Abstract

The strategy to control and minimize the possibility of potential crimes in advance physically in terms of urban planning and architectural design according to social changes is "Crime Prevention Through Environmental Design (CPTED)."

CPTED began to be applied in the United States in the 1970s and is widely considered in Japan in terms of residential environment planning. And recently, as interest in safe cities or crime prevention cities has increased in Korea, CPTED is being integrated in earnest. However, although the physical environment or components of urban and residential areas in Korea are seemingly similar to those of the West, differences exist in the components. Therefore, it is difficult to incorporate CPTED, which has been studied and developed abroad, into Korean cities. In order to find a more efficient way to create a safe residential environment in reality, we need to understand the characteristics of Korean cities and proceed with the study based on them.

The CPTED strategy is more effective if applied when initially planning the residential complex than in improving the existing co-residential complex. But this is limited to redevelopment areas such as newly developed towns and cities. In the case of existing co-residential complexes, which may be vulnerable to crime, improvements such as installing additional CCTVs or introducing unmanned crime prevention systems in the complex can have considerable effects. In addition, visibility of the space should be high in order to enable natural surveillance, and above all, it should be bright by light and lighting fixture and should not be obscured from facilities and landscaping. And we should find ways to limit crime by using security measures and lighting to dampen the criminals’ psychology before they commit a crime. This cannot be done with the environmental design alone, so physical means such as professional personnel, unmanned security systems, etc. should be combined.

However, simple changes in the physical environment have limitations in reducing crime or the fear of crime. The effect of crime prevention is maximized only when the organic solidarity of the community and the community consciousness of the local residents are preceded. An approach that activates the interaction of local communities through the expansion of active participation of residents in local autonomous administration and the vitalization of youth and women’s activities should be pursued simultaneously with CPTED. In this regard, it is important to cooperate with local residents, police, local governments, local councils, and civic groups.

[Keywords] CPTED, Cooperative Security, CCTV, Urban Planning, Architectural Design

1. Introduction

Today, the Korean society is rapidly developing through high economic growth, and the social structure is also changing in complex, various ways. This change in social structure is increasing crimes in the society both qualitatively and quantitatively, and many social problems are occurring as a result of the side effects. Moreover, new characteristics are also emerging in the crime scene, and new types of crimes are rapidly increasing[1].
Following this social change, the strategy to control and minimize the possibility of potential crimes in advance physically in terms of urban planning and architectural design is "Crime Prevention Through Environmental Design (CPTED)." This, for example, includes setting up a security office in a place where the traffic of people can easily be checked, installing high-performance CCTVs and emergency bells in underground parking lots, replacing streetlight with bright LED lights, and removing trees or obstacles to ensure maximum visibility around parks and playgrounds.

CPTED began to be applied in the United States in the 1970s and is widely considered in Japan in terms of residential environment planning. And recently, as interest in safe cities or crime prevention cities has increased in Korea, CPTED is being integrated in earnest. However, although the physical environment or components of urban and residential areas in Korea are seemingly similar to those of the West, differences exist in the components. Therefore, it is difficult to incorporate CPTED, which has been studied and developed abroad, into Korean cities. In order to find a more efficient way to create a safe residential environment in reality, we need to understand the characteristics of Korean cities and proceed with the study based on them. To this end, the research used a descriptive approach to research using secondary data such as various books, related research papers, and Internet data.

2. Basic Discussion: Environmental Planning and CPTED

2.1. Environmental planning and crime prevention

The types, motives, damages, and methods of crimes occurring around us are very complex and diverse. Therefore, it is virtually impossible to prevent all crimes just by improving the urban environment. Crimes affected by the urban structure or environment are usually opportunistic crimes committed on impulse. Therefore, opportunistic crimes can be prevented to some extent through the improvement of the urban environment.

In general, a typical feature of opportunistic crime is that they are accidental. The creation of an environment in which crime can occur increases the likelihood of accidental crime. Due to the nature of these opportunistic crimes, environmental conditions have become more important than the social conditions around them, and various movements to create an urban environment for crime prevention have been initiated[2].

Creating a safe urban environment is an effort to prevent crime by eliminating the causes of crime in the urban planning stage. In other words, it is a way to minimize opportunistic crime by reducing the environment or situation in which crimes can occur. The focus is mainly on strengthening potential targets or securing visibility to ensure natural surveillance. From the planning stage, crime preventive environmental factors are considered, so the best environmental improvements can be achieved at the minimum cost.

In general, safe and good city in terms of crime prevention means a city where one can walk alone at night, where one can raise children with peace of mind, and where the elderly can live relaxed.

2.2. The elements of CPTED

In the past, traditional criminology defined crime as "illegal acts by criminals" and focused on the causes of crime. However, there is a difference in so-called modern environmental criminology, which includes CPTED, in that it defines crime as a 'dynamic event held at a specific place simultaneously by the criminal and victim' and focuses on the environmental factors in which crime occurs[3].

