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A Study on the Relationship of Spatial Planning Aspects in Occurrence of Street Crimes in Dhaka City

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ABSTRACT

Street crime, like mugging and vehicle theft, are the significant crime problems in every developing city of the world. The study area for this research is Dhaka city, which is experiencing an situation of increasing street crime. This research focuses on the relationship between spatial planning and street crimes and tries to recommend different strategies for prevention of crime and violence in the streets of Dhaka city by proposing urban design and infrastructure planning. The study tries to assess the relationship from macro to micro level through different spatial and physical planning components. For the detail level study, four Thana (police station) areas have been selected from Dhaka City Corporation area (DCC) according to their physical layout and other characteristics. In this level, the relationship is studied through the association between spatial layout and different physical planning factors like land use along with some elements of streetscape. Space Syntax methodology was applied to assess the impact of spatial configuration in occurrence of street crime with the selected four study area. In the micro level the study reveals that different types of land use with different design elements lead to change in public activity spaces which have impact on occurrence of street crimes. For the overall research the street crime data (both macro and micro level) of mugging and vehicle theft were collected from the police authority and some insecure places are identified by the local people through field survey. It is expected that the outcome of this research will unveil the impacts of spatial planning on occurrence of street crimes in a city.

Keywords: *street crime, spatial distribution, spatial con iguration, land-use, crime density, streetscape elements*

INTRODUCTION

Crime occurrence in urban areas is always considered as a disquieting situation for every developing city. Crime is also a predominant social problem for every society and always considered to be a major urban concern which has a deep impact on the quality of urban life. Crime that occurs on the street is one of the main problems in everyday life. The most talked about street crime refers to crime such as vandalism, car theft and mugging that are usually committed outdoors (UK Home Office 2009). The study area for this research, Dhaka city, is no exception and is experiencing a horrifying situation of street crime.

As a fast-growing megacity, Dhaka has been experiencing a high rate of urban growth. This rapid mass urban transformation of Dhaka is not commensurate with its overall development. It began with a manageable population of 2.2 million in 1975 which reached 12.5 million in 2000. The growth rate of the population during 1975-2000 was 7% (UN 2001). The growth rate of Dhaka's population will also continue to remain high. During 2000-2015 it is expected to grow at a 3.99% annual growth rate and reach a total population of 22.8 million in 2015 (UN 2001). Significant portions of Dhaka's population are living in slums and squatter settlements.

Crime and violence have been identified as key issues for Dhaka, and particularly affects the urban poor. The situation in Dhaka is thought to be worse than in the rest of the country (World Bank, 2007). According to Ahmed and Baqee (1996) nearly 61% of the country's crime occurs in Dhaka City where less than 10% of country's total population live (Hossain, 2006). The character of Dhaka, with large slums, poor housing, excessively high land prices, traffic congestion, water shortages, poor sanitation and drainage, irregular electric supply, unplanned construction, increasing air pollution and poor urban governance, results in growing problems of law and order. In this situation Crime and violence have been identified as key issues for Dhaka (World Bank, 2007).

This research recommends strategies for prevention of crime and violence in the streets of Dhaka city by incorporating urban design and infrastructure planning. This paper focuses on the relationship between spatial planning and crimes in order to predict the street characteristics that attract criminals and the opportunities they offer to the occurrence of street crime. The focus of this research is physical environmental aspects and less priority will be given on other factors as socio-economic factors, law and order situation. The study assesses the relationship from the macro scale to micro scale through different spatial and physical planning components.

It is expected that the outcome of this research will unveil the effects of physical planning factors on the occurrence of street crimes in a city and it can be a useful tool for police administrators and law enforcers in the diminution of street crime in a city. Findings of this research will be beneficial for planners, architects and policy makers to plan for a secure and safer community in the city.

Street design and different urban design theories regarding security feelings:

The relationship between crime and the physical environment has been studied extensively from various angles over the time. Earlier studies include the work of Jane Jacobs regarding the relationship between crime and street layout and land use, Oscar Newman's attempts at using architectural form to reduce the effects of crime in public housing schemes in the United States through his "defensible space" ideas, and situational crime prevention, which involves the introduction of discrete managerial and environmental changes to reduce opportunities for specific crimes to occur (Kruger, 2005).

Natural Surveillance theory by Jane Jacob (1961) and Defensible Space theory by Oscar Newman in 1972: The first contemporary urban planner to develop a theory linking crime to street use was Jacobs (1961). Jacob focused on site specific and situational features of a place. She argued that the circulation of people and appreciation of public space are crucial elements to the urban vitality and indicated that informal (natural) surveillance ("eye on the street") is a good deterrent to criminal activity. She proposed that crime in urban residential areas could be reduced if those areas became less anonymous and less isolated and argued for orienting buildings in a way that allows residents to observe all activity surrounding them (Jacob, 1961 in Fanek, 1997).

Newman elaborated the idea of defensible space and its most important elements of territoriality and natural surveillance. Later, the concept of defensible space provided the theoretical grounding for the development of Crime Prevention Through Environmental Design (CPTED) (Baran, et al, 2007).

But later, A study done by the Beavon and Brantingham's (Beavon, et. al., 1994), which explored the relationships among the accessibility of street networks, property crime, and the concentration of potential targets. The study compared the relative amount of property crime in each street segment with that segment's relative accessibility, traffic volume and quantity of potential targets. Both road network complexity and traffic flow were found to be of substantial importance. Crime was higher in more accessible and highly used areas and lower in the less accessible and less used areas. The concentration of potential targets was highly related to accessibility and traffic flow and to overall property crime totals. The findings of the study clearly point to the importance of the urban background created by cities through zoning and road network development. The study suggested that street networks influence the mobility patterns, awareness spaces and target choices of criminals, particularly those using automobiles or street-level public transit (Beavon, et. al., 1994).

Crime and Spatial Planning Aspects

Crimes cannot be separated from the space in which they happen. According to Brantingham and Jefffery, crime can be defined as a complex, multi-dimensional event that occurs when the law, offender and target (refers to a person in personal crimes and an object in property crimes) converge in time and place (such as a street corner, address, building or street segment) (Henry and Bryan, 2000). Another view given by Brunsdon et al (1995) is termed as "vulnerability" which is not identified by the official figures of the problem associated with actual crime occurrence. This would allow us to address the criminal behaviour, non-reportable crimes and other consequences associated with the official figures (Brunsdon et al, 1995).

In this study, two dimensions of spatial planning related to insecurity from crime occurrence are considered. One is the place of actual crime occurrence reported to police authority and another is the insecure place identified by the local people related to fear and insecure feelings of people.

Crime has long been thought to be intimately associated with the physical environment. Different bodies of research focused on exploring the relationship between physical environment and fear of crime or actual crime location (Long and Baran, 2006). A Study done in the District of Columbia to examine the relationship between land use and crime, found that commercial and transitional areas tended to be more attractive target for criminals, where residential areas considered being least attractive (Liggett, et al, 2004). Surrounding land uses has been found to have a major effect on the incidence of crime. The presence of physical features that increase the visibility of a site (such as open storefronts, unobstructed windows, and well-lit areas) and the absence of features that can block views (for example, blank walls, thick vegetation) can help ameliorate crime (Liggett, et al, 2004). The environment can also play a significant role in influencing perceptions of safety. Certain environments can impart a feeling of safety, while others can induce fear, even in areas where levels of crime are not high (Kruger, 2005).

METHODOLOGY OF THE STUDY

In this research, different statistical and reported crime data and different spatial data (maps etc.) have been gathered from primary and secondary sources. General methods were used to gather data such as literature survey, field survey, field observation, interviews and focus group discussion.

A physical survey was carried out in the study areas to find the characteristics of physical planning attributes such as land use, road network, boundary wall features, building entry points, position of lamp posts, and other attributes of the study area. Focus group discussions were conducted with different groups of people in the selected study areas. The purpose of these focus groups was to assess the vulnerable crime locations and the views of the residents on crime and space context were recorded from these focus group meetings. The process was repeated in each Thana. Focus groups varied in size from three to eight participants, and included a diverse mix of people; including office workers, security guards, students, architects, and local tea sellers.

