17.7	0.0	3464.8	691.2	389.9	0.0	44.3	4607.9	4625.6
65	Badr	0.0	0.0	11.7	11.7	23.3	58.3	0.0	1596.9	454.6	174.8	0.0	69.9	2354.6	2377.9
66	10th of Ramadan 1 <sup>st</sup>	6.8	0.0	23.7	0.0	30.5	10.2	0.0	234.0	288.2	186.5	0.0	54.3	773.1	803.6
67	10th of Ramadan 2 <sup>nd</sup>	0.0	0.0	14.9	0.0	14.9	9.0	0.0	161.4	119.5	107.6	0.0	3.0	400.4	415.3
68	Al Obour	18.3	0.0	4.6	0.0	22.9	27.5	0.0	532.1	174.3	367.0	9.2	0.0	1110.1	1133.0
69	Al-Sheikh Zayed	40.8	0.0	6.8	0.0	47.6	20.4	6.8	1332.3	271.9	203.9	0.0	88.4	1923.7	1971.3
70	6th of October 1 <sup>st</sup>	10.3	5.2	0.0	0.0	15.5	5.2	0.0	1861.3	592.9	427.9	5.2	175.3	3067.7	3083.2
71	6th of October 2 <sup>nd</sup>	8.7	1.7	3.5	0.0	13.9	8.7	1.7	1059.8	954.0	144.0	10.4	26.0	2204.6	2218.5

Modified according to the PSB's reports (see pages 166, 167)

**Appendix D**  
**UNDERSTANDING CRIME AT THE**  
**DISTRICTS LEVEL**  
**“MAIN AGGLOMERATION DISTRICTS”**

**Table (D-1) Social ranks and agglomeration districts classification**

	QISM_ENAME		Illiteracy rate	#	Unemployment rate	#	Internal Migration rate	#	Average Family size	#	Rate Scramble	#	Population Density	#	Total ranks	Total crimes rate
1	Al-Marg	A	22.47	5	10.19	3	13.94	3	4	1	1.14	1	30260	31	44	563.7
2	Al-Salam	C	20.39	5	9.05	2	13.39	3	3.94	1	1.21	1	17684	18	30	504.0
3	Ain Shams	C	14.46	3	12.23	3	12.53	3	3.92	1	1.12	1	63046	64	75	769.1
4	Al-Khsos	A	26.43	6	4.95	1	47.12	10	3.92	1	1.1	1	49861	50	69	120.9
5	Al Mataria	A	19.29	4	13.69	3	10.94	3	3.93	1	1.18	1	80077	81	93	411.5
6	Shobra Al Khaima 2 <sup>nd</sup>	A	22.36	5	11.83	3	25.55	6	4	1	1.16	1	44004	44	60	129.1
7	Shubra Al Khaima 1 <sup>st</sup>	A	24.94	5	11.67	3	24.26	5	4.04	1	1.2	1	32720	33	48	95.4
8	Al Sahel	A	15.78	4	13.07	3	7.64	2	3.52	1	1.04	1	55293	56	67	360.9
9	Rod Al-Farag	C	20.68	5	11.31	3	7.94	2	3.4	1	1.05	1	55966	56	68	967.4
10	Shobra	C	19.26	4	12.44	3	8.43	2	3.4	1	1.05	1	53123	54	65	1766.1
11	Sharabia	A	27.75	6	14.29	3	8.99	2	3.78	1	1.29	1	58409	59	72	569.6
12	Al-Zawya Al Hamra	C	23.02	5	14.65	3	11.46	3	3.94	1	1.19	1	63706	64	77	772.8
13	Al Zaitoun	A	13.4	3	13.2	3	12.3	3	3.69	1	1.07	1	39275	40	51	525.6
14	Hadayeq Al Qoba	A	18.86	5	13.72	3	11.29	3	3.68	1	1.13	1	73402	74	87	565.3
15	Nozha	B	4.98	1	8.04	2	15.53	4	3.31	1	0.87	1	2743	3	12	1574.6
16	Masr Al Gadida	B	6.31	2	8.48	2	16.48	4	3.31	1	0.83	1	12411	13	23	2737.4
17	Al Wayli	B	14.66	3	6.11	2	7.89	2	3.4	1	0.99	1	15600	16	25	1779.8
18	Al Zaher	C	10.16	3	9.91	2	8.7	2	3.44	1	0.95	1	32491	33	42	1693.5
19	Bab Al-Shairia	C	24.3	5	7.3	2	4.43	1	3.61	1	1.13	1	55231	56	66	1852.7
20	Al gammalia	C	27.08	6	7.83	2	3.93	1	3.6	1	1.18	1	24407	25	36	1541.1
21	Al-Darb Al-Ahmar	C	22.86	5	8.55	2	4.72	1	3.71	1	1.12	1	32479	33	43	1673.1
22	Al-Mouski	C	27.17	6	8.16	2	6.38	2	3.4	1	1.05	1	27512	28	40	3543.6
23	Al-Azbakeya	B	14.62	3	7.77	2	6.07	2	3.19	1	0.93	1	19490	20	29	2796.7
24	Bolaq	C	31.54	7	5.94	2	6.12	2	3.31	1	1.27	1	27212	28	41	713.9
25-26	Qasr Al-Niel +Zamalik	B	4.39	1	5.76	2	14.63	3	2.42	1	0.56	1	6933	7	15	3131.4

