Urban Nightscape and Nightscape Lighting

Analysis and Evaluations on Typical Nightscape Cases in Nanjing

May, 2014

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Master Thesis in Urban Design, 30 credits
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Abstract

A city’s nightscape can be treated as a re-introduction of the city during the night. Due to the development of city economy and citizens’ leisure life, people are paying more attention to their nightlife. With appropriate lighting design and illumination systems, a city can draw very impressive pictures as its ‘identification card’ to the whole world. Recently, more and more Chinese cities have also started to attach importance to nightscape. Beijing, Shanghai, Guangzhou and Hongkong, as the biggest Chinese cities, have already made notable progress since 1980s. This leads more and more Chinese cities put nightscape design into their urban planning and urban design process. However, as a new subject, nightscape is usually treated as a topic which belongs to urban planning or illumination technology. Few of the recent studies on nightscape in China are done from the scope of urban design. Due to the lack of multidisciplinary studies on nightscape, some Chinese cities mistreated nightscape as simply lighting the urban spaces up with bright lights. This misunderstanding brings up a nightscape fever and makes some Chinese cities jump into a brightness competition.

This thesis aims to make some contributions for the studies on nightscape from the scope of urban design. To achieve that aim, this thesis has three main research questions:
1. How could a typology of nightscape in Chinese cities be constructed based on available literature and the practical situation in Nanjing?
2. What are the strongpoints and shortcomings of the nightscape in the chosen cases in Nanjing?
3. This paper sets out to address a series of strategies in nightscape design which can be applied in different types of urban public spaces in Chinese cities.

The final goal of this thesis is to achieve a series of strategies about urban public spaces’ nightscape design. This thesis studies on the available literatures and Chinese official documents about urban nightscape to make a conclusion of the definition of nightscape. A typology of nightscape in Chinese cities is constructed by combining existing theories about urban open spaces with municipal regulations about nightscape lighting in Nanjing. This thesis uses graphic analysis, urban night space evaluations and interviews to figure out the strongpoints and shortcomings of the nightscape in the chosen cases in Nanjing. And at last, a series of strategies are addressed for the future nightscape designs based on the theoretical studies and sites analyses.

Key Words: nightscape, nightscape lighting, typology, strategies, urban design, Nanjing, China
Acknowledgements

This thesis concludes my two years’ study in the Master of Science Programme in Spatial Planning with an emphasis on Urban Design in China and Europe at Blekinge Institute of Technology and Nanjing Forestry University. It would not be possible for me to finish this work without the support of my classmates and teachers. It is my honor to have the opportunity to get this priceless experience in both educational and personal aspects. During this programme I have met a lot of brilliant classmates and teachers who make these two years so pleasant and unforgettable. Studying and living in Sweden broadens my sight and inspires me a lot about both knowledge and culture.

I am thankful to both Blekinge Institute of Technology and Nanjing Forestry University for making it possible for me to get this incredible chance to join in this special programme.

I would like to extend my thanks to my tutor, Thomas Hellquist, who keeps encouraging me and inspiring me with my thesis. I benefit a lot from his advices and comments.

I also want to thank Gunnar Nyström, who takes care of all of us during the whole period when we are in Sweden.

I would also like to thank Ana Mafalda Madureira. It is Ana who taught me a lot about how to structure a thesis patiently.

And I am also thankful to all my classmates of this urban design programme who shared the wonderful time with me.

At last, I am sincerely grateful to my family for their support, encouragement and love for all the time.
Chapter 1. Introduction

As the key concept of this paper, nightscape is a complex subject; generally, it may involve the knowledge about aesthetics, making sense of place, urban design, urban planning, economy, psychology, engineering, and even ecology. But in this thesis, the research is taken mainly from the angle of urban design. Just like some other human geographic or natural scientific topics, nightscape can be discussed in urban design area. And it is also reasonable to put emphasis on how nightscape and illumination help in identifying a city and creating the image of a city with proper design proposals.

1.1 Background

Nowadays, the nightscape of a city is becoming more and more significant. A city’s nightscape can be treated as a re-introduction of the city during the night. The nightscape of a city is as important as how it looks like during the daytime. And sometimes, the nightscape can make more impact on people’s mind about the city: since the development of city economy and citizens’ life styles, most people are busy at work during the day time; nights become their main leisure periods. People start to pay more attention to their nightlife. This trend brings out an increasing need of consumptions. The night economy of cities are usually stimulated by people’s night activities, it also drives the development of the relevant industries and keeps the public facilities in use during night. And nightscape can provide a more comfortable environment for people’s night activities which will get more people willing to enjoy their nightlife in urban public spaces.

Besides the city economy, nightscape also affects a city’s “brand building”. How a city looks like in the night is a vital part of the image of the city. With the illumination system, the cities can draw very impressive pictures as their “identification card” to the whole world. Many cities, especially some western megalopolis, have already noticed the importance of nightscape and put efforts in their nightscape design, such as the nightscape of The Avenue des Champs-Élysées and Eiffel Tower in Paris, the City of Las Vegas’s night view and the nightscape in Washington.

In China, some Chinese cities have also started to attach to their nightscape. Beijing, Shanghai, Guangzhou and Hongkong, as the biggest Chinese cities, have made some progress since 1980s. Nowadays more and more Chinese cities put nightscape design into their urban planning and urban design process. But there is still a lack of a principle or a regulation for the nightscape design in urban public spaces. Most cities have a misunderstanding on nightscape design, only focus on the brightness of the cities in the night, especially the spaces around their landmarks. Most cities’ nightscape design finally became part of the brightness competition and not only lost their identities, but also caused light pollutions for the nearby traffic spaces and residential areas.

Another reason that makes most recent Chinese cities’ nightscape look similar with each other is that most of the recent studies on nightscape proceeded by Chinese scholars treat this subject as a topic from urban planning area or illumination technology area. Few of the studies are treating nightscape as a topic from urban design area; this might make this paper distinguished from others. But at the same time, the fact that nightscape can be a subject which involves many other areas will also become a limitation to this paper.

