Discussion on Defense Safety Design Strategies of Composite Public Space in Changchun

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ABSTRACT. There are many types of public space in urban from the view of defense safety design. Urban composite public space (abbreviation as CPS) is an important spatial pattern having the attributes of combination of many kinds of mankind activities, such as commerce, amusement and so on. Its main characteristic is that all function spaces are related and interweaved together, and it has multi-level, multi-meaning and multi-function properties as well. CPS is kind of high crime risk area because of the treasure gathering, complex functionality, and high mobility population. The paper classified the CPS of Changchun as linear, grid and hybrid pattern and put forwards strategies and solutions for defense safety problems of CPS, which is based on existing unsafe factors by investigating Chongqing Road, Guilin Road and railway station.

1. Introduction
People have different demands in different types of urban space. According to Maslow’s hierarchy of needs, when people’s physical needs being satisfied, the safety needs would like to dominate individual’s behavior. The gathering and interweaving of multifunctional spaces form the urban composite public space (abbreviate as CPS). Compared with single function public space, the CPS have multi-level, multi-meaning and multifunction, and all the units are related, interweaved, jammed and stacked together. They serve as spaces where two or more functions are integrated with each other such as business, office, entertainment, traffic and dwelling. Changchun, located in North China, has shown some common characteristics of Chinese northern cities in urban space structure and building layout. The CPS may be vulnerable to become one high risk area of crime because of complicated crowd, gathering treasure and lacking administration, which is an important area in defense safety design. The CPS of Changchun has characters of linear, grid and hybrid pattern. Taking different defense safety strategies for the outside environment of different kinds of CPS can reduce or prevent crime and improve the quality of urban public space.

2. The defense safety problems and design strategies of linear pattern of CPS
The main commercial pattern of linear CPS is organized by line shape roads. Linear CPS has leading and flowing property, and people in these spaces are unwilling to hang around compared to square or park. The Chongqing business street is a representative of linear CPS.

2.1 Defense and safety problems of Chongqing Road of Changchun City
2.1.1 Dilapidated building’s outside environment. Space environment is the carrier of crime and it has some effect on crime committing. Chongqing Road is a business street that has relatively long history in Changchun city and the surrounding buildings are comparatively old. Poor environment would give criminals so many hints that the place may be lack of administration and less risk of crime committing.

2.1.2 Building’s outside environment lacks the sense of enclosure. Many stores and restaurants are distributed along two sides of Chongqing Road, and its high mobility affects people’s communication. Under this tension and urgent situation, people couldn’t have strong feeling of territoriality in the space. The enclosure of space is formed by buildings and low-layer shops along the road, which makes people have the sense of enclosure and belonging.

2.2 Defense and safety design strategies of Chongqing Road of Changchun

2.2.1 Improve quality of building’s outside environment around buildings. In order to improve quality of building’s outside environment, we can adopt strategies as follows.

![Figure 1. The way to improve quality of building’s outer environment.](image)

(1) Improving ground decoration and increasing greening can improve the quality of building’s outside environment, warning criminals, increasing crime committing difficulty so as to reducing crime rate (see Figure 1).

(2) Adding more iconic element in the shops along road can make people recognize the space area more clearly and therefore, can prevent the invasion of potential criminals.

(3) In the places where large concave-convex existed, we can achieve space transition by greening in order to cut down the spatial blind zone so as to prevent criminals hiding in these spaces.

![Figure 2. The way to strengthen sense of closure of building’s outside environment on Chongqing Road.](image)
2.2.2 Strengthen sense of enclosure. In order to strengthen sense of enclosure of outside environment, we can adopt strategies as follows.

(1) Trees should be planted and flower bed should be set up (see Figure 2) which can not only achieve artistic effect but also achieve sunshade effect. Besides, setting chairs along the street can achieve natural surveillance effect.

(2) Space node or element should be adding for every segment of road which can make people realize the change of environment, increase people’s precaution so as to reduce the crime. To improve the sense of enclosure of building’s outside environment can make it difficult for criminals to approach and invade victim of crime, make the crime process easy to be found, increase crime difficulty and make it inconvenient to run away after crime.

3. The defense safety problems and design strategies of grid pattern of CPS
The business pattern of grid CPS is mainly organized through grid shape roads. Grid CPS has characteristics of collecting and flowing. It can not only gather people together to a spot but also make people spread apart. Although it can solve crowding problems, it increases the complexity of stream of people greatly. The Guilin business street is a typical grid pattern of CPS.