At the Macro Level, the spatial distribution of street crimes of all Thana in the DCC area were represented in a Choropleth map using GIS software with attributes using crime count, crime rate and crime density. Choropleth maps are a type of thematic map in which areas are coloured or shaded to reflect the value of the mapped phenomenon or to display classes of values (Yang, 2005).

The relationship of spatial configuration with street crime is analysed through Space Syntax methodology, incorporating GIS data and different statistical tools. The data was analysed to establish the relationship on the basis of physical planning attributes as integration and connectivity of Space Syntax measures, land use and different streetscape elements.

Space Syntax Methodology

Space Syntax starts with defining movement and occupation as the fundamental functions of a layout, where permeability of all spaces is the priority condition for a functioning layout structure. On an urban scale, Space Syntax regards movement as the generic function of street spaces and hence; reduces these spaces to the longest accessible lines that cover all convex spaces in a map, that is; the axial lines or "lines of sight"(Al_Sayed, K. et.al., 2014).

Space Syntax analysis examines the spatial configuration of cities by defining all external spaces as a continuous network of open spaces. The spatial configuration is represented by the set of the fewest and longest lines of vision that link all spaces in the network known as an axial map. Research has revealed the importance of the axial map in representing the patterns of movement and activity in urban environments. (Fanek, 1997).

The configuration of a space from the point of view of its constituent lines can be measured exactly through the measure of 'integration'. The 'integration value' of each line reflects its mean linear 'depth' from all other lines in the system. In the map these integration values represented from red through purple, means most integrated to the most segregated space of a system and produce a global integration map of the whole of a whole space (Hillier, 1996).

SELECTION OF THE STUDY AREA

To conduct the research, the study area has been selected from the DCC (Dhaka City Corporation) Area, which has an area of 153.84 square km and a population of about 5.33 million according to 2001 census (BBS 2007). Four Thanas (Police Stations) of DCC area have been selected considering the diversified character of land use, accommodation of social group, crime rate, built space and data availability to accomplish the study. Among the four Thana, two of them are selected from higher class, planned residential areas like Gulshan and Dhanmondi, developed for upper and upper-middle income group. The other two are inadequately planned residential Thana, Mohammadpur and Ramna, developed for middle or lower-middle income group.

Profile of Study Area

Dhaka City Corporation comprises with a total 153.84 square km with total 90 ward and 731 no. of Mahalla with a literacy rate of 70.66% according to census 2001 (BBS, 2007). The development of Dhaka city mainly started from the pre-independence - period since 1947. The residential and commercial areas were developed side by side for easy access to infrastructure along the road side. In old Dhaka there are mixtures of land use like commercial, residential and industrial. Motijheel area was developed as a commercial area where Dhanmondi was developed as a planned residential area according to the first master plan of Dhaka city in 1958. But now Dhanmondi has turned to mixed use of land with enough educational and health institutes, commercial areas etc. along with the residential area. The land use of the Tejgaon area is mainly industrial with some residential and commercial use. Gulshan, Banani and Baridhara were developed by the DIT as planned residential areas for higher income people and Uttara for middle income people. But now the land use of major portion of Gulshan and Banani has turned to commercial area.

Land Use Character of the DCC area in Different Thana

Land use plays a pivotal role in the pattern of spatial distribution of crime. It also delineates the activity of

a city. The core part of a city is also guided by the land use pattern of a city which has a combination of mixed use character of land use with residential, commercial, institutional and administrative. To understand the spatial pattern of a city it is also necessary to identify the major land use character of the specific area from the land use pattern of the city.

In this study Land use data from the DCC area was also collected from GIS data provided by DCC and overlain with the land use pattern map with different Thana boundary. Figure 1 shows the land use pattern of DCC area demarcates with different Thana boundary.

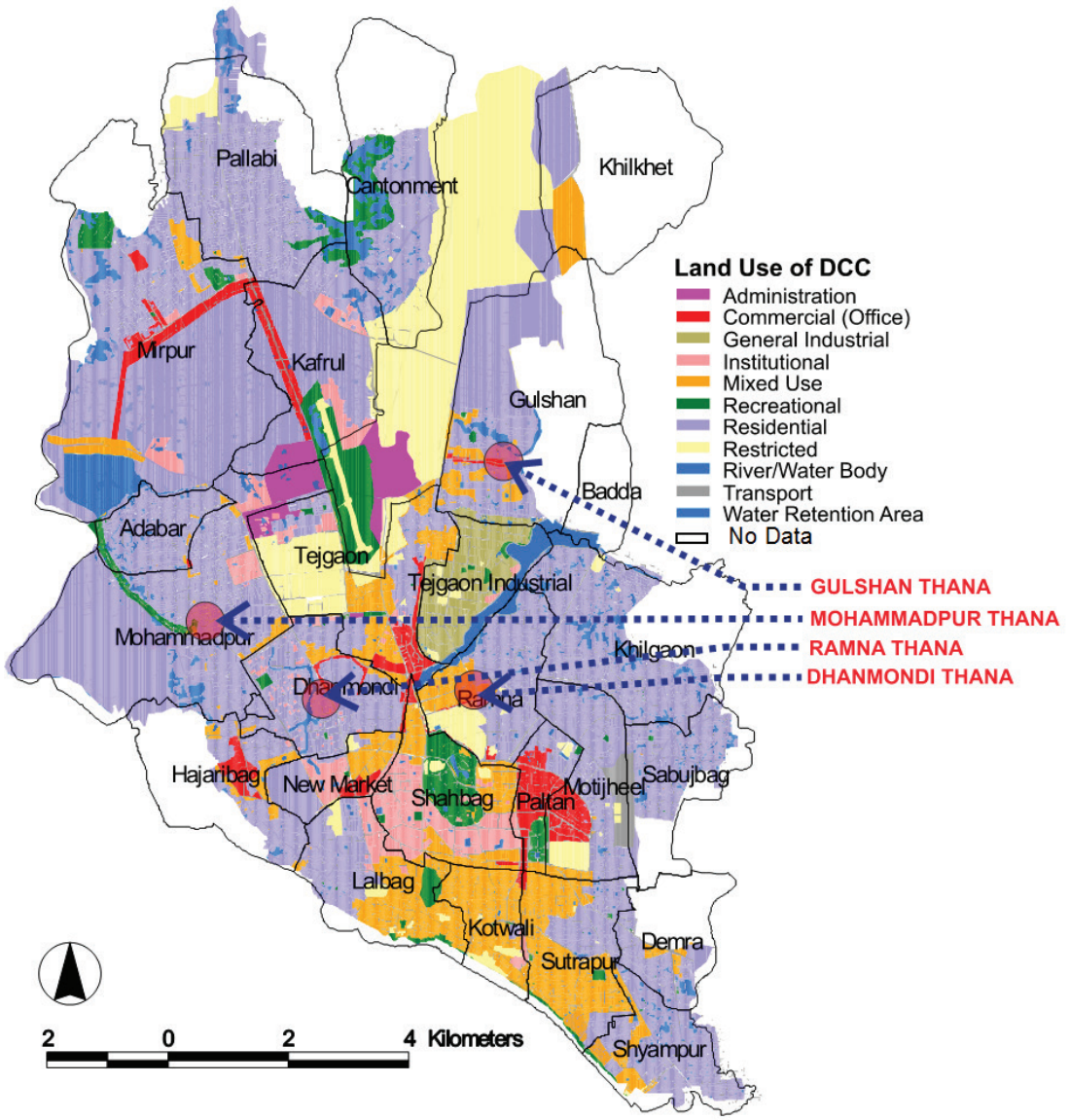

Figure 1:
Land Pattern of DCC area with different Thana Boundary
Source: Prepared by the Author from the Spatial Data provided by DCC

SPATIAL PATTERN OF STREET CRIME DISTRIBUTION AND LAND USE IN DHAKA CITY

A macro level analysis was done covering the overall DCC area to understand the spatial pattern of street crime occurrence. In this study the Choropleth map generated from GIS application is used to show the distribution pattern of street crime. Three months street crime data of all Thana of DCC area were collected from the Dhaka Metropolitan Police is used to conduct the research. The spatial distribution map is produced through three attributes as crime count, crime rate and crime density (Chowdhury, 2013).