1.2 Research Question

This thesis aims to make some contributions for the studies on nightscape from the scope of urban design. By analyzing different types of urban public spaces in Nanjing, the goal of this thesis is to achieve a series of strategies about urban public spaces’ nightscape design.

The research questions are:

- How could a typology of nightscape in Chinese cities be constructed based on available literature and the practical situation in Nanjing?
- What are the strongpoints and shortcomings of the nightscape in the chosen cases in Nanjing?
- This paper sets out to address a series of strategies in nightscape design which can be applied in different types of urban public spaces in Chinese cities.

1.3 Disposition
Chapter 1: Introduction

The remaining part of this thesis consists of five chapters. The first part includes Chapter 2 that presents the methods that have been used in this thesis, and gives explanations about why chose them. A brief introduction about the collected data and a general analysis on the data will also be presented. The second part is Chapter 3 which will be divided into four subchapters to discuss the key concept “nightscape” and some relevant theories about the role of nightscape. Thereafter, in Chapter 4 a typology of nightscape in Nanjing city will be built and the standards of how to evaluate the nightscape will also be formed. Then in Chapter 5 some evaluations of nightscape in chosen sites in Nanjing city will be presented. The strongpoints and shortcomings of the nightscape in each chosen site will be concluded in Chapter 5. In Chapter 6 a series of strategies on nightscape design will be built up based on the evaluations in Chapter 5. Chapter 7 contains final words and self-reflections over the whole thesis, and also recommends some future avenues for others’ further research.
Chapter 2. Methodology

To answer the research questions, this thesis involves various research methods following the scheme in figure 1. On the top of the scheme is the final goal stated.

In the theoretical part of this thesis, a literature research is done first. To achieve the final goal, it is necessary to get a comprehensive and accurate understanding on the key concept “nightscape”, which is highlighted in this thesis. The literature review will focus specifically on the aspect of urban design. Getting a good understanding on the definition of nightscape and the different opinions of scholars can help build the base of this paper to answer the research questions.

After that, a further theoretical study on typology of urban open spaces will be done along with a research on the municipal regulations about urban nightscape in Nanjing. Combining the results of these studies will be helpful to answer the first research question:

1. How could a typology of nightscape in Chinese cities be constructed based on available literature and the practical situation in Nanjing?

Since this thesis aims to evaluate the nightscape of Nanjing city, an analysis on the municipal documents about urban lighting planning and nightscape design will be done in the next phase. With knowing the official planning of the nightscape in Nanjing, the sites where the government has paid more attentions on the nightscape construction will be chosen. After that, there is an empirical study taken on the chosen sites, including practical observation, field study, interviews and nightscape analysis. These empirical methods will make it possible to answer the second research question:

2. What are the strongpoints and shortcomings of the nightscape in the chosen cases in Nanjing?

The results of the sites analyses, in combination with the theoretical studies on nightscape and its typology will help achieve the final goal of this thesis, as stated in research question 3:

3. This paper sets out to address a series of strategies in nightscape design which can be applied in different types of urban public spaces in Chinese cities.
Chapter 3. Literature Review

3.1 Nightscape

3.1.1 Nightscape and nightscape lighting

Nightscape, or night landscape, is the key concept in this paper. But there is not an accurate definition to it which can be acceptable to every single person. Many scholars have argued about what nightscape is in many different ways. In this paper, the discussions about nightscape will be taken in the scope of the night landscape and the illumination systems particularly in urban spaces. Literally, nightscape in urban spaces can be included in the generalized concept of urban landscape. As a concept, landscape has been used in many subjects, such as human geography, aesthetics, physiography, landscape architecture and urban design. In the field of urban design, a generalized definition to urban landscape can be described as “the comprehensive characters in a city or an urban space, including the interactions between different landscape factors, its spatial structure, local functions, cultural features and also its visual images to people”(Yu Kongjian, 1987). Urban landscape is more than the physical morphology of a city or an urban space. It has its aesthetic value which can offer people different visual perceptions. Nightscape can be treated as a branch of urban landscape, just as the day time landscape. Nightscape is a re-performance of the day time landscape in urban spaces; the key factors that make nightscape distinguished from day time landscape are the differences between the natural lighting and man-made lighting on different time (Shen Xinrong, 2002). A Chinese urban planner, Wang Xiaoyan, pointed out that nightscape does not mean nightscape lighting; nightscape design is part of urban design (2002). In the book <Technology guide of Chinese urban nightscape lighting> there is a definition to nightscape lighting: “it means the lighting of outdoor spaces and urban landscape, except the security lighting and the lighting in stadiums or construction sites.”(Beijing Illuminating Engineering Society, 2004) Meanwhile, a Dutch scholar, D.A. Schreuder argued that nightscape lighting is a new concept. “Compare with beautify the city, nightscape lighting is some kind of improved public lighting which uses illuminating facilities and methods to elevate urban landscape” (1998). To make a better understanding about the relationship between nightscape and nightscape lighting, Wan Min, a Chinese planner summarized the contents of urban nightscape as: firstly, it contains illuminating technology, such as lighting facilities and electrics knowledge. Secondly, it has artistic effects, like the forms, colors, how the lights rebuild the objects and human’s psychological feeling about them. Thirdly, it still has the characters of urban landscape which might be in different types (2002).

3.1.2 American and European studies on nightscape and nightscape lighting

The studies on nightscape and nightscape lighting, especially among American scholars and in some European developed countries, have already started since the invention of electricity and the widely use of illuminating technology by the end of 19th century. In 1920s, the development of nightscape of New York City drew the whole world's attention, which accelerated the construction of urban nightscape (Xiao Huqian, 1999). As the studies on outdoor space illumination went further, there were more and more scholars starting to work on making relevant recommended parameters and the calculation formulas of different types of lamps. The book <Lamps and lighting> written by J.R. Coaton, M.A. Cayless and A.M. Marsden also started to pay attention to the light pollution and gave some possible solutions in the book (1997). The Illuminating Engineering Society of North America (IESNA) has pointed out that “the lighting in outdoor spaces usually can make the lightened objects more outstanding in the night environment, making them visible from a long distance.” IESNA also studied in the impact of nightscape on human’s life: “nightscape and illumination may have some influences on people’s emotions and normal life. Considering their privacy and visibility, the control of lighting is rather significant.” The International Commission on Illumination (CIE) defined nightscape lighting as “exterior lighting for the decorations of the night time urban landscape” (1989).

