EiABC

Ethiopian Institute of Architecture,
Building Construction and City Development
Addis Ababa University

Creating Safe Sidewalk for Crime Prevention: The Case of AMCE area, Addis Ababa

A Thesis submitted to the Ethiopian Institute of Architecture, Building Construction, and City Development in Partial Fulfillment of Master of Science in Urban Design and Development

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This thesis is submitted to the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC), the School of Graduate Studies of Addis Ababa University in Partial fulfillment of all requirements for the degree of Masters of Science in Urban Design and Development.

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The Case of AMCE area, Addis Ababa

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Declaration and Confirmation

I, the undersigned, declare that this thesis is my own original work and has not been presented for a degree in any other university and all sources of materials used for the thesis have been duly acknowledged, following the scientific guidelines of the Institute.

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The thesis can be submitted for examination with my approval as an Institute`s advisor.

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List of Abbreviations

CPTED	Crime Prevention Through Environmental Design
UN-HABITAT	United Nations Human Settlements Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN	United Nations
CCTV	Close Circuitry Television
AMCE	Automotive Manufacturing Company of Ethiopia
QSAE	Quality and Standards Authority of Ethiopia
ESA	Ethiopia Standards Agency
U.S	United State
LDP	Local Development Plan

Abstract

Safety is one of the most critical factors affecting the quality of sidewalk. Sidewalk users reliably recognize their risks from crime to be significantly high, discouraging many from using sidewalk. Study aims to create safe sidewalk to prevent crime the case of AMCE area in Addis Ababa. Its analysis and propose was based on the primary and secondary data of the case study. The secondary data was collected from the concerned agencies and related references. However, primary data has been generated and analyzed with the help of surveys.

The findings of the study illustrates that crime has significant correlation with the built environment along sidewalk and sidewalk. Physical design can shape human behavior for the better. Built environment along sidewalk and sidewalk have an impact on fear and crime influence wellbeing, particularly through restrictions on movement. Studies of the result show that the main causes of sidewalk safety problems included: low prospect, high refuge, high roundedness, lack different activities, low rise building height, lack of seating, lack mixed use, dense vegetation, lack of windows and door opening up onto a street.

Safety is the basic necessity of urban development. Being able to walk in a safe sidewalk is of high value. Reducing crime and fear of crime can improve the quality of life. Good design of physical environment can reduce opportunities for criminal and develop feelings of safety. Studies show that changes of design of places, sidewalk, buildings and spaces can contribute in reducing crime. This study identify that crime prevention is largely achieved through applying lighting, activity, mixed use, way of finding, high rise building height ,closed circuit television, recreation area, open space and natural surveillance in ways that can reduce crime. The active involvement of community in spaces draws more “eyes on the street,” which in turn to prevent criminals.

This paper concluded that good design can make crime more difficult to commute, increase the likelihood of detection of criminal activity and improve safety of sidewalk. The researcher recommends at any planning and design stage, every development has aspects of design that should be considered to reduce opportunities for crime. Urban planner ,Urban designer, Architect and local authority plays a role in shaping physical environment along sidewalk and sidewalk that are safe for people.

Keywords: Crime, Sidewalk, Built environment, Safety

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Chapter One: Introduction

Enhancing urban safety addresses two major threats to the safety of citizens: crime and violence; insecurity of tenure and forced evictions (UN-HABITAT, 2007*).* Human beings need to walk in a place where they are safe. They want to ensure that there is a concerned body that protects their lives from potential hazards (Wilson, 1990). Safety is the fundamental right and prerequisite for promoting people welfare. Maslow (1970) proposed basic human needs includes five levels where safety needs is at the second level after physiological needs for human excellence and is right located after human physiological needs which are necessary to survival.

Safety has always been a major human need throughout history (Cozens, 2008). It is also one of the general concerns in modern societies. Safety can largely influence one's daily life and behavior. A sense of safety is an essential prerequisite of successful urban design (Hagerstrand, 1970). Being able to walk in a safe environment is of high value not only such places are attractive to walk but are also places of safety from crime and from fear of crime (Latimer, 2004).

As Jacobs (1961) puts it, public spaces are the vital organs of the city and it is essential to make a city safer. " When people say that a city, or a part of it, is dangerous or is a jungle, what they mean primarily is that they do not feel safe on the sidewalks " Poor urban planning and design play a role in the shaping of urban environments that put citizens at risk. The fabric and layout of cities impact on the movements of offenders and victims and on opportunities for crime (UN-HABITAT, 2007).

Crime is a social issue that affects the lives of millions each year. Severe crimes against people considerable fear within the society. Crimes like theft, rape and murder are among serious threats to the safety of the community. The resulting crime and fear of crime in itself can restrict people's freedom of movement, prevent them from fully participating and integrating in the community (National Crime Prevention Council, 2003).

In Africa, as in other countries of the world, the high levels of murder, assault, rape, robbery and other crimes are threats to the safety of the community. A recent UN study has shown that 25 percent of urban dwellers in Africa have been victims of crime, over a five-year period (UN-HABITAT, 2007). Youth crime is increasing exponentially in the cities of developing countries. Youth gangs are growing in most of the cities in Africa and represent a new face of urban insecurity (UNESCO, 2010).

Like any country, Ethiopia has a crime problem. Pedestrian can be targeted for crimes, as it assumed that they possess valuables and are more susceptible to becoming victims. Pedestrians are targeted most for crimes such as snatch-and-run thefts, hanging, including from occupied vehicles and other petty crimes. These crime occur anytime and are more common in areas where there are small numbers of pedestrians. Physical violence in these instances is uncommon but does happen on occasion. These are generally crimes of opportunity rather than planned attacks (U.S Embassy, 2016).

To address the prevention of crime and violence, urban safety includes the enhancement of individual rights including the physical and psychological integrity of a person. As such, urban safety is a complementary concept to crime prevention, inappropriate condition of urban development encourage crime and violence. In this perspective, urban safety adopts a citywide to address the risk factors and protection factors of insecurity in cities, creating the conditions of more sustainable and inclusive cities (Universidad Alberto Hurtado, 2008).

It is common to see in the various international news media that to control crime, the world governments, have focused most of their efforts in combating it through police force-related methods. However, this problem of crime rates around the globe continued to escalate. It is therefore important to think on alternative to solve the existing irrelevant crime related problems. Meanwhile, the contribution of the built environment towards the reduction of crime has received considerable attention in the last four decades (Newman, 1972). According to Yazdanfar (2013) if the environment is formed properly, then it can meet human needs such as safety, as motivational needs, and subsequently the need for social connection.

It is difficult to think in terms of safe cities without considering crime and safety in the design and planning process (Cozens, 2007). The design of buildings, streets, public facilities and other outdoor spaces can affect the opportunity of crime and the level of fear of crime. Developing safer cities and diminishing the fear of crime and crime ought to be a central component of any planning and design process. Numerous planning and design measures have been developed and implemented in urban areas to reduce crime and make people feel safe (Cozens et ' al., 2005).

1.1. Problem Statement

According to U.S Embassy (2016) Addis Ababa is becoming the crime capital of Africa. Since 2011, purse snatchings and harassment by gangs of youths in Addis Ababa have increased. These crimes have occurred in both the day time and night time. People stabbed, hanging in broad day light. There were also beatings and stabbings of expatriates in the city. Parts of the city are definitely less safe, particularly at night people are scared to go out after midnight. Stranger and residents of Addis are walking on sidewalk in fear.

According to Geri Police Station (2016) in the study area indicated, safety of sidewalk is regarded as a critical issue. Crime threatens the safety of residences and visitors, inturn by reducing the vitality of walking. Although the study area of the sidewalk is bustling 24 hours a day people often do not feel safe. Especially during night the sidewalk are empty or nobody overlooked. Because of this, people always are worry about being attacked by robbery.

Fig.1.1 Empty Street of AMCE Area
Source: Photograph by the author, 2016

1.2. Research Questions

- What are the current safety problems of sidewalk look like in AMCE area?
- What are the main causes for the sidewalk safety problems in AMCE area?
- How to enhance safety to prevent crime on sidewalk in AMCE area?

1.3. Objectives

1.3.1. General Objective

The main objective of the research is to understanding current situation of safety of street and create safe sidewalk that is safe.

1.3.2. Specific Objectives

The Specific objectives of this research are:

- To assess the current sidewalk safety problems of AMCE
- To identify the main causes of sidewalk safety problems in the AMCE
- To enhance safety to reduce the sidewalk crime

1.4. Methodology

This section introduce such as research approach, type and sources of data, data collection techniques, sampling size, case study selection criteria, data analysis, interpretation and presentation.

1.4.1. Research Approach

This study had been employed the case study approach. The approach to data collection and analysis in this study included both quantitative and qualitative sources and approaches.

The tools that were used under quantitative method include: Survey questionnaire, mapping & field Survey at site level. Under qualitative method the main tools was open ended interviews, Photography and observation. The primary data had been improved by secondary data obtained from different documents such as journals, books, guidelines, report, manuals and etc.

1.4.2. Type and Sources of Data

A. Secondary Data

Secondary data sources such as both published and unpublished documents, relevant research documents, journals, satellite image, articles, maps and books are used. In addition, government policy, guidelines, report, manuals, photographs and etc. were sources of secondary data.

B. Primary Data

For the case study area primary data were used. Primary data was collected from pedestrian who use the sidewalk of study area. The physical features of the study area explained based on primary sources from site observation and physical survey.

1.4.3. Data Collection Techniques

Data collection and information gathering had been done from primary and secondary sources.

1.4.3.1. Primary Data

Primary data were collected through questionnaires, interview and site observation /pictures

i) Questionnaire

The questionnaire survey is intended to collect primary data from Pedestrians of the study area. Its aims to collect data to assess the current safety problems, identify the main causes of sidewalk safety problems and enhance safety to reduce sidewalk crime. Two sets of questionnaire were used i.e. closed ended and open ended questionnaire. Closed ended questionnaires are Sex, Frequency crime, Unsafe Time and etc. Open ended questionnaire is include: Age, Location of your living place, how a change in the daily life/routine of you or your family?.

ii) Interview

The data were collected using structured and unstructured interviews. Interviews was conducted to explore the views, feelings and perspectives. Interview had been employed for officials and expert who are directly and indirectly involved to protect society from crime. The interview with manager, planners, architect and police were made to collect specific data. This interviews were made to collect specific data which need more clarifications.

The interview materials were prepared for five different organization experts and officer. The following table shows the detail of interviewee's position in the organization their position and number.

Table 1.1. Name of the Institution (Officials And Experts) with their position

No.	Name of the Institution	Number	Position
1	Bole Sub-city Administration Office of Urban Planning department	2	Experts urban planning and Architecture
2	Bole sub city police district	1	Head
3	Gerji police station	2	Head and Secretary
4	Bole Sub-city woreda 06 administration	1	Manager
5	Electric Power Corporation, Addis Ababa	1	Head

iii) Site Observation and Mapping

This method was important to get information about reality concerning the issue. Field experience was gained through observation. This method was also significant to observe the sidewalk safety problems. Taking pictures in the site was one of the methods that helped me to show some of the physical problems in the site.

1.4.3.2. Secondary Data

Secondary data were from documents of different offices such as Bole Sub-city Administration Office of Urban Planning, Addis Ababa police commission, Bole sub city police district, Gerji police station and review of related cases.

1.4.4. Sampling Size

To make the output of the thesis convincing and reliable, the data source and method of representation had to be appropriate. The different respondents in the site were selected based on sampling technique to reach at a comprehensive representative sample. To obtain reliable and manageable data, the study undertook the sample size from all target populations on the site. However, the different respondents in the site were selected based on Convenience Sampling technique from non-probability sampling. These were conducted on hundred in number of respondents based on availability who use this sidewalk. Here special emphasis was given to the particular times of the day when the sample was taken, i.e. surveys were conducted both night and morning.

1.4.5. Case Study Selection Criteria

The AMCE area was selected on the basis of having increasing crime rates, according to the latest available police reports of Gerji Police Station, land uses and visible openings of the buildings were considered for the selection.

1.4.6. Data Analysis, Interpretation and Presentation

After collection of the research data the analysis of the data and its interpretation would then follow. The analyses of the collected information from the different sources were organized into their representative categories so as to come up with logical results. Information from primary and secondary sources was analyzed by using qualitative and quantitative data forms. For the purpose of data analysis the study employed Excel and some related tools. Spatial analyses were conducted using GIS (Geographic Information System), Revit Architecture, Photoshop, Illustrator, Arch CAD and Auto CAD software as analytical tools.

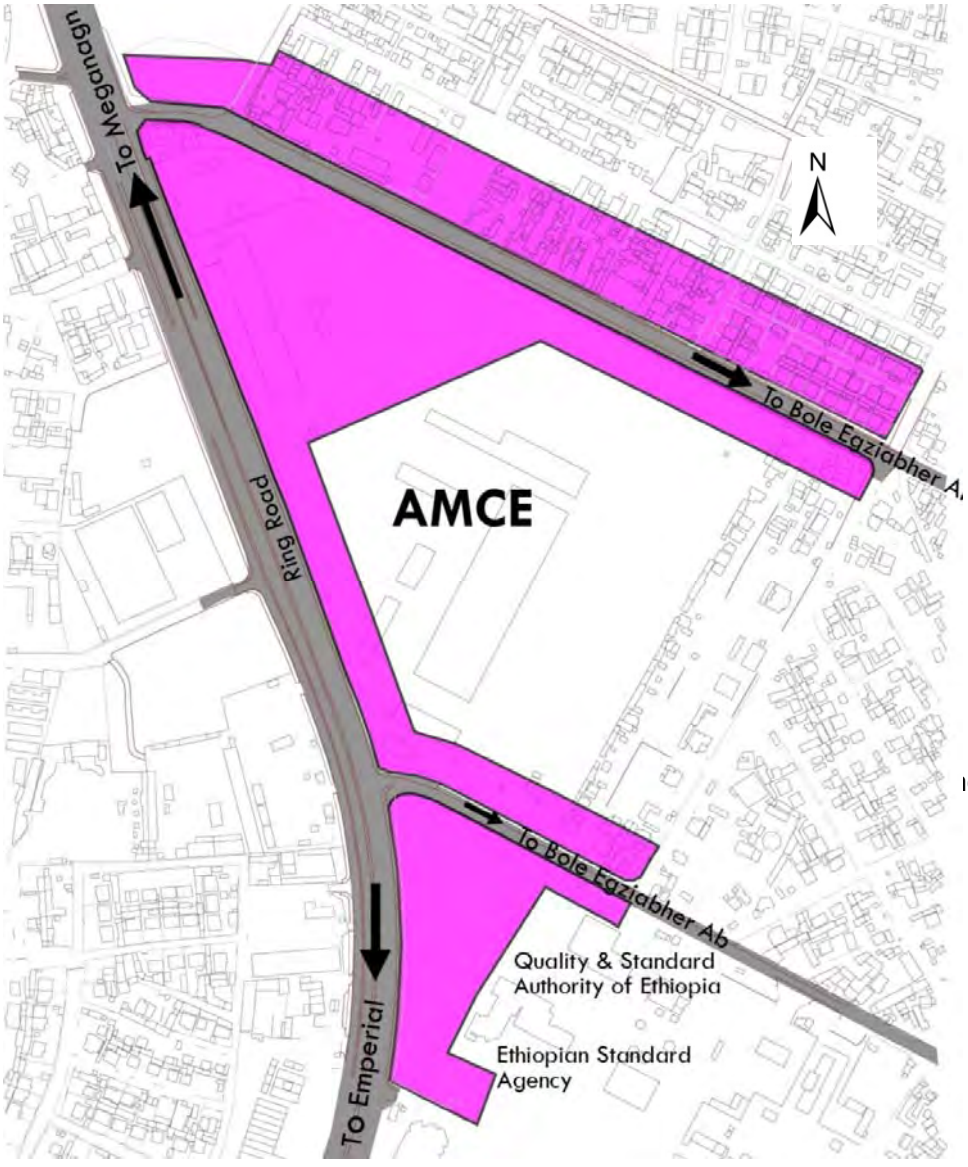
Data presentation was made by the use of tables, bar graph, charts, figures, plans/maps, GIS data explanation and visual photograph accompanied by textual discussions. Finally, the presented data was clearly interpreted.

1.5. Scope and Limitation of the Study

1.5.1 Scope

The spatial scope, located in Bole sub city Woreda 06 the site starts from Ethiopian Standards Agency following the road to AMCE and turns to the east following the AMCE in both side. Area covers 11.5 hectares of land.

The thematic scope of the paper is mainly focusing on sidewalk and developments along the sidewalk specifically with respect to safety of pedestrians to create safe sidewalk.



ıder

Map 1.1. Study Area (Source: Own Computation, 2016)

1.5.2. Limitation of the study

The major limitation of the study was collecting information from police office in the city was a challenging task. This was due to information was not specific as needed. So that access to them was time consuming. The top constraints of this study are: Unavailability of update resources for literature review, the lack of contextual review and lack of crime map.

1.6. Significance

The outcome of this research can be used as a springboard for further studies in prevention of crime. This study will also be important in terms of providing the necessary resource in light of the possibility of future urban design intervention projects. In addition to its academic objective, that is the creation and accumulation of knowledge, the study contributes to the safety of the city by critically evaluating the current urban development.

1.7. Structure of the Thesis

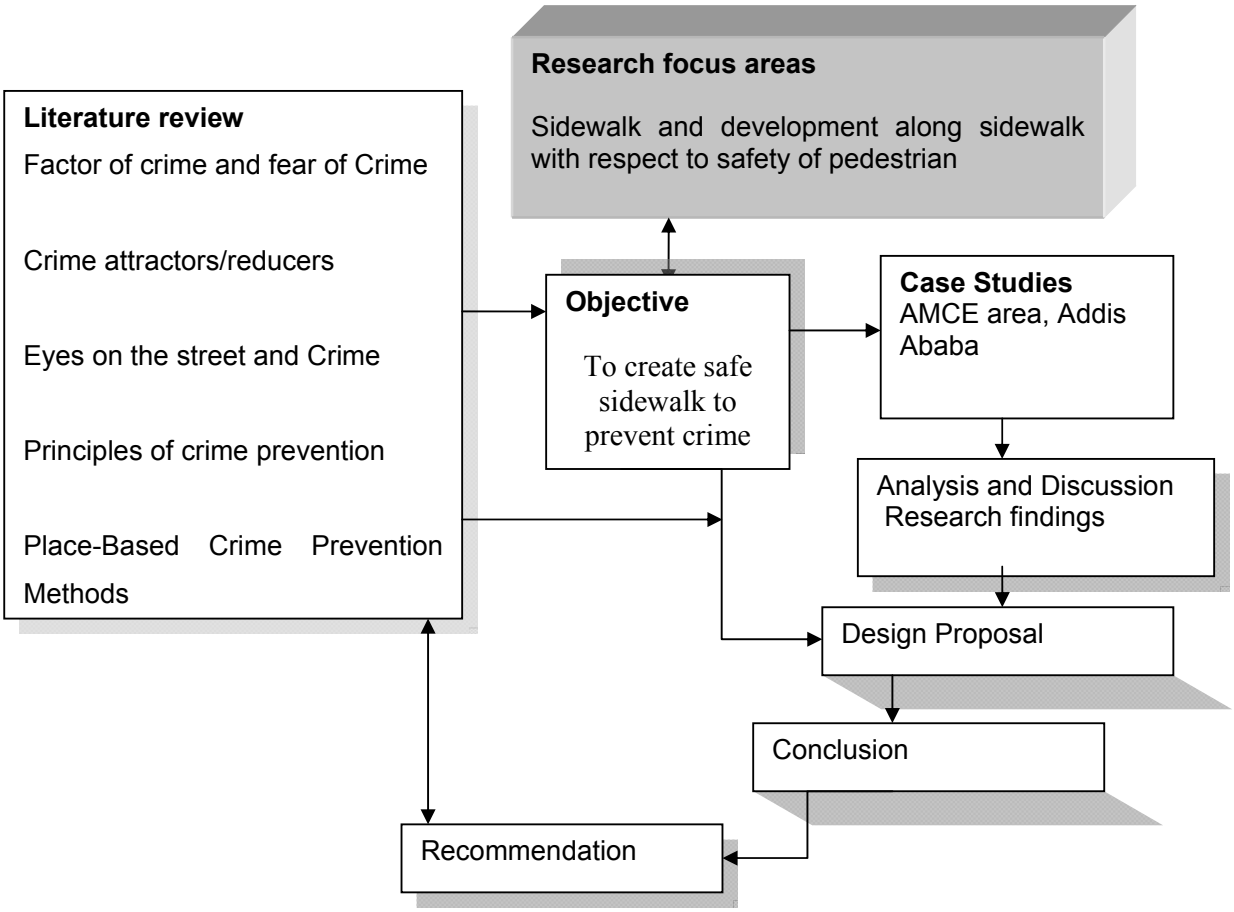


Fig.1.2 .Structure Of The Thesis (Source: Own Computation, 2016)

1.8. Organization of the Thesis

The preliminary pages of the thesis document consisted of the title page, approval sheet; acknowledgment, abstract, table of content; list of figures, maps, picture, tables and Abbreviations.

This study has four main chapters
The first chapter is the introductory which comprised the theoretical background. This chapter also includes the following subtopics, problem statement, research question, objective, methodology, scope and Limitation of the study , Significance and Structure of the thesis.

In the second chapter of this study literature review of relevant topics, such as relationship physical environment and human behavior, nature of robbery, factor of crime and fear crime, crime attractors/reducers, theory of safety, density, eyes on the street and crime, Urban design and crime, principles of crime prevention and place-based crime prevention methods are presented from various sources.

Chapter three deals with the case study field findings, discussion and design Proposal which concerned about site selection criteria, results of the questionnaire, site analysis and design proposals for crime reduction of sidewalk. The existing physical of the area is well analyzed and proposals including different layers of plans and urban design details related to the safety aspects. This document is the analysis and propose based on primary and secondary facts of the case study.

Finally, Chapter fourth presents conclusion and puts forward recommendations.

Chapter Two: Literature Review

2.1. Definition and Concepts of Key Terminology

2.1.1. Safety

Safety is about victims and the fear of victimization (Carmona et al., 2003). Safety refers to the extent to which streets enable people to use, enjoy and move around the outside environment without fear of being attacked. Safety is freedom from physical or emotional harm (Burton, E. and Mitchell, L. ,2006).