It has been found from the spatial distribution analysis of street crime in DCC area that vulnerability of crime occurrence is concentrated in the core area of Dhaka city, where urban activity is high where there is a density of public movement. The public movement is always higher in the commercially developed urban core area where monetary transaction is also higher. From the various distribution of street crime it was seen that crime prone areas are located in the core area or near the core area of the city which always have high public activity because of mixed or commercial land use. The urban core of Dhaka city has always acted as an important factor for Bangladesh as majority of the country's investment, commerce, manufacturing, constructions, development etc. emerged from here. As criminal occurrence is related with the potential targets for exploiting by the criminals so these areas are favourable places for the criminals to commit crime as they find proper victims in these areas (Chowdhury, 2013).

Mezzo Level Perspective of Land Use of Each Thana and Street Crime

An overall perspective of land use pattern of an area was analysed to identify the source of potential criminals and potential target area of criminals for each Thana. It was necessary to recognise whether there were any potential sources of crime locations in each Thana and whether the criminal chose any particular type of land use for committing different types of offences.

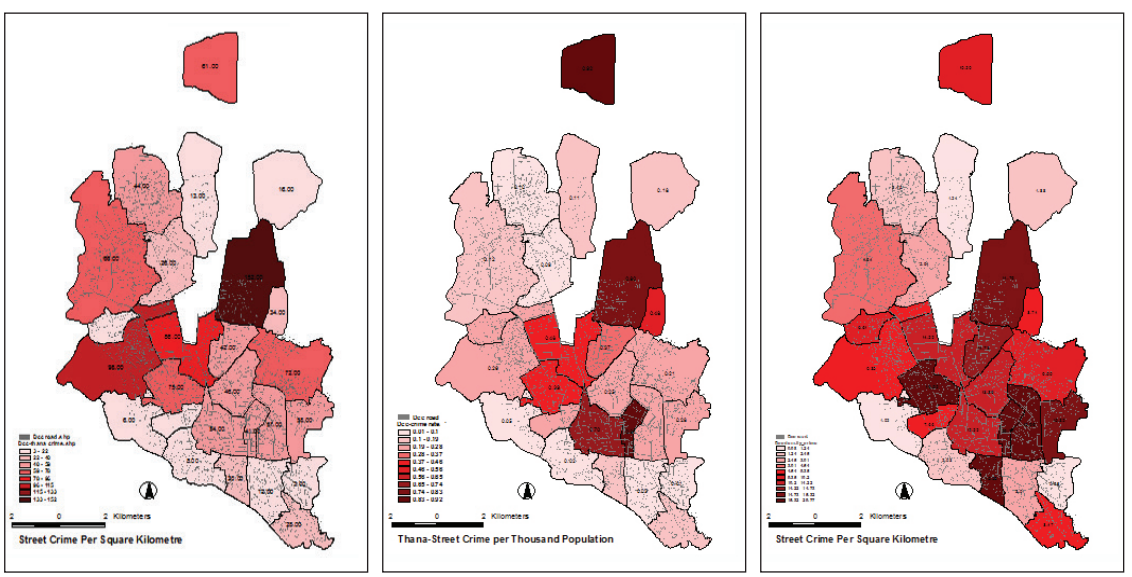

Figure 2:
Spatial Distribution of Street Crimes in the Thanas of DCC area
Source: Prepared by the Author using GIS data

- **Land Use Pattern of Gulshan Thana and Street Crime**

Gulshan Thana consists of mainly three planned residential area named Gulshan and Banani Model town, and Baridhara residential area that were previously developed as residential areas for the high income group. In spite of the residential characteristics, there are commercial strips developed along the roads leading to National Shooting Complex up to Gulshan-2 circle about towards Kamal Ataturk Avenue which includes offices, banks, shops, restaurants, shopping malls and plazas (DAP, 2004). Though it was developed as an aristocratic residential area, there is also informal settlement where 18% of the total population of Gulshan Thana lives (Islam, M.S., 2007). A significant portion of lands of Gulshan and Baridhara are used as diplomatic zone for different embassies. Mohakhali has a variation of land use. In this ward, the land beside Mohakhali-Gulshan road is used for commercial where a large portion of lands of Mohakhali are used for different government and semi government health institutes and T&T complex. There is also spontaneous development at the Mohakhali portion like Karail Slum which lacked utility services, connection roads along with serious water logging problem. Figure 3 shows the land use map of Gulshan Thana with crime location.

From the perspective of crime occurrence and the land use pattern of Gulshan Thana, it was found that the crimes reported mainly in the planned portions of Gulshan Thana which become a potential target places for criminals and very rare street crimes are recorded in the informal portions which are less attractive to criminals. But a large number of people from the focus group discussion identified the informal development of land use of Gulshan Thana as insecure places specifically the surrounding slum area near T&T. From the overall pattern of Gulshan Thana, it was found that street crimes concentrated in the zone with commercially concentrated land use. But some insecure places are found in the residential zone, near the Banani Graveyard and along with some portions of Baridhara diplomatic zones which become quiet because of low public movement in that particular type of land use.

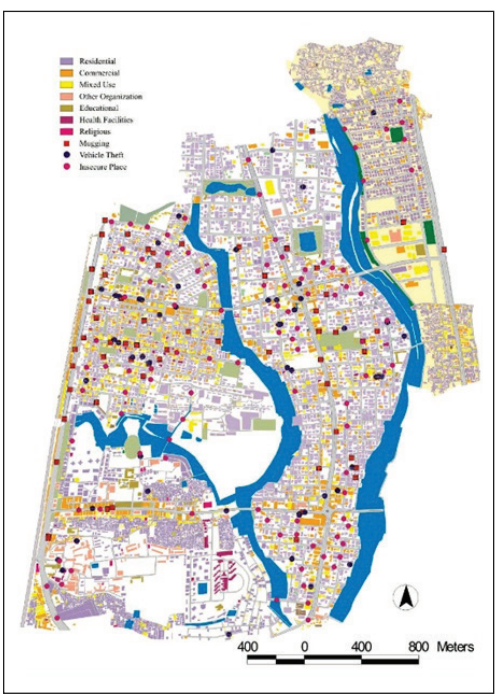

Figure 3:
Land Use Map of Gulshan Thana with Street Crime Location
Source: Prepared by the Author from the Spatial Data by DCC and Crime Data by DMP

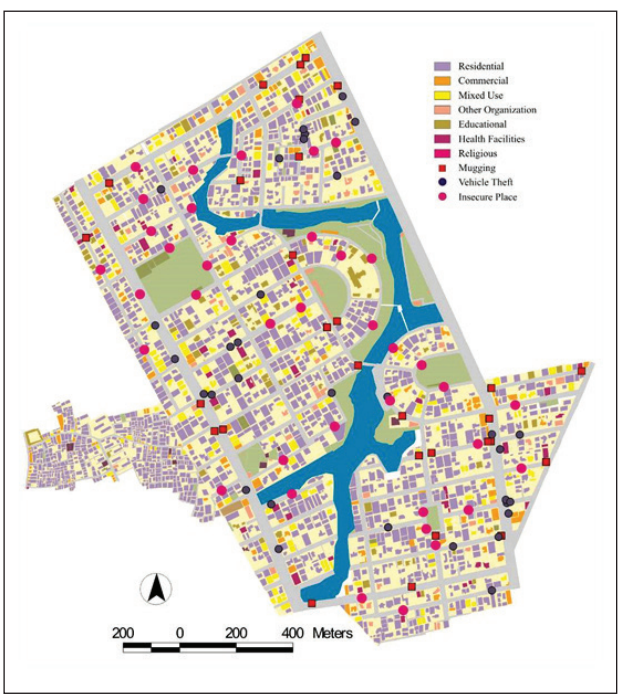

Figure 4:
Land Use Map of Dhanmondi Thana with Street Crime Location
Source: Prepared by the Author from the Spatial Data by DCC and Crime Data by DMP

- **Land Use Pattern of Dhanmondi Thana and Street Crime**

The initially designed Dhanmondi residential area for higher income group or class gradually changed its character after Liberation war in 1971, to a mixed land use area. Along with the major roads a significant inner land use has been transformed to mixed use, educational and health institute. Different organizations, NGOs, and other voluntary organization adopted Dhanmondi as their ideal place to have an office. Figure 4 shows the land use map of Dhanmondi Thana with crime location.