3.1.3 Chinese studies on nightscape and nightscape lighting

While Chinese studies on nightscape have developed in a different way, unlike American or European countries, Chinese nightscape design is still on its beginning. But China has a night culture since ancient time. In ancient China, nightscape was defined as the combination of lighting infrastructures, the night
Chapter 3: Literature Review

view of the celebratory on important festivals with lanterns and fireworks, the night markets driven by local commercial activities. Recent years, more and more theories and technical studies on nightscape have been made by Chinese scholars, but most of them treat nightscape the same as the concept “lighting planning”. Most published books on nightscape written by Chinese professors mainly discussed about the lighting technology and lighting planning. Wang Xiaoyan gave a brief introduction about how to use lighting technologies and art of lighting in urban planning in her book <Planning and Design of Urban Night-landscape> (2000). And later Beijing Illuminating Engineering Society has published the book <Technology guide of Chinese urban nightscape lighting> in which the BIES explained the definition of nightscape lighting and introduced some basic principles of nightscape lighting design and construction (2004). Besides published books, Chinese academic articles can be also found on some journals like <City Planning Review>, <Planners> and <China Illuminating Engineering Journal>. Wang Jianhua framed a series of basic principles of urban nightscape lighting as “1. Nightscape lighting should be contained in overall urban planning process; 2. Nightscape lighting should satisfy human’s physical and psychological requirements; 3. Public participation should be taken into consideration; 4. Nightscape lighting in different scales should be in a harmonious environment; 5. The nightscape lighting design should be sustainable; 6. Nightscape should help identify the local characters; 7. Creative nightscape with both new planning theories and new technologies can enhance the effects of the design.”(2003, pp 46-48) Hao Luoxi, a Chinese professor, concluded the elements of nightscape lighting as “roads (including traffic roads, business streets, tourism streets and roads in residential areas), spatial nodes, buildings, green spaces, water (including banks of river, water stages and bridges), outdoor advertisement boards and other facilities.”(2004, pp 64-65) Ma Jian, professor of Tianjin University, discussed the development of Chinese nightscape and argued that there are some problems in Chinese urban nightscape design, like most cities have a lack of unified planning and management, China does not have the regulations for guiding nightscape design, the design tools are out of fashion, some cities cannot offer proper maintenance for nightscape, too much glare which causes energy waste and glare pollution (1999, pp 44-45). These articles discussed about the basic theories and methods of nightscape lighting to give a general introduction about nightscape design. Some of them have started to notice some problems like glare pollution and waste of energy. But few of them treat this subject from the angle of aesthetics or urban design. In the field of urban design, some academic institutions like Tongji University and Tianjin University are playing an important role. They first started to combine nightscape with the image of city together. They tried to study nightscape from the angle of urban design and architecture to define the concept, function and design principles of nightscape.

Conclusion:
According to available literature, nightscape as a concept could be defined like this:

1. It is a concept which can be treated as a branch of landscape. It contains both natural landscape (the natural environment that are not influenced or slightly changed by human) and culture landscape (the landscape caused mainly by human activities) with natural lighting, which usually comes from the moon and other luminous planets during night, and man-made illuminating.
2. It usually appears as composite scenes with natural environment, urban elements, human activities, lighting facilities and so forth. It exists as a different representation of urban landscape from the day time which relies on the same elements and urban facilities as its carrier.
3. Nightscape aims to create a night view for a certain area or a city with artistic effects. It usually uses different lighting methods to change the appearance of urban spaces and human’s psychological feeling about them.
4. A nightscape can be designed to work for a long periods like years, but also can be temporary built for special purposes. It still has the characters of urban landscape and can be divided into different types.

3.2 Night-time Economy
Night-time Economy is a new topic which draws more and more attentions from global academics. On this topic, British scholars have made lot contributions to it. Marion Roberts, a professor of University of Westminster, described the expansion of the night-time economy in British town and city centres like this: “in a time span of 10 years, many English town centres have been transformed from being relatively deserted at night to being filled with concentrations of young drunken people out on the streets until the early hours
Chapter 3: Literature Review

of the morning”. (2006, p331) This expansion of the night-time economy made British scholars start to study on people’s night activities, especially among young people. Paul Chatterton and Robert Hollands termed the relationship between young people and city space as “urban playscapes”, which means young people’s activities in bars, pubs, night-clubs and music venues within the night-time entertainment economy (2002, pp95-96). Franke pointed out that the comfort of lighting colors can make an impact on people’s night-time activities and consumption (2005). Cao Xinxiang, a Chinese professor of Henan University, also did some studies in how the nightscape lighting affects mental preference by visual effects. Cao argued that human has the natural requirement for light in dark environment. Nightscape lighting with proper colors and diversified functions can become an attraction to human during the night. Cooperate with urban public facilities and business industry, the nightscape can make excellent aesthetic effects and stimulate people’s night-time consumptions (2008, pp207-208). Unlike British towns and cities, Chinese cities have more different kinds of night-time activities than alcohol related entertainment among young people. Most Chinese cities have already taken the night-time economy into their considerations of city economy strategies. They encourage all kinds of business and tourism to participate in the night-time market. In Chinese cities, people can easily find self-help banks, supermarkets, shopping malls, restaurants and city parks open in the night, some are even open for 24 hours. Most Chinese cities have already noticed that a good nightscape can accelerate the development of night-time economy. This will expand citizens’ night life, keep the urban facilities in use, stimulate citizens’ night consumptions and provide more job opportunities.