2.1.2. Crime

Crime is to see it as a legally defined threat to society (giritlioglu et al, 1994). Crime has been defined in the Oxford English Dictionary (1989, p. 20) as 'an act punishable by law, as being forbidden by statute or injurious to the public welfare; an evil or injurious act; an offence, a sin, especially of a grave character'. The types of crime include assault, murder, kidnapping, rape, sex offenses, auto theft, arson, larceny, robbery, burglary, fraud, gambling, narcotics/drug crimes, vandalism, weapons violations, embezzlement, and other crimes.

2.1.3. Sidewalks

Sidewalks means something only in conjunction with the buildings and other uses that border it. Streets and their sidewalks, the main public places of a city, are its most vital organs. Sidewalks and those who use them are not passive beneficiaries of safety or helpless victims of danger. Sidewalks, their bordering uses, and their users, are active participants in the drama of civilization versus barbarism in cities. To keep the city safe is a fundamental task of a city's streets and its sidewalks (Jacobs ,1961).

2.1.4. The Built Environment

Built environment is defined as the part of the physical environment that is constructed by human activity. It consists of the following elements: land use , the distribution across space of activities and the buildings, the roads, sidewalk, etc., (Handy et al., 2002).

2.1.5. Natural Surveillance

The discouragement to wrong-doing by the presence of passers-by or the ability of people to see street out of windows and building entrances (Croydon Council, 2006).

2.1.6. Robbery

Robbery is defined as the intentional taking of property from a person “by the use of force or by threatening the imminent use of force.” a robbery where the victim is a person or a group of people, the victim is aware of the event, and the location is the public open space, excluding buildings and sidewalk (Smith, 2003).

2.2. Safety

Cities are the places where the effects of crime, fear of crime and changes in crime occurrence appear in the clearest way. This fact represents a great challenge for cities, that are now increasingly in search of new ways to tackle these kind of problems. Some cities are well managed and working well they provide a good quality of life and a good way of living. Others have lack of safety (Lirebo,2014).

2.3. Relationship Physical Environment and Human Behavior

“People act and behave differently in different settings. This implies that the built environment provides cues for behaviour and that the environment can therefore, be seen as a form of non-verbal communication.” Rapoport (1977).

According to Nes (2009), human behaviour takes place in space and the spatial layout of the environment provides various opportunities for people’s interaction. The interaction between people can create safe or unsafe communities which are a foundational part of society’s welfare.

Relationship between the physical environment and human behaviour is a matter of some debate. At one extreme is in Winston Churchill's contention that, "we shape our buildings and our buildings shape us"; the other extreme is the view that behaviour results from social and behavioural factors only and is not influenced to any great extent by the physical environment. Although both extreme views are currently in disfavour there is uncertainty over the actual relationship between behaviour and environment especially when we consider specific matters, such as crime, rather than behaviour in general. Urban planners and architects all recognize this difficulty, particularly when attempting to clarify the effective role of the built environment professions in influencing crime rates (Wollan, 1976).

2.4. Nature of Robbery

Robbery is against a moving opportunity: a person. Street robbery is listed among the violent crime types in most world and this crime is causing more worry among people than the property crime types such as burglary or car crime (Hillier, 2005).

A very detailed one is Alford's study (1996) of Deptford, in which she takes snatches and robbery alongside other types of personal crimes in public realm. Areas with the lowest pedestrian levels often attracted the highest levels of violent crime. The safest building-street interaction configuration was where the access to the house fronts onto the busy street. The most dangerous case was found to be where a semi-public space and private space.

According to Alford (1996) and Hillier (2004) the victimization risk factor in robbery is duo to pitfalls of built environment. Hillier and Alford look at risk in the sense of how the configuration of movement in urban space can increase or decrease the potential danger of being a victim of robbery and they point out that it is necessary to normalize the simple distributions of robbery with the estimated or observed count of people using the space. Therefore, we can say that Hillier and Alford were looking at the "victim side" of crime– space relationship in particular (Hillier, 2004).

2.5. Factor of Crime and Fear of Crime

The physical characteristics of a setting can affect perceptions of risk there. Since significant portions of walking take place in neighborhood streets, these activities are greatly influenced by the street context. Conversely, Safe Street invite outdoor activity (Transportation Research Board, 2005).

Fear of violence and strangers is often generalized to fear of the street. The street is public, owned by everybody and nobody, and so vulnerable to abuse. It links activity areas and so is vulnerable to the stigma placed on it by "dubious" activities abutting it (Conklin, 1975).

People's fear of street often appears to be situated in particular built environments. Streets are particularly frightening: Anonymous and deserted open spaces such as empty parks and dead frontage. Valentine (1990) this allow potential offenders to conceal themselves and act outside the visual range of others. Of course, some boisterous, social places such as bars and gang hangout places can also be particularly scary to some groups. Fear-inducing factors in public environments include darkness, desolation, lack of opportunities for surveillance by the general public.

Atkins (2012) as Day explains, ‘‘people fear physical features, such as bushes, low lighting, and dark tunnels. Such features often limit the ability to see into a place where something might may be hiding making to attack the prey. Such features may also provide ‘refuge’ for a criminal hunter to wait for a potential victim. Feared features are often high in ‘boundedness’ or limits on the ability to escape if danger arise. Feared places typically display some combination of low prospect, high refuge, and high boundedness.’’ Day (2001) describes three environmental conditions that individuals perceive as ‘‘cues to danger’’: lack of familiarity with an environment, darkness, and the presence of others. Physical features of places can generate feelings of risk and fear.

Studying street crime in Oakland, California, Angel noted that ‘‘the physical environment can exert a direct influence on crime settings by delineating territories, reducing or increasing accessibility by the creation or elimination of boundaries and circulation networks, and by facilitating surveillance by the citizenry ’’(Angel,1968).

Studies have shown that certain inherent features of microenvironments affect the likelihood of crime. For example, it is easier for criminals to commit crimes near major streets. Brantingham PL, and Brantingham PJ (1993) the more escape routes in the vicinity of a site, the easier it is for them to escape.

There are strong relationship between certain urban form features and opportunities for crime, it needs to be emphasized that these features are not inherently unsafe. It is rather that certain environmental and design qualities of places (e.g., darkness, lack of ground floor activities, lack of windows opening up onto a street or public area, etc.) that make them susceptible to crime. Therefore, good design can make a big difference for real and perceived safety (Loukaitou, 2001).

Picture.2.1. Residential streets that lack natural Surveillance can feel unsafe that is not conducive to safe walking, particularly at night
Source: (Seminar, 2012)

Picture.2.2.Dense vegetation eliminated almost all natural surveillance of this making pedestrians more vulnerable to crime.
Source :(Fritz, 2015)

2.6. Crime Attractors/Reducers

Specific land uses that are associated with increased or decreased crime. Jacobs, for example, hypothesized that parking lots, truck depots, and gas stations were harmful for city life but that bars and restaurants would reduce crime.Specific commercial uses are more likely to generate crime than others, especially if there is a high concentration of them in a limited area. The presence of a great number of liquor stores, bars and taverns can have a negative effect on neighborhood crime (Block and Block, 1995).

The type of surrounding land uses has been found to have a major effect on the incidence of crime (Shaw and McKay, 1929). Poyner (1983) the surrounding land uses can also affect crime, with certain land uses (e.g. liquor stores, taverns, pawn shops, pool halls, vacant lots, and abandoned buildings) considered to be ‘‘crime generators’’ (Byrne,1986). For example, crime rates at Los Angeles near liquor stores, check cashing establishments and vacant buildings marked by graffiti and litter. In the District of Columbia found that the commercial and transitional areas tended to be more attractive targets for criminals, followed by industrial areas, with residential areas. Multifamily housing areas are not typically found to be more susceptible to crime than single-family housing (Rhodes and Conly, 1981).

Offenders want to avoid the risk of being seen while committing a crime. The possibility of surveillance by shop owners, managers, employees, guards, or caretakers has been found to have a strong effect in reducing crime (Brantingham and Brantingham, 1993).

Brantingham and Brantingham (1998) considered the environmental criminology within the planning process which argued that “most of planning proceeds with little knowledge of crime patterns, crime attractors, crime generators, the importance of edges, paths or the site specific solutions that facilitate or even encourage crime”.

2.7. Urban Design and Crime

Jacobs (1961) drew attention to characteristics of urban design that she opined may jeopardise community safety. The ‘imageability’ (Lynch, 1960) of the city was also an important area of investigation which was to transform how design professionals and social scientists dealt with urban form and design. Jacobs (1961), Angel (1968) and Jeffery (1969, 1971) provided further impetus, but it was not until Newman published 'Defensible Space’ (1973) that specific elements of urban design became widely associated with enhancing or reducing opportunities for crime. Significantly, Newman’s ‘Defensible Space’ (1973) raised the profile and popularity of the idea that architectural and environmental design can influence criminality.

2.8. Theory of Safety

Government policy in the UK, USA and Australia has increasingly advocated the development of high-density mixed-use residential developments in walkable neighborhoods. Close to public transport, employment and amenities (Poyner, 1983, Grabosky, 1995 and Doyle, 2006) such policies are often associated with New Urbanism. It is argued that such designs reduce opportunities for crime by increasing opportunities for surveillance of street by encouraging walking and social interaction and by promotion a sense of community and social control (Atkins, 2012).

Jacobs (1961) observation underpin much of new Urbanism thinking and current planning policy in Australia, the UK and America, particularly in relation to safety. The concept of' eyes on the street' is the foundation of a number of safety assumptions in planning. Which are associated with increasing permeability mixed uses and higher densities (Cozens, 2011). Arguably and Newman's (1973) Defensible Space component of geographical juxtaposition attempts to build on Jacobs's somewhat hunted perspective. Crucially, Newman's (1973) ideas on the potential crime risks associated with locating commercial and institutional facilities within a housing project challenged Jacobs's assertions as being unsupported hypotheses'. He argued that increasing activity in order to provide safety in numbers 'needs to be critically evaluated in terms of the nature of business, their periods of activity and the nature frequency of the presence of concerned authorities.

2.9. Density

The relationship between density and crime has been quite ambiguous. Jacobs's (1961) prescription of 'eyes on the street' as a deterrent to criminal activity has been questioned by researchers who argued that high levels of activity do not necessarily imply adequate surveillance (Mayhew, 1981). Some studies even found levels of pedestrian and vehicular traffic to be negatively related to the incidence of certain crimes (Pablant and Baxter, 1975).
Loukaitou Sideris (1999) has proposed that a level population density exists; where the density is sufficiently high to mask a range of less serious offences. However, the existence of natural surveillance opportunities within the built environment does not necessarily mean that surveillance is routinely taking place, or that any direct action by citizens is guaranteed. Increases in commercial and residential densities were associated with reductions crime (Barr and Pease, 1992).

High density high-rise dwelling forms have lower commitments of crime than low density low-rise dwelling units in the built environment. Therefore, the security of high density high-rise

dwelling forms is far better than low density low-rise housings by creating opportunities for community natural surveillance through ‘many eyes on the street’ (Lirebo,2014).

2.10. Eyes on the Street and Crime

Large numbers of people entertain themselves, off and on, by watching street activity. These ideas are often collectively known as the concept of ‘eyes on the street’. Globally, a multitude of urban design, planning and CPTED guidelines and policies have been produced all of which seek to promote ‘eyes on the street, Saville and Cleveland observe: what is significant about Jacobs’s “eyes on the street” are not the sightlines or even the streets, but the eyes’. The ‘eyes on the street are of course inevitably attached to citizens who must be capable and motivated to respond individually or collectively.

Eyes on the street’ could therefore be promoted through mixed land uses, where ‘a substantial quantity of stores and other public places are sprinkled along the sidewalks of a district are used evening and night (Newman’s, 1973). These flourish alongside residences, and ensure that there are always both people watching and people being watched .For jacobs, strangers, therefore, inadvertently keep one another safe, Land user such as retail stores and restaurants ‘work in different and complex ways to abet sidewalk safety.

- they provide reasons for using the sidewalk
- they attract people along the sidewalk and near to places which basically lack public attraction, but become travelled as routes to somewhere else
- storekeepers and business people are great ‘street watchers’ and sidewalk guardian where they are present in sufficient numbers

Essentially for Jacobs, the promotion of ‘eyes on the street’ via diverse and well-used vibrant city streets is the principal method underpinning public safety. However, she notes that this is not necessarily an easy task as you cannot ‘make people use streets they have no reason to use’ nor ‘make people watch streets they don’t want to watch’ (Jacobs, 1961). Later, she argues that the process of watching itself is more fundamental than the act of intervention.

2.11. Principles of Crime Prevention

2.11.1. Natural Surveillance

Desyllas,et al.,(2003) mentioned that the occupants of surrounding buildings provide surveillance by seeing street from windows and building entrances. Many have argued that design should create opportunities for natural surveillance by residents, neighbors and bystanders. Natural surveillance consists of increased visibility of urban places directed at keeping intruders under observation and undesirable behavior under control (Sorensen et al., 2008). Balconies and windows provide good surveillance.

Picture.2.3.Open Stairwells and Stair Landings are easily visible.
Source: General Guidelines for Designing Safer Communities

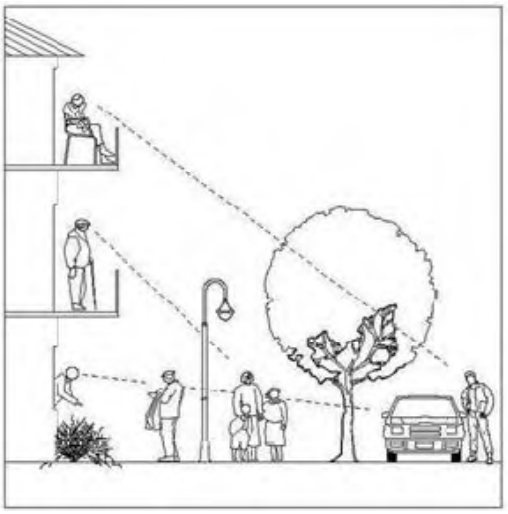


Figure 2.1.The Social Control of Space through Natural Surveillance by people

Source: (Seminar, 2012)

Picture.2.4.Low walls, or quality railings in front of houses, allows transparency
Source: A Kent Design Guide for Developers, Designers & Planners

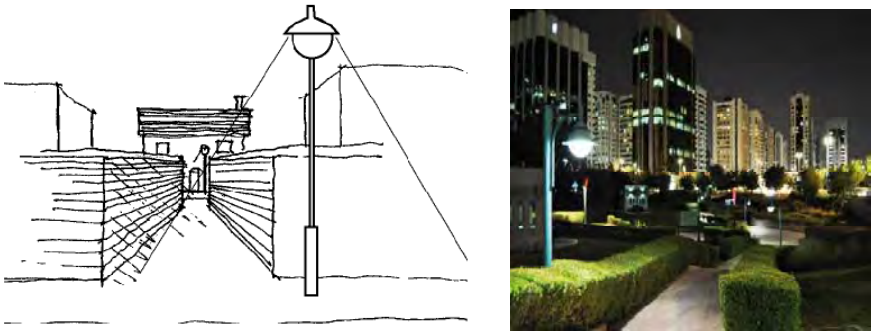
Picture.2.5.Outdoor seating allows for natural surveillance
Source: City of Virginia General Guidelines For Designing Safer Communities

2.11.2. Lighting

After dark, surveillance opportunities are affected by lighting conditions (Cozens et al., 2003). In America in the 1960s many cities began major street lighting programmers to reduce crime and initial results found that such improvements produced substantial reductions in recorded crime (Hartley, 1974).

A study by Painter and Farrington (1997), which used experimental and control areas, showed reductions in crime and an increase in pedestrian street use. They concluded “in the experimental area, there was a substantial decrease in the incidence of all categories of crime after the improved street lighting”.

Good lighting makes it easier for people to see what is happening around them while also aiding way finding



Picture 2.6: Lighting Can Help to Increase Natural Surveillance (Source**:** Dudley Metropolitan Borough Council)

2.11.3. Close Security Television

The growth in the use of CCTV to prevent crime in recent years, especially in the United Kingdom (Norris and Armstrong, 1999).Webb and Laycock (1992) found CCTV installation at London Underground stations reduced robberies compared with a control group and similarly CCTV at parking lots has been found to reduce car-related crime (Poyner, 1991). Some studies also revealed that CCTV can significantly reduce levels of fear of crime within the community (Mahalingham, 1996).

Lee (2007) comments on the proliferation of closed-circuit television has now become omnipresent in public spaces, spurred on by government interest into reducing the fear of crime. The public demand for security has become a dominant feature of contemporary life .Additionally, Hope & Sparks (2000) introduce trust as a factor in fear.

2.11.4. Mixed Use Development

Jacobs (1961) advocated diverse land use streets so that there is a continuous flow of people enhancing natural surveillance on city streets. Angel (1968) asserted that with higher levels of activity, crime falls because there are enough people to assure informal surveillance of the site. Diverse mix of land uses ensures some or other activities being carried out for most part of the day, which in turn increase the continuous presence of people on streets all the time (Robinson, 1999).

Mixed-use along street where it found that opportunities for crime are reduced by virtue of the increased range of activities in spatial and temporal terms (Pettersson, 1997). It is contended that the systematic zoning of areas for particular uses reduces the number of potential 'eyes on the street' (Jacobs, 1961). Furthermore, promoting street-level activity by encouraging the practice of residential provision above retail units is a relatively recent innovation (Wekerle and Whitzman, 1995).

2.11.5. Activity Along Sidewalk

The buildings that are occupied by uses or activities that are functioning till late night hours ensure continuous presence of people in the buildings and thus provide a continuous surveillance. Vogel and Pettinari (2002) argued that the street level commercial activity and upper level residential activity provide round the clock activity and eyes on the street, where as public buildings such as post office, station etc., fall short of providing activity and eyes on the street after working hours.

2.11.5.1. Activity Support

Activity support involves the use of design and signage to encourage intended patterns of usage of street. Crowe (2000) notes how within reason, activity generation and support seeks to street inherently "unsafe" activities "safe" locations. Although increased numbers of pedestrians may provide additional 'eyes on the street' and potentially discourage some offences, this may also actually encourage and provide other targets for crime. Schneider and Kitchen (2002) argue it is about choice and that "although there is a clear clash of ideas here, that does not mean that they cannot co-exist". Sorensen (2003) observes, "pedestrian thus seems to increase risk and decrease risk.

Activity support involves both passive and active efforts to promote the presence of responsible pedestrian users in a given area, thus increasing the community value of the area, while discouraging actions by would-be offenders who desire anonymity for their actions. Passive examples are design elements that make an area appealing to appropriate

pedestrian use, such as attractive landscaping, and public art. Active examples involve scheduling events for an area to attract appropriate users, such as picnics, parks, concerts, children's play groups or sports events(Joseph, 2012).

Picture.2.7:Inactive frontages with no surveillance contribute to anti-social behaviour Source: A Kent Design Guide for Developers, Designers & Planners

Picture.2.8.Asingle-use housing potentially a lack of activity that there is no one around and the criminal will be undetected. Source: (Croydon Council, 2006)

Picture.2.9.Active frontages and people friendly design enhance safety andsurveillance Source: General Guidelines For Designing Safer Communities

2.12. Safer Design Guidelines for Victoria

What makes for safer design?

Well designed and maintained urban environments are essential for improved safety in the community. The key to safer places is to improve the quality of the environment, minimize the opportunity for crime and promote accessible and livable places that encourage a feeling of safety and community participation.

Principles for Safer Design

2.12. 1. Maximize visibility and surveillance of the public environment

When there are 'eyes on the street' or 'natural surveillance' from passers-by, and if public places are overlooked from adjoining buildings, people feel safer and potential offenders feel exposed. Natural surveillance is one of the primary aids for crime prevention.

2.12. 2. Provide safe movement, good connections and access

People feel more comfortable using public places that provide well defined routes and clear sightlines (day and night) so they can see and be seen. Entrances to buildings should be safe and accessible without compromising security.

2.12.3. Maximize activity in public places

Balancing the needs of all users of streets and public places is vital so that people feel comfortable and safe. Encouraging walking increases activity, social interaction and surveillance in public places and reduces the risk of crime.

2.13. Place-Based Crime Prevention Methods

Several methods of practice and research have addressed the relationship between crime and place, which resulted in place-based crime prevention approaches. Together, it refers to the approaches that focused on modification and change of the physical environment in preventing crime (Higgins & Millard, 2009).

According to the National Institute of Justice (1997), there are two main components for place-specific crime prevention. The first component focuses on physical design changes which consists controlling access, increasing opportunities for surveillance, targeting crime 'hot spots' and improving image. The second component refers to use changes which comprise increasing the use at different times of the day and the night, increasing the variety of business uses and increasing residents and others' usage for leisure activities.

2.13.1. Defensible Space

Defensible space involves design changes to the built environment to maximize the natural surveillance of streets provided by people going about their day-to-day activities. They can also include more mundane techniques such as the removal of objects from windows of convenience stores that obscure lines of sight in the store and the removal of bushes in front

of homes so that residents may have a clear view of the street. Although more difficult to gauge than security guards and place managers, the use of defensible space practices to prevent crime in public places still holds great interest today (Cozens et al., 2005).

Oscar Newman's idea about residential surveillance was not effective to reduce crimes in residential areas but not in commercial areas. Cozens, P. et al. (2002) examined the perception of crime, fear of crime and defensible space in two buildings with the same design but with different levels of maintenance, to test the impact of image on crime, fear of crime and defensible space, and found that detached-houses, semi-detached houses and terrace houses were safe places to walk and represented positive images of a defensible space.

2.13.2. Crime Prevention through Environmental Design

The CPTED approach is on the basis of reducing opportunity, which aims to manipulate the built environment in order to affect users' behavior that will reduce crime and the fear of crime (Cozens, 2007b). CPTED is assumed on the hypothesis that "the proper design and effective use of the built environment can lead to a reduction in the fear of crime and the incidence of crime, and to an improvement in the quality of life" (Crowe, 1991).

The strategies employed in CPTED approach is natural access control, (Parnaby, 2007).Access control is a CPTED concept focused on reducing opportunities for crime by denying access to potential targets and creating a heightened perception of risk in offenders. Studies by Newman (1973) has all indicated an association between design features and levels of crime; particularly features that allowed unrestricted pedestrian movement through residential complexes. However, researchers have also found that busier streets with some pedestrian movement have experienced reduced levels of recorded crime (Hillier and Shu, 2000a).

Enhancing Urban Safety and Security: Global Report on Human Settlements 2007 looks into crime prevention strategies through environmental design.