27	Abdin	C	14.47	4	5.94	2	10.41	3	3.13	1	0.92	1	25018	26	37	1724.2
28	Al-Sayeda Zainab	C	18.37	4	9.33	2	6.72	2	3.47	1	1.08	1	35839	36	46	2236.7
29	Masr Al-Qadima	C	28.97	6	9.61	2	8.27	2	3.52	1	1.13	1	21477	22	34	405.7
30	Al-Khalifa	B	22.6	5	6.64	2	9.96	2	3.75	1	1.21	1	6162	7	18	1007.7
31	Monshat Naser	A	47.05	1 0	4.31	1	11.99	3	3.91	1	1.51	1	47183	48	64	507.5
32	Madinat Nasr 2 <sup>nd</sup>	B	12.33	3	13.85	3	17.74	4	3.91	1	1.14	1	4387	5	17	1730.8
33	Madinat Nasr 1 <sup>st</sup>	B	6.75	2	9.14	2	21.84	5	3.69	1	1	1	6800	7	18	708.5
34	Al-Basatine	C	21.67	5	11.83	3	10.69	3	3.96	1	1.17	1	27613	28	41	574.1
35	Al-Maadi	B	7.43	2	10.44	3	13.09	3	3.32	1	0.87	1	3118	4	14	3645.6
36-37	Tora + Helwan	C	20.84	5	13.97	3	13.37	3	3.91	1	1.18	1	4632	5	18	303.9
38	Al tebin	B	25.5	6	18.82	4	16.31	4	4.36	1	1.33	1	2686	3	19	603.8
39	Giza-Qism	C	25.05	6	11.99	3	11.59	3	3.82	1	1.14	1	22354	23	37	1098.6
40	Al-Omrana	C	14.83	3	11.09	3	25.5	6	3.86	1	1.09	1	41447	2	16	361.2
41-42	Al-Ahram	B	22.5	5	11.83	3	19.16	4	3.97	1	1.12	1	15073	16	30	594.2
43	Bolaq Al dakrou	A	18.87	4	12.22	3	13.86	3	3.92	1	1.15	1	61717	62	74	327.8
44	Dokki	B	6.37	2	6.76	2	22.95	5	3.23	1	0.8	1	18427	19	30	1843.7
45	Al-Aagouza	C	12.32	3	10.77	3	29.23	6	3.43	1	0.91	1	30380	31	45	1171.2
46	Imbaba-Qism	A	21.73	5	10.07	3	19.34	4	3.98	1	1.19	1	71490	72	86	338.3
47-48	Al waraq	C	28.84	6	8.78	2	19.18	4	3.96	1	1.17	1	19921	20	34	309.2

\* The black highlighted cells represent values larger than the region's values as follows:

The region's rank = 35

The region's crime rate = 571.58

\*\* Districts classification key:

- a- Districts generating criminals rather than being vulnerable to crimes.
- b- Districts attracting criminals rather than generating them.
- c- Districts attract and generate criminals at the same time.