3.3 Nightscape in Creating the Image of City

Kevin Lynch brought our subjective feelings into his study of urban space in his book Image of the City (1960). Lynch’s theory occurred just during the time when American big cities constructing their nightscape. The combination between nightscape and creating the image of city helped American urban nightscape’s rapid development. With the theory of creating the image of city, urban space is no longer a cold spatial concept, but a social place which can meet people’s physical and psychological needs. Since Chinese nightscape is on its beginning, there are still some cities misunderstanding about nightscape, which only concentrate on the luminance. This paper tries to use Lynch’s theory to help people understand how nightscape works in creating the image of a Chinese city. Lynch explained how people get a mental image from feeling the physical environment. It works like a reflection in our mind about how we know the world. Based on this, he pointed out that legibility (or Image ability) should be one of targets for the construction of the image of the city. In his theory, urban space can be understood as a “mental map” for people, consisted by paths, edges, districts, nodes and landmarks. Allan B. Jacobs also points out the importance of edge space design in urban space. The edge of a public space can give people a sense of scale (1993). The legibility of a space connects people’s behaviors and the environment. It means a degree of how easy people can understand the environment pattern and structure then form a mental map or a reflection in mind. It is the legibility of a street that makes it distinguish from the others on people’s impression.

The nightscape of a city also needs to have its legibility to help people build their mental map of the city during the night. Therefore the illumination design of the paths, edges, districts, nodes and landmarks needs to be proper and reasonable. Among American and European cities, there are some successful examples where the urban spaces are distinguished from any other places in the world, especially due to their nightscape. Such as the nightscape of The Avenue des Champs-Élysées and Eiffel Tower in Paris, the City of Las Vegas’s night view and the nightscape in Washington. Unlike American cities, most Chinese cities have a long history with a lot of historical elements remaining in them. This can help people get their mental image of the city by remind people of its history and regional culture. In China, the image of a city is also created by some different factors besides those in Lynch’s theory. It also contains the city’s geographical location, history, landscape and human activities (Chen Quan, 2013). In nightscape construction, the lighting usually works together with other urban elements. The elements with lighting in proper colors and brightness will create comfortable public spaces for people. Just like in the day time, the lightened paths in the night will show the cities’ spatial structure and keep the citizens who pass through public spaces safe. The visible edges during the night can help people keep their sense of scale. The districts and nodes with well-designed nightscape and illumination system can be used by citizens in both day and night to hold social activities. And an outstanding landmark during the night can be one of the best ways to make a
Chapter 3: Literature Review

3.4 Nightscape in Impacting Human Activities

3.4.1 Dilemma of Chinese nightscape design

The construction of urban nightscape in China has developed for more than 30 years. Some successful nightscape designs in big cities like Beijing, Shanghai and Hong Kong have become the symbols of these cities in global. Witnessing these successes, the other Chinese cities also started to invest in their own nightscape. It is undeniable that nightscape can make a city attractive and stimulate its tourism and consumption. But not all the cities made their nightscape successful. The rapid development of China from 1990s provided the economical foundation for Chinese nightscape construction. But at that time, there were few studies in nightscape design. For a long time, Chinese academic studies on nightscape fell behind the practical constructions happened in most cities. Some local government misunderstood urban nightscape as the same with night illuminating. Their focus concerned specifically the brightness of the city during the night. Recently, more and more urban planners and designers started to stress that the design of nightscape needs to take energy cost, aesthetic effects and local cultural characters into consideration. Although the nightscape of a city can extend the active period of its economic activities and help creating the image of the city, the most important function of nightscape is still to benefit citizens. Nightscape is not only about making the city look impressive during the night, but also about providing comfortable public spaces for citizens to have more night-time activities.

3.4.2 Development of Chinese urban nightscape

A better understanding on the relationship between human and nightscape can help the nightscape design meet citizens’ requirements for their night life. Urban nightscape appeared following the development of the city economy and its social culture. Human is the subject that makes use of nightscape to carry on various night activities. At beginning, the purpose of nightscape construction is to satisfy human’s physical and psychological needs and to provide places for human’s night life. Later, since human’s night life become more active and prosperous, human’s requirements to nightscape have expanded. Rather than providing a place and lighting (basic functions of nightscape), human starts to ask for a qualified nightscape with artistic effects and more potential functions. This change of nightscape’s role in human’s night life can be easily found in Chinese history. In ancient China, the appearance of urban nightscape was related to the mode of production in the agriculture-oriented society. Before Tang Dynasty (BC618-907), normal people were forbidden to have any kinds of night activities. Later, with new lighting tools and the development of society, people were allowed to have some night activities on some particular festivals. Usually people would be well-dressed to gather at specific places, which decided by the emperors, to watch different entertaining shows. Night markets occurred in Tang Dynasty, caused by the rapid economy development and people’s stronger needs of consumption. At first, the night markets were under strict limitation about their locations and business hours. Later in Song Dynasty (BC960-1279), the night markets were already an important part of people’s night life without any limitation of time. In Modern Times, especially during the Second World War, the development of either nightscape or people’s night life was stagnated for a long time. The revival of Chinese cities night life started in 1990s. In order to speed up the economy development, city governments encouraged both business industry and citizens to participate in city’s night with new policies. Due to the increasing night-time economy activities, the contents of people’s night life expanded from singing, dancing, bars, pubs and restaurants to shopping, fitness, tourism and so on.

3.4.3 Jan Gehl’s theory on human activities

In most Chinese cities, the public spaces that work as carriers of people’s night-time activities usually include business streets, pedestrian streets, city squares, and city parks. And people’s activities in public spaces, according to Jan Gehl (2008), can be divided into three types: necessary, optional and social behaviors. He pointed out that the necessary behaviors (including going to school, going to work, shopping, waiting for buses and so on) usually take place regardless of the quality of physical environment and the participators can barely make their own choice. The optional activities, however, depend to a significant degree on what the place has to offer and how it makes people behave and feel about it. The better a place, the more optional activity occurs.
Chapter 3: Literature Review

and the longer necessary activity lasts. In Jan Gehl’s description, social activity is “the fruit of the quality and length of the other types of activities, because it occurs spontaneously when people meet in a particular place” (2008). Social activities include children’s play, greetings and conversations, communal activities of various kinds, and simply seeing and hearing other people. Communal spaces in cities and residential areas become meaningful and attractive when all activities of all types occur in combination and feed off each other. In another word, the quality of public spaces is relevant to people’s activities. Also, the quality of the nightscape in a public space can affect how frequently activities take place and how long the activities last. During the night, people usually enjoy their leisure time with different optional activities or social activities in urban public spaces, like walking, sight viewing, chatting and resting. Therefore, the nightscape needs to contain good conditions for the residents around and tourists to have optional and social activities.