1. The link between crime and city size in developing countries can be explained crime are likely to be higher in larger cities due to the greater concentration of wealthier victims, more opportunities to commit various types of crime.
2. Poor urban planning, design and management have increasingly been cited as playing a role in the shaping of urban environments that put citizens and property at risk.

3. Effective urban planning, design and governance should seek to manipulate the built environment in ways that are intended to reduce or even eliminate the opportunity to commit crimes.
4. Land-use juxtapositions, street layouts, building and site design, transportation system planning, infrastructure improvements – especially lighting, landscape maintenance, physical planning to allow for activities and public space – have variable impacts on crime opportunity and on the subsequent incidence and fear of crime.
5. Deployed closed circuit television cameras (CCTVs) widely during recent years, in public places such as shopping centers, on street and car parks
6. Focusing on the setting of crime, linking crime prevention and reduction to changes in physical design, is most advanced in the developed world.

2.13.3. Situational Approaches

Crowe (2000) suggested that the Situational Crime Prevention concept is more comprehensive than CPTED, because it unifies other law enforcement and crime prevention strategies in an attempt focusing on place-specific crime problems.

Table 2.1. Situational Approaches

	Jane Jacobs	Oscar Newman	CPTED	Bill Hillier
Surveillance	Need for 'eyes upon the street' belonging to street's 'natural proprietors' Enhanced by a diversity of activities and functions that naturally create peopled places	Surveillance capacity of physical design to provide Opportunities for residents and their agents.	Natural surveillance As a result of the routine use of property.	Surveillance provided by people moving through spaces
Activity	Sidewalks need 'users on it fairly add to the number of effective eyes on the street and to induce people in buildings along the street to watch the sidewalks in sufficient number	Rejects the Argues that more activity on the street and the presence of commercial uses necessarily reduces street crime	Argues for reduced Through movement and hence reduced Levels of activity.	As feeling safe depends on areas in continuous occupation

(Source: Carmona et al., 2003)

2.13.4. Environmental Criminology

This analytical framework is concerned with the characteristics of crime events. Brantingham and Brantingham (2001) have noted that for any crime to occur, some factors must happen simultaneously: the victim, the specific location, and mechanical requirements of the crime. It has been defined (Bottoms & Wiles, 1997) that: "… the study of crime, criminality, and victimization as they relate first, to particular places, and secondly, to the way that individuals and organizations shape their activities by placed-based or spatial factor.

2.14. Criteria for Safe Sidewalk Safety

Jane Jacobs and Oscar Newman have similar findings for crime prevention and people's perception of space. From these researchers, four determining factors were identified to promote a safe design and positive perception of safety. These factors were:

1. Natural Surveillance

Places where all publicly accessible spaces are overlooked.The physical design must provide the ability for the public to survey their surroundings.

2. Constant Users

The outdoor site must have at least 5 or more constant users to add to the natural surveillance of an area and to make the site seem user friendly.

3. Clear Design

The area must have good circulation with well-designed pedestrian pathways and seating space. The site must have clear way finding features so that users can easily find their way around the vicinity.

4. High Prospect (line of sight), Low Refuge (hiding place for offenders) and Escape (for users): Fear of crime in relation to exterior site features is highest for low prospect and high refuge areas, and lowest for high prospect and low refuge areas

Chapter Three: Field findings, Discussion and Design proposal

3.1. Case Study Selection Criteria

This selection processes considered as crime spots or areas of vulnerability. The figure below show that crime report of Addis Ababa of sub-city. Bole has a relatively high crime compared to other sub-city in the city and Lideta has a significantly low crime compared to other sub-city.

Fig.3.1.Crime Report Addis Ababa (September, 2010 - August, 2015)

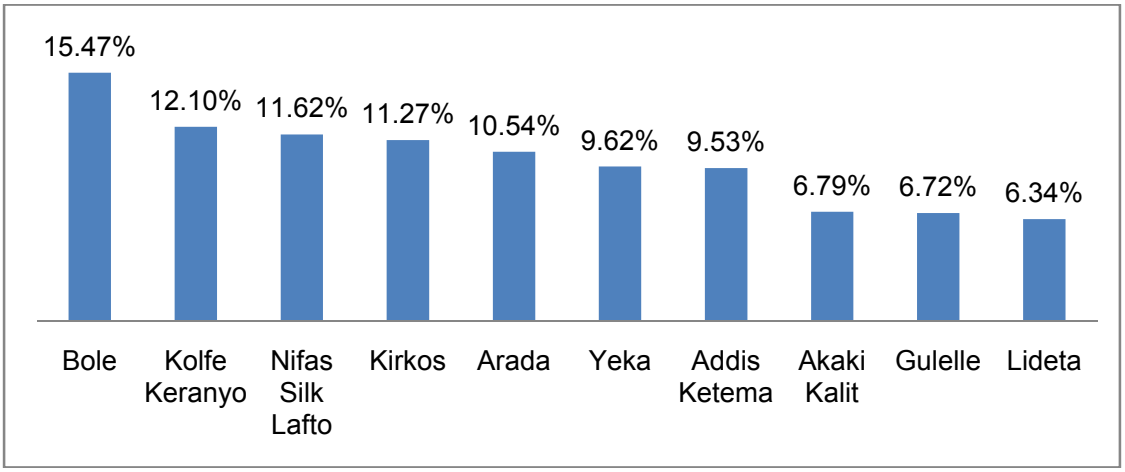


Table.3.1 .Crime Report Addis Ababa (September, 2010 - August, 2015)

Ababa of sub-city	No of crimes	Percent
Bole	40725	15.47%
kolfe Keranyo	31859	12.10%
Nifas Silk Lafto	30586	11.62%
Kirkos	29665	11.27%
Arada	27721	10.54%
Yeka	25296	9.62%
Addis Ketema	25079	9.53%
Akaki Kalit	17862	6.79%
Gulelle	17675	6.72%
Lideta	16675	6.34%
Total	263143	100.00%

Source: Addis Ababa police commission (September, 2010 - August, 2015)

The figure above indicates that Bole sub-city is highest crime therefore, Bole was selected for study area. In bole there six police station. Gerji has a relatively high crime compared to other police station in the sub city and bulbula has a significantly low crime compared to the other police station.

Fig.3.2. Crime Report Bole Sub-City (September, 2010 - August, 2015)

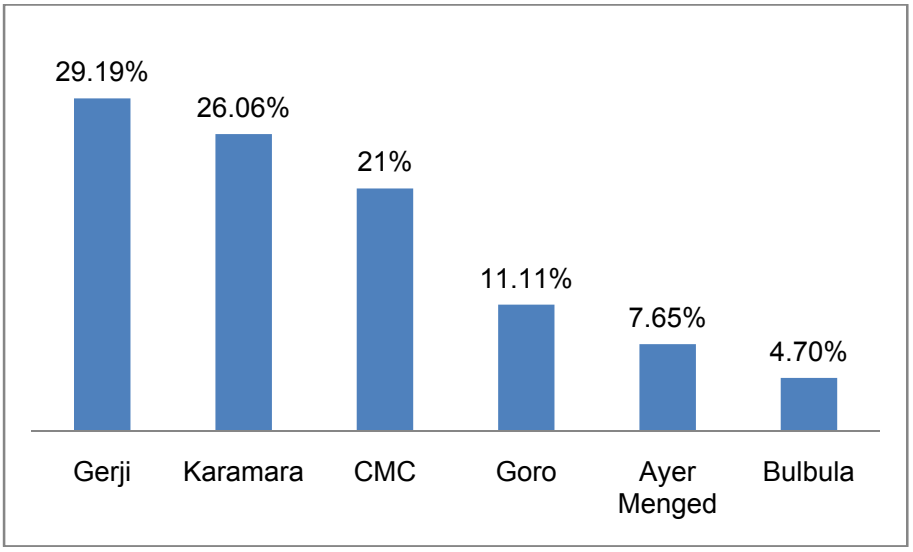


Table.3.2. Crime Report Bole Sub City (September, 2010 - August, 2015)

Bole sub-city police stations	No of crime	Percent
Gerji	10647	29.19%
Karamara	9510	26.06%
CMC	7768	21%
Goro	4054	11.11%
Ayer Menged	2787	7.65%
Bulbula	1713	4.70%
Total	36479	100.00%

Source: Bole Sub City Police District (September, 2010 - August, 2015)

Figure 3.2. above clearly shows that Gerji has high when relative to other station, therefore Gerji was selected for study area Under Gerji police station there are many sites that have high crime. However, Out of the sites AMCE was selected on the basis of having highest crime by Gerji police station according to the latest available police reports.

Selection criteria was developed also by taking into account the safety of all sidewalk users depend on built environment.

- It is located in the near CBD and It is an area of higher land value
- It‘s one of sidewalk developed to accommodate increasing pedestrian movement
- It is located near ring road that lack of active frontage potential for crime
- Existence residential area
- Presence of school
- Take into consideration lack of lighting
- Existence of manufacturing and storage
- Lack opening entrance and window

3.2. Results of the Questionnaire

The number of respondents in both south and east direction are 100. Their responses are analyzed in the following pages. The analysis is done on three levels. First, there is a general analysis of the current situation sidewalk safety. The second part of the analysis deals with the cause of sidewalk safety. The third part is proposed solution for sidewalk safety problem.

3.2.1. Unsafe times

As shown in figure 3.3. below, the majority of respondents said that they felt safe during the night on sidewalk 70 (70%). Respondents also tended to feel unsafe when after dark 60 (60%).

Fig.3.3. Unsafe Times

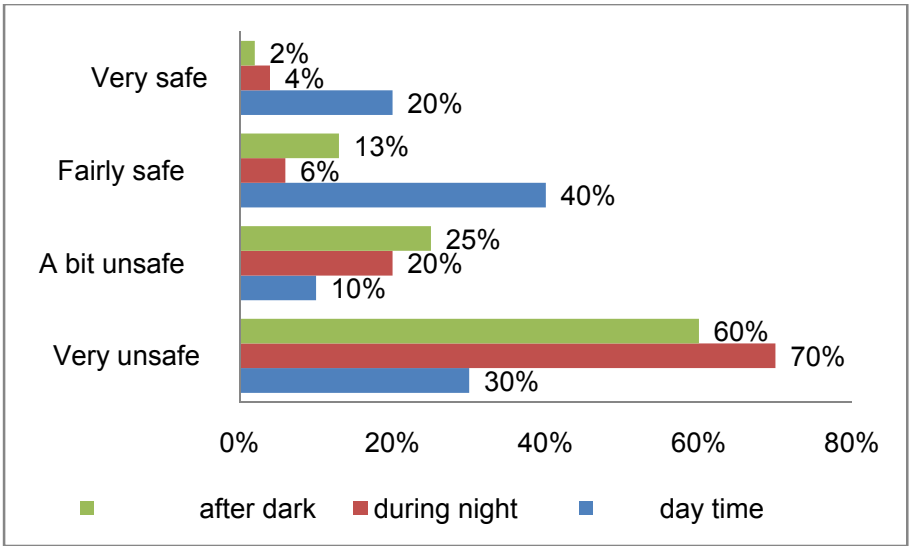


Table 3.3. Unsafe Times

	During the day time		Going out at night		Going out at after dark	
	Frequency	percent	Frequency	percent	Frequency	percent
Very unsafe	30	30%	70	70%	60	60%
A bit unsafe	10	10%	20	20%	25	25%
Fairly safe	40	40%	6	6%	13	13%
Very safe	20	20%	4	4%	2	2%
Total	100	100%	100	100%	100	100%

According to obtain data from interview the site has no street light, lacking in constant use and lack frontage activity. Site most is dominated by residential, school and manufacturing due to this, it is often under used. Therefore, perceived unsafe at night time. These leading site is not good safety for walking.

3.2. 2. Concern about Specific Crimes – Crimes in the Community

If fairly safe or unsafe what are the types of street crimes are there?

As indicated in figure 3.4 below, high percentage of respondents 86 percent of (86), believe robbery/hanging is one of the main concerns affecting the personal safety of community.

Fig.3.4. Crime Types on Sidewalk

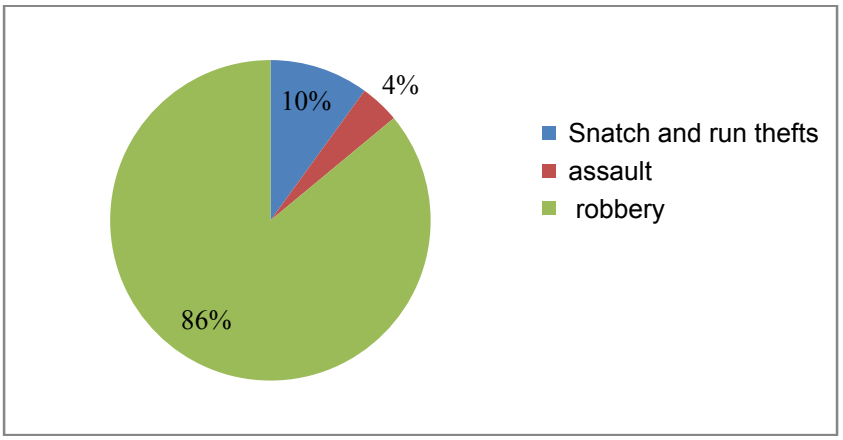


Table 3.4.Crime Types on Sidewalk

	Frequency	percent
Snatch and run thefts	10	10%
Assault	4	4%
Robbery	86	86%
Total	100	100%

Most of site is private space nobody overlook sidewalk. According to Alford study (1996) most dangerous case was found to be where a semi-public space and private space. In addition, interview made with police the study area is poor visibility because of this street crime high in this area.

3.2.3.Frequence of Snatching, Robbery, or other Street Crimes?

As shown in figure 3.5.below, 50 (50%) respondents reported having threat frequently / daily on sidewalk, while another 30 (30%) reported having occur occasionally. Few of them report threat is happen rarely.

Fig.3.5.How often would street crimes occur?

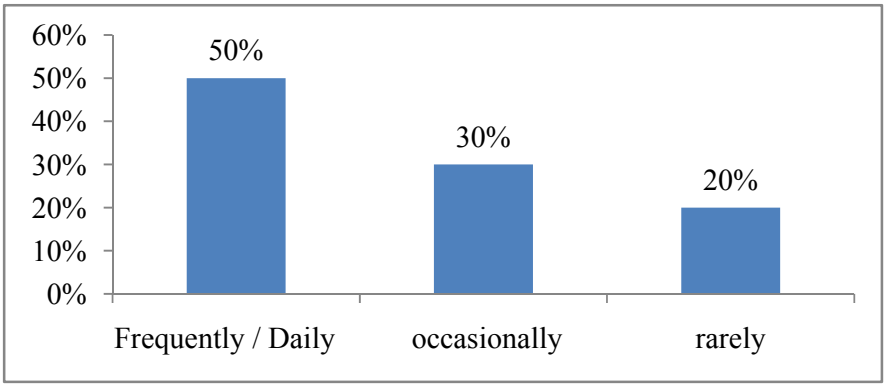


Table 3.5.How often would street crimes occur?

	Frequency	Percent
Frequently / Daily	50	50%
Occasionally	30	30%
Rarely	20	20%
Total	100	100%

Moreover, according to the interview made with officials and experts within the study area shows that, Robbery threat frequently / daily on sidewalk special in night time this contribute pedestrian restrict their movement.

3.2.4. Perception of Presence of Level Crime

Figure 3.6 in the next page shows that 40% (40) of pedestrians indicating level crime is a very serious and a further 15 % (15) pedestrians indicating it level crime is a not at all serious on sidewalk. Those more likely to have rated crime as a problem.

Fig.3.6.Perception of Presence of Level Crime

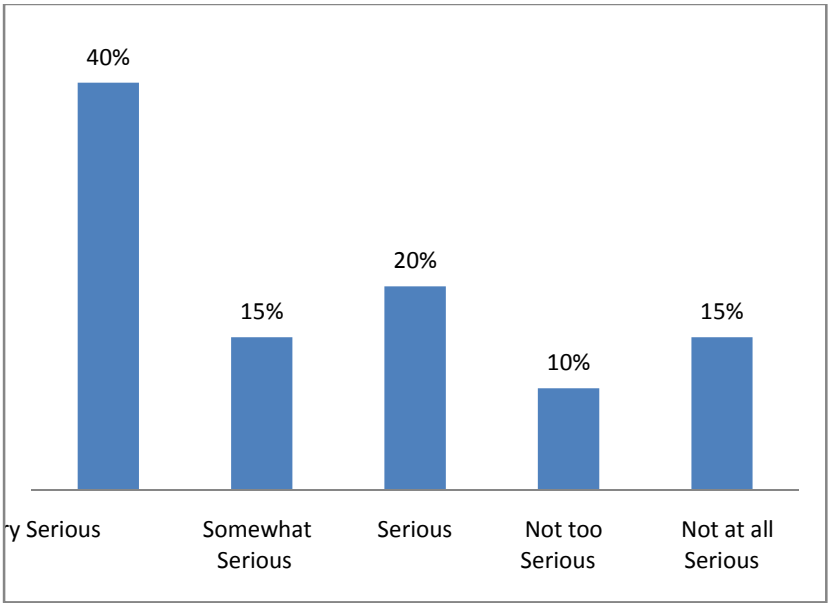


Table 3.6.Perception of Presence of Level Crime

	Frequency	percent
Very Serious	40	40%
Somewhat Serious	15	15%
Serious	20	20%
Not too Serious	10	10%
Not at all Serious	15	15%
Total	100	100%

According to Park (2008), sense of security is measured by number of windows facing to sidewalk, presence of boarded up buildings and unused plots, lighting and number of crime. It can be also measured by people perception of security from crime.

3.2.5. Fear of Crime

Firstly, respondents were asked, in general, how they were fearful about becoming a victim of crime and asked to give their response. Responses are outlined in the chart below.

Figure 3.7. in the next page shows that the majority 53 (53%) of respondents indicated that they were fearful about becoming a victim of crime, answering that they were either somewhat fearful or very fearful. That said, it's notable that respondents were more inclined to say that they were very fearful 29 (29%) than somewhat fearful 24 (24%).

In contrast, just nearly a half 47 (47%) said they were not fearful although respondents were more likely to say that they were not at all fearful 29 (29%) than not very fearful 15 (15%). However, this does mean that one-in-twenty respondents expressed the highest level of concern about crime.

Fig.3.7. Fear of Crime

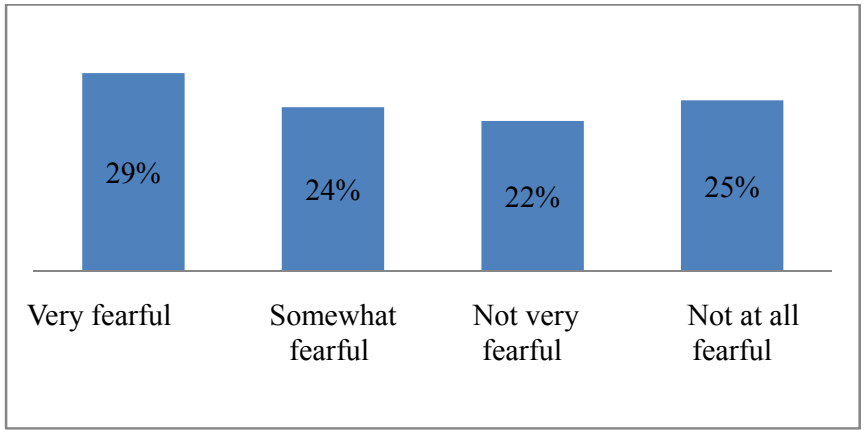


Table 3.7.Fear of Crime

	Frequency	percent
Very fearful	29	29%
Somewhat fearful	24	24%
Not very fearful	22	22%
Not at all fearful	25	25%
Total	100	100%

According to Ferraro (1995) fear of crime is a subjective phenomenon which has been defined as “an emotional response of dread or anxiety to crime or symbols that a person associates with crime” Fear of Crime is at last being recognized as a serious issue, which can impact significantly on an individual lifestyle and sense of wellbeing. In addition, according to the interview made with officials and experts reducing levels of crime and anti-social behaviour in the area can help reduce fear of crime. Fear of crime is affect people from all walks of life at any stage of their lives.

Charles (1983) and Wilson (1983) fear of crime can also be related to exterior site features of a location. Fear tends to be highest in areas with refuge for potential offenders and low prospect of escape for potential victims. Thus, the mere design of public places can contribute to feelings of security or fear.

3.2.6. Impact of Crime and Fear of Crime on Quality of Life

The below figure indicates that the majority of respondents felt that both crime and the fear of crime impact significantly on their quality of life. In total, 56% (56) gave a total effect on their quality of life for crime itself 70% (70) of highest proportion gave for the fear of crime While this is clearly positive, it should be noted that around 40% (40) gave a no effect on their quality of life for crime. 6% (6) gave no effect by the fear of crime.

Table 3.8.Impact of Crime and Fear of Crime on Quality of Life

	How much is your own quality of life affected by			
	Crime		Fear of crime	
	Frequency	percent	Frequency	percent
No effect	40	40%	6	6%
A little effect	4	4%	10	10%
Not very effect	10	10%	14	14%
Total effect	46	46%	70	70%
Total	100	100%	100	100%

Based on the information collected from Police officer, fear of crime and crime have usually negative effect on quality of life by prompting pedestrians to severely restrict their movements. Therefore, important to study impact of crime and fear of crime on quality of life in order to minimize the negative impact of fear of crime on quality of life.

The proper design and effective use of the built environment can lead to a reduction in the fear of crime and the incidence of crime and to an improvement in the quality of life" (Crowe, 1991).

3.2.7. Has this problem inconvenienced or caused a change in the daily life/routine of you or your family?

Table 3.9.Inconvenienced of problem

	Frequency	percent
Yes	98	98%
No	2	2%
Total	100	100%

What are the Effects of Fear of Crime and Crime?

As indicated in figure 3.8, the majority of respondents said that fear crime and crime effect on socio-economic. In total, 64.3% (63) gave a fear of crime and crime effect on their socio-economic, while another 20.4 % (20) of respondents are withdrawal from participating. Few of them altered lifestyle.

Fig.3.8.How the daily life/routine of you or your family change?