The crime pattern in Dhanmondi Thana was distributed all over the residential area with the special type of land use along with its changing character. Though the street crime was high in the commercially transformed major road, there were significant portions of crime distributed in the inner residential zone. The insecure places were identified in the quiet zone of land uses with low public activity on the road.

- **Land Use Pattern of Mohammadpur Thana and Street Crime**

Mohammadpur area was previously developed by the government in mid 1960's to accommodate migrant Muslim people from Bihar, India (Tawhid K. G., 2004). The land use pattern of Mohammadpur Thana is different from Gulshan and Dhanmondi Thana. It is also a densely populated Thana of Dhaka. This Thana is developed as a residential area for middle income people with some minor commercial activities. There are informal settlements in the western fringe of Mohammadpur Thana and in Geneva camp area in the central part of this Thana. The northern portion of land use of Mohammadpur Thana are designed as planned residential area for middle and lower middle class and lower portion is unplanned development with residential area. Maximum portion of the west side of BeriBadh is still underdeveloped with low lying areas with some informal portions of residential use on both sides of Beribadh. The commercial use of Mohammadpur is not very much developed as Gulshan and Dhanmondi, though the land use beside the Ring Road, Tazmahal Road and some portions of Asad Avenue are growing as commercial use. Figure 5 shows the land use map of Mohammadpur Thana with crime location.

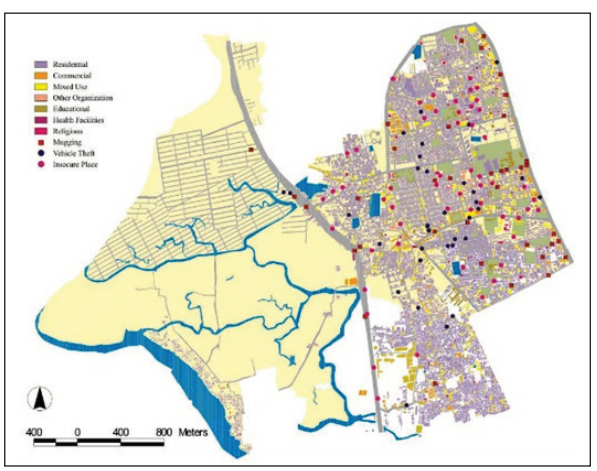

Figure 5:
Land Use Map of Mohammadpur Thana with Street Crime Location
Source: Prepared by the Author from the Spatial Data by DCC and Crime Data by DMP

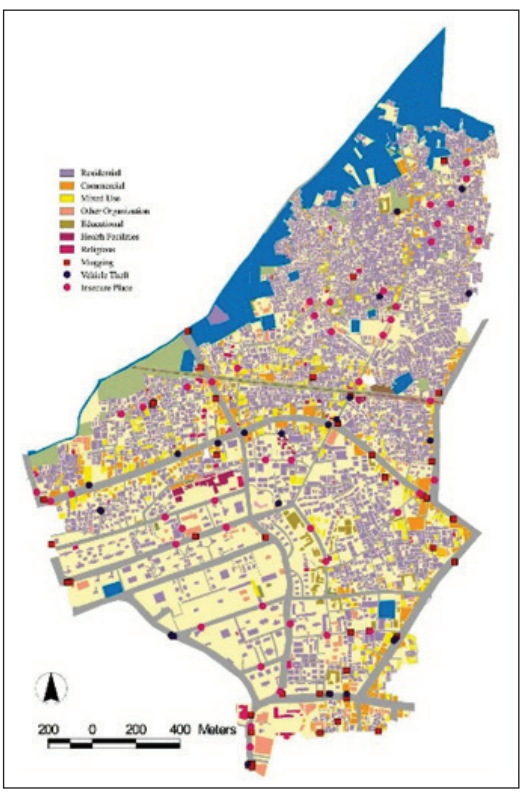

Figure 6:
Land Use Map of Ramna Thana with Street Crime Location
Source: Prepared by the Author from the Spatial Data by DCC and Crime Data by DMP

The overall street crime patterns of Mohammadpur were mainly concentrated in the planned residential portion. A significant portion of street crimes were also developed in the BeriBadh road. Huge mugging occurrences recorded in the Aurangazeb Road which had a land use in one side with residential activity and other side with backside of school. So this quiet road with low public activity which is connected to Tazmahal road with commercial or mixed used activity become a preferred target places for criminals in committing street crimes. From the focus group discussion the local people identified the Geneva Camp area in the planned portion as a negative land use as those areas could be a potential source of criminals. The people feel insecure in moving besides those areas. People also identified the total Beribadh as insecure places as both sides of it are still underdeveloped or no particular land use. The main roads with commercial land use have very little impact on Mohammadpur Thana.

- **Land Use Pattern of Ramna Thana and Street Crime**

Ramna Thana has a diversified pattern of land use. The land use pattern of whole Ramna Thana can be divided into two zones with the Outer Circular Road. The northern portion of Ramna Thana is basically developed for low or lower middle class people as highly dense residential use mainly in the Moghbazar area with poor service and infrastructure facilities. A significant parcel of lands of Ramna Thana (basically northern side) is consisted of T&T administrative offices and quarters on both sides of the Wireless Gate Road. The southern portion of Ramna Thana was emerged in the British Colonial period as an adjacent development to the old core for accommodating government offices and residences in the colonial period. Ramna Thana is a very important area of Dhaka City Corporation with many government, semi government, autonomous housings and private institutions (Sarkar, M. M. H., 2008). Commercial uses are developed on both sides of Outer Circular Road, Tongi Diversion Road, Kakrail Road and Anjuman Mufidul Islam Road. Other Roads has basically residential use but with some mixed and institutional use. Figure 6 shows the land use map of Ramana Thana with crime location.

Like Gulshan and Dhanmondi the reported street crimes basically concentrated in the major roads with commercial use. The vehicle theft crimes concentrated in the major roads like New Eskaton road near Bangla Motor node and Outer Circular road where a concentrated commercial use of shops with motor parts vehicle and workshops. A huge concentration of mugging and vehicle theft found in Shahid Monsoor Ali Sarani road which has a commercial use of government offices like International Mother Language Institute, Matsho Bhaban, Shipakala Academy etc with other side of recreational use like Ramna Park. But the important factor is that the insecure places identified by the local people are concentrated mainly in the unplanned portion. The local people always felt a fear of street crime in the residential portions of both informally developed Moghbazar area and government officers housing in Eskaton area. The T&T area also found as insecure places by the local people. There are some crime prone areas also found in the Mirbag and Modhubag area of Noyatola which are located near the informal settlements of slum area at Moghbazar.

Micro Level Perspective of Land Use around crime locations in Each Thana and Street Crime

From the mezzo level analysis of land use of different Thana, it was found that street crime mainly concentrated in the commercial zone or near the commercial and mixed use zone. In micro level analysis of land use and street crime a detail level relationship was examined from the definite location of crime occurs beside the specific land use from the reported street crimes of each Thana.

This analysis was done from the percentage of different types of land use beside the specific reported crime location.

Dhanmondi Thana

In Dhanmondi Thana analysis from Figure 7 it was found that mugging is highest besides commercial land use (38%), then residential (24%), mixed (14%), different organizational (14%) respectively and lower in other types.