**Table (D-2) Correlation between studied housing areas and crime**

	QISM	Formal housing area			Informal housing area		Total crime	Crime against person	Crime against property
		The existence of old deteriorated housing areas	The existence of public housing areas	The existence of shelter housing areas	The existence of informal housing areas	Percentage of Informal housing areas			
1	Al-Marg	0	0	0	1	19.60%	563.7	8.3	555.4
2	Al-Salam	0	1	0	1	6.30%	504.0	13.9	490.1
3	Ain Shams	0	0	0	1	0.70%	769.1	7.2	761.9
4	Al-Khsos	0	0	0	1	1.90%	120.9	3.4	117.4
5	Al Mataria	0	1	0	1	82.90%	411.5	7.6	403.9
6	Shobra Al Khaima 2 <sup>nd</sup>	0	0	0	1	37.30%	129.1	9.5	119.6
7	Shubra Al Khaima 1 <sup>st</sup>	0	1	0	1	28.70%	95.4	10.6	84.8
8	Al Sahel	0	0	0	1	4.70%	360.9	4.6	356.3
9	Rod Al-Farag	1	0	0	1	2.50%	967.4	15.2	952.2
10	Shobra	0	0	0	1	12.10%	1766.1	11.2	1754.8
11	Sharabia	0	0	0	1	6.60%	569.6	4.6	564.9
12	Al-Zawya Al Hamra	1	0	1	0	-	772.8	7.0	765.9
13	Al Zaitoun	0	1	0	1	1.10%	525.6	5.6	520.0
14	Hadayeq Al Qoba	1	0	0	1	6.00%	565.3	6.9	558.4
15	Nozha	0	0	0	0	-	1574.6	19.8	1554.8
16	Masr Al Gadida	0	0	0	0	-	2737.4	26.4	2711.0
17	Al Wayli	1	1	0	1	0.60%	1779.8	23.2	1756.6
18	Al Zaher	1	0	0	1	0.10%	1693.5	18.7	1674.8
19	Bab Al-Shairia	1	0	0	0	-	1852.7	11.1	1841.6
20	Al gammalia	1	0	0	1	4.60%	1541.1	24.1	1517.0
21	Al-Darb Al-Ahmar	1	0	0	1	1.30%	1673.1	19.8	1653.2
22	Al-Mouski	1	0	0	0	-	3543.6	17.9	3525.6
23	Al-Azbakeya	1	0	0	0	-	2796.7	49.9	2746.8
24	Bolaq	1	0	0	1	8.40%	713.9	12.8	701.1



25-26	Qasr Al-Niel +Zamalik	1	0	0	0	-	3131.4	58.4	3073.0
27	Abdin	1	0	0	0	-	1724.2	14.2	1710.0
28	Al-Sayeda Zainab	1	1	1	1	1.20%	2236.7	10.6	2226.1
29	Masr Al-Qadima	1	1	0	1	21.20%	405.7	17.5	388.2
30	Al-Khalifa	0	0	0	1	2.20%	1007.7	22.5	985.2
31	Monshat Naser	0	0	1	1	58.40%	507.5	7.6	499.9
32	Madinat Nasr 2 <sup>nd</sup>	0	1	1	1	3.00%	1730.8	13.2	1717.7
33	Madinat Nasr 1 <sup>st</sup>	0	1	1	1	3.40%	708.5	13.2	695.4
34	Al-Basatine	0	0	0	1	15.00%	574.1	8.3	565.8
35	Al-Maadi	0	0	0	1	2.20%	3645.6	23.0	3622.5
36-37	Tora + Helwan	0	1	1	1	4.60%	303.9	5.9	298.0
38	Al tebin	0	1	0	1	4.40%	603.8	5.8	598.0
39	Giza-Qism	1	0	0	1	3.30%	1098.6	12.7	1085.9
40	Al-Omrانيا	1	0	0	1	4.70%	361.2	5.8	355.5
41-42	Al-Ahram	0	0	0	1	10.80%	594.2	15.8	578.4
43	Bolaq Al dakrou	0	0	0	1	1.70%	327.8	7.0	320.8
44	Dokki	0	0	0	1	1.80%	1843.7	23.4	1820.2
45	Al-Aagouza	0	1	1	1	2.60%	1171.2	13.7	1157.5
46	Imbaba-Qism	1	1	1	1	3.70%	338.3	6.7	331.6
47-48	Al waraq	0	0	0	1	2.00%	309.2	5.1	304.0
Total crimes	r=	0.3227**	-0.2229	-0.0915	-0.5670*	-0.3546*	Total districts (df=42)		
	t=	3.0882	-1.1813	-0.5431	-2.3450	-1.6966			
Crimes against person	r=	0.3225**	-0.1799	-0.2017	-0.4954*	-0.2242			
	t=	3.0842	-0.9884	-1.0876	-2.1469	-1.1870			
Crime against property	r=	0.3216**	-0.2227	-0.0899	-0.5659*	-0.3549*			
	t=	3.0727	-1.1802	-0.5344	-2.3421	-1.6977			
Total crimes	r=	0.195426	-0.13752	0.12067		-0.0242	Districts generating criminals (df=10)		
	t=	0.7681	-0.3823	0.4340		-0.0748			