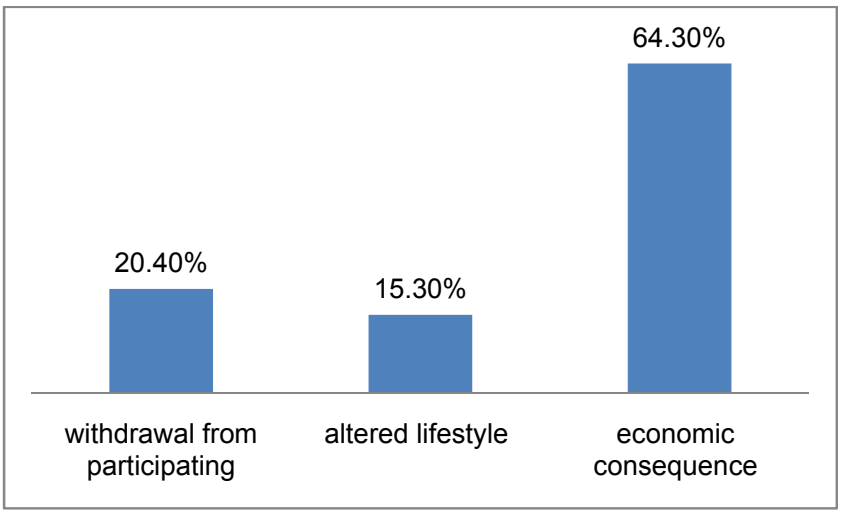


Table 3.10.How the daily life/routine of you or your family change?

	Frequency	percent
withdrawal from participating	20	20.4%
altered lifestyle	15	15.3%
socio-economic consequence	63	64.3%
Total	98	100%

Withdrawal from Participating

Withdrawal from participating within the community disrupts their effective functioning in the community, damages social harmony and generates tensions and isolation which lead to further crime, major costs to the community and significant human suffering amongst victims, perpetrators and their families.

Altered Lifestyle

They feel vulnerable and isolated. Instead of enjoying of trips to school, grocery stores, and work, they feel worried and afraid. The effects of fear of crime on their lifestyle, which included refraining from going out at night.

Economic Impact

Crime, whether it be the incidence or fear of crime, and/or victimization costs the community economically. They do not work their own business in night duo to they fear to go in night .

3.2.8. Perceived change in crime rate on this sidewalk in last five years

As shown in figure 3.9 below The majority of respondents felt that nothing had changed the crime rate was 'about the same level 50 (50%) on sidewalk. Overall, respondents were almost twice as likely to feel that there was more crime' than they were to feel there was less crime' 18 vs. 33 (18% vs. 33%) compared to two years ago

Fig.3.9.Perceived change in crime rate

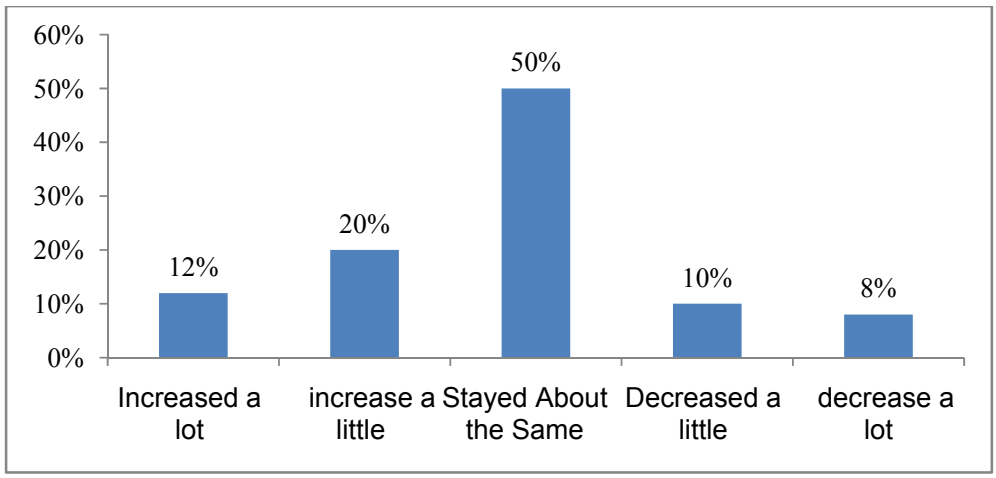


Table 3.11. Perceived change in crime rate

	Frequency	percent
Increased a lot	12	12%
Increase a little	20	20%
Stayed About the Same	50	50%
Decreased a little	10	10%
Decrease a lot	8	8%
Total	100	100%

According to the data obtain from interview of police officer the number of crimes reported was lower crime than before. However, according to user perceptions and data obtain from interview of crime rates do not match with police statistics of recorded crime or surveys on victimization rates.

Urban planners and architects all recognize, particularly when attempting to clarify the effective role of the built environment in influencing crime rates (Wollan, 1976).

3.2.9. Likelihood of becoming a victim of crime in next 5 years

Figure 3.10 below clearly shows that the majority thought that it was likely they would be a victim, with 35% (35) indicating that it was both not very likely and not at all likely. More than four-in-ten 40 (40%) thought that it was actually likely they would become a victim, although only 20% (20) thought it was very likely

Fig.3.10.Likelihood of becoming a victim of crime in next 5 years

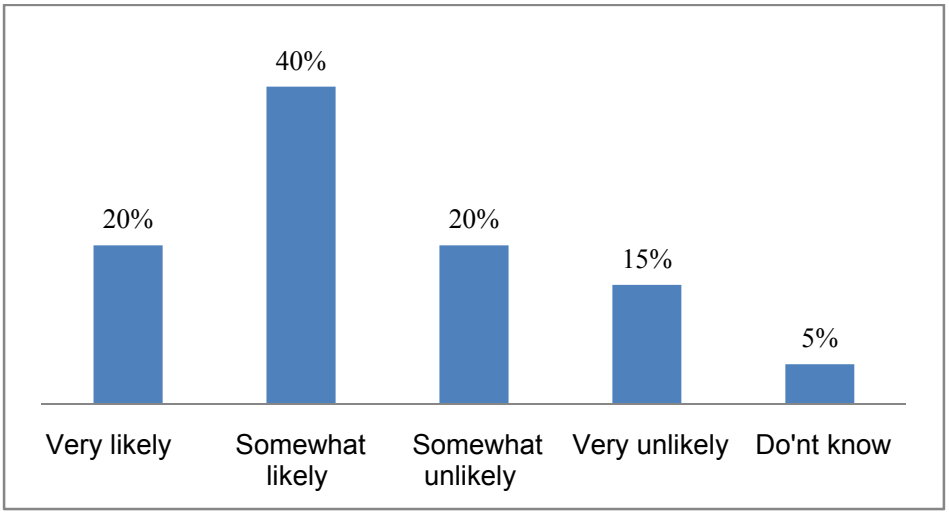


Table 3.12.Likelihood of becoming a victim of crime in next 5 years

	Frequency	percent
Very likely	20	20%
Somewhat likely	40	40%
Somewhat unlikely	20	20%
Very unlikely	15	15%
Do'nt know	5	5%
Total	100	100

3.2.10. Factors affecting safety on sidewalk Physical features

As indicated in figure 3.12., all responses are from the site where the respondents were interviewed. 50 percent (50) of pedestrian attribute their sense of insecurity due to Vacant space, low prospect and lack street lighting. 27 percent (27) of pedestrians gave the level of risk a pedestrian faces is linked to high refuge and Absence street lighting. 23 percent (23) of

pedestrian consider vacant space, high bounded and low prospect is an additional factor that heightens risks to their personal safety.

Fig.3.11.Factors affecting safety on sidewalk Physical features

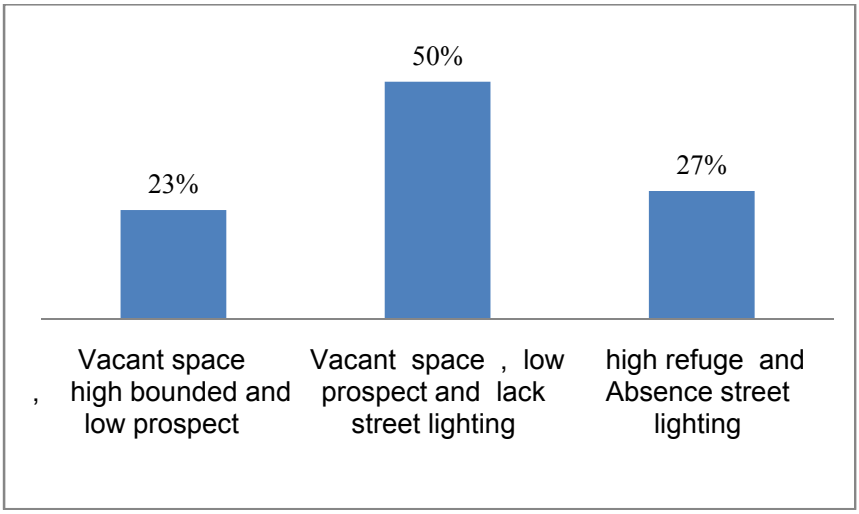


Table 3.13.Factors affecting safety on sidewalk Physical features

	Frequency	percent
Vacant space , high bounded and low prospect	23	23%
Vacant space, low prospect and lack street lighting	50	50%
high refuge and Absence street lighting	27	27%
Total	100	100%

According to Park (2008) pedestrian perception is measure by sense of security which affected by visibility at night, number of windows facing to sidewalk, lighting ,Visual Surveillance from nearby Buildings and presence of others.

3.2.11. How to create sidewalk safety to prevent crime?

Figure 3.12.in the next page shows that most responder gave the Natural surveillance, Different activity & street light along the street some responder gave of high density-high rise building & street light can prevent crime in way of pedestrian feelings of safety. Most respondents of 50 percent (50) of pedestrian attribute their sense of security by developing Natural surveillance, Different activity & street light. 21 percent of (21) pedestrians gave the level of safety of a pedestrian solved by proving high density-high rise building & street light. 29 percent (29) of pedestrian consider CCTV and different activity can prevent crime of sidewalk.

Fig.3.12.How to create sidewalk safety to prevent crime?

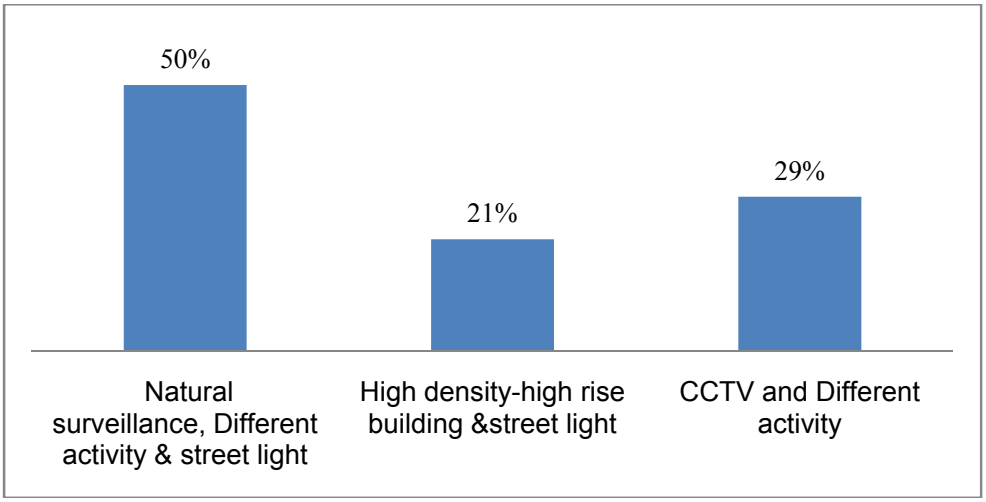


Table 3.14.How to create sidewalk safety to prevent crime?

	Frequency	percent
Natural surveillance, Different activity & street light	50	50%
High density-high rise building &street light	21	21%
CCTV and Different activity	29	29%
Total	100	100%

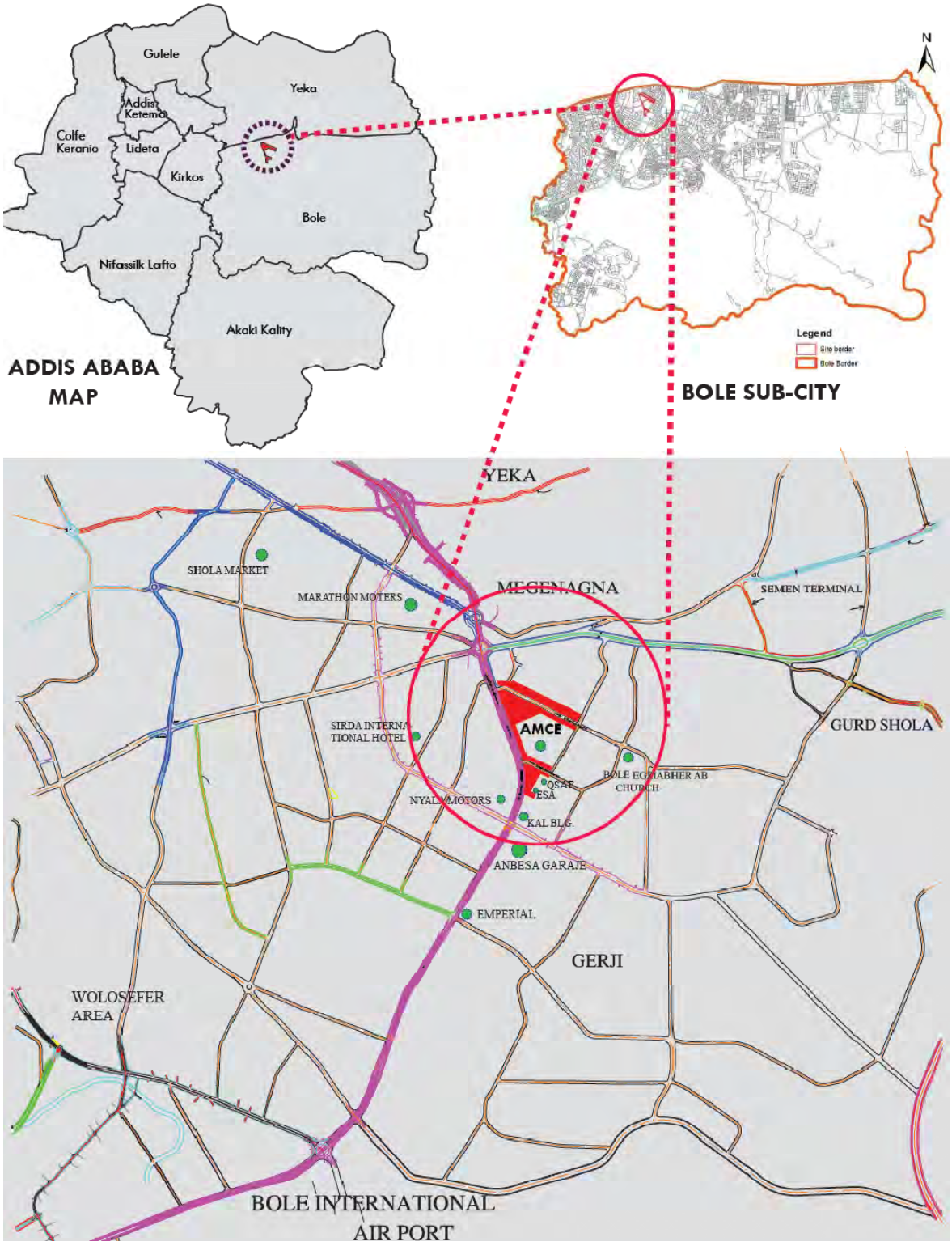
3.3. Site Analysis and Discussion

3.3.1. Location of study area in Addis Ababa

Addis Ababa is the capital city of Ethiopia. It is a seat of the African Union (AU) and the United Nations Economic Commissions for Africa and gateway for diplomats and tourists. The average elevation of the city is around 2,500 meter above sea level (m.a.s.l). In terms of governance there are three level of government: City Government at the top, 10 sub-city administrations in the middle and 116 Woredas which is the smallest unit of government in the hierarchy.

Map.3.1. in the next page shows that site is located bole sub city woreda 06.The name of the site is known as AMCE. The area covers about 11.5 ha. The site dominated by residential area and manufacturing. It is a low density area characterized by most houses are G+0.

Location Map OF Study Area In ADDIS ABABA



Map.3.1. Location of the Study Area in Addis Ababa

Source: computed by the authors, 2016

3.3.2. Existing Building Height

As shown in map 3.2. below, most of the site is dominated by low rise buildings used for residential and manufacturing purposes. The building height in the site area is far below the Addis Ababa structural plan proposal. All most all of the site are G+0 building height except three buildings are above one story height of building.

Map.3.2. Existing building height

Source: computed by the authors, 2016

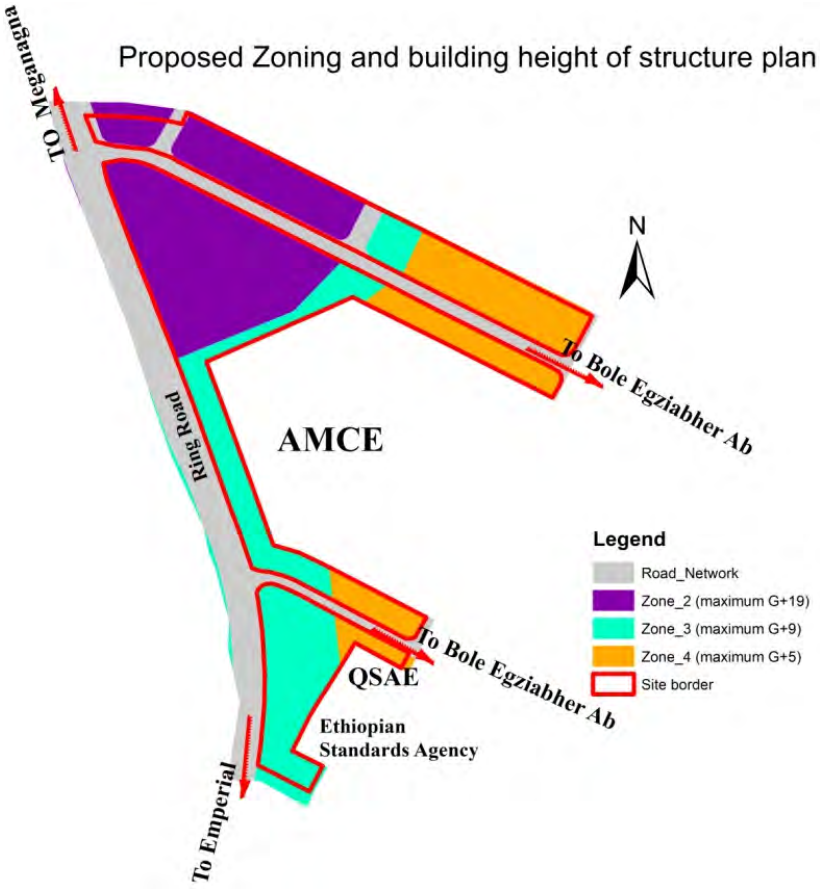
According to Loukaitou-Sideris (1999) low rise building density, where sufficient number of people are lacking which is not generate vitality. Low rise building density flows and movements are weak which is not provided natural surveillance on the streets. Therefore, Low-rise building have high commitments of crime than high-rise building.

3.3.3. Proposed Building Height of structural plan

The new Master Plan divides the city into four zones, dictating the heights of the buildings that are to be constructed in these zones.

Zone I constitutes areas that are the centres of the city and are the major sites of construction currently. They are located around roads with higher traffic flow. Zone II constitutes areas near 40m wide roads. Zone III and Zone IV are places far from main road

As indicted above the existing building are mostly zero story buildings. According to the revised regulations, the buildings in Zone II building heights will be in the range of nine to 19 storeys; Zone III buildings will be between five and nine stories; located at the outskirts of Addis Abeba, Zone IV constitutes residential buildings up to ground plus five, not higher than 21m.



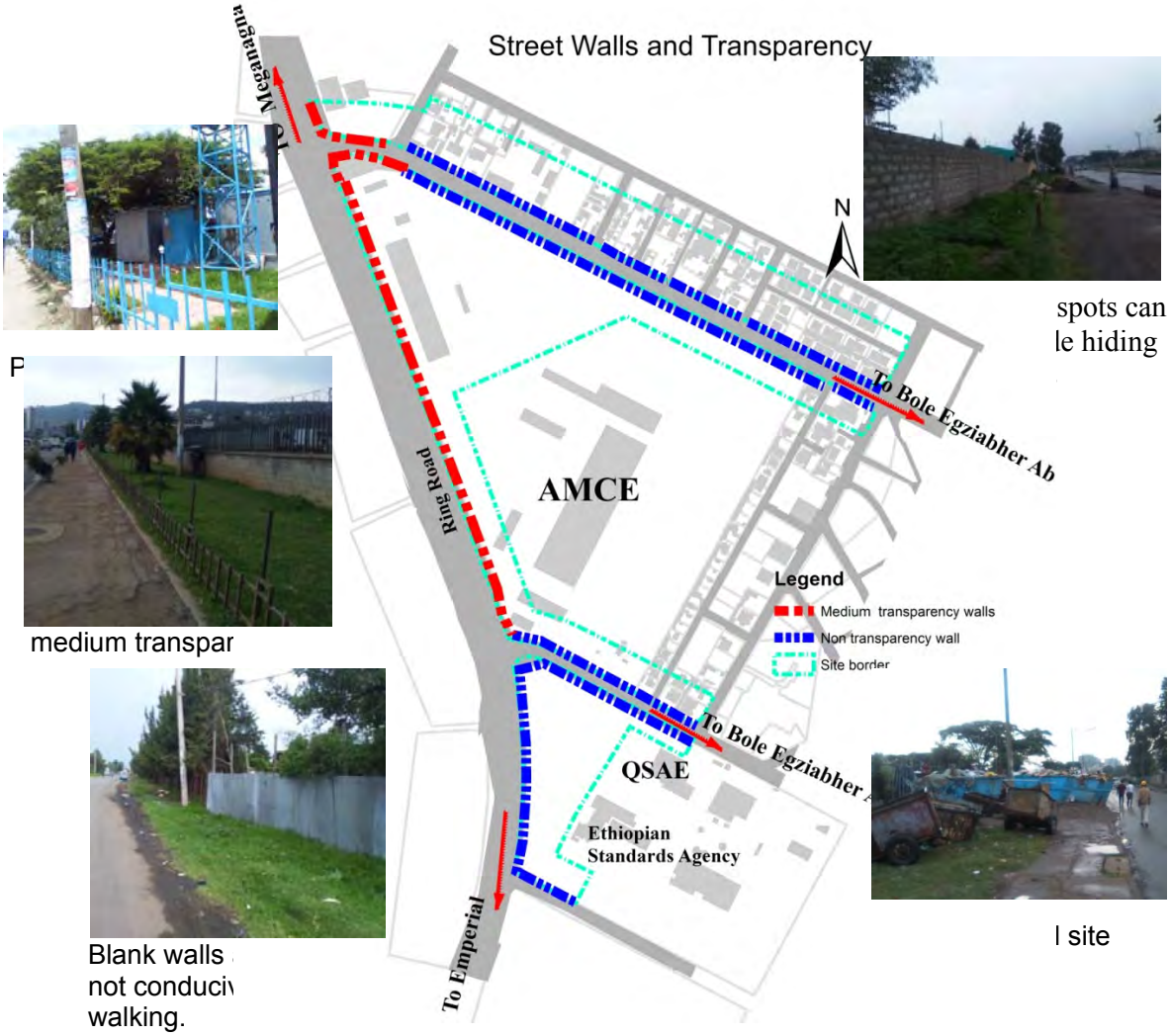
Map.3.3. Proposed Building Height of structural plan
Source: Planning office of Bole sub city

3.3. 4. Street Walls and Transparency/Natural surveillance

As indicated in map 3.4. most of the areas are non-transparency which is 72.71%, these due to there are tall blank walls and fences, Public toilet and dump rubbish around pedestrian routes those are all obstacles to visibility. Street is not defined by building so that most of site lack of transparence.