3.4.4 Human behaviors during the day and night

What people need from a good nightscape is not completely the same with a good landscape during the day time. If the view of a city in the day time is one side of a coin, then the nightscape of the city is the other side. Lighting is the key factor that makes nightscape different from the day time. The differences between day time landscape and nightscape are mainly decided by the change of city’s climate and environment, the differences of citizens’ life between day and night, and the different ongoing activities which take place in urban public spaces. During the day time, the natural sun light has big influences on the city. The cyclical changes of the sun light and the climate conditions can make the colors and luminance of a city quite different during different periods in the day. While the nightscape of a city, however, is not easily influenced by neither the time nor the climate. Yoshinobu Ashihara, a Japanese architect, also described the differences between day and night in his book <The Aesthetic Townscape> “when night falls upon the city, lights inside the windows of the apartment building have been turned on. Later, the façade of the building just disappear into the darkness. During the day time, the façade was the subject of the building, but at night we can only see the windows and the view inside the windows.”(1984) When the colors and the luminance of the lighting are also unchanged, the nightscape will become quite stable, even boring sometimes. Human’s visual perception is also different in the night. 

Affected by the change of light and temperature, human’s activities during the night become more theatrical and dangerous. On one hand, the darkness will weaken human’s sense control and visual judgment. On the other hand, they do not need the rational and logical thinking as much as during the intense day time work (Rudolf, 2001). Human pursues their mental peace in the night. They will become more sensitive and emotional. Therefore, a well-designed nightscape should have an environment which can offer people mental relax and rest.
Chapter 4. Typology

Ahead of starting a practical analysis on the nightscape of the chosen sites in Nanjing, it is necessary to figure out the typology of nightscape that existing in Nanjing urban public spaces. However, after a theoretical study on Chinese literature about nightscape and the official documents published by the local government, it has been proved that there is not a formal typology of existing Chinese city nightscape yet. In the official documents, there are some brief descriptions about the different situations of nightscape lighting in Chinese cities. This shows a possibility to develop it further into a typology of nightscape lighting which could be helpful to make a new typology of nightscape which can be applied among Chinese cities.

4.1 Official Documents Studies on Typology of Nightscape Lighting

In 2008, China Academy of Building Research (CABR) invited Beijing Institute of Architectural Design (BIAD), scholars from Tianjin University and Chongqing University, Illuminating Engineering Society of Beijing, Illuminating Engineering Society of Shanghai and some illuminating corporations to compile the document <Code for Lighting Design of Urban Nightscape>, which has been carried out from May, 2009. This document, for the first time in China, gave general principles for nightscape lighting design and definitions to the key technical concepts of nightscape lighting. It also made a guideline for lighting design and evaluation in a technical way. About the lighting design basic principles, it claimed that: firstly, the lighting design of urban nightscape should be people-oriented for all the time, and it also needs to focus on the overall artistic effects. A city’s nightscape and the illuminating aim to create a comfortable light environment at night, but the designers should also take how the appearances of the nightscape facilities look like during the day time into their consideration. Secondly, the document pointed out that there are three most important parameters should be paid more attentions: illuminance (how bright the lightened objects are), luminance (how bright the light source is) and light power density (how much energy does it cost). Thirdly, the choices of types of light sources, luminaires and lighting methods should be appropriately fitted to the surroundings. And the installations of luminaires need to have proper locations and angles for human behaviors. In some situations, some shading measures will be necessary to avoid light pollution. Fourthly, when urban designers want to choose colorful lights, the decision needs to be made cautiously. The color of the light source should be harmonious with the object’s own color and the surroundings. In addition, the colorful lighting design should never look like any particular signals or traffic lights. Fifth, the lighting facilities’ setting needs to collaborate with the site environment and meet the requirements of safety. The constructions should both keep people in safe and keep the nearby heritages unharmed (2008).

In the document <Code for Lighting Design of Urban Nightscape>, it divided the objects of nightscape lighting into six groups: architectures, special landscape elements and structures, commercial pedestrian streets, squares, civic parks, and exterior advertisements or signs (2008). According to this framework, Nanjing municipal government listed out the common urban spaces in Nanjing city where there should be proper nightscape lighting design:

1. The architectures and greenery along both sides of main roads;
2. The architectures which have a height over 40 meters;
3. Urban public spaces like harbors, ports, airports, railway stations, bus stations, squares, business streets, civic parks, gardens;
4. Landmarks like bridges, towers, chimneys, gates, city walls, monumental architectures, historical heritages;
5. The shore-lines along Yangtze River, lakes or other water systems (2012).

Based on the studies on the official documents and the actual situations of Nanjing, this thesis can try to build a typology of nightscape illuminating here.

1. Festival lighting: it usually exists as temporary nightscape lighting for some big festivals which can draw a lot of people to gather to celebrate. The lights can be designed to be on the present spatial structures in the site or on some temporary additional facilities. Festival lighting mainly focuses creating a joyful and festive mood to change people’s feeling about the urban spaces.
The artistic effects of festival lighting are always directly legible for people to understand. The lighting methods are usually like adding some decorative lights, which are in the common patterns of the festival, on buildings’ facades, or lighting up the contours of some landscape structures and buildings to give them a new appearance which can be easily recognized by people. Occasionally, laser technology and some digital illuminations can also be seen in festival lighting. The investor could be some shopping malls runners who want to use the decorative lighting to attract more customers during some big festivals like Christmas when people have a huge demand for buying presents or other wares. With some discounts in the malls, it can stimulate citizens’ consumptions rapidly. Sometimes this kind of lighting can be settled by the municipal government for some important national festivals or some custom events. The government usually uses festival lighting in some important open urban spaces like city central squares or big civic parks. In this situation, the festival lighting can remind citizens of their countries, histories and ethnographic culture. Festival lighting can also be used for some regional events with different themes. This can be seen in scenic zones, communities, or just some outdoor concerts.