Crimes against person	r=	-0.01988	0.265224	0.061585		0.5026**	
	t=	-0.0616	1.1415	0.2075		3.1953	
Crime against property	r=	0.195083	-0.14019	0.119604		-0.0300	
	t=	0.7664	-0.3888	0.4296		-0.0920	
Total crimes	r=	0.421242*	-0.45694	-0.2827		-0.6102	
	t=	2.3016	-0.9918	-0.6969		-1.1984	
Crimes against person	r=	0.769359***	-0.5243	-0.35212		-0.5108	Districts attracting criminals (df=10)
	t=	10.5485	-1.0877	-0.8235		-1.0692	
Crime against property	r=	0.414136*	-0.4538	-0.28035		-0.6088	
	t=	2.2353	-0.9871	-0.6924		-1.1967	
Total crimes	r=	0.39495**	-0.1995	-0.049		-0.4003	Districts generating and attracting criminals (df=18)
	t=	2.7694	-0.7056	-0.1982		-1.2129	
Crimes against person	r=	0.474683**	-0.0368	-0.32677		0.0285	
	t=	3.8337	-0.1506	-1.0449		0.1247	
Crime against property	r=	0.393146**	-0.1999	-0.04705		-0.4018	
	t=	2.7486	-0.7068	-0.1907		-1.2161	

Significant at level df=42	0.000***	Critical value	3.551
	0.01**		2.423
	0.05*		1.684
Significant at level df=18	0.000***	Critical value	3.922
	0.01**		2.552
	0.05*		1.734
Significant at level df=10	0.000***	Critical value	4.587
	0.01**		2.764
	0.05*		1.812