Table 3.15.Percentage of Street Walls and Transparency

Street Walls and Transparency	Distance in meter	Percentile %
Medium transparency	670.57	27.29%
Non transparency	1785.59	72.71%
Total	2456.16	100%



Map.3.4. Existing street Walls and Transparency

Source: computed by the authors, 2016

According to the interview made with officials and experts within the study area shows that ,lack of ability to see what is ahead along a route due to window, walls, fences, and tree can be serious obstructions to the feeling of being safe. Solid front walls block views to and from the street which reduces the opportunities for passive surveillance. In addition, according to National Crime Prevention Council (2003) tall and black fences, blind facade, and other impediments blocking visibility adjacent to sidewalk could shelter for robber. Criminals prefer areas that are not visible to people. Most people feel unsafe in isolated areas if people judge that signs of suffering or shouting will not be seen or heard.

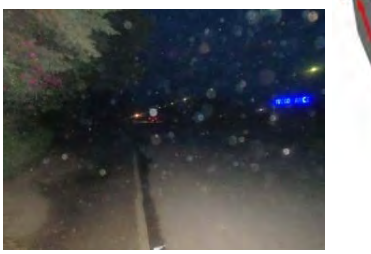
Street furniture

In site there no street furniture such as street light and seating. Due to this it create fear of crime .

3.3.5. Existing street Light

As shown in map.3.5 below, there is no street light .Absence of street lights in site is reported to be a serious problem facing pedestrian of the site. This situation exposes pedestrian to criminal activities. This apparent problem is even acknowledged by authorities in the power company. In night the area is dark.

Poor lighting focus attention in the wrong area, create shadows or glare. After dark, surveillance opportunities are affected by lighting conditions. The area hidden in total darkness serve as for criminal activity; the most noticeable being the illicit activity that occurs in these dark holes. Many of pedestrian are fearful of these areas. It can influence an individual's perception about his environment in safety terms. Walking routes can be targets for crime (Cozens et al., 2003).



no street light in night

No street light on day ime

Map.3.5. Existing Street light

Source: Field photograph, 2016

No Street light on day time

light in night

3.3.6. Existing Vegetation

As shown in map.3.6 below, there are dense vegetation. Dense vegetation obscure views and create shadows to see sidewalk. In site Sight-lines 39 is obstructed by dense vegetation.

According to data obtain from interview, dense vegetation is linked to fear of crime. Fear of crime and crime are higher where vegetation blocks visibility. Large shrubs and dense woods all substantially diminish view and therefore are capable of supporting criminal activity. As the study made by Fisher & Nasar in 1992 improperly placed vegetation can give a potential criminal a place to hide. Without Careful placing of suitable plant and tree species create for concealment or vandalism. Poor landscape design cannot compromise the safety and security of its users.

Dense vegetatio

Tree block visibili
inside

Tree barrier visibility

Map.3.6. Existing Vegetation

Source: field survey and Google earth, 2016

3.3. 7. Existing Land use

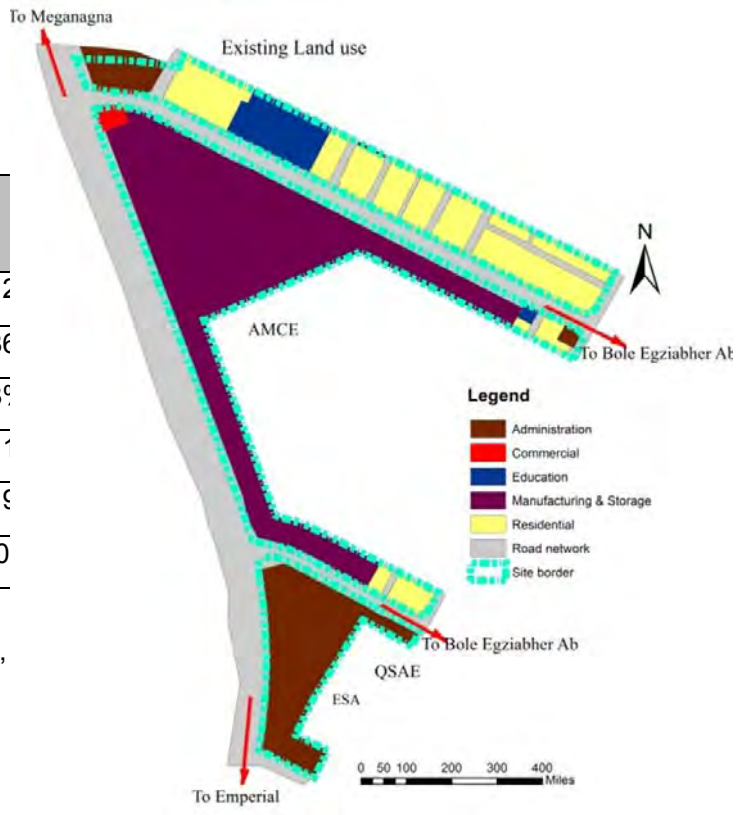
The site is known by AMCE mainly covered with residential and manufacturing. Small scaled commercial activities like shops and cafeterias exist along the major roads. There are educational services like primary school and college. The table below shows that the manufacturing takes the largest portion from the existing land use, numerically it is 49.13%. Therefore, there is problem of land use distribution that is the largest land use (manufacturing) prevent the expansion of other land use groups. The existing land use in the site area is not same with Addis Ababa structural plan proposal.

According to the interview made with officials and experts within the study area shows that residential and manufacturing can be attractive targets for crime. According to Rhodes and Conly (1981) land-use is one of determinant of the type of movement structure required. This is particularly impacted by the nature of the land use formation and the zoning of uses. If land use will not face the street, It have poor surveillance. These developments can be largely uninhabited after dark, making these types of pedestrian particularly vulnerable to crime.

Table:3.16. percentage of existing Land use

Land use category	Area (m2)	%
Administration	23216.48	20.2
Commercial	980.57	0.86
Educational	6634.99	5.8%
Manufacturing	56195.2	49.1
Residential	27357.97	23.9
Total	114385.21	100

Source: computed by the authors,



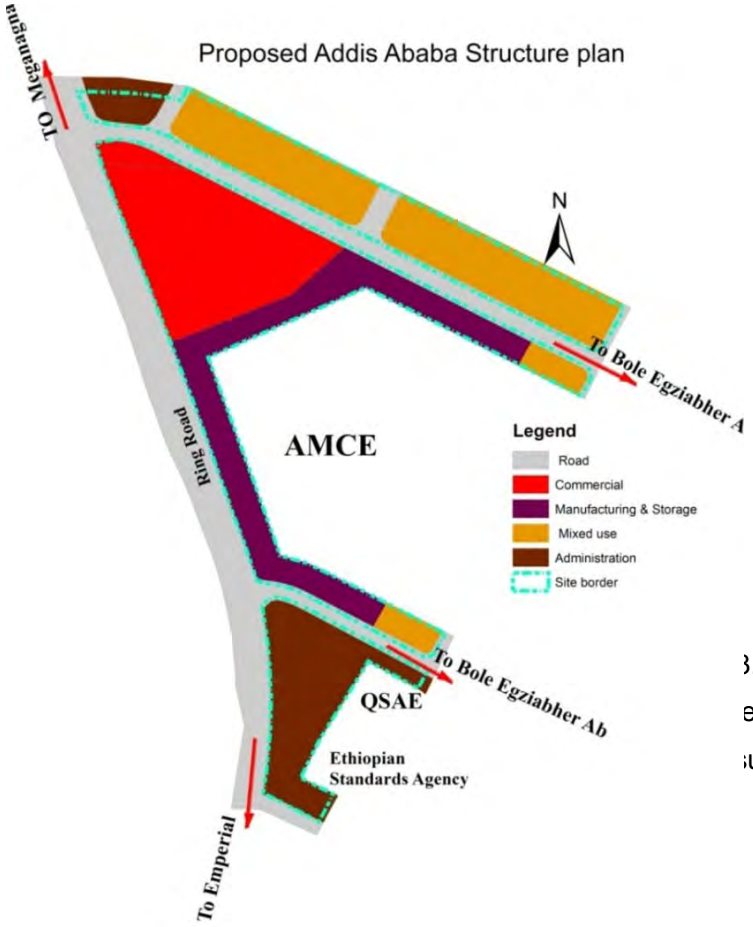
Map.3.7. Existing Land use

Source: computed by the authors, 2016

3.3. 8. Permitted land use

As shown in map.3.8.below,the permitted land use for the area is the mixed land use as it is indicated on the structural map of Addis Ababa but the current land use of the area is more or less similar but their has to be some improvements to attain the permitted land use of the area, because when we see the existing land use there no mixed use but the expected land use from the structural map indicates that it is 16% , means it needs upgrading of the site in the physical setup of the area.

In the Structure plan, the area for the center includes those areas east of the ring road or Bole – Megenagna road. However, in the Megenagna project, the area west of the ring road as well is included in the action.Area for the ring road at this section will have an overpass and will not hinder east – west pedestrian crossings.



3.8.Permitted land use
e: planning office of
ub city

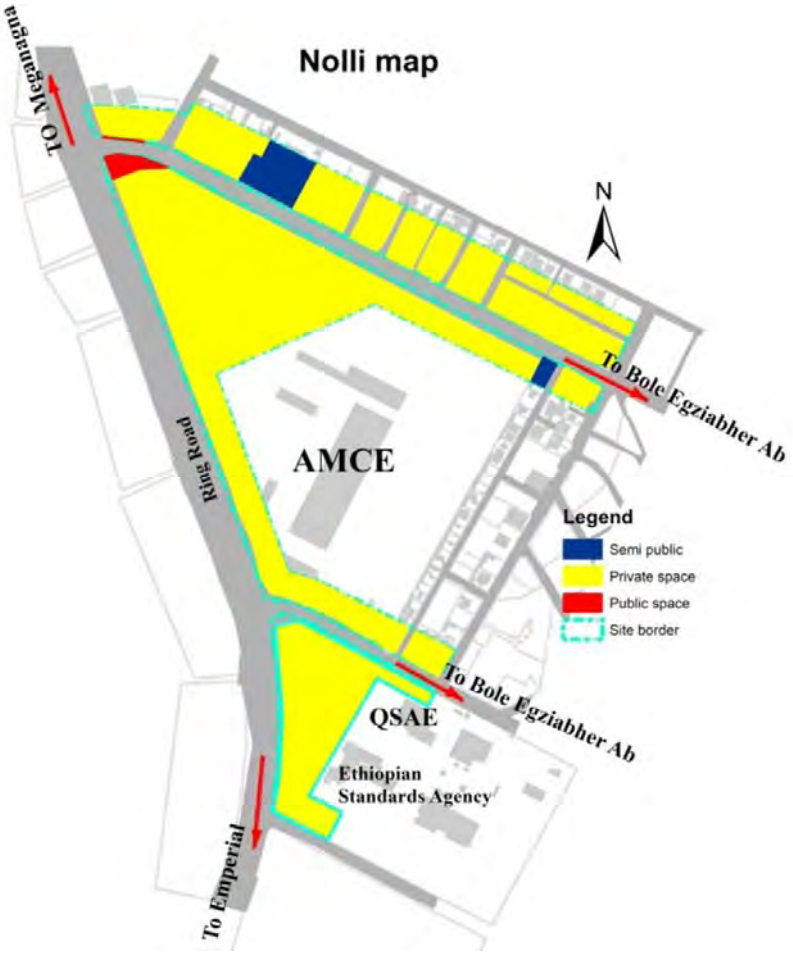
Most of this land use not recommended for this research except mixed use development only due to generate high crime. According to Robinson (1999), Block (1995),Block(1995), Jacobs (1961) Specific Commercial, manufacturing and administration uses are more likely to generate crime than other. Those land use lead to substantially more street robberies and batteries in their immediate vicinity.

3.3. 9. Existing distribution of public and private space

As shown in map.3.9.below, differentiates between public, semi public and private space. Public space include: Cafe and shop. There are few semi-public such as college and school.Private space are privately owned by building and land parcel. Most of the areas are private space which is 94.9%. Private spaces is not accessible when compared with public space. Particularly on the site there is no visible recreation area and open space. Every inches of the site are used for building construction. There is no provision for communal meeting areas.There is no public open space which is used for playground.

Table 3.17. Distributio
public and private space

	Area (m2
Public	1426.98
Semi public	4337.89
private	106813.3
Total	112578.2



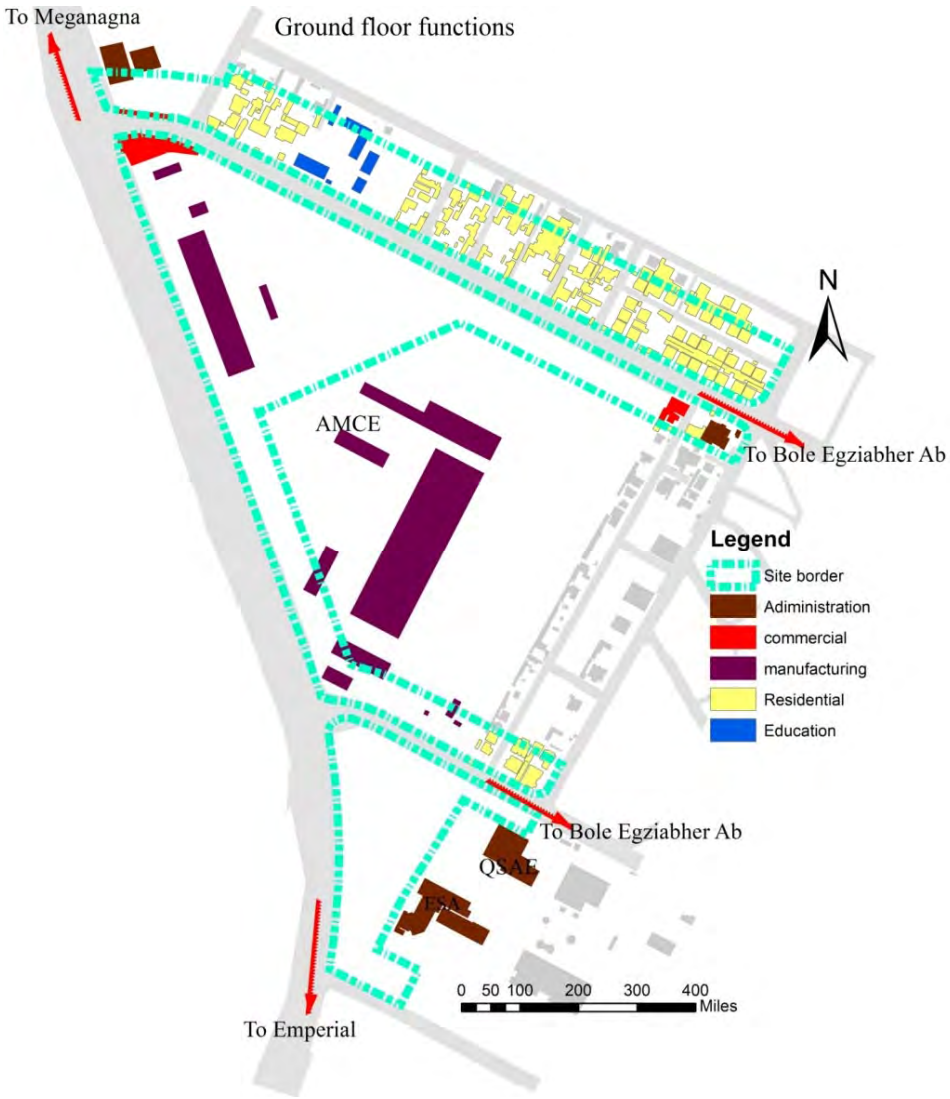
Map.3.9. Existing Nolli map
Source: computed by the authors, 2016

According to Alford study (1996) most dangerous case was found to be where a semi-public space and private space. Areas with the lowest pedestrian levels and low public building often attracted the highest levels of violent crime. As the study made by Hillier and Shu in 2000a busier streets with some pedestrian movement have experienced reduced levels of recorded crime.

3.3.10. Existing ground floor functions / activities

As indicated in map 3.10. most ground floor function are manufacturing and residential. So the ground floor function has problem in its distribution and there is low ground floor activity.

According to the interview made with officials and experts low ground activity create crime. According to Loukaitou (2001) crime can be create where there is a low level of legitimate activity at different times of day and night. The fear of crime and crime can create places where people are not passing or looking on. Lack of ground floor activities that make vulnerable to crime. Therefore, good design can make a big difference for real and perceived safety.



Map.3.10. Existing ground floor functions

Source: computed by the authors, 2016

3.3.11. Existing frontage character

As shown in map.3.11 below, Most of the areas are dead active frontage which is 94% of site. These is especially for due to lack of shopping, cafes, gathering places or recreational facilities. So the frontage levels depends on the functions. The other point is that especially on the southern part of the site there is vacant spaces with no the buildings. Some of site is more active at the day time but on Sunday and in night there no activity.

Table 3.18.percentage of Frontage character

Frontage character	Distance in meter	Percentile %
Active Frontage	201.8	6%
Dead Frontage	2998	94%
Total	3199.8	100%

esidence

Primary schc

Vacant frontage

Map.3.11.Existing frontage character

Source: computed by the authors, 2016

According to data obtain by interview inactive lanes provide opportunities for potential offenders. Inactive frontages with no surveillance contribute to anti-social behaviour.

3.3.12. Existing Way of finding, sign & information

In site there is not the way finding information available, sign, and their ability to orientate. People has problems finding their way. There is no sign for pedestrian direction which show were to go and were the path led to.

.

no sign

No finding

No information

Map.3.12. Existing way finding, sign & information

Source: Field photograph, 2016

Problems with the decision process arise when people have never visited a site before. Many factors affect how people orientate themselves and find their way, but way finding is essential a series of interrelated decisions influenced by environmental factors. Functional and attractive signage system with consistent messaging and appearance. It led to confusion/unclear understanding of the site and use of inappropriate places (Arthur and Passini, 1992). Day (2001) describes environmental conditions that individuals perceive as ‘‘cues to danger’’: lack of familiarity with an environment.

3.4. Summary of Finding

Findings as related to research questions

There were two major points raised as research questions. This research tries to answer the current sidewalk safety problems look like and the main causes of sidewalk safety problems through built environment analysis in the study area. The findings are presented below according to the research questions.

3.4.1. Current sidewalk safety problems look like

- Lack Safety during the night and after dark rather than day time due to absence Street light and frontage activity.
- Presence of Robbery/hanging is one of the main concerns affecting the personal safety due to no one over looked
- Robber threat frequently on sidewalk special in night time this contribute pedestrian restrict their movement.
- There is very serious crime as specified by user and experts
- Presence fear about becoming a victim of crime special at night due to the site has refuge for potential offenders and low prospect of escape for potential victims.
- Fear of crime and crime have negative effect on quality of life by prompting pedestrians to severely restrict their movements
- Fear of crime effect people daily life such as withdrawal from participating, altered lifestyle and effects on economic.
- Crime rate is about the same level when camper within last five years

3.4.2. The main causes of sidewalk safety problems

- Lack high rise building which not provided a sufficient number of people which is preferably for criminal activity.
- Absence of transparency wall/ natural surveillance such as absence of windows, entrances, porches, balconies, impermeable wall and fence which impediments blocking visibility adjacent to sidewalk could shelter for robber.
- Lack of lighting serves for criminal activity the most noticeable being the illegal activity that occurs in these dark holes.
- Existence of dense vegetation and shrubs around pedestrian routes create high crime due to obscure views and create shadows for people to hide

- Lack of mixed land use that limited opening and closing hours can be attractive targets for robbery.
- Lack ground floor functions and insufficient number of public buildings that has the low level of natural surveillance where people are not passing or looking on and few number people are present that contribute preferable for criminal nobody overlook
- Lack of parks and plazas that contributed to low level of presence of people and poor natural surveillance because of this people not use this sidewalk it not provide reasons for use.
- Lack of seating that contributes to less walk ability of these places and create fear of crime and crime
- Presence dead active frontage contributed inactive lanes provide opportunities for potential offenders due to there is no street watchers
- Absence of way finding to navigate through this led to unclear understanding of the site
- Lack of landmarks that contributed to the low level way of finding
- Lack street activities that contributed to unattractive place for people to use sidewalk.

3.5. Design Proposals for Crime Reduction

3.5.1. Introduction

According to Stratford-On-Avon District Council (2006) crime have harmful impacts upon society security on sidewalk. Developing safer sidewalk and diminishing the fear of crime and crime ought to be a central component of urban planning and design process. Good design of sidewalk have a major role to play in reducing crime. Good design and layout can make crime more difficult to hand over, increase the likelihood of detection of criminal activity and improve public safety. The main opportunity to incorporate crime reduction measures is in the design phase, where they must be an integral part of the design.

The main objective is creating sidewalk safety for prevention of crime by incorporate suitable design features in built environmental and building design which will help deter criminal. Crime can be managed and reduced in several ways which involve the built environment. This allows for an integrated approach with high-rise building density, Natural Surveillance, Street furniture, activity frontage, Lighting, Close Circuitry Television, Open space, mixed land use, way of finding and other primary design decisions being made with consideration of their potential to reduce crime.