CPTED is a crime prevention strategy that aims to reduce the chances of crime occurring in cities through appropriate environmental design or urban planning and ultimately improve the
quality of life by reducing residents' fear of crime[4]. Although there is no academic consensus on the factors that make up this, its components are generally thought to be natural surveillance, natural access control, territoriality, increased usability, and maintenance. It intends, based on these five principles, to design urban spaces to fundamentally reduce the likelihood of the occurrence of crime.

The CPTED strategy has proven its effectiveness in major developed countries such as the United Kingdom and the United States, and Korea has recently begun to apply the CPTED strategy to the planning stage of residential complexes. In 2011, the Seoul Metropolitan Government publicly announced the 'CPTED Guidelines for Redevelopment Promotion(New Town) Project'[5]. In these guidelines, natural surveillance, access control, territoriality, and location image were included as the four basic principles of CPTED.

The basic principles of CPTED are as follows. First, the principle of natural surveillance is to strengthen natural surveillance activities by placing buildings, facilities, and plants so that people can have maximum visibility at any location and creating an environment where residents can mingle together.

Second, access control is a principle to reduce and prevent the occurrence of crimes by making it difficult for potential criminals to access the space that should be protected. Restricting access is the most common way for access control. In addition to restricting access, giving certain area territoriality is another common way to control access.

Third, territoriality refers to the classification of certain areas into public and private areas through walkways, fences, landscaping, etc. This territoriality grants residents a sense of belonging, thereby raising awareness in crime, while at the same time making it difficult for potential criminals to gain access to a particular space. The territoriality principle is also highly relevant to the principle of location image.

Fourth, the principle of location image is to increase the territoriality of the space by creating an impression that the surrounding facilities or landscaping are kept clean and well managed, thereby minimizing the occurrence of crime[6].

Table 1. CPTED guidelines for redevelopment promotion(new town) project by Seoul metropolitan government[7].

<table>
<thead>
<tr>
<th>Basic principles</th>
<th>Implementation strategies</th>
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<tbody>
<tr>
<td>1</td>
<td>Securing a clear line of sight using suitable lighting</td>
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<td>Improving isolated area</td>
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<td>Eliminating blind spots</td>
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<td>Promoting combined use of land</td>
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<td>3</td>
<td>Increasing activity factors</td>
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<td>Enhancing territoriality</td>
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<td>4</td>
<td>Providing information with accurate indicators</td>
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3. The Limitations of CPTED

So, is CPTED a panacea for all types of crime? It is not. CPTED has the following limitations.

3.1. Limitations of planning effect

CPTED is a strategy to prevent and reduce crimes that are likely to occur in cities through environmental design plans and is not a direct solution to the problem of crime. As a way to find a fundamental solution, it seeks to reduce crime by finding environmental factors that may lead to crime.

3.2. Different effectiveness according to the timing of plans

CPTED is more effective and less costly when applied in the planning stage than improving and supplementing existing complexes. Residential complexes completed in the 1980s and 1990s have recently installed additional CCTVs and establish crime prevention services in connection with private security services to enhance safety in the area. These improvements can also increase the safety of the complex in terms of crime prevention, but applying CPTED strategies from the stage of planning the complex has greater cost-effectiveness.

3.3. Regional differences

The generally recommended CPTED design guidelines ignore situational characteristics. Therefore, the application of CPTED to a specific region requires that CPTED standards be established and reflected in a flexible manner in accordance with the local circumstances in which they wish to be applied. In other words, it is important to design crime prevention to suit local characteristics. Daejeon City and Sejong City are different, and Gongju City and Nonsan City are different too. Each should analyze the industrial structure, population distribution, and geographical characteristics of the region and then implement a suitable CPTED strategy for the region.

3.4. Conflicts among planning elements

CPTED should not be a sole consideration for crime prevention when planning residential complexes. There will be a duality between the recommended methods for CPTED and for sustainable development.

CPTED promotes designs to gain visibility in any direction for natural surveillance, but this can cause problems such as invasion of privacy. Also, it is basic to ensure that the traffic inside the complex is minimized in the normal design plan for a residential complex, while the reduction in traffic due to the minimization of transit traffic does not ensure natural surveillance[8].

4. Cases of CPTED Application: Domestic and Overseas

4.1. Overseas cases

Major advanced countries such as the United States have been paying attention to CPTED ahead of Korea and have applied CPTED policies to urban planning. In the United States, design
guidelines were continuously developed from the 1960s to ensure that matters related to crime prevention were reflected from the design stage when building local residential complexes or constructing roads[9].

The U.S. city of Gainesville, Florida, has banned postings covering windows at convenience stores. The checkout counter shall also be installed in a location that is easily visible from the outside, and CCTVs and bright lights shall be installed in parking lots. These efforts reduced property crime of 6,441 cases per 100,000 people by 39% to 3,974 cases per 100,000 people in 2005[10].

The United Kingdom has established the Secure By Design(SBD) under the initiative of the central government, granting certification to areas that meet standardized experimental standards and requirements meet standards related to building materials, buildings, or crime prevention that have passed police screening since 1992[11]. Also, in the late 1980s, London's three areas of Edmonton, Tower Hamlets, and Hammersmith raised the lighting of streetlight from an average of five lux to ten lux, reducing the fear of disorder and crime in all three areas, and increasing the rate of pedestrian road use by more than 50 percent[10].