2. Architecture/building lighting: including the lighting of building façade, it is used to redraw a night time picture of the architectures which work as carriers of human activities and behaviors during the day. Architecture lighting can be seen in different types of urban public spaces. The lightened object can be a skyscraper in central business district, or some shops on a pedestrian street, or a tower in a civic park, or some special monumental buildings. This kind of nightscape lighting’s focus point in its designing may differ from one case to another. Since the architectures can have different types, functions, structures and so on, the lighting can be design to enhance the buildings’ style, spatial structures, materials, historical characters, or just some parts which have high aesthetic value. As Yoshinobu Ashihara described, the look of a building during night can be quite different to people. In the day time, people will always be able to clearly see a building’s style, structure, color, materials, and some other details of the building itself, but hardly to see the interior through the windows. During night, when the lights inside each room of the buildings are turned on, the scene in windows become bright and clear to see, while the façade of the building feels like it gradually disappears into the darkness. The architecture lighting can bring the architecture back into people’s sight in the night and sometimes it can tell even more information about the building itself than the day time. According to the building’s situation, the lighting methods used in architecture lighting can be various. For some monumental architecture, or the main landscape architecture in a park or a square, or some important municipal buildings, the floodlights will be designed outside the building in a distance to make the architecture much brighter than the surroundings to claim its importance. Since the high luminance of floodlighting is too bright for people to stay in its light, it is usually used for the buildings which are closed during night. Contour lighting is the most common way in architecture lighting. It uses neon lights or some other luminaires to outline the building’s contour. Another lighting method is lighting the building with its interior lights. This method is usually used for the lighting of modern architectures, especially the ones with glass curtain walls or some reflective materials. The widely use of glass and other reflective materials among modern architectures make it difficult to use floodlighting or contour lighting. The floodlighting reflected by glass or similar materials will cause light pollution to the surroundings, and the contour lighting will make bad influence on the interior activities through the building’s glass wall. Using the interior lights can both avoid light pollution and reduce the cost of energy. Besides, interior lighting is quite popular in the lighting design of shops, restaurants, galleries and big shopping malls. By the gentle lights coming out from the interior, these buildings can attract more customers by showing their interior environment and wares. Sometimes, the architecture nightscape lighting can be design during the architecture design process. In this way, some parts or elements of the building, like walls, columns, eaves, windows, corners or rooftop, can be constructed with lights on or inside them, making the nightscape lighting incorporate with the building much better. In some situation the architecture may have particular design in some parts of it, like a statue or a garden on the rooftop. The nightscape lighting can also be designed to enhance the aesthetic effects of the very part of the building by setting a special lighting.

3. Special structure lighting: here the “special structure” refers to some city
facilities and built infrastructures like towers, bridges, sculptures, tunnels, chimneys, city walls and gates. As a special kind of lighted objects, these special structures are not built mainly for viewing or artistic effects in the first place. They all have a particular function which could be quite important to the surroundings or even the whole city. And usually they are not used by people as urban spaces where they can stay for a long time to enjoy their life. Therefore the lighting design should firstly keep their functions working well during night. Then the illumination can try to create some artistic effects for the structures based on their characters and the surrounding environment. For the structures with a traffic function, like a bridge or a tunnel or an overpass, the lighting is the key to keep the traffic safe during night, which means it cannot be too bright or too dim. It usually just use some simple lighting methods like the contour lighting and traffic functional lighting without too much dramatic decorations, especially when there are other traffic lines going cross the special structures. For the structures like towers, pagodas and chimneys, the nightscape lighting can create some aesthetic effects and also works as a signal to keep planes away from accident. Usually the lighting method will be using several floodlights from different angles around the object and designing a signal light on the top of the structure. In this way, it can provide a nightscape view from each potential viewing position. In Nanjing, and some big Chinese cities, there are some part of historical city walls and gates remaining in the urban public spaces. The lighting methods are usually contour lighting to outline them and accent lighting to show the key elements on the structure to people, like towers, doorways, crenels and platforms. For the well protected city walls and gates which can still be open for people to walk on, the illuminating system can also provide a secured environment for pedestrians with traffic functional lighting.

4. Square lighting: this kind of nightscape lighting is one of the most common lighting in urban public spaces. It can be used in different types of squares in the city. Generally, there is always an overall lighting planning which may contain a particular theme of the square and an overall lighting layout. The density of lights will be designed after scientific calculations to make sure the square will be lightened up with a proper distance between each two luminaires. The square lighting does not mean to make the whole square bright like the day time or provide the same luminance for everywhere. The lighting design usually highlights the entrances, the traffic paths and the public gathering spaces, while the grass or bushes will be less bright. The square lighting usually uses basic functional lighting to provide a convenient walking environment for people that they can see the ground clear enough for walking, especially the places with slopes, steps, stairs and other kind of elevation changes. In square lighting, sometimes the lights can be designed as lamps with a lower height or even buried in the ground or grass. In this way, ground can be easily lightened for walking with gentle lights. For some staying spaces or some landscape spots, the lighting can be designed to create some contrast between the main object and the background, by using lights in different colors and luminance. For some corner spaces or edge spaces, the lighting design can even create a silhouette by setting the lights behind the objects. The forms and appearance of luminaires in square lighting are also quite important. The lighting facilities can also be designed in an artistic way to present the square’s theme and characters.

5. Road lighting: this kind of lighting is quite different from the others. It must obey a lot of strict regulations to provide a safe traffic environment. The artistic effects of it are limited by many rules about the luminance, light colors, forms of luminaires and so on. But it still has a chance to do some design work on the road lamps’ forms and shapes. As the lightened object, the road is usually a linear space, which gives an opportunity for the nightscape lighting to create a kind of dynamic nightscape. Since the traffic flows always move along the linear space fast, an appropriate repetition of road lamps, which designed into an aesthetic shape, will become an enjoyable driving environment.