3.5.2. Crime prevention concept

Crime prevention has become an increasingly important component of strategies on sidewalk safety and security. The concept of prevention is grounded in the site that crime is driven by factors. The design of built environment is the diminution of occasion for crime to occur. This reduction is attained by physical design features that discourage crime, while at the same time encouraging lawful use of the environment.

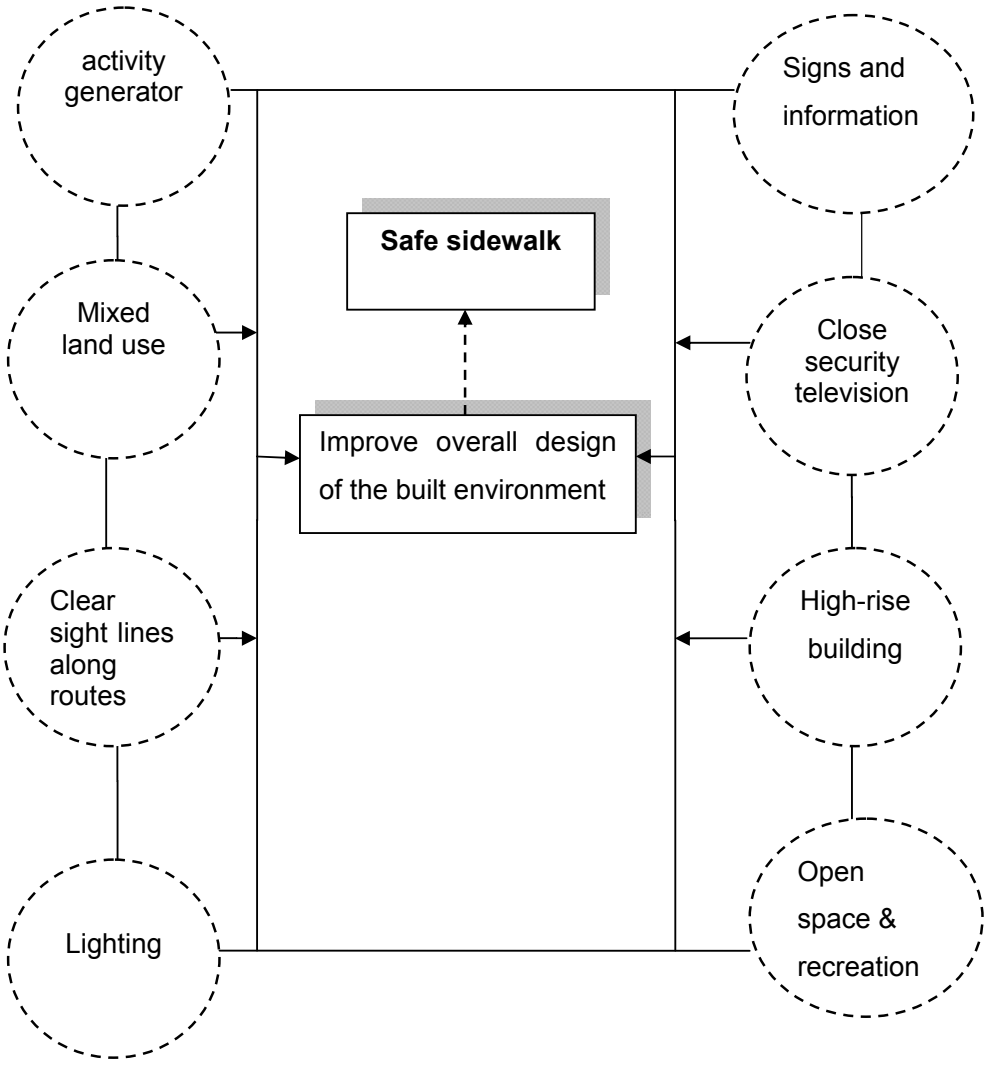
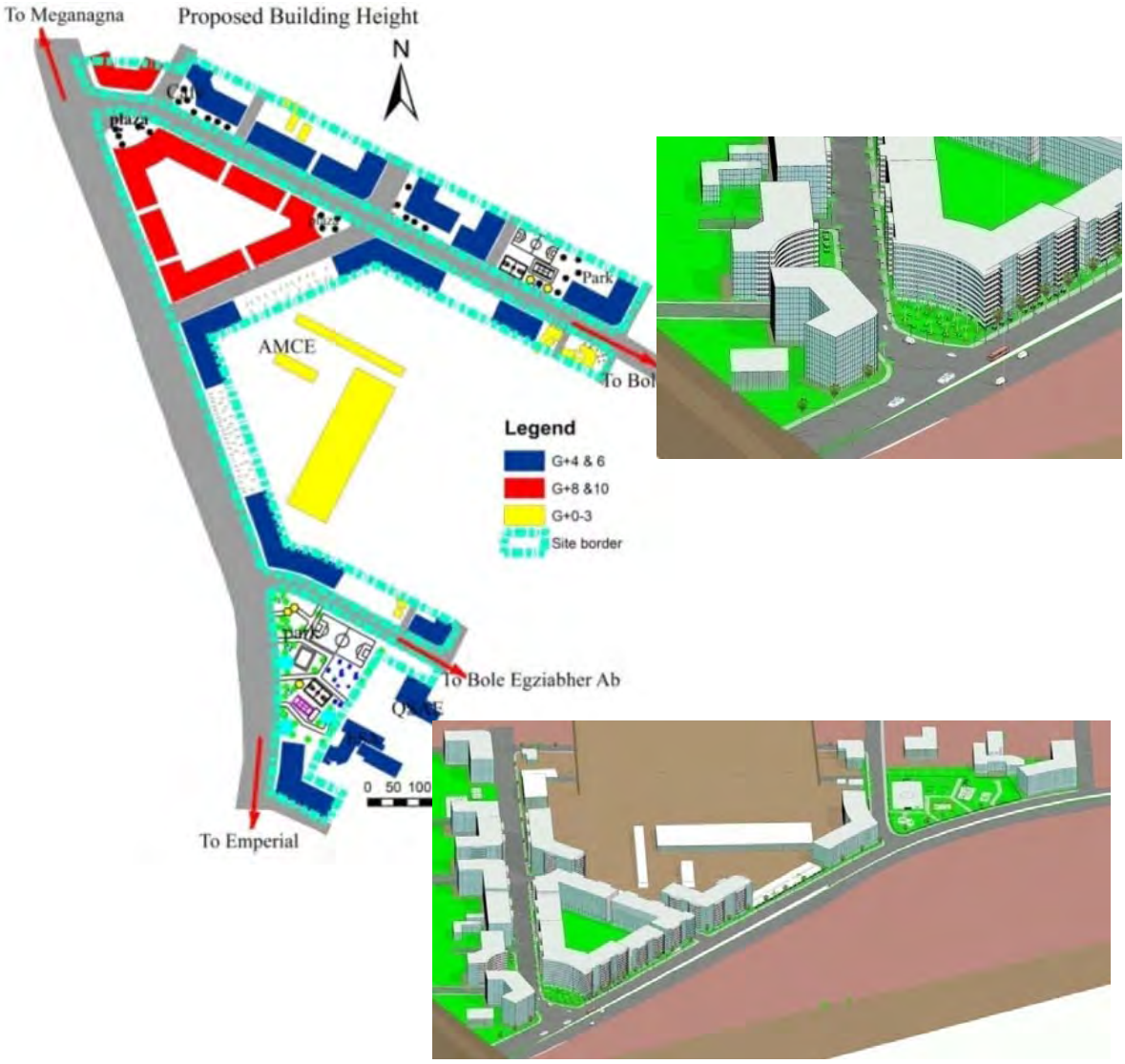


Fig.3.13.Conception diagram

3.5.3. Proposed Building height

This proposal is proposed according to building height of structural plan. The proposal encouraged medium density high-rise building by delivering mixed use development. The minimum number of floors above the ground floor should be 4 story, the maximum is 10.



Map.3.13. Proposal building height

According to Lirebo (2014) the design of new and altered buildings takes into account the sidewalk safety of the users. When increase the density with adding building height it should encourage: Increase positive interaction and diversity. Planned and designed medium high-rise building can bring space efficiency in terms of sidewalk safety. High-rise building can help reduce crime by creating opportunities for community surveillance through many eyes on the street and increasing pedestrian activity through 24 hour.

3.5.4. Proposed Street Transparency/natural surveillance

Proposed full transparency wall, balconies, low hedges, wrought iron or chain-link fences, transparent reinforced glass, opening entrance with no 'hiding' places and blank walls. Site should be overlooked by buildings at all times. Buildings should be structured without deep recess in the building line which might allow an intruder to work unseen. Windows and doors should be face onto the sidewalk. To attain safety through transparency, from the ground floor to second floor should have more than 80% of its surface glazed. The remaining floors should also have more than 60% of their façade transparent.

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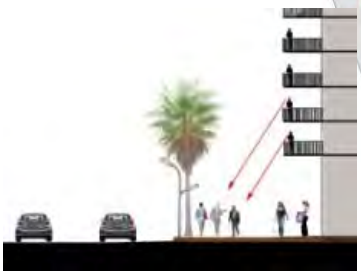

A transparent front
ensures that this h
active element of t
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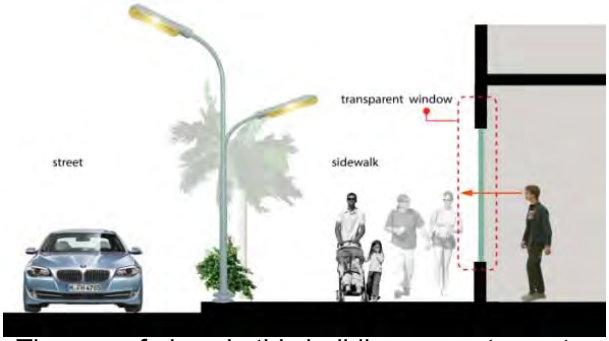
The permeable fence adds to
the opportunities for natural surveillance



The use of glass in this building promotes natural surveillance.

Map.3.14. Proposal of Street Walls and Transparency

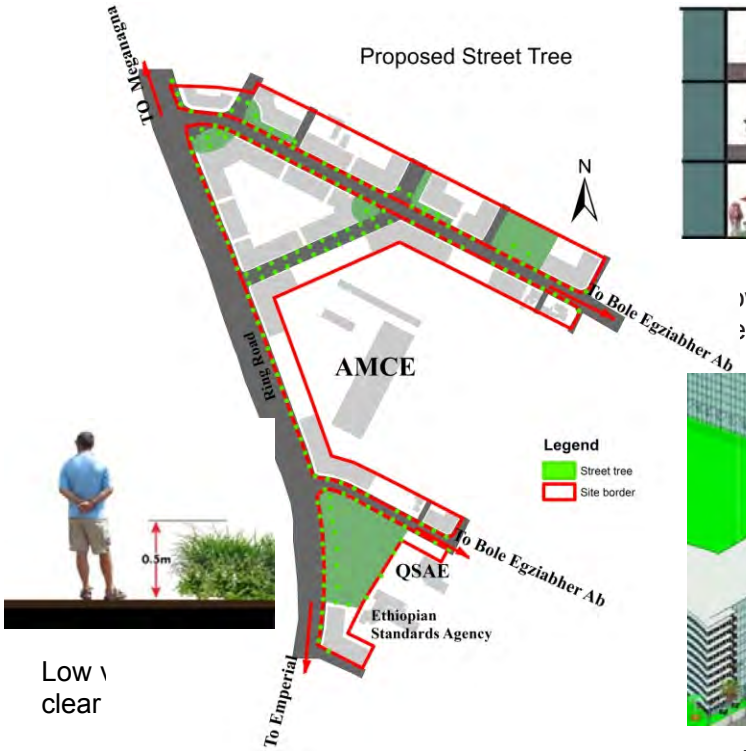
Sorensen et al., (2008) visibility should especially be taken into account when designing spaces where risk to pedestrian is perceived to be high. Transparency creates visual interest, safety and applies to the ground floor as well as upper storey's of a building. Designs and layouts that ensure that there are always eyes on the street can help to deter criminal activity by giving potential offenders the message that any criminal activities are likely to be observed and reported. People feel safe on sidewalk where they can be seen. This design is directed primarily at discouraging criminal activity by ensuring that sidewalk is easily observable.

3.5.5. Street furniture and public art

Well-designed street furniture and public art on streets and public places can contribute to a safe and distinctive urban environment. Poorly designed and sited street furniture and clutter can lead to an increase in crime and fear of crime. Street furniture should not obstruct pedestrian views or movement or be positioned to encourage anti-social behavior.

3.5.6. Proposed Street tree

In terms of surveillance, tree can be critical. Factors such as growth characteristics of plants and their placement in relation to potentially vulnerable areas are extremely important. Shrubs should be of the low growing variety and tree should be high stemmed. Landscaping spaces must not restrict the opportunity for natural surveillance and should be designed to prevent the potential for hiding places.



Map.3.15.Proposed street tree

ow vegetation and high branching
ees ensure clear sightlines

Low
clear

Tree should not shade light

The ill-considered placing of plants can cause and create sidewalk that accommodate antisocial and criminal behaviour. Dense vegetation blocks visibility. The use of certain plants such as the spiny or thorny variety can help to prevent graffiti and unnecessary loitering. A well-maintained grassy area certainly does not block visibility; widely spaced, high-canopy trees have minimal effect on view and flowers and low-growing shrubs seem unlikely to provide cover for criminal activities (Sullivan et al., 2001*).*

3.5.7. Proposed Street Light

Proposals of street light incorporate good, consistent and well-designed lighting. It seek to achieve a high level of uniformity and avoid the use of low-pressure sodium (orange) lamps without casting shadows and causing light pollution. The sub-city five-year Local Development Plan also recognizes the problem and tries to address it by including steps for the installation of street lights in the next five year plan period.

ghting at night time

lighting at day time

High quality light fittings that provide consistent illumination at night time

Lighting can be both functional and attractive

Map.3.16.Propose Street Light

According to the interview made with Electric Power Corporation, Proper exterior lighting should provide a safe sidewalk. Good lighting makes it easier for people to see what is happening around them and it also assist way finding. According to Painter and Farrington (1997) from a security point of view, lighting that is strategically placed can have a substantial impact on reducing the fear of crime and crime. Lighting can help to improve the quality of the built environment and increase pedestrian activity after dark. An increased provision of lighting is unlikely to lead to an increased notice of criminal activity. Crime and the fear of crime can be combated by using a public lighting Strategy that aims to have uniformity of light across a target area. Routes must have effective lighting so the users feel safe and comfortable with using them at night

3.5.8. Close Circuitry Television

The use of CCTV in crime prevention is well documented. The use of CCTV in crime prevention should be used to complement good design which itself encourages natural surveillance of sidewalk.

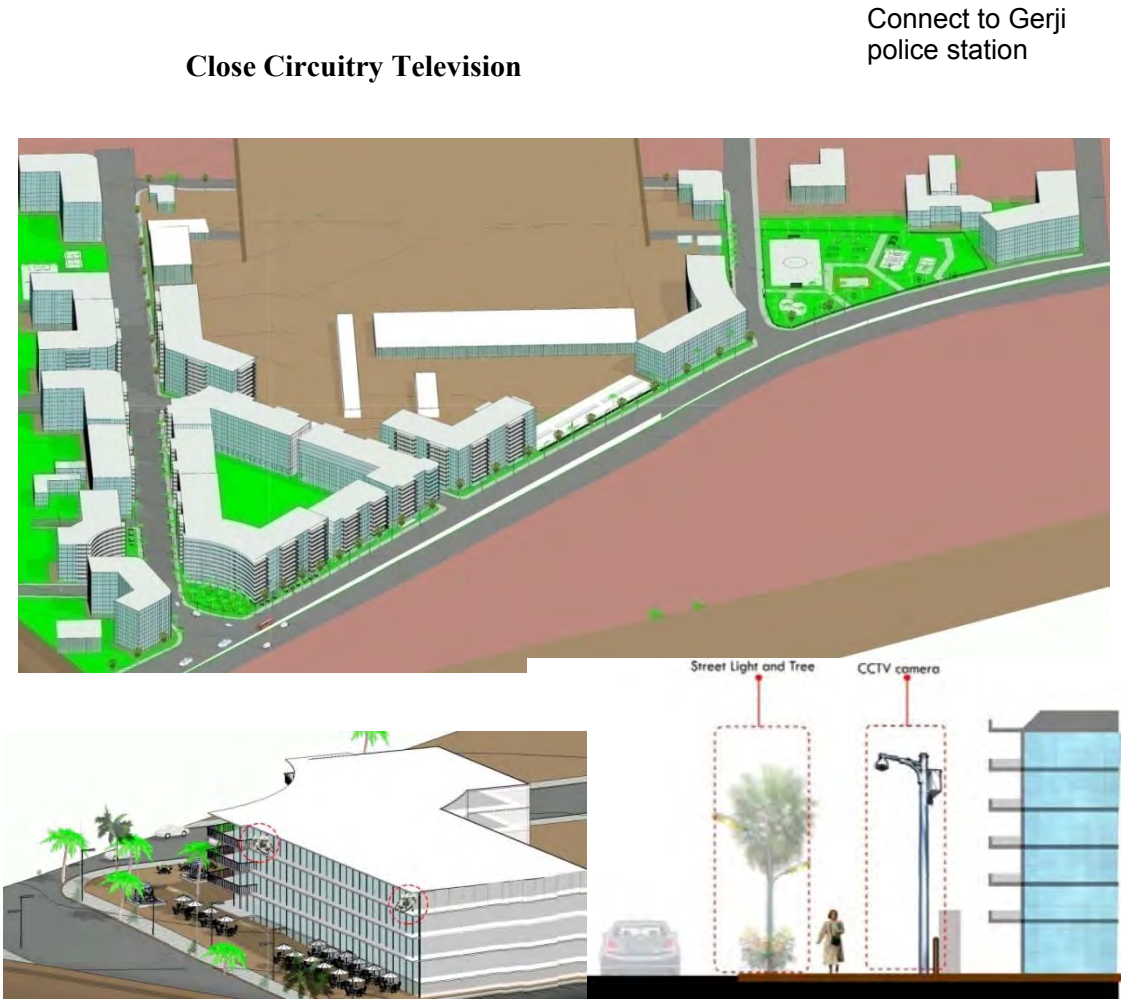
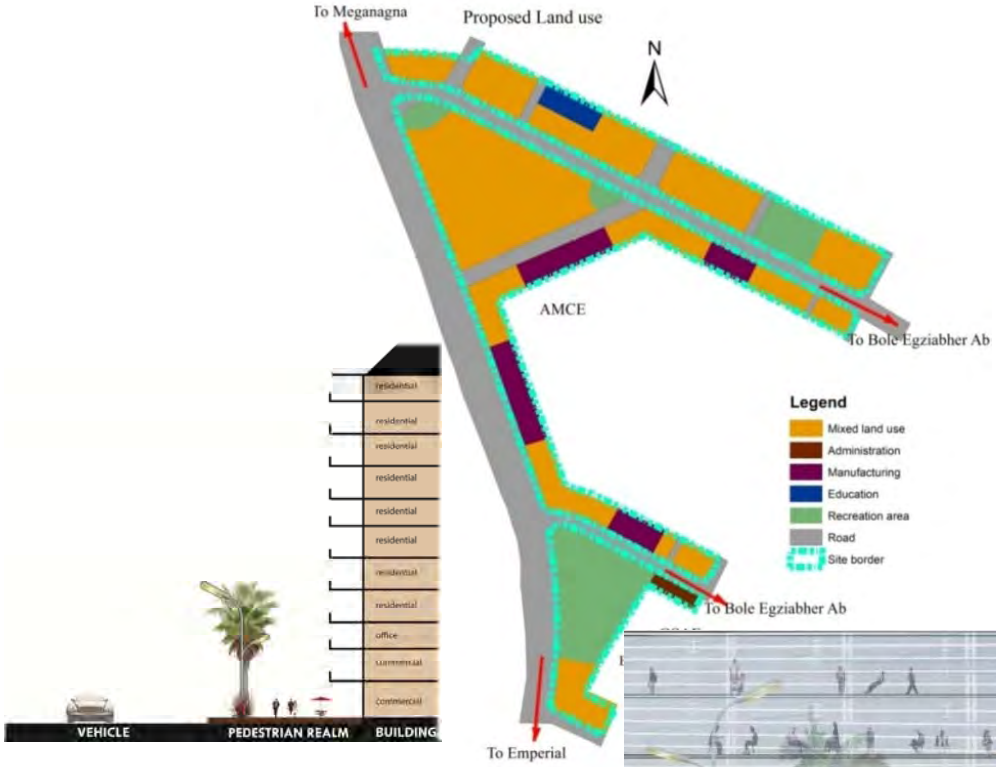


Fig.3.14. proposed CCTV cameras

According to the interview made with Police, CCTV is very important for crime prevention. Government also recognizes the problem and tries to address it by including steps for the installation of CCTV equipment in the next five year plan period. As studied by Tiesdell in 1991 CCTV cameras have been used widely in city centers to enhance security on street in recent years. Security cameras can have an effect on reduction of crime.

3.5.9. Proposed Land use

There is no activity which is incompatible. It is possible to develop the frontages of the dead frontage of AMCE by mixed use. Action area land use is intended to reorganize existing land use through infill, upgrading and renewal projects for purpose of mixed residential development, public open and green, etc. in overall effect to make this part of the safe round the clock. The land use and functions incorporated better enhance and alleviate the all year 24 hour activeness of the area by mixing functions. The ground floor of the base has to be used for retail and other public engaging activities. The remaining stories could also be for retail and mixed uses.



A varied mix of activities will ensure that there are people around throughout the day and evening.

Map.3.17. proposed Land use

Mixed uses can encourage activity, natural surveillance and contact among people

According to the interview made with architect and urban planner, mixed-use that are comprised of residences, retail spaces, work places and recreation facilities serve the community by encouraging people to walk more. As indicated by the study made by Pettersson in 1997, the mix of different uses that bring people into the public space at different times of the day. It relates to the intensity of activity and the density of office, commercial and residential uses that determines how many people there are about. A mix of uses incorporated to offer more choice over longer periods of the day. According to Jacobs, (1961), mixed-use development are safer than commercial or residential zones. Mixing uses will lead to fewer street crimes by increasing pedestrian and generating more supervision of street activities. Mixed-use along street where it found that opportunities for crime are reduced by virtue of the increased range of activities in spatial and temporal terms.