**Table (D-3) Correlation between studied housing areas and different types of crime**

#	Housing type		Crimes against person				Crimes against property						
			Homicide and Attempted murder	Kidna-pping	Sexual harassment	Rape	Robbery	Arson	House-breaking	Shoplifting	Car theft	Rusting	Pickpocketing
Districts generating criminals (df=10)	Old deteriorated housing	r=	0.0110	0.2136	0.0474	-0.2299	0.5357**	-0.0059	-0.0091	0.0989	0.3664*	0.0986	0.3651*
		t=	0.0353	0.8591	0.1572	-0.5910	3.6489	-0.0185	-0.0284	0.3470	1.8285	0.3459	1.8181
	Public housing	r=	0.2177	-0.3170	0.2884	-0.0203	0.2645	0.2335	-0.2784	-0.2495	0.2295	-0.1439	0.1438
		t=	0.8801	-0.7612	1.2816	-0.0628	1.1372	0.9635	-0.6887	-0.6315	0.9417	-0.3977	0.5311
	Shelter housing	r=	-0.0251	0.2726	-0.1629	0.1499	0.2719	0.0311	0.1075	0.1699	-0.1370	-0.0558	0.3408
		t=	-0.0774	1.1849	-0.4431	0.5577	1.1811	0.1016	0.3810	0.6472	-0.3811	-0.1672	1.6348
	Informal housing	r=	0.0325	0.1600	0.1654	0.7746***	0.0402	0.0818	0.0789	0.1113	-0.5032	-0.3872	0.3570
		t=	0.1064	0.6025	0.6266	10.8674	0.1324	0.2819	0.2708	0.3962	-1.0586	-0.8827	1.7555
Districts attracting criminals (df=10)	Old deteriorated housing	r=	-0.0881	0.6144***	0.7618***	0.4232*	0.4380*	-0.1154	0.1010	0.2430	0.0003	-0.1845	0.7717***
		t=	-0.2561	5.0382	10.1121	2.3203	2.4647	-0.3272	0.3554	1.0152	0.0010	-0.4925	10.6915
	Public housing	r=	-0.7684	-0.1528	-0.3667	0.3002	-0.5856	-0.6058	-0.3787	-0.2120	-0.3312	-0.0071	-0.2588
		t=	-1.3740	-0.4192	-0.8485	1.3567	-1.1679	-1.1929	-0.8685	-0.5532	-0.7867	-0.0223	-0.6501
	Shelter housing	r=	-0.5893	-0.2304	-0.1965	0.3424	-0.4447	-0.2611	-0.2779	-0.1556	-0.0081	-0.2566	-0.2170
		t=	-1.1725	-0.5922	-0.5194	1.6467	-0.9734	-0.6548	-0.6877	-0.4258	-0.0255	-0.6457	-0.5639
	Informal housing	r=	0.1728	-0.3967	-0.5464	-0.3548	-0.7060	-0.1163	-0.3151	-0.4281	-0.5649	0.3431	-0.4329
		t=	0.6605	-0.8982	-1.1174	-0.8282	-1.3087	-0.3295	-0.7577	-0.9479	-1.1415	1.6519	-0.9553
Districts attract and generate criminals (df=18)	Old deteriorated housing	r=	0.1341	0.1862	0.2388	0.3645*	0.2077	0.0990	0.1323	0.4673**	0.0285	0.2194	0.3463*
		t=	0.6570	0.9709	1.3310	2.4336	1.1124	0.4661	0.6469	3.7221	0.1245	1.1926	2.2478
	Public housing	r=	0.1177	-0.2076	-0.0428	0.0303	-0.1360	-0.2377	-0.0977	-0.2684	0.2287	0.0178	-0.2006
		t=	0.5661	-0.7293	-0.1740	0.1324	-0.5079	-0.8147	-0.3777	-0.8976	1.2579	0.0770	-0.7089
	Shelter housing	r=	-0.1685	-0.1708	-0.1874	-0.1193	-0.1914	-0.1606	0.1263	-0.1273	0.2289	-0.0093	-0.1354
		t=	-0.6117	-0.6189	-0.6697	-0.4521	-0.6814	-0.5869	0.6132	-0.4790	1.2593	-0.0389	-0.5060
	Informal housing	r=	0.0991	-0.0663	0.1131	-0.0783	-0.1275	-0.1614	-0.1551	-0.4346	-0.2385	-0.1787	-0.3202
		t=	0.4668	-0.2637	0.5412	-0.3082	-0.4797	-0.5897	-0.5698	-1.2854	-0.8171	-0.6433	-1.0289

Significant at level 0.000\*\*\* Critical value 3.922  
 df=18 0.01\*\* 2.552  
 0.05\* 1.734  
 Significant at level 0.000\*\*\* Critical value 4.587  
 df=10 0.01\*\* 2.764  
 0.05\* 1.812