6. Commercial (pedestrian) street lighting: the nightscape lighting in a commercial street is more complex than the others. It still needs to have an overall lighting planning to keep the nightscape in the area looks in a harmony, but the overall planning can be a broad one which means it still allows the elements have various lighting design in some degree. A street lighting needs to provide a comfortable shopping environment and public spaces. The lightened objects can include the entrances, shopping
mall, restaurants, shop windows, plazas, urban furniture, public facilities, green spaces, fountains and other nightscape elements. The street lighting, especially for the pedestrian street, needs to ensure the walking environment is secured and lightened enough. Unlike in road lighting, lamps and other luminaires in street lighting should be in a smaller scale and the decorative lights’ colors can have many choices or even be blinking with more than one color. Since people on a pedestrian street usually have a demand to interact somehow, the lighting in pedestrian spaces can be brighter than that on a square or in a park, to make it possible for people to recognize others’ faces from a distance. The street lighting barely uses floodlighting. Contour lighting, decorative lighting and building interior lighting are the common ways to make the shop windows and building facades dynamic and attractive.

7. Park/garden lighting: like square lighting, park lighting is also quite familiar to public. It can be designed to fit in with different types of parks. A park’s nightscape design also needs an overall lighting planning which may contain a particular theme of the park and an overall lighting layout. But most lights will be designed only along the paths and around some public spaces. In most situations, park lighting contains three main parts: hard landscape lighting, vegetation lighting and waterscape lighting. This means the lightened objects usually include hard landscape like hills, rocks, paths, landscape architecture; vegetation like grass, bushes, trees; waterscape like rivers, waterfalls, lakes, fountains and so on. The hard landscape lighting is usually brighter than the others. It usually highlights the entrances, the traffic paths and the public gathering spaces. Park lighting also has basic functional lighting to ensure the ground can be seen clearly by pedestrians, especially the places with slopes, steps, stairs, children playgrounds and other kind of elevation changes. The lights along paths in the park can be designed as lamps with a lower height or even buried in the ground or grass. In this way, the ground can be easily lightened for walking with gentle lights. For some staying spaces or some landscape spots, the lighting can be designed to create some contrast between the architecture and the background vegetation, by using lights in different colors and luminance. For some corner spaces or edge spaces, the lighting design can create a silhouette by setting the lights behind the objects. In park lighting design, the luminaires are treated as nightscape elements, too. This means the lighting facilities can also be designed in an artistic way to present the park’s theme and characters. The vegetation lighting and waterscape lighting are the two factors that make park lighting quite unique. Sometimes, a special lighting method will be used in park lighting: by setting a light source on the branch of a tall tree, it will shine like the moon in the sky and the shadows of the tree and other elements under the light will become a dramatic scene in a small area. When designing vegetation lighting, the most important factor is not to harm the vegetation by lights or facilities installations. In the waterscape lighting design, the reflection of the water should always be taken into consideration so that the reflection can enhance the artistic effects without causing light pollution.

8. Lighting of advertisements and signs: this kind of lighting can be seen in all kinds of urban spaces. It is usually used to send messages to the public with some lightened boards, facilities or some other kind of structures. In most situations, the lighting objects are public information, business advertisements, public service advertisements, words, photos, symbols and patterns. The lighting focuses on making the message attractive and can be seen clearly by people from a long distance to read. To gain that purpose, the lighting could be quite bright with outstanding colors or even flashing. This makes the lighting design should always pay attention to the luminance and its glare in case of causing light pollution. Another character of this kind of lighting is that in most situations, the contents can also be seen during the daytime without lighting. The facilities need to be designed beautiful in the place during both day and night. Usually the lighting facilities and the advertisements do not belong to the same company. The facilities’ owner takes charge of the maintenance and the advertiser should pay to get the access to the facilities.

4.2 Theoretical Literature Studies on Typology of Urban Open Spaces

Even though there are no formed theories on the typology of nightscape in the area of urban design yet, it is still possible to refer to the typology of some other similar concepts. This thesis brings in some theoretical typology of urban
open spaces to help build a new typology of nightscape. The reasons that make this attempt practicable are: firstly, the concept of nightscape that is discussed in this thesis is mainly about the night view and illumination of urban spaces; secondly, the studies on urban open spaces have been brought on the table for much longer than the studies on nightscape, some theories on urban open spaces are quite systematic and convincing as references for nightscape studies; thirdly, the typology of urban open spaces contains more contents than nightscape, after narrowing it down with the reality of Chinese cities current situations and the new typology of nightscape lighting above, it will be easier to get the typology of nightscape in Chinese urban spaces.

Mark Francis illustrated a typology of urban open spaces as Table 1. He divided urban open spaces into two main types: traditional urban open spaces and innovative urban open spaces (1987, pp78-79). In his descriptions about different types of urban open spaces, especially the innovative ones, it is not hard to find out that in late 20th century, more and more kinds of spaces in cities, even some vacant lands, were gradually developed into urban open spaces for human activities. He pointed out that “the awareness of open spaces as the larger public landscape of cities is providing increased public support for design innovation and research activity.” Mark Francis explained that the growth of urban open-space types was mainly caused by the expanding definition of what urban open space is. As Lynch (1981) argued in his work that open space is open when it is accessible, Francis followed Lynch’s avenue and defined urban open spaces as publicly accessible open places designed and built for human activity and enjoyment (1987, pp76).