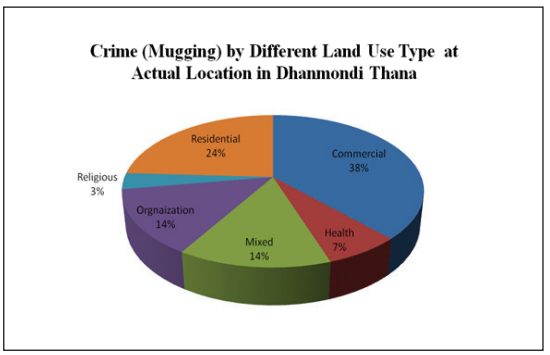

Figure 7:
Reported Muggings on Different Types of Land Use of Specific Locations in Dhanmondi Thana

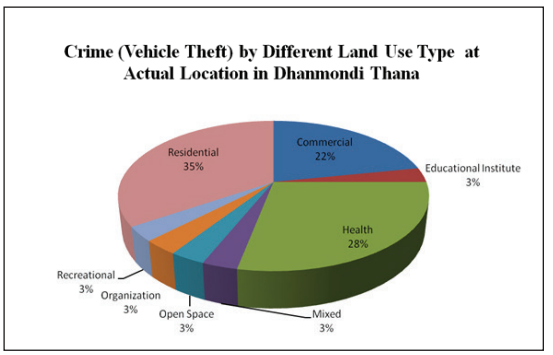

Figure 8:
Reported Vehicle Theft on Different types of land use in specific locations of Dhanmondi Thana

But in case of vehicle theft crime from Figure 8 it was found that crime occurrence is higher besides residential (35%) and health facilities (28%) than to commercial land use (22%). So it was found that a major portion of vehicle theft crime relates with the land use with health institute activity which is a huge source of vehicle with low security in Dhanmondi Thana.

Gulshan Thana

From Figure 9 it was found that mugging is highest in Commercial land use (42%) then in residential (28%) and in mixed use (20%) land use respectively. Other types had very low occurrence of mugging. From Figure 10 it was found that the vehicle theft crime mostly occurs in the commercial area (48%) than in other areas.

Mohammadpur Thana

The relationship of land use with reported street crimes in Mohammadpur Thana was found totally different from Dhanmondi and Gulshan Thana. From Figure 11 it was found that mugging in Mohammadpur Thana was same in case of residential (30%) and commercial (30%) land use. Then it comes with a significant portion besides educational institutes (19%).

It was different also in case of vehicle theft. From Figure 12 it was found that vehicle theft was much higher for residential use (53%) than commercial use (9%). But a major portion of vehicle theft crimes occurred besides the mixed use (23%) of land.

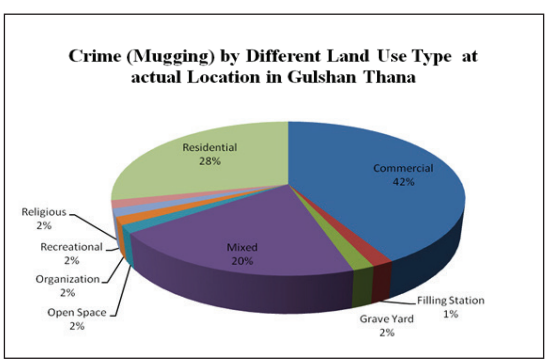

Figure 9:
Reported Muggings on Different types of land use of specific locations of Gulshan Thana

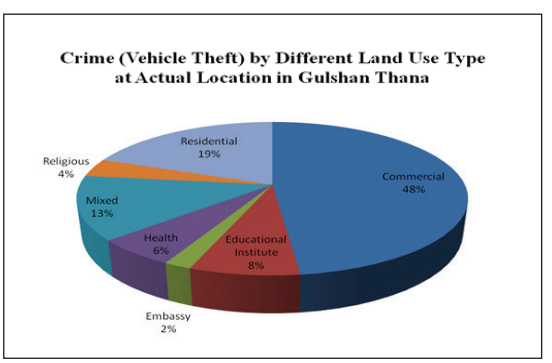

Figure 10:
Reported Vehicle Theft on Different types of land use in specific locations of Gulshan Thana

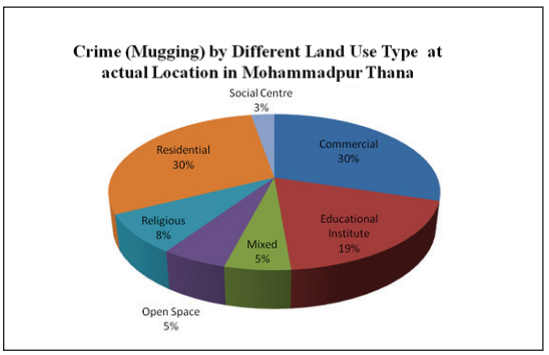

Figure 11:
Reported Muggings on Different types of land use of specific locations in Mohammadpur Thana

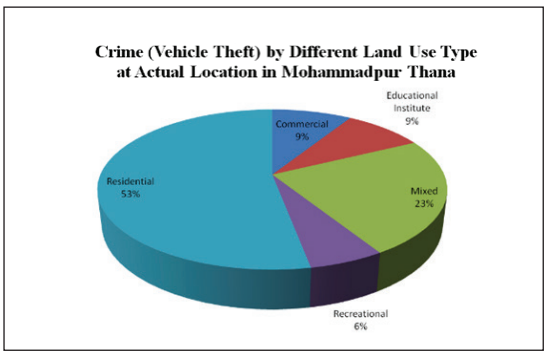

Figure 12:
Reported Vehicle Theft on Different types of land use in specific locations of Mohammadpur Thana

Ramna Thana

From Figure 13 it was found that highest mugging occurs in Ramna Thana besides Commercial land use. Then a major portion of mugging occurs besides different organization (21%) and residential (18%) land use. But no vehicle theft crime found besides organizational land use in Ramna Thana. From Figure 14 it was found that maximum number of vehicle theft crime occurs in Ramna Thana beside commercial (35%) land use. Then significant portions beside residential (26%), mixed (18%) land use and open spaces (13%).

INFLUENCE OF SPATIAL CONFIGURATION IN OCCURRENCE OF STREET CRIME IN POLICE DISTRICTS

In this phase Space Syntax analysis was done to examine the relationship between spatial configuration and crime occurrence. At first a macro level analysis was done for the whole DCC area for global level analysis, and local level analysis is done for each four Thana area. The Integration (Rn) value for each Thana was obtained from the axial map analysis of the whole spatial configuration of DCC area considering entire network of Dhaka city. The other values of different attributes of axial map like Integration (R=3) and Connectivity were derived from the individually analysed axial map of each Thana (Chowdhury, 2012). The crime data were plotted on

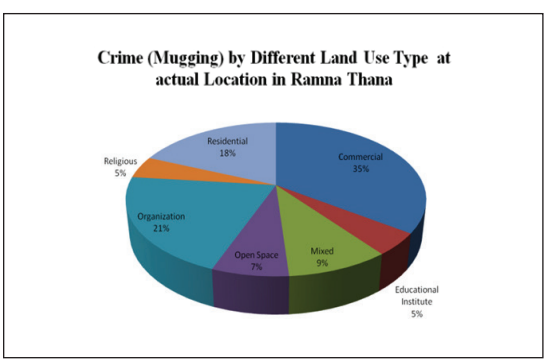

Figure 13:
Reported Muggings on Different types of land use of specific locations in Ramna Thana

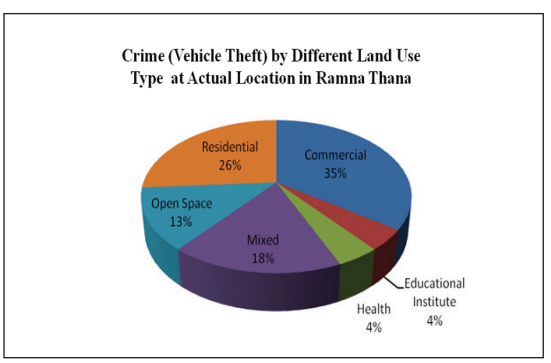

Figure 14:
Reported Vehicle Theft on Different types of land use in specific locations of Ramna Thana

the axial maps prepared for each attributes. From the reported crime occurrence and the insecure places recognized by the local people some streets or axial lines were identified as crime concentrated area.