**Table (D-4) Correlation between studied land uses and crime**

	qism_name	Blocks				Vacant lands			Total crime	Crime against person	Crime against property
		Residential	Commercial	Industrial	Cemetery	Vacant lands	Agriculture	Desert			
1	Al-Marg	47.4	0.6	0.9	0.5	5.1	27.2	0	563.7	8.3	555.4
2	Al-Salam	30	3.4	2.5	0.1	8.2	5.1	17.7	504.0	13.9	490.1
3	Ain Shams	55.8	2.7	1.8	1.1	2.6	1.3	0	769.1	7.2	761.9
4	Al-Khsos	55.2	1.9	9.2	0	2.8	20	0	120.9	3.4	117.4
5	Al Mataria	56	3.8	0.8	0.2	8.2	3.4	0	411.5	7.6	403.9
6	Shobra Al Khaima 2 <sup>nd</sup>	39.5	0.6	16.1	0.1	0.1	15.6	0	129.1	9.5	119.6
7	Shubra Al Khaima 1 <sup>st</sup>	34.6	3.4	19.1	0.2	4.1	21.3	0	95.4	10.6	84.8
8	Al Sahel	48.9	7.7	2.4	0	0.2	2.1	0	360.9	4.6	356.3
9	Rod Al-Farag	53.4	2.8	5.9	0	0.1	3.9	0	967.4	15.2	952.2
10	Shobra	44.3	2.9	0.6	0	0.2	1.2	0	1766.1	11.2	1754.8
11	Sharabia	33.6	7.8	2.6	0	0.4	0.2	0	569.6	4.6	564.9
12	Al-Zawya Al Hamra	45.9	0.9	10.3	0	0.3	4.5	0	772.8	7.0	765.9
13	Al Zaitoun	42.8	9.4	1.3	0	1.6	1.2	0	525.6	5.6	520.0
14	Hadayeq Al Qoba	58.5	3.6	2.8	0.1	0	1.5	0	565.3	6.9	558.4
15	Nozha	8.9	5.7	4.5	0	2.2	2	0.8	1574.6	19.8	1554.8
16	Masr Al Gadida	34.9	1.7	1.3	0	1.4	3.7	0	2737.4	26.4	2711.0
17	Al Wayli	20.9	1.7	4.4	0	0.9	0	0	1779.8	23.2	1756.6
18	Al Zaher	32	4.6	0.3	0	0.2	1.2	0	1693.5	18.7	1674.8
19	Bab Al-Shairia	34	6.5	0	0	0.2	0.7	0	1852.7	11.1	1841.6
20	Al gammalia	39.6	1.6	4.9	12.2	2.4	0	0	1541.1	24.1	1517.0
21	Al-Darb Al-Ahmar	49.5	17.4	0.2	6.5	0.8	0	0	1673.1	19.8	1653.2
22	Al-Mouski	37.6	4.6	0.1	0	1	6.8	0	3543.6	17.9	3525.6
23	Al-Azbakeya	21	10.4	1.1	0	0.2	0.9	0	2796.7	49.9	2746.8
24	Bolaq	39.1	8.3	1.5	0	0.3	0.1	0	713.9	12.8	701.1