### Table 1. Mark Francis’s Typology of Traditional and Innovative Urban Open Spaces

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional</strong></td>
<td></td>
</tr>
<tr>
<td>Public parks</td>
<td>A public open spaces; developed and managed by Parks Department as part of zoned open-space system of city; often located near center of city; often larger than neighborhood parks.</td>
</tr>
<tr>
<td>Streets</td>
<td>Much of the publicly accessible open space of cities; increased awareness of importance of street use and traffic impacts on children; changes to streets include pedestrian improvements and sidewalk widening, street tree planting, and so forth.</td>
</tr>
<tr>
<td>Transit malls</td>
<td>Development of improved transit access to downtown areas; may replace a traditional pedestrian mall with a bus and “light rail” mall.</td>
</tr>
<tr>
<td><strong>Innovative</strong></td>
<td></td>
</tr>
<tr>
<td>Community open spaces</td>
<td>Neighborhood spaces designed, developed, owned and/or managed by local residents on vacant land; may include viewing gardens, play areas, and community gardens; often developed on private land; not officially viewed as part of open-space system of cities; highly vulnerable to displacement by other uses such as housing.</td>
</tr>
<tr>
<td>Neighborhood open spaces</td>
<td>Space located in neighborhood often near private open space; often heavily used by children and teenagers; important setting for environmental learning and socializing.</td>
</tr>
<tr>
<td>Schoolyards</td>
<td>Not normally considered part of open-space system of cities; increased awareness as place for environmental learning; some schoolyards redeveloped as environmental centers.</td>
</tr>
</tbody>
</table>

Mark Francis illustrated a typology of urban open spaces as Table 1. He divided urban open spaces into two main types: traditional urban open spaces and innovative urban open spaces (1987, pp78-79). In his descriptions about different types of urban open spaces, especially the innovative ones, it is not hard to find out that in late 20th century, more and more kinds of spaces in cities, even some vacant lands, were gradually developed into urban open spaces for human activities. He pointed out that “the awareness of open spaces as the larger public landscape of cities is providing increased public support for design innovation and research activity.” Mark Francis explained that the growth of urban open-space types was mainly caused by the expanding definition of what urban open space is. As Lynch (1981) argued in his work that open space is open when it is accessible, Francis followed Lynch’s avenue and defined urban open spaces as publicly accessible open places designed and built for human activity and enjoyment (1987, pp76).
Chapter 4: Typology

<table>
<thead>
<tr>
<th>Farmers’ markets</th>
<th>Open space used for farmers’ markets or flea markets; often temporary or held only during certain times in existing space such as Parks, downtown streets, or parking lots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town trails</td>
<td>Connects parts of cities through integrated urban trails; use of streets and open spaces as settings for environmental learning.</td>
</tr>
<tr>
<td>Vacant/ Undeveloped open spaces</td>
<td>Still much of the open space in cities; found in redevelopment areas, where abandonment has occurred, or in undeveloped areas; increased awareness as potential open space; interest in vacant land being used to develop urban forests or natural areas in cities.</td>
</tr>
<tr>
<td>Waterfronts</td>
<td>Increased awareness of waterfronts as urban open space; many cities working to increase public access to waterfront areas by developing waterfront parks.</td>
</tr>
<tr>
<td>Found spaces</td>
<td>Informal open spaces of cities where social life takes place; include street corners, sidewalks, paths connecting buildings, bus stops, steps to public buildings, and so forth.</td>
</tr>
</tbody>
</table>

Found spaces  Informal open spaces of cities where social life takes place; include street corners, sidewalks, paths connecting buildings, bus stops, steps to public buildings, and so forth.

Ten years later after Mark Francis’s illustration about his typology of urban open spaces, Clare Marcus and Carolyn Francis built another typology in 1997. As many new forms of urban open space occurred in 20th century, Clare Marcus and Carolyn Francis paid their attention mainly on providing a guideline for designing and managing urban open spaces. Their typology was built mainly based on the urban open spaces’ users, management and accessibility. They classified urban open spaces into three main groups: 1. the urban open spaces which are owned by the public and can be approached by all people, like neighborhood parks, mini-parks, vest-pocket parks and some urban plazas. 2. The urban open spaces that are privately owned and managed by company or local group but can be open to the public, like some plazas besides office buildings or company buildings, campus outdoor spaces and so forth. 3. The urban open spaces that act as communal spaces and privately owned to serve a certain group of people, like the outdoor spaces which are located next to the elderly housing, child care center or hospitals (Clare Marcus & Carolyn Francis, 1997). About their typology (see Table 2), they also admitted that there are some other types of urban open spaces missing, like community gardens, playgrounds, streets, office parks and so on.

Table 2. Clare Marcus and Carolyn Francis’s Typology of Urban Open Spaces

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Plazas</td>
<td>Open spaces mainly located in the city central areas with outdoor hard pavements. Often developed as an affiliated part of new built tall buildings. This kind of plazas usually are owned and managed privately but still accessible for the public. Including street plazas, company’s foyer, urban oasis, transit foyer and a street which is closed to traffic to work as a plaza.</td>
</tr>
<tr>
<td>Neighborhood Parks</td>
<td>Consist of grass, woods, plants and other kind of soft landscape elements. Usually located in residential areas with different types of facilities for dynamic activities like sports, games, walking or jogging, and quiet activities like sitting, sunbathing, resting and so forth.</td>
</tr>
<tr>
<td>Mini-parks and Vest-Pocket Parks</td>
<td>Mini-parks in small scale. Mainly serves the local pedestrians and often heavily used by children and teenagers.</td>
</tr>
<tr>
<td>Campus Outdoor Spaces</td>
<td>The outdoor spaces located in schoolyard with different kinds of hard and soft surfaces. Mainly designed for passing through, studying, resting, social interacting and other kinds of activities.</td>
</tr>
<tr>
<td>Outdoor Spaces in Housing for the Elderly</td>
<td>Open space usually with well-designed planting. Mainly used for slow walking, resting, sitting, sight viewing, plants keeping and so forth. Attached to – and for the exclusive use of – the residents of a housing scheme for elderly people.</td>
</tr>
</tbody>
</table>
Chapter 4: Typology

### Child Care Outdoor Spaces
The outdoor play area of a child care center, usually including hard and soft surfaces and some fixed and movable play equipment. The primary focus is on preschool-aged children (three to five years), but spaces for infants, toddlers, and school-aged children are sometimes provided.

### Hospital Outdoor Spaces
A courtyard, garden, patio, or park that is part of a hospital development. Such spaces are most often provided for use by patients, visitors, staff, and, occasionally, the general public. They have important social and therapeutic uses and are a visual amenity. They may have predominantly hard or soft surfaces or a combination, depending on their location and intended use. They also include hospital play areas for pediatric patients.

While Helen Woolley suggested that the typology of urban open space should be built from the user’s point of view, which consists of three main groupings – domestic, neighborhood and civic – based on the concept of home range (Woolley, 2003). Woolley paid