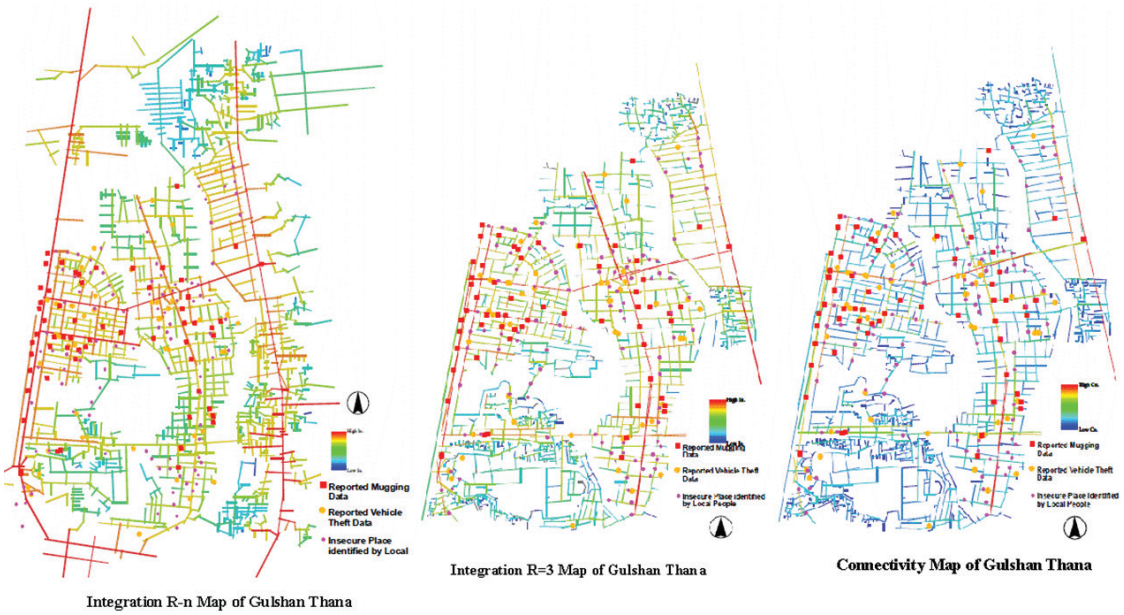

Figure 15:
Axial Maps of Gulshan Thana
Source: Chowdhury, 2012

Figure 16:
Axial Maps of Dhanmondi Thana
Source: Chowdhury, 2012

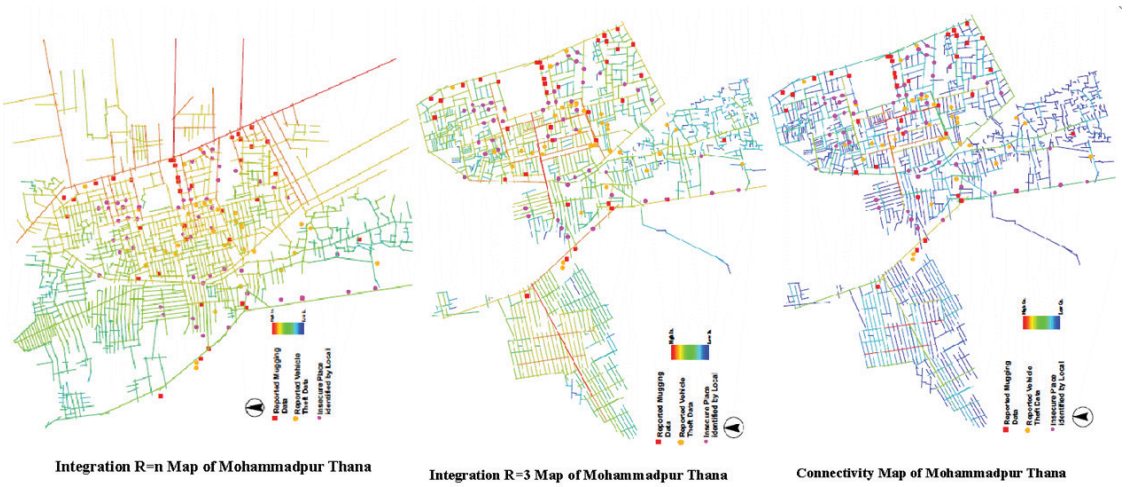

Figure 17:
Axial Maps of Mohammadpur Thana
Source: Chowdhury, 2012

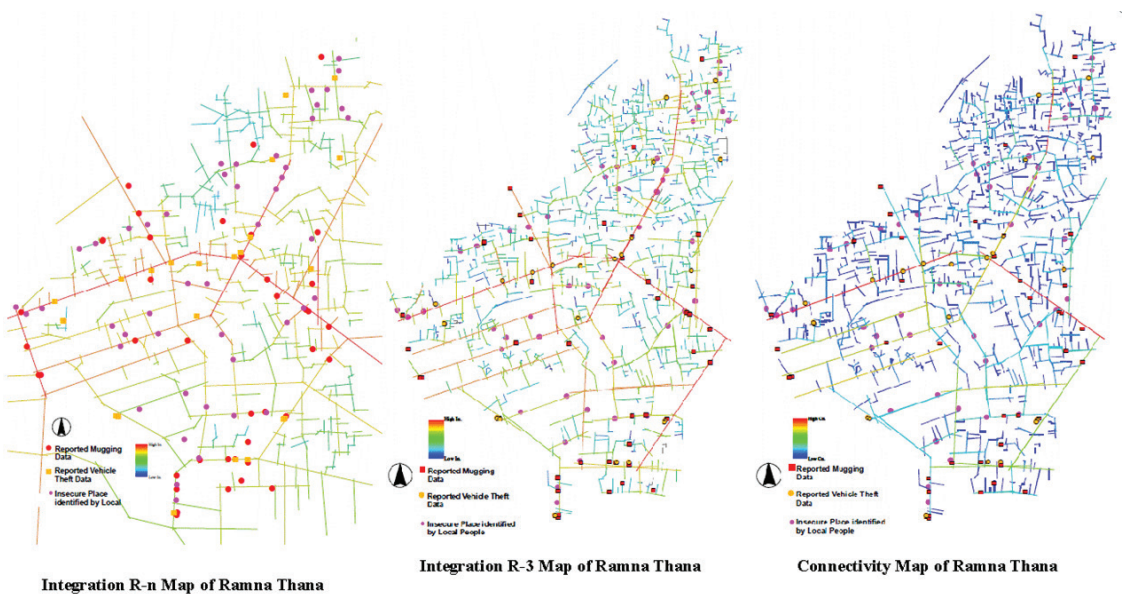

Figure 18:
Axial Maps of Ramna Thana
Source: Chowdhury, 2012

From the analysis of spatial configuration and street crimes, the findings are different in four Thana according to different crimes and layout of each Thana.

In case of planned residential area with upper income group like Gulshan and Dhanmondi Thana, street crimes concentrated mainly in the integrated main roads with higher connectivity which turns to

commercial area with change of time as those areas have more potential targets of criminals because of high monetary transaction and those are related to escape routes for criminals after committing crimes. But some street crimes also found in some segregated parts of residential area with dead ends roads near the lake with low connectivity (Chowdhury, 2012).

In Mohammadpur Thana, the relationship was not similar with the Gulshan and Dhanmondi Thana. The character of Mohammadpur Thana land use is not similar with Dhanmondi and Gulshan Thana as the integrated roads of Mohmmadpur Thana is not turned to totally commercial like Dhanmondi and Gulshan Thana. The mugging cases of Mohammadpur Thana mainly happened in the low connectivity streets near the integrated areas where criminals of vehicular theft mainly preferred the segregated streets. The insecure places identified from the Mohammadpur Thana are mainly found in the segregated streets of spatial configuration (Chowdhury, 2012).

The spatial layout of Ramna Thana was very much different from other three Thanas. Mugging and Vehicle theft crime of Ramna Thana mainly concentrated in the integrated major roads with higher connectivity and high public activity. But some mugging crimes also occurred in the segregated parts of organic portions of Ramna Thana. The insecure places identified mainly in the segregated streets with low connectivity (Chowdhury, 2012).

DIFFERENT PHYSICAL PLANNING FEATURES AND STREET CRIME

In this study the data was analysed to establish the relationship on the basis of physical planning factors as land use, and different streetscape elements like features of boundary wall, and entrance to the roadside plot.

The research was done in both macro and micro level with mugging and vehicle theft data from police authority and insecure places identified by the local people. Figure 19 shows the criteria for examining the relationship of street crime with physical planning factors like land use along with some selected streetscape elements like boundary wall, building entry point and street light.