3.1 Defense and safety problems of Guilin Road

3.1.1 There are Blind zone around space of road. The Guilin commercial street mainly centered by the crossing of Guilin Road and Tongzhi Street and the radiating outward business circle. Tongzhi Street is the main road which is 28 meters wide and its sidewalks are 6 meters wide. Tongguang Road, Longli Road, Guilin Road and Xikang Road are 20 meters wide and the sidewalks are 5.5 meters wide. The high building density, peddle stalls, night market and crowd of people make Guilin Road a very crowded road. Besides, there are many blind zones, which make it convenient for criminal committing and escaping.

3.1.2 Poor space environmental image.
The existing building’s facade and outside ground decoration in Guilin commercial street are old, and the stores with out of style image usually occupies the first or lower two floor of residential building. These make the spatial environment look poor and bring people depressive feeling. Uncleaned food garbage, random scrawl and advertising along road sides all brought up adverse effect to spatial environment. Poor environmental image would give criminals a signal that this place may be not well managed and no one would notice what they do. This environment makes residents feel panic. Besides, the dim light in alley may lessen the physiological pressure of potential criminals and increase crime opportunity.

![Figure 3. We should increase greening and change two-way street to one-way street.](image-url)
3.2 Defense and safety design strategies of Guilin Road

3.2.1 Rationalize the size of the streets. The high building density and narrow street layout block residents’ sight thus make it more convenient for criminal to escape. In order to rationalize the size of the streets, we can adopt strategies as follows.

(1) If the street is too narrow, we can change it into a one-way street (see Figure 3) so as to monitor the crowd situation and avoid blind zone.

(2) Separating walkway from motorway using green belt in order to prevent disorder parking and improve the safety defense.

3.2.2 To improve the image of space environment. In Guilin business district, Tongzhi Street are intercrossed with Xikang Road, Xikang Alley, Guilin Road and Guilin Alley. These business streets are very active, and there are many peddle stalls and eating stalls can be found out in narrow alleys. In order to improve the image of the space, we can adopt strategies as follow.

(1) Clean the rubbish in time and keep the environment neat because this can give criminals a signal that this place is well managed.

(2) Add lighting facility appropriately (see Figure 4) to promote monitor effect, thus it can improve psychological safety and it is also advantageous to prevent and reduce crime.

4. The defense safety problems and design strategies of hybrid pattern of CPS

Hybrid CPS is a complex CPS that has the characteristic of the linear and the grid CPS. It does not have specific systematicness which increases the difficulty of safety defense.

4.1 Defense and safety problems of the railway station of Changchun

4.1.1 The felling of undependable. Changchun railway station is a typical hybrid CPS. The complex ambient situation, complicated crowd, large mobility of migrant population and disorder vendors are factors that weak the emotional connection among people. The poor sense of enclosure make people feel unsafe. What is more, it inspires crime. The design with high sense of enclosure will increase people’s reliability.
4.1.2 The existing blind zone. People and vehicles messing together are very common around railway station. The narrow street can not provide pedestrians adequate field of vision and causes blind zone. The blind zone are convenience for potential criminals to escape, thus increase the probability of crime.

4.2 Defense and safety design strategies of Changchun Railway station

4.2.1 Emphasize border design, strengthen the place reliability. People usually do not communicate much with strangers in railway station. In order to enhance the safety and improve people’s reliable feeling in the place, we can adopt following strategies:

(1) Greening should be increased (see Figure 5) because green plants have various types and are easier to be favoured and accepted by people. Using green plants with various shapes can increase sense of security, reduce crime stimulation and will not be repelled by people.

(2) More warning signs should be added to increase people’s precaution so as to reduce crime.

4.2.2 Improve road size.
Railway station is one of the places where most complex of stream of people lies in. The vehicles that come to or leave the station, the people in and out surrounding restaurants and peddling vendors all make the road very crowd and cause blind zone. In order to widen the road, the strategies are as follows.
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(1) The driveway with high vehicle mobility can not be too winding in order to reduce blind zone and increase crime difficulty.

(2) The crossroads are the places which have most massive vehicles and crowds(see Fig. 6). Widening roads can reduce blind zone and cut down crime.

5. Conclusion
Rational environment design can prevent or reduce crime, increase people’s safety feeling and create favourable living environment. Through analysis of current defense safety conditions of linear, grid and hybrid patterns CPS in Changchun, the paper summarizes the existing problems in different kinds of CPS with regard to defense safety and proposes corresponding defense safety improvement strategies for every type of CPS.

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Figure 6. Narrow roads should be widened.