Mixed-use development, especially including residential use, can help in crime reduction by increasing the number of people living in or using an area which will produce a general feeling of safety. Mixed use development encourages activity in a given area at all hours of the day rather than during only business hours or in the evening in residential neighborhoods (Wekerle and Whitzman, 1995).

3.5.10. Propose open space and recreation area

The proposal is providing of access to good quality public green spaces that could be a significant community facility for reducing crime. Design of public space can help contribute towards a secure to ensure that such areas do not become the focus of anti-social behavior and crime. Pedestrian routes through open spaces should be carefully designed to ensure safety and have good overall levels of lighting and clear signage.

It is important to design public open space to be interesting and inviting to legitimate pedestrian. Open space and recreation area are facilities or uses that generate people, create activities and add life to the street or space and thus assist reduce the opportunities for crime. The widespread popularity of outdoor team sports, park and plaza in green space areas offers many opportunities to reduce of crime (National Crime Prevention Council,2003).

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Plaza

Recreational use helps to activate areas in the evening

Park

Map.3.18.proposed recreation area

3.5.11. Proposed ground-level activity

The proposal is incorporate such as theatres, cinemas, restaurants, cafes, libraries, museums, galleries ,shops and other cultural venues to set up to stay open. Design the ground level of non-residential buildings to be transparent and physically and visually oriented toward the sidewalk.

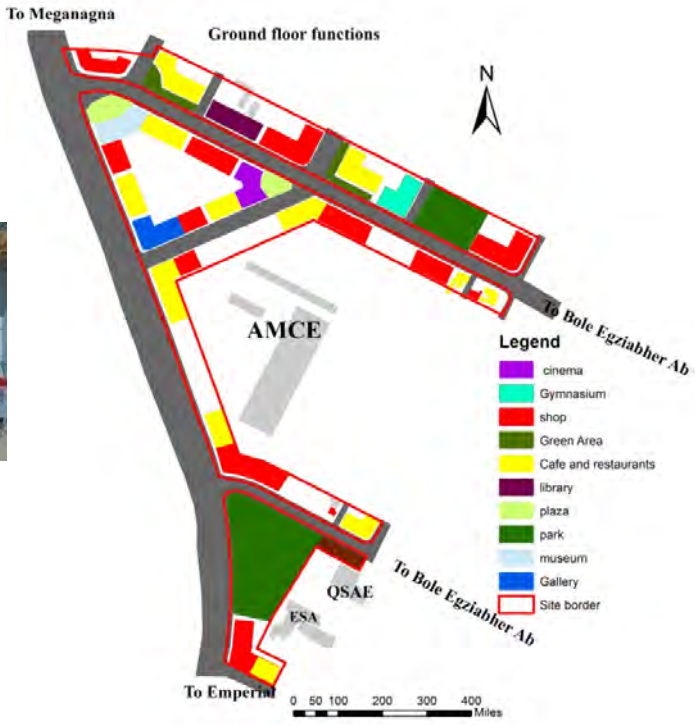
Buildings facing street should have their ground floor highly transparent/glazed. The use richly detailed facades at ground level which offer an interesting visual environment to pedestrians, and minimal challenge to criminal.

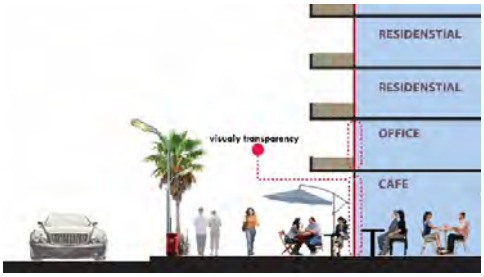
Shop

Restaurant

1.Store

2.Shopping center





cafe with transparence window

Map.3.19. Proposed ground floor functions

Crime can be reduced where there is a high level of ground floor activity at different times of day and night. The level of activity increases that crime will be observed or challenged. The development of an evening economy is a good way of extending activity and diversifying uses throughout the night and day. Pedestrian oriented activities should be encouraged at ground level in high and medium density areas. Fear crime and crime can be alleviate by making more ground level activities such as retail which could increase eyes on the street. The fear of crime can also be reduced in places which are in continuous occupation and where people are passing or looking on (National Crime Prevention Council, 2003).

3.5.12. Proposed Activity Frontage

Good activity frontage of interest, such as places to sit or street art, can encourage people to use routes and spaces, increasing the general level of activity. Buildings should provide active frontages in which windows and doors face onto streets, footpaths and public spaces. Room and window orientations should provide views to and from the street, with at least one habitable room fronting the street. Entrances and shop frontages should be well lit. Provide retail, entertainment and other after-hours uses in public buildings that front onto public spaces, particularly where pedestrian activity outside office hours is reduced.

An active street front with balconies and cl sight lines provide go opportunities for

1

treet

ments enhancing

Active street frontages and activity enhances community safety

Attractive outdoor seating areas help make an area feel safe

1. Attractive outdoor dining areas help make an area feel safe

Outdoor sport provide active frontages of overlooked streets

Map.3.20. Proposed Activity Frontage

Active outdoor areas provide surveillance and a feeling of safety around an area. Mixed use development with an active building frontage, an elevated balcony and a good corner address contribute to a safe environment. Active frontage involve scheduling events for an area to attract appropriate users, such as picnics, concerts, children's play groups, or sports events (Joseph, 2012). An increase in activity places more eyes on the street it can assist in reducing the opportunity for crime, reduce the fear of crime. Commercial have lives, a day life and a night life. Initiatives which bring people into these areas in the evening and weekends can increase the safety of the street. Active frontages can also have a positive impact on safety. Busier streets with some pedestrian movement reduced levels of recorded crime (Hillier and Shu, 2000a). Alford's study (1996) the safest building-street interaction configuration was where the access to the house fronts onto the busy street. Commercial centers that provide night time activity extend the natural surveillance of an area into the evening.

3.5.13. Proposed Way of finding, sign & information

Signage contributes to legibility, that is, the ability of the environment to create a sense of place and give messages of orientation, direction and desired behaviors. Providing adequate, easily legible signage to assist all user groups, particularly young people, older people and people with disabilities to find their way safely and to provide signage which indicates safe places and routes. A neglected space receives little attention and detracts from a sense of place(National Crime Prevention Council, 2003).

Knowing where you are and which way to go contributes to a sense of security. Way finding is the use of signage cues and symbols to assist navigation through areas, to guide correct use of this place and make wrong use clear to others (Ministry of Justice, 2005).

Signage should be simple and legible,

Land mark

AMCE Entrance

Park

Fig.3.15 Way finding, sign & information

3.5.14. The all site plan and 3D of proposed

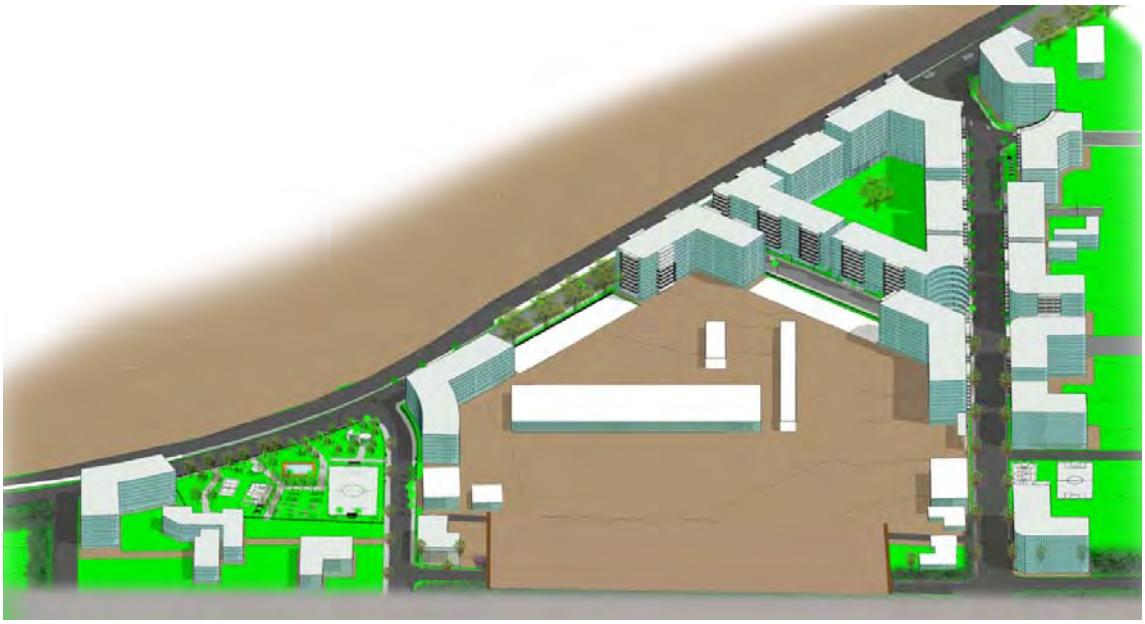


Fig.3.16.3D of proposed

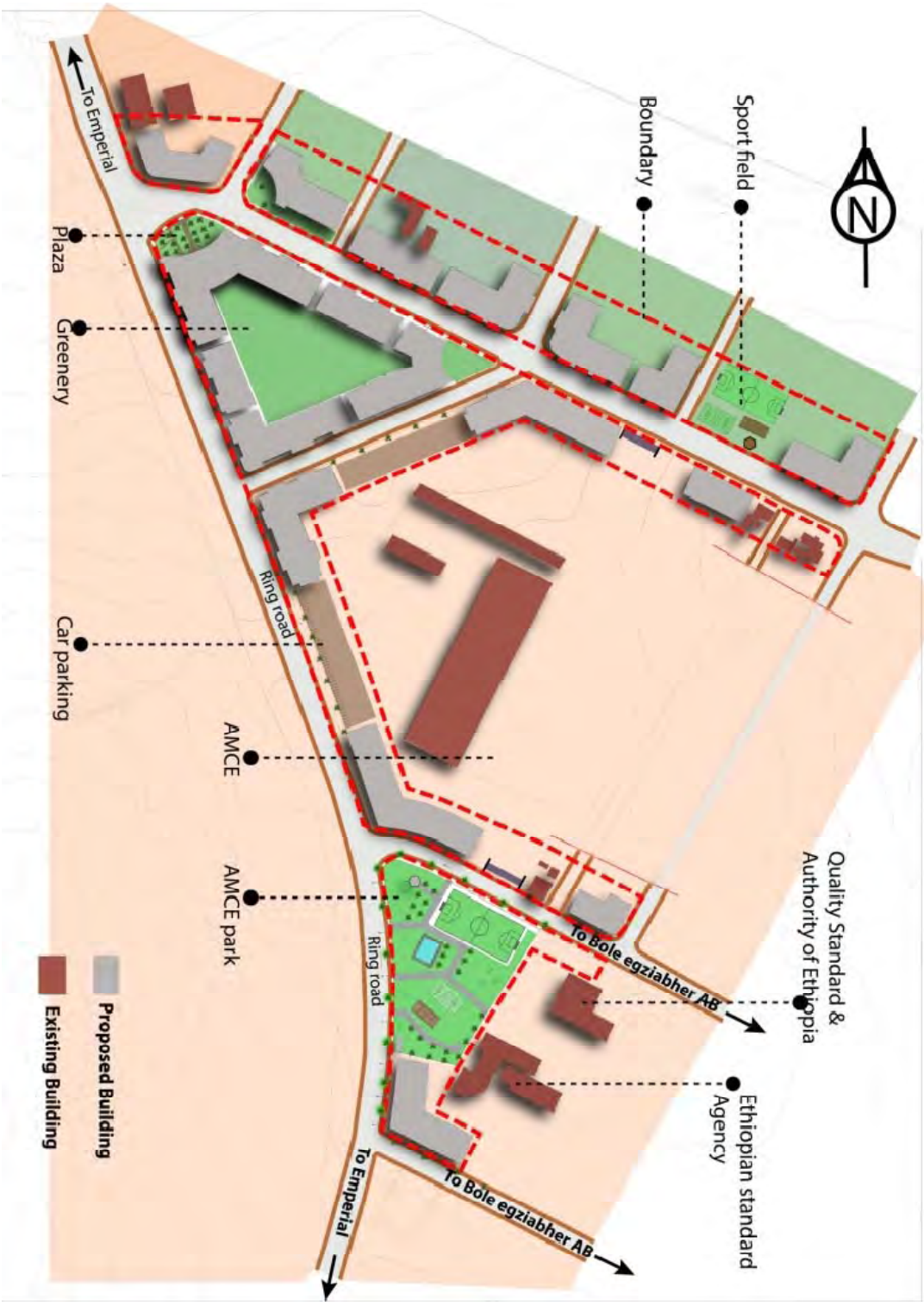


Fig.3.17. site plan

Chapter Four: Conclusion and Recommendations

4.1. Conclusion

The aim of this paper is to create sidewalk safety by focusing on development along sidewalk and sidewalk for protection of crime. According to Lirebo (2014) cities are the places where the effects of crime, fear of crime and changes in crime occurrence appear in the clearest way. Crime is a social issue that affects the lives of millions each year. The resulting crime and fear of crime in itself can restrict people's freedom of movement (National Crime Prevention Council, 2003). Fear of violence and strangers is often generalized to fear of the street. The street is public, owned by everybody and nobody, and so vulnerable to abuse (Conklin, 1975). Street robbery is listed among the violent crime types in most world (Hillier, 2005).

Human behaviour is influenced by the physical environment especially when we consider crime, rather than behaviour in general (Wollan, 1976). Physical features of places can generate feelings of risk and fear. People's fear of street often appears to be situated in particular built environments. Streets are particularly frightening: Anonymous and deserted open spaces such dead frontage (Conklin, 1975).

According to Valentine (1990), Atkins (1989) and Day (2001) fear crime and crime factors in public environments include darkness, desolation, bushes, low prospect, high refuge, high roundedness and low lighting. Such features often limit the ability to see into a place where someone may be hiding. Day (2001) describes environmental conditions that individuals perceive as ‘‘cues to danger’’: lack of familiarity with an environment and the presence of others. According to Loukaitou (2001) certain environmental and design qualities of places such as darkness, lack of ground floor activities, and lack of windows opening up onto a street or public area, etc that make them susceptible to crime.

Specific land uses that are associated with increased or decreased crime. Jacobs, for example, hypothesized that parking lots, truck depots, and gas stations were harmful for city life. Specific commercial uses are more likely to create crime than others (Block and Block, 1995). Studies by Newman (1973) has all indicated an association between design structures and levels of crime; particularly features that allowed unhindered pedestrian movement through residential.

Crowe (1991) “the good design and effective use of the built environment can lead to decrease in the fear of crime and the rate of crime, and to an improvement in the quality of

life". Loukaitou S. (1999) has proposed that a level population density exists; where the density is adequately high to mask a range of less serious crimes. High-rise dwelling forms have lower commitments of crime than low density low-rise dwelling units in the built environment (Lirebo,2014). The concept of' eyes on the street' is the foundation of a number of safety assumptions in planning. Which are associated with increasing permeability mixed uses and higher densities (Cozens, 2011). Vogel and Pettinari (2002) argued that the street level commercial activity and upper level residential activity offer round the clock activity and eyes on the sidewalk. Jacobs (1961) advocated mixed land use streets so that there is a continuous flow of people improving natural surveillance on sidewalk.

Multifamily housing areas are not typically found to be more vulnerable to crime than single-family housing (Rhodes and Conly, 1981). Cozens, P. et al. (2002) detached-houses, semi-detached houses and veranda houses were safe places to walk. Busier streets with some pedestrian movement are reduced levels of recorded crime (Hillier and Shu, 2000a).

Natural surveillance involves of increased visibility of street directed at keeping intruders under observation and undesirable behavior under control (Sorensen et al., 2008). The removal of objects from windows that obscure lines of sight in the building and the removal of bushes in front of homes so that residents may have a clear view of the street(Cozens et al., 2005). A study by Painter and Farrington (1997), there was a substantial reduction in the rate of all categories of crime after the improved street lighting. Some studies also displayed that CCTV can significantly reduce levels of fear of crime within the public (Mahalingham, 1996).

From results of the questionnaire the majority of respondents said that they felt unsafe during night and after dark on sidewalk. The robbery is one of the main concerns affecting the personal safety of community and there is risk frequently. Crimes are a very serious. Site is fearful about becoming a victim of crime. Crime and fear of crime negative impact on their quality of life. Most of respondents said that duo to this problems they changed in the daily life such as economic decline, altered lifestyle and withdrawal from participating. Sense of insecurity is due to vacant space, low prospect, high refuge, high bounded and lack lighting.

Most criminals search for easy places that provide high opportunities for escape to commit their crimes. Numerous causes in the physical environment are perceived to influence crime, including visibility and signs of inattention. From results of site analysis cause of the sidewalk that makes unsafe are include: low rise building height, low street walls and transparency, lack street light, no seating, dense vegetation and shrubs, lack of mixed, lack of parks and plazas, absence of way finding to navigate, lack of public buildings, lack of landmarks and

low activity. Because of the above reasons most of pedestrians has negative view about safety of site.

To design the site many factors must be in place to make the area safe for pedestrian and prevent crime. The presence of more people on sidewalk appears to provide higher risks of detection and apprehension to potential criminals. To create a safe sidewalk the role of physical environment is greater. Designing out crime approaches are highly in line with built environmental. According results of the questionnaire and analysis indicate that built environment along sidewalk and sidewalk is an important factor to consider sidewalk safety. The research proposal include: design of higher rise building height, natural surveillance, light, CCTV, seating, mixed use, way of finding and activity to enhance the safety of pedestrian on sidewalk. The proposal reducing crime by shaping the built environment.

Therefore, the study concludes well designed urban structure such as mixed use high-rise building forms, open space and street furniture along street can achieve to combat incidence of crime through ‘natural surveillance by creating many eyes on the street like cafe, restaurants, CCTV, park, shops, seating and good light in the urban environments such circumstances on the other hand would create 24-hours active pedestrian movement in the area.

4.2. Recommendations

Urban planner, Urban designer, architect and local authority plays a role in shaping physical environment along sidewalk and sidewalk that are safe for people where effective implementation of planning and design will help in preventing crime.

According to the findings of this research and their analysis, some recommendations are put forward in order to provide a safe sidewalk. Planners, architect, urban designers and local authority have to grow awareness and experience of safety to consider the capability of the built environment to reduce crime. Crime must considered in the development process as effective displays of safety.

The researcher recommends that this process can be accomplished through a set of expert and officer which have to work with each other within the whole system. Those expert and officer include the following:

4.2.1. Local governance

Local governance at different levels has the responsibility to distribute resources. Allocating more resources of the general budget to deliver public services and utilities especially, street lighting, seating and CCTV.

4.2.2. For urban designer, Architect and Urban planner

At the planning and design stage, every development has aspects of design that should be considered to reduce opportunities for crime.

4.2.2.1. Design of high-rise building

High rise building forms are assumed to protect crime through ‘natural surveillance’ by creating ‘many eyes on the street 'like multi-family apartments. Properly designed and planned high-rise building can prevent crime and fear of crime. High rise building must design of along sidewalk.

4.2.2.2. Designing buildings to overlook streets

Avoid long blank walls to street frontages when designing of buildings. Locate buildings to minimize setback from the street and maintain the street alignment of adjacent buildings. Ways to design buildings which offer natural surveillance include: Locate windows, entrances, porches, balconies, benches, etc., to overlook the street. Windows and doors should not be obstructed. Designate a main entrance and window point into the facility that is

easily observable from both inside the building and sidewalk. Use transparent materials walls and doors adjacent to sidewalk. Design of good interior to exterior surveillance through illumination.

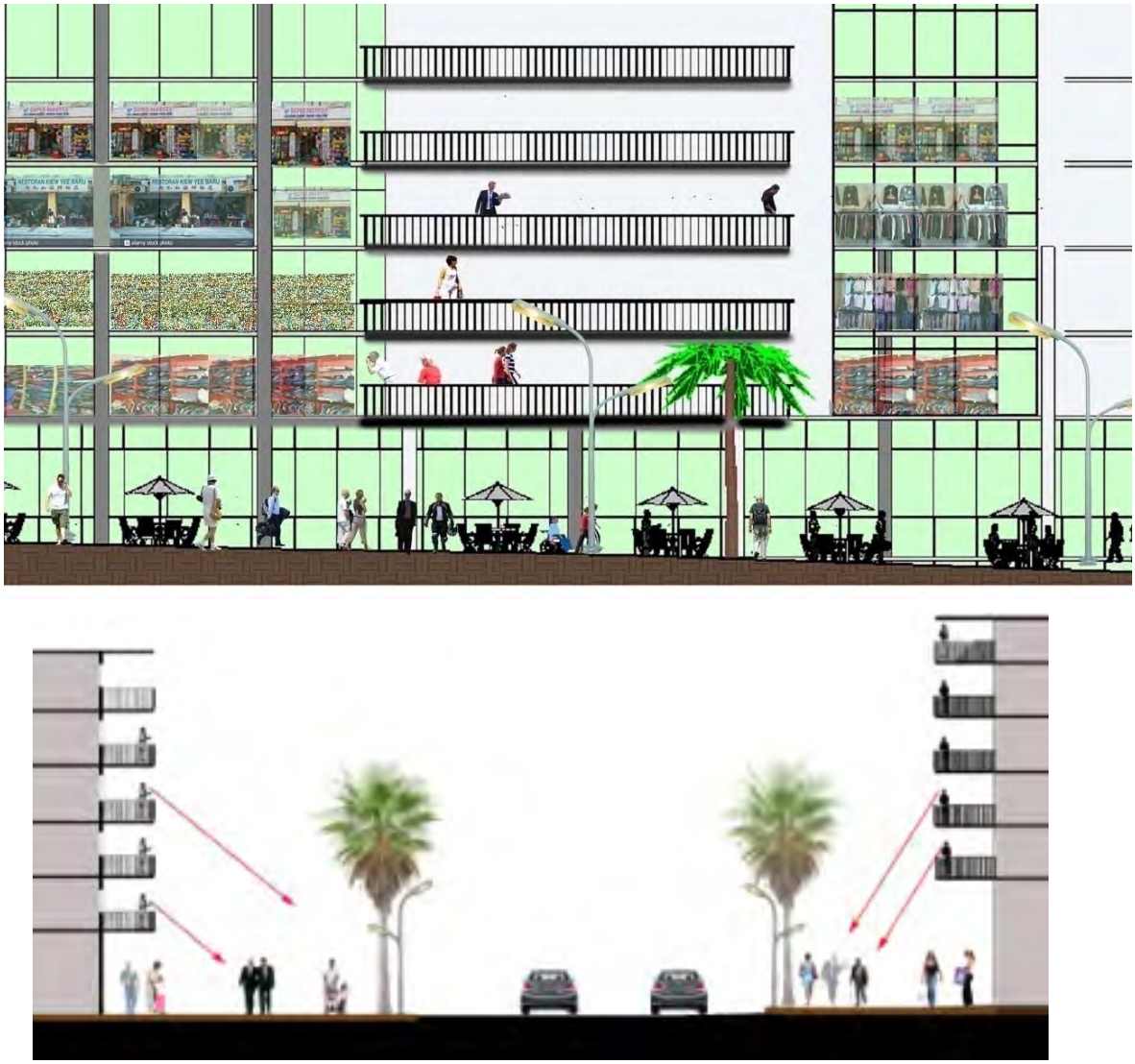


Fig.4.1. Locate windows, entrances, porches, balconies and benches to overlook the street

4.2.2.3. Ensuring that there are clear sightlines along routes

Eliminate entrapment spots, e.g. dense vegetation, waste disposal, concealed entrances, high walls or hedges, or alcoves along pedestrian walkway can obscure views. Avoid landscape materials acting as a barrier to unimpeded views of pathways. Make sure that pedestrians have a strong visibility ahead.