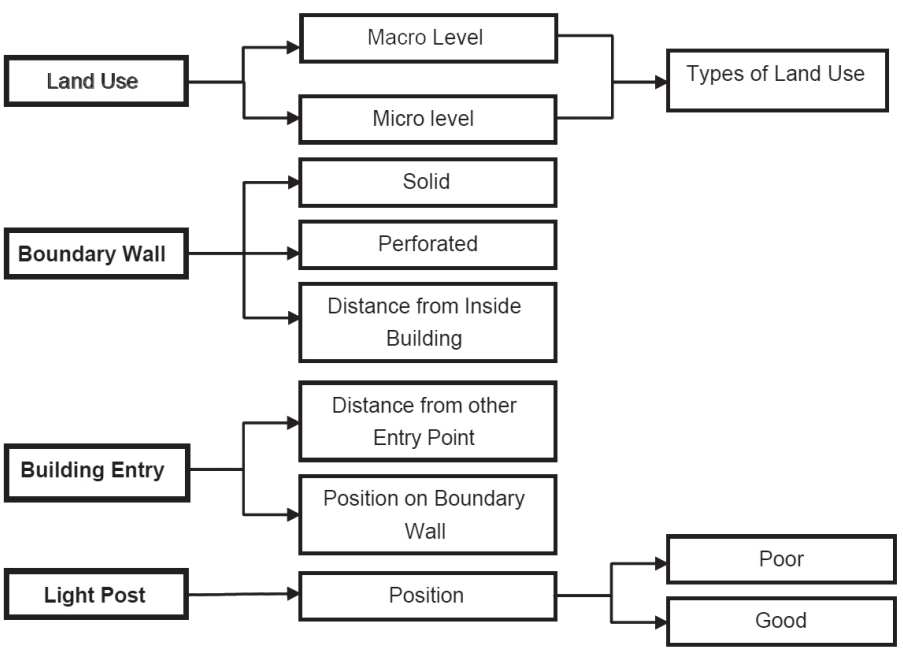

Figure 19:
Criteria for Analysing the Physical Features

Different Streetscape Elements and Street Crime

- **Boundary Wall Features**

One of the features that impact upon the visibility of street from the neighbourhood plot is boundary walls of individual property. In this study two features of boundary walls are considered. The features are perforation and set back from inside buildings in the road frontage. This analysis is done with the place of actual crime occurrence and the observed physical condition of the location.

Perforation of Boundary Wall and Street Crimes

Solid boundary wall of a plot in the road frontage is one of the measures that block the visibility of the street from the property. In this case the natural surveillance of the crimes that occurred on the street was also blocked from the surrounding plots. So it was easy for the criminals to commit the offences in the streets in front of solid boundary walls as they were not noticed from the adjacent plot. Some examples shown from the study area in Figure 20 that solid boundary wall in the road frontage blocked the natural surveillance in street and create crime prone areas.

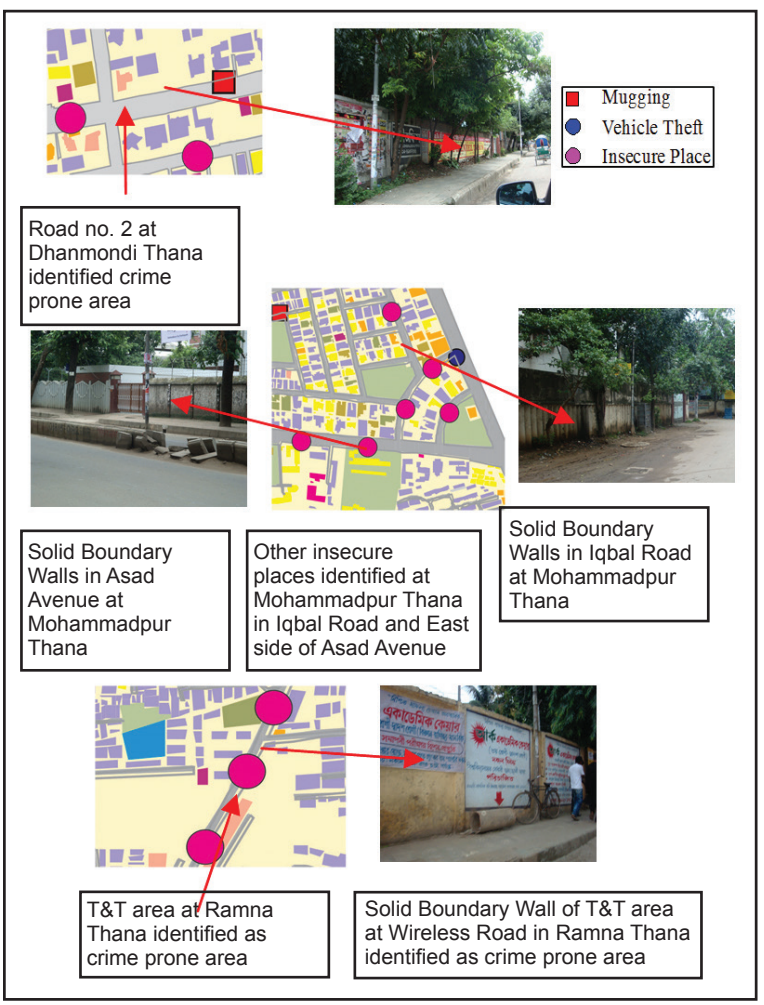

Figure 20:
Solid Boundary wall in Occurrence of Street Crimes

In the contrary of solid boundary wall perforated or transparent boundary wall in the road frontage of any plot enhanced the natural surveillance of road from the inside buildings. From focus group discussions and field survey it was found that perforated boundary walls could act as a tool for crime prevention and it increase the visibility of the adjacent streets so that the criminals would not find those places as vulnerable to commit different crimes. The perforated walls also increase the lighting of the adjacent streets with the inside light of different plot so the street could be lighted without the absence of street lighting. Figure 21 shows some examples of perforated boundary walls which could increase the visibility and lighting to the adjacent streets.