In the Netherlands, the Police Label Secure Housing system was introduced in 1994 and has been expanded nationwide since 1996 to give certification to building materials or structures that meet standards. As a result of implementing these policies, housing complexes with SBD have had a lower incidence of theft, vehicle-related crime, and damage compared to non-SBD housing complexes, and annual home invasion theft decreased from 120,000 cases in 1997 to 86,000 cases in 2000.

4.2. Domestic cases

Starting with the 'Guidelines for Crime Prevention Design' devised by the Ministry of Construction and Transportation in 1992, Korea began to conduct a policy level CPTED research. In 2005, when the National Police Agency announced its plans for crime prevention and public policy development, the environmental design for crime prevention began to be reflected in the policy. The actual cases applied to residential complexes were expanded to the development of Pangyo New Town development project after Bucheon City applied the crime prevention environment design on a trial basis and are currently applied to the New Town projects in Seoul. As interest in CPTED has increased in Korea, and the number of cases applied to actual residential complex plans has increased, researches on the institutionalization and standardization of CPTED are actively carried out in related academia and research institutes. To standardize CPTED, the Seoul Metropolitan Government enacted 'CPTED Guidelines for Redevelopment Promotion(New Town) Project' and published these CPTED design guidelines in 2009. The CPTED design guidelines established by the Seoul Metropolitan Government range from road planning to landscape facilities and tinting of building windows. However, as the application of CPTED was not as active as expected, the Seoul Metropolitan Government released the CPTED design guidelines in 2011 to make it easier for related companies to use them.

In 2010, the Korea CPTED Association was established and has actively conducted research in connection with the study of architecture, environment, and crime, and a 'crime prevention design certification system' is implemented to examine and give certificates to construction companies when they create residential complexes. The number of complexes that have been
certified as CPTED designs has been expanding to include Gangseo Hillstate in Seoul and Centreville in Gyeyang, Incheon.

As such, Korea is also doing a lot of research and making efforts to create safe cities through CPTED strategic design.

5. Improving CPTED for Safe Cities

5.1. Improving existing residential complexes

The CPTED strategy is more effective if applied when initially planning the residential complex than in improving the existing co-residential complex. But this is limited to redevelopment areas such as newly developed towns and cities. In the case of existing co-residential complexes, which may be vulnerable to crime, improvements such as installing additional CCTVs or introducing unmanned crime prevention systems in the complex can have considerable effects.

If CCTVs and emergency bells are installed to prevent the victimization, control the access of outsiders with unmanned crime prevention systems or vehicle barriers, and manage them with affection, existing complexes that were vulnerable to crime can be reborn as safer ones.

5.2. Elements that need improvement

In order to prevent crime and reduce user anxiety, the following guidelines are presented around CPTED theory, eliminating the factors causing crime.

5.2.1. Natural surveillance

In order for natural surveillance to be possible, visibility of the area must be high, and above all, it must be bright by light and lighting and must not be obscured by facilities and landscaping. Therefore, one can suggest a solution by finding ways to prevent potential criminals from committing crime easily and eliminate places to hide.

5.2.2. Natural access control

Recently built residential apartment complexes have relatively tight access control against unauthorized people, making it difficult to access potential criminal targets. However, if the area is relatively old and commercial areas are nearby, it is difficult to control and block people due to the large floating population. In this case, there is no restriction on access, so it is difficult to figure out the route of escape after committing a crime. Therefore, it is necessary to find ways to prevent crime by using security measures and lighting to dampen the criminal's psychology before committing a crime. This cannot be done with the environmental design alone, so physical means such as professional personnel, unmanned security systems, etc. should be combined.

5.2.3. Territoriality

A clear distinction between the territoriality of public land and private land can increase the sense of ownership of the space, and, furthermore, can make potential criminals reluctant to trespass. Therefore, complementary areas should be identified between residents in the area and visitors with specific purposes by creating actual or supposed boundaries.
5.2.4. Location image

The location image refers to the impression of an area and the surrounding environment that is consistently highlighted by people. Wilson and Kelling published the 'broken window theory' in 1982, which said that leaving a broken window alone will start to spread crime around the spot. Likewise, the location image is related to the idea that neglecting minor disorder increases the likelihood of leading to a major social problem and the perception that disorder and illegality are easily permitted in that area.

In the case of residential areas in modern society, there are many housing complexes that have not yet been properly managed, although the custodian, or the residents themselves, should consider them their own territory and maintain them well. Therefore, it is necessary to have a custodian who can manage and supervise the residential area, and the appropriate direction should be established accordingly.

However, simple changes in the physical environment have limitations in reducing crime or the fear of crime. The effect of crime prevention is maximized only when the organic solidarity of the community and the community consciousness of the local residents are preceded. An approach that activates the interaction of local communities through the expansion of active participation of residents in local autonomous administration and the vitalization of youth and women's activities should be pursued simultaneously with CPTED. In this regard, it is important to establish a cooperative security system involving local residents, police, local governments, local councils, and civic groups.

6. References

6.1. Journal articles


6.2. Books


6.3. Additional references

7. Contribution

7.1. Authors contribution

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