Features that facilitate sightlines are low hedges and low fences. Improve the sightlines in established areas through a modification of routes and times of access. Screen or conceal dumpsters, but avoid creating shade spots and hiding sidewalk. People feel more safe using public places sightlines (day and night) so they can see and be seen.

Fig.4.2. AMCE fence permeable cannot obscure views

A. Public toilets

The design of public toilets can play an important role in ensuring safe and legitimate use of these facilities. The essential principle is to reduce the possibility of entrapment or inappropriate use. To maximize surveillance opportunities in the location of public facilities and to ensure prompt. Locate adjacent to legitimate activity areas, rather than in isolation. Ensure approaches and entrances to all toilets in allocations are highly visible so that people cannot enter or loiter without being seen. Ensure adequate lighting ensure adequate signage.

Fig.4.3.Locating public toilets at the edge of an active public space ensures that the facilities are both highly visible and easily located.

B. Landscape Design

Design of landscape is not to obstruct visibility between the lower floors and the street. Planting does not grow to obscure the view or provide hiding places for offenders. Ensure that landscaping is transparent enough to allow views to and from the street. All plants and trees should be kept away from windows, especially basement windows and entrances to buildings. Keep shrubs and other plant growth to less than 0.5 meter and trees canopy should be up to two meters from the ground. This promotes natural observation and inhibits one from concealing themselves in overgrown and unkempt vegetation.

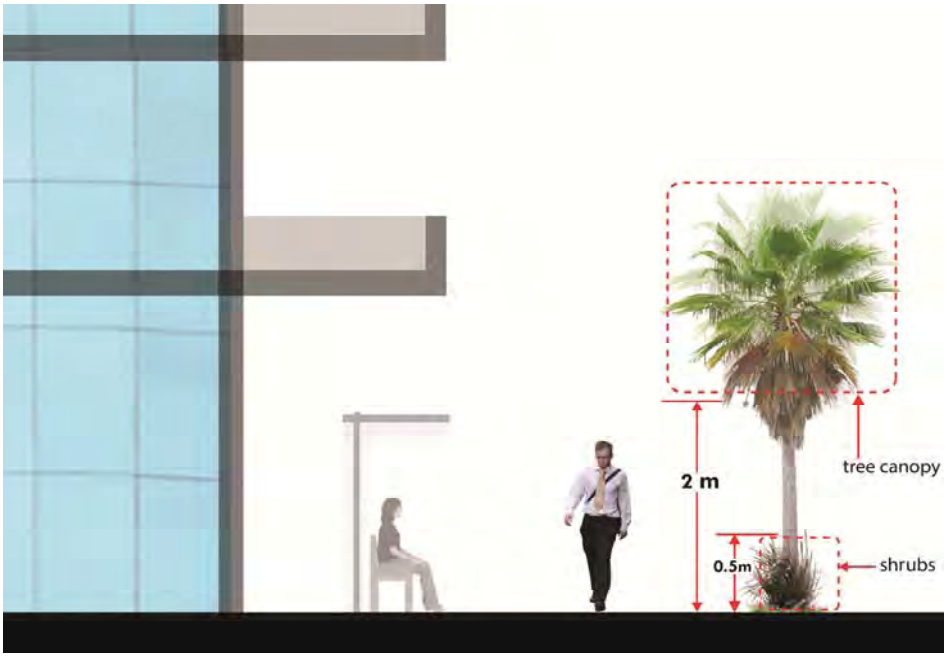


Fig.4.4.Two meters from the ground to the tree canopy should be clear and Bushes should be 0.5 meter or less from the ground

4.2.2.4. Lighting

Crimes like robbery are more likely to happen in dark areas than in well-lit areas. Make sure that lighting is an early consideration in site planning and design. Provide adequate lighting for all pedestrian walkways to be used in hours of darkness. Providing sufficient lighting systems that will enhance the ability to observe street. Lighting should be located at all building entrances, pedestrian walkways and alongside of every building. Ensure that tree or other landscaping does not obscure lighting. Lighting should be located at least 10 meter from trees to reduce shadowing effects. Providing sufficient lighting in the unofficial settlement area of AMCE can help reduce the cases of crimes committed there.

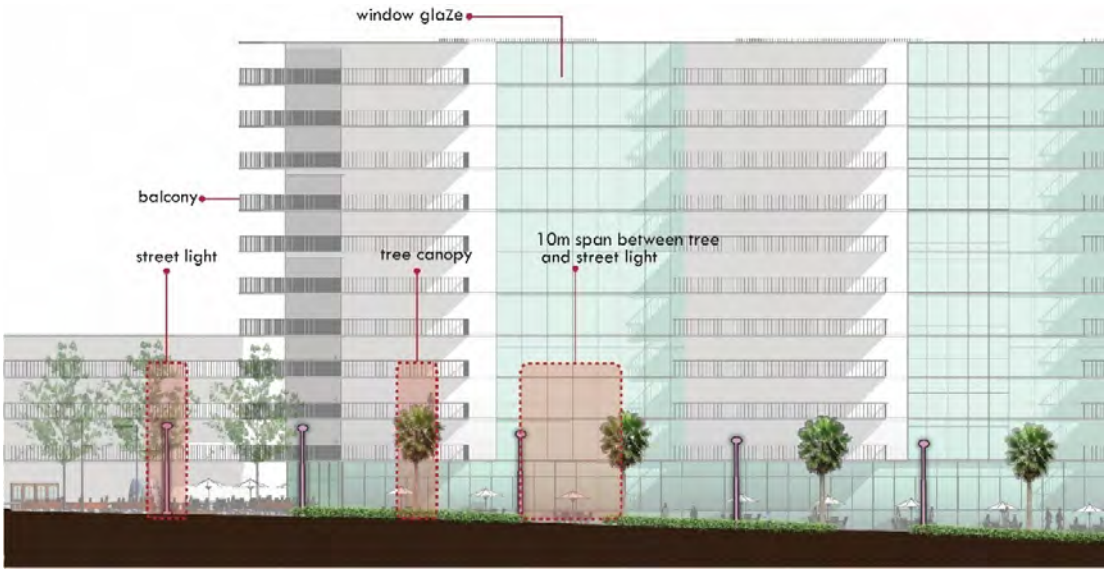


Fig.4.5.Trees and lights should be separated from each other, especially along sidewalk, to avoid causing shadows.

4.2.2.5. Close security television

It is one of the elements which is used to prevent crime along sidewalk. CCTV equipment should be installed on sidewalk which are obvious but that does not compromise the visual amenity of a place. It used to reduce opportunities for criminals to detect camera direction. It should be placed at a height which ensures equipment cannot easily be obstruct. Lighting

and CCTV are considered together so that glare does not compromise the clarity of CCTV footage.

4.2.2.6. Signs and Information

Way finding is the use of symbols, cues and signage to help navigate through areas, to guide appropriate use of this space and make inappropriate use obvious to others. Good designed, strategically placed signs and maps provide feeling of security. Signs should be standardized to give clear, easily understood, concise, visible, well maintained, consistent and readable messages from the street. Where it is challenging to find one's way around; symbols with direction can help.

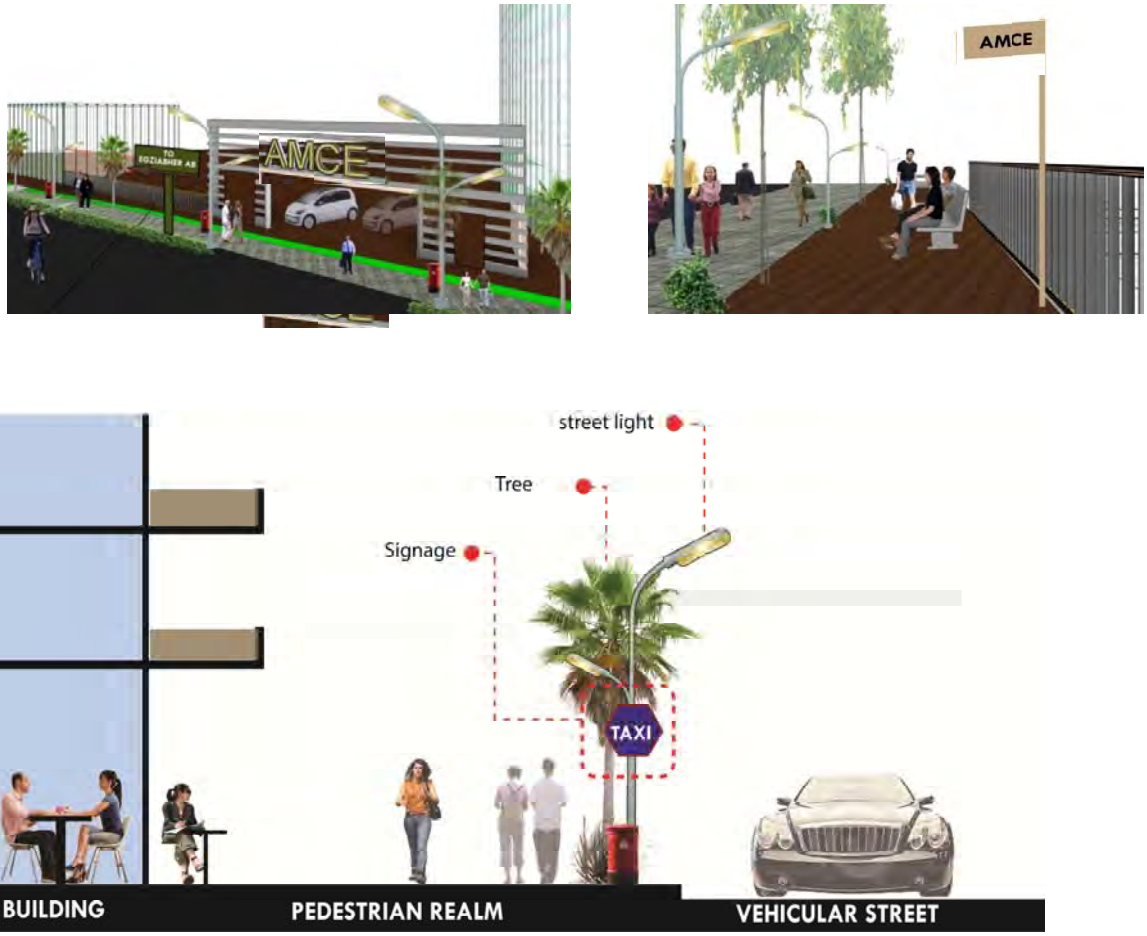


Fig.4.6.Proposed signs and information

4.2.2.7. Censuring that there is plenty of activity

Mixed use solutions can help to increase the presence of people in the streets. Combining a mix of activities and higher densities will increase the presence of people. Balancing the needs of all users of streets is vital so that people feel safe. Encouraging walking increases activity along sidewalk and reduces the risk of crime. Encouraging a mix of uses so that

space is used throughout the day and the evening. Appropriate night-time uses should be located along sidewalk. Encourage home-based business activity along street to provide for greater surveillance for longer periods of time. Locating a variety of night-time uses with a range of closing times, such as cinemas, libraries, mix of offices, residential and restaurants, complement each other when located in the same zone, providing more 'eyes on the street'.

Designing recreation centers so that they are overlooked by street. Locate variety of activities that invite large numbers of people such as basketball courts, playgrounds, sport, plazas, parks and many entertainment areas to fill the leisure time of the residents and pedestrian. Such an act will make great contribution to preventing crimes.

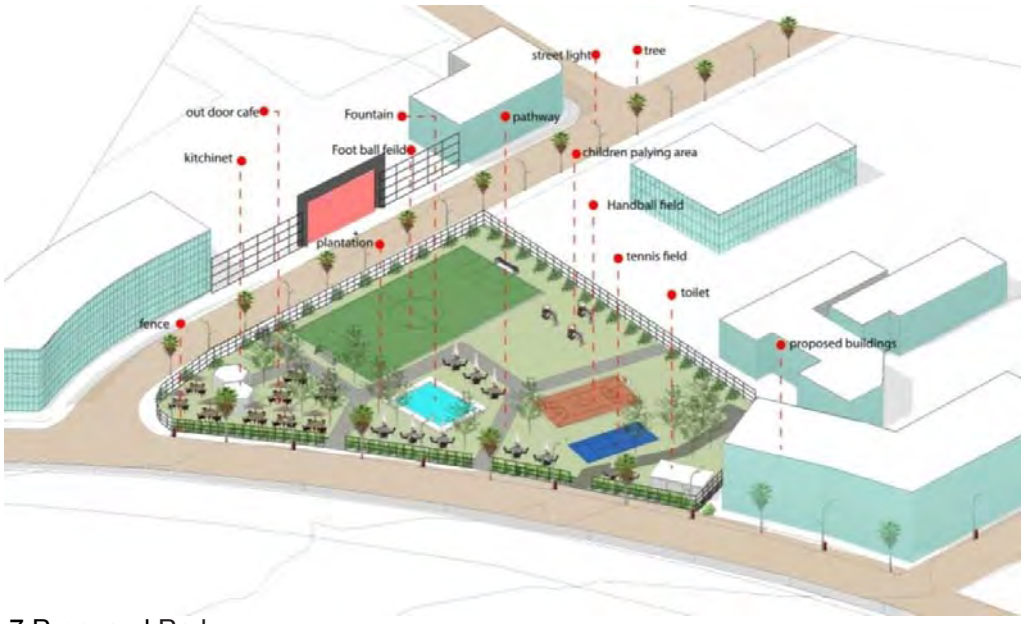


Fig.4.7.Proposed Park

4.2.2.8. To encourage active uses along streets to increase the 'eyes on the street

Encourage block parties, etc. to create more activity around the street. Ensure the ground floors of large or mixed use buildings are 'active' by providing a visual connection to the street and opening directly on to the street. Ensure activities on the ground floor uses with inside/ outside activities. Encourage active uses along main roads to ensure these streets promote a sense of safety for people during most hours of the day and night. Activity generate facilities that invite people, create normal activities and rise unexpected surveillance within a space and sidewalk. The purpose of activity or visitor attractions is to add 'eyes on the street'; to make places more secure by populating them. This decreases opportunities for criminal activities and increases the view of safety. Examples include cafes, public seating areas and community facilities.

Fig.4.8. Proposed Public seating

4.2.3. For residents to make their sidewalk feel safer

Residents can help to make their sidewalk feel safer by watching sidewalk. Locate entrances and exits in areas that are under surveillance or direct supervision. Provide fencing which allows views to and from the street. Use open fences, i.e. vertical wrought iron. They are easy to see through and less susceptible to crime. Use glass wall, mirrored glass, window and door to enable to see sidewalk.

Use open landscaping and see-through fences instead of solid walls of hedges for boundaries or property lines. Ensure that you have a clear view of the street and that passers can see you by: Keeping fences between front windows and the street low or having seen through. Select and install proper landscape that will allow unhindered visibility of vulnerable entrance, windows and door from the sidewalk**.** Ensuring that trees and shrubbery do not obstruct the view of the street from the building. Keep shrubs and other plant growth trimmed to less than 0.5 meter and trees should be trimmed up to two meters from the ground.

4.2.4. Recommendations for further research

This study has opened the door for variety of studies that can creating safety for protection of crime in the Addis Ababa. For the future, more detailed study is recommended. It can be done by using single physical environment such light, building, CCTV and etc. It can also be done by dividing the crime further by types and time which will give a more detailed understanding of the crime and influence physical environment on crime.

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Appendixes

Annex 1. Questionnaire to be Answered by Pedestrian

Dear respondents,

This questionnaire for the partial fulfillment of the requirement of master's degree in urban design and development from Addis Ababa University. It is designed to make a study on creating safe sidewalk for crime prevention (The Case of AMCE area, Addis Ababa). Therefore, your cooperation in providing the data collected through this interview will be used strictly for academic purpose. So, I politely ask you to give me clear and unbiased information on what you are asked below.

1. Sex 1. Male 2. Female
2. Age_____
3. Educational level
   1. Illiterate 2.Only read and write 3.Elementary
   4. High school completed 5.College or university graduate
4. Location of your living place_____
5. How often have you walked on this sidewalk?
   1. Frequently / Daily 2.occasionally 3.rarely
6. What is your major purpose of your trip?
   1. Working 2.shopping 3. Educational 4.recreational 5.other _____
7. How safe or unsafe do you feel in the following situations?

	Very unsafe	A bit unsafe	fairly safe	Very safe
On this sidewalk during the day	1	2	3	4
Going out at night on this sidewalk	1	2	3	4
Walking on this sidewalk after dark	1	2	3	4

8. If fairly safe or unsafe what are the threats?
   1. Snatch and run thefts 2.assault 3. Robbery 3.other_____
9. How often would you say purse snatching, robbery, or other street crimes occur ?
   1. Frequently / Daily 2.occasionally 3.rarely
10. How serious you feel the level of crime is on this sidewalk.
   1. Very Serious 2. Somewhat Serious 3.Serious
   4. Not Too Serious 5.Not At All Serious
11. How fearful are you about gangs on this sidewalk?
   1. Very fearful 2 somewhat fearful
   3. Not very fearful 4.Not at all fearful

12. How much is your own quality of life affected by crime?

1. No effect 2.A little effect 3.Not very effect 4. Total effect

13. How much is your own quality of life affected by the fear of crime?

1. no effect 2.A little effect 3.Not very effect 4. Total effect

14. Has this problem inconvenienced or caused a change in the daily life/routine of you or your family?

1. Yes 2. No

If yes how? _____

15. Compared to five years ago would you say the level of crime on this sidewalk has

1. Increased a lot 2. Increase a little 3.Stayed About the Same 4.Decreased a little 5. Decrease a lot

16. In the next 5 years, what is the likelihood that you will become a victim of crime on this sidewalk?

1. Very likely 2. Somewhat likely 3. Somewhat unlikely 4. Very unlikely 5.Do'nt know

17. Selecting the main reason, or reasons, for not feeling a sense of safety on the sidewalk looks and feels? Physical features?

1. Low prospect 2. High refuge 3. High bounded 4.deserted open space /Vacant 5. Absence street lighting 6.Other _____

18. What do you think must be done to prevent crime on sidewalk? (try to make sure physical environment type suggestions are included)

1. by providing the natural surveillance and eyes on the street
2. by design of public facilities and other outdoor spaces along street
3. By developing High density-high rise
4. Good street light
5. Closed circuitry television
5. Other _____

Annex 2. Interview for Bole Sub-city Administration Office of Urban Planning Department

Interview Questionnaire

This questionnaire is a research instrument of the study on "Creating safe sidewalk for crime prevention: (The Case of AMCE area, Addis Ababa). This survey is strictly confidential and your answers will only appear as totals combined with those of other respondents for academic purposes only.

Purpose of the interview

- To understand the current safety problems
- To identify the main causes of sidewalk safety problems
- To enhance safety to reduce sidewalk crime

1. Can you tell me about the sidewalk safety problems encountered AMCE area?

   _____

   _____

2. What do you think about the main causes of sidewalk safety problems?

   _____

   _____

3. Are you considering the safety when you papered the LDP?

   A. yes B. No

4. If yes , Is there any LDP proposal to protect the crime on sidewalk? How?

   _____

   _____

5. Are there any guideline/principles of the sub city to protect crime on sidewalk? if yes what kind of guideline/principles?

   _____

   _____

6. What do you think is the best approach to solve this problem through planning and design?

   _____

   _____

7. What future plan does the office has to protect crime on sidewalk?

   _____

   _____

Annex 3. Interview for Bole Sub-city Woreda 06 Administration, Police District and Gerji Police Station

Interview Questionnaire

This questionnaire is a research instrument of the study on "Creating safe sidewalk for crime prevention: (The Case of AMCE area, Addis Ababa). This survey is strictly confidential and your answers will only appear as totals combined with those of other respondents for academic purposes only.

Purpose of the interview

- To understand the current safety problems
- To identify the main causes of sidewalk safety problems
- To enhance safety to reduce sidewalk crime

1. What do you think about the sidewalk safety problems encountered AMCE area?

_____

_____

2. What do you think about the causes of the crime ? Physical features

_____

_____

3. What should be done to solve this problem through physical environment ?

_____

_____

4. How does the policy enforcement to protect crime through planning and design?

_____

_____

5. What are guidelines of physical environment to protect crime on sidewalk?

_____

_____

Annex 4. Interview for Electric Power Corporation

Interview Questionnaire

This questionnaire is a research instrument of the study on “Creating safe sidewalk for crime prevention: (The Case of AMCE area, Addis Ababa). This survey is strictly confidential and your answers will only appear as totals combined with those of other respondents for academic purposes only.

Purpose of the interview

- To understand the current safety problems
- To identify the main causes of sidewalk safety problems
- To enhance safety to reduce sidewalk crime

1.What are problems of light that lead to occur crime around AMCE area?

_____

_____

2.How improved lighting to reduce crime in darkness?

_____

_____

3.What are standard of light to protect crime on sidewalk?

_____

_____