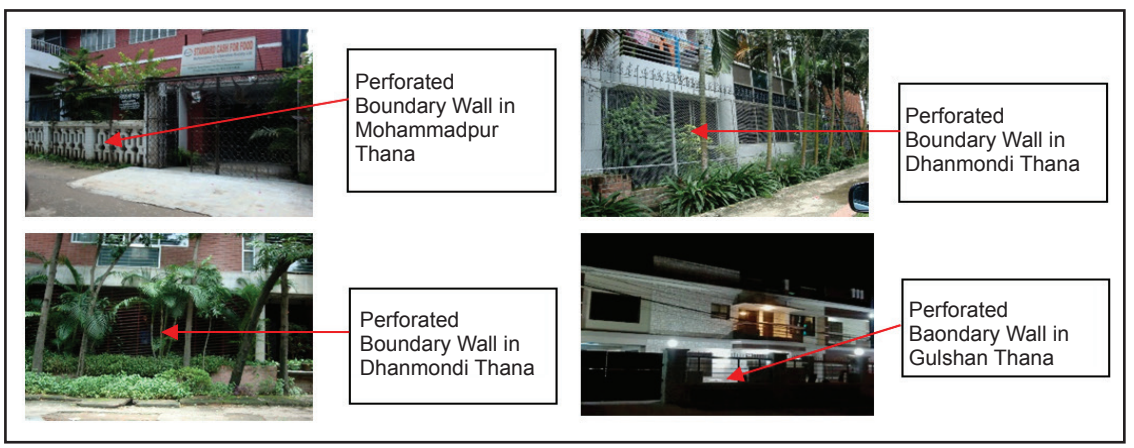

Figure 21:
Perforated Boundary Wall Enhance the Visibility of Streets

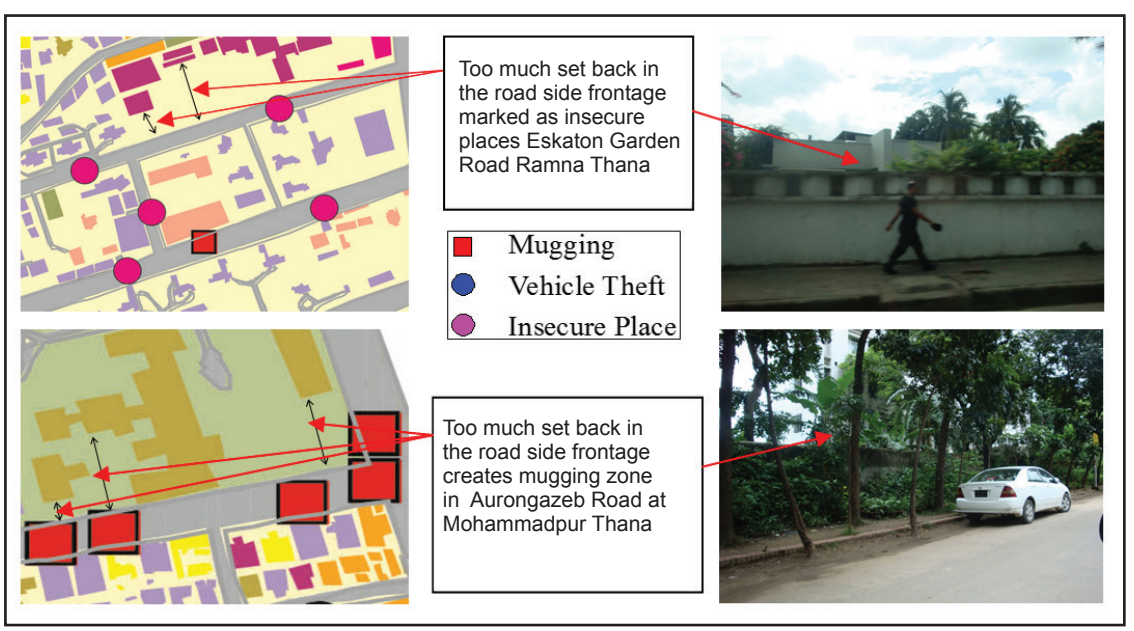

Figure 22:
Set Back of Boundary Wall in the road Frontage and Street Crime

Setback from inside Buildings and Boundary Wall

It was found from the field survey and different observation that if the continuous setback of buildings from the boundary walls on the road side is too wide it will decrease the natural surveillance of adjacent streets.

Proportionate distance of setback of boundary wall in the street side created visibility from the inside building. Figure 22 shows the impact of setback of boundary walls from the inside building in the road frontage on occurrence of street crimes with some examples of crime prone locations of the study areas.

Plot Entrance and Street Crime

Entry point of a plot in every street could act as an important measure for street crime occurrences. Two factors of entry point are considered from the observation. One was the numbers of entry points in a street and position of entry point on different streets.

The numbers of plot entrance in each street is an important factor in occurrence of street crimes. Every building entry point has one or more security guards who could always keep an eye on the streets. Another factor is that the entry of a building always possessed good lighting. So the large the number of building entry points on a street the more secured the street will be from street crimes. Figure 23 shows some examples with absence of building entry points in the crime prone areas.

The position of building entry point in every street has a good influence on street crimes. The distance and position of entry points considering next entry in a continuous street segment is an important element for surveillance of streets.

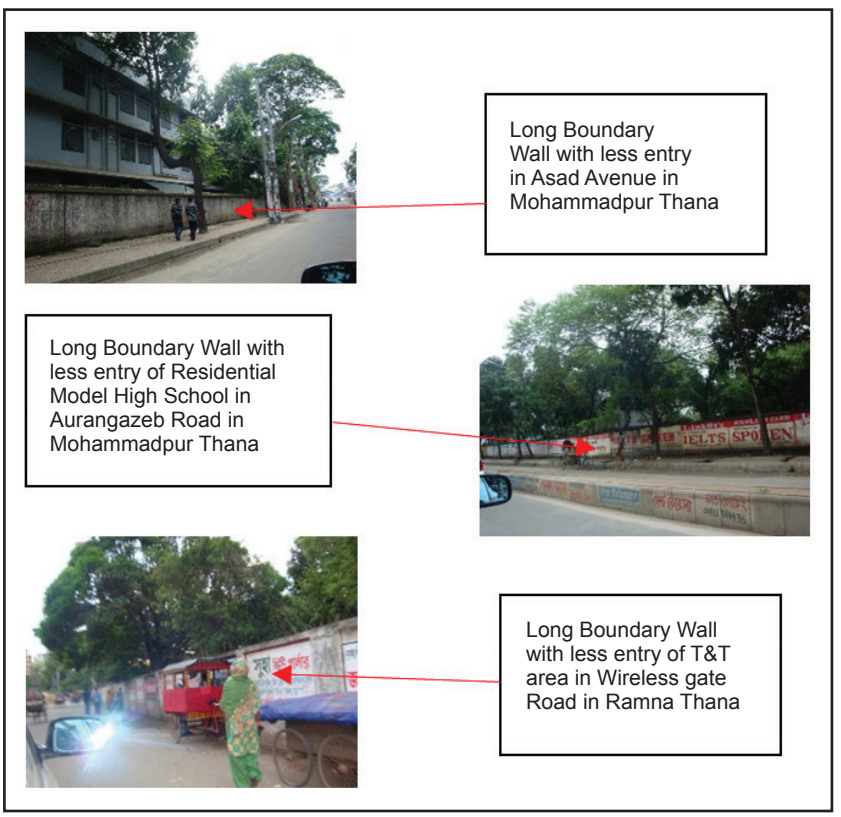

Figure 23:
Plot Entrance from Street and Vulnerability of Street Crime Occurrence

POLICY RECOMMENDATIONS

- **Develop a comprehensive spatial planning strategy for crime prevention**

- New development in city should measure the crime prevention knowledge related with physical environment.in terms of land use, connectivity and visibility

- **Incorporating different physical planning features in urban design configuration as a crime prevention tools**

- Incorporate different physical planning features which can act as a factor for reducing street crimes at the crime prone areas in or near the commercial use of road (like Gulshan, Dhanmondi and Ramna) to deter street crime. Redesign and rethinking the connectivity at integrated commercial roads or provide security in the connected roads which can act as easy escape routes with the potential target places for criminals. Other features like secured building entry, lighting, alteration of land use after office hours etc. should incorporate according to situational approach of the layout.

- Facilitating proper land use in micro level scenario in urban layout to reduce crime as crime occurrence of a city is closely related with the land uses with public movement. Negative land use can facilitate street crimes in urban environment. Like different open space with no activity or exhibition space with less use or commercial office spaces which became closed after office hour create quiet and isolated environment vulnerable to crime situation. Mixed use environment with multiple uses at different times can be incorporated with the commercial area.

- **Improve the natural surveillance of a community by incorporating streetscape elements in urban design strategy**

- Incorporate perforated boundary walls and gates instead of solid boundary wall in the road frontage of buildings with clever landscaping for a secured community with visibility. This will increase the natural surveillance of adjacent roads from committing crimes. This can also illuminate the adjacent streets with lights of inside building.

- Careful planning should incorporate in road side set back of boundary wall in any building plot. The road frontage setback of any building shouldn't too much that it will reduce the natural surveillance of roads from the building itself.

- Incorporate quantity and position of plot entrance in streetscape design which will increase the natural surveillance of streets by security guards of individual plots. The lights of the individual plot entrance can also increase luminosity of the streets and enhance visibility.

CONCLUSION

Crime and violence in Dhaka city are not a new problem from the social criminology point of view. But the spatial planning aspects were always ignored. From this study, it is evident that crime has a close relationship with the spatial planning aspects. The understanding of relationship of crime and spatial planning is needed to recognise in the policy level to crime prevention in a city.

The study of street crimes in spatial planning from macro level to micro level like spatial distribution of street crimes to local level street crimes provides a picture of street crime scenario of Dhaka city which can be helpful for further crime analysis considering spatial planning aspects.

For the analysis different perspectives of spatial planning were considered. The powerful understanding of the relationship between crime and physical environment may emerge from an integration of all these different perspectives.

There are many non-reported crime areas in any locality which can be recognized by the local people of any community. People of the community are related with the fear of crime in any street or community. So they should be incorporated in the awareness and process of crime prevention along with physical planning.

ACKNOWLEDGEMENTS

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