25-26	Qasr Al-Niel +Zamalik	19.9	7.3	0	0	0	4.3	0	3131.4	58.4	3073.0
27	Abdin	25.6	14.7	0	0	0.1	1.3	0	1724.2	14.2	1710.0
28	Al-Sayeda Zainab	39.1	3.1	0.7	3.5	0.6	2.3	0	2236.7	10.6	2226.1
29	Masr Al-Qadima	39.5	3.9	2.2	2.2	7.8	10.5	4.9	405.7	17.5	388.2
30	Al-Khalifa	27.4	1	1.3	11	0.2	0.1	42	1007.7	22.5	985.2
31	Monshat Naser	44.1	1.3	0.2	24.1	0.3	0.2	3.7	507.5	7.6	499.9
32	Madinat Nasr 2 <sup>nd</sup>	8.2	3.6	3.2	0.8	1.3	3.8	0	1730.8	13.2	1717.7
33	Madinat Nasr 1 <sup>st</sup>	17.5	1.1	3.5	1.9	0.3	2.3	0	708.5	13.2	695.4
34	Al-Basatine	35	1.5	1.2	0.6	1	5.4	19.9	574.1	8.3	565.8
35	Al-Maadi	17.1	0.6	2	0	0.6	1.7	74.1	3645.6	23.0	3622.5
36-37	Tora + Helwan	12.5	5.2	3.3	0.4	1.4	3.8	18.8	303.9	5.9	298.0
38	Al tebin	2.2	0	24.1	0	0	3.3	0	603.8	5.8	598.0
39	Giza-Qism	31.2	0.9	0.7	0	1.2	34.7	0	1098.6	12.7	1085.9
40	Al-Omrana	52.5	3.4	0.5	0	3	19.3	0	361.2	5.8	355.5
41-42	Al-Ahram	47.7	0.9	0.8	0.2	5.3	27.8	0	594.2	15.8	578.4
43	Bolaq Al dakrou	56.4	0.8	0.2	0	2.9	7.1	0	327.8	7.0	320.8
44	Dokki	39.9	1.5	1.4	0	2.1	0.1	0	1843.7	23.4	1820.2
45	Al-Aagouza	55.3	2.7	0	0	0.8	0.2	0	1171.2	13.7	1157.5
46	Imbaba-Qism	57.7	0.5	3	0	0.9	2.3	0	338.3	6.7	331.6
47-48	Al Waraq	28.8	0.7	1.7	0	2.1	69.7	0	309.2	5.1	304.0
Total crimes	r=	-0.3638*	0.2208*	-0.3230	-0.0533	-0.3408	-0.3067	0.2502*	Total districts (df=44)		
	t=	-1.7286	1.8369	-1.5821	-0.3280	-1.6472	-1.5210	2.1622			
Crimes against person	r=	-0.3616*	0.2429*	-0.2140	-0.0263	-0.1385	-0.2159	0.1129			
	t=	-1.7209	2.0788	-1.1425	-0.1752	-0.7886	-1.1507	0.8250			
Crime against property	r=	-0.3625*	0.2198*	-0.3231	-0.0541	-0.3420	-0.3067	0.2509*			
	t=	-1.7244	1.8261	-1.5827	-0.3324	-1.6515	-1.5211	2.1708			
Total crimes	r=	0.0743	0.3587	-0.8160	0.2317	-0.0884	-0.4999	0.2290	Districts generating criminals (df=10)		
	t=	0.2537	1.7688	-1.4209	0.9535	-0.2569	-1.0540	0.9394			

Crimes against person	r=	-0.2857	-0.4723	0.4801**	0.1264	0.2801	0.3889*	0.1132		
	t=	-0.7026	-1.0145	2.9197	0.4574	1.2306	2.0121	0.4038		
Crime against property	r=	0.0774	0.3631	-0.8192	0.2295	-0.0914	-0.5030	0.2270		
	t=	0.2651	1.8029	-1.4240	0.9420	-0.2648	-1.0583	0.9289		
Total crimes	r=	-0.0172	0.4518**	-0.4332	-0.3265	-0.3210	-0.3453	0.3594		Districts attracting criminals (df=10)
	t=	-0.0534	2.6067	-0.9559	-0.7784	-0.7683	-0.8117	1.7743		
Crimes against person	r=	0.1462	0.7842***	-0.4993	-0.1045	-0.2845	-0.1671	-0.0516		
	t=	0.5414	11.4912	-1.0530	-0.2991	-0.7005	-0.4528	-0.1553		
Crime against property	r=	-0.0195	0.4448*	-0.4302	-0.3283	-0.3200	-0.3463	0.3638		
	t=	-0.0605	2.5338	-0.9513	-0.7815	-0.7666	-0.8135	1.8083		
Total crimes	r=	0.0459	0.2630	-0.3343	0.1659	-0.4203	-0.3230	-0.4268	Districts generating and attracting criminals (df=18)	
	t=	0.2040	1.5141	-1.0630	0.8441	-1.2555	-1.0358	-1.2690		
Crimes against person	r=	0.0985	0.3264*	-0.0981	0.5910***	0.0951	-0.3828	-0.2455		
	t=	0.4636	2.0562	-0.3789	6.1310	0.4461	-1.1745	-0.8362		
Crime against property	r=	0.0454	0.2617	-0.3347	0.1627	-0.4222	-0.3215	-0.4265		
	t=	0.2017	1.5042	-1.0640	0.8242	-1.2595	-1.0323	-1.2686		

Significant at level df=42	0.000***	Critical value	3.551
	0.01**		2.423
	0.05*		1.684
Significant at level df=18	0.000***	Critical value	3.922
	0.01**		2.552
	0.05*		1.734
Significant at level df=10	0.000***	Critical value	4.587
	0.01**		2.764
	0.05*		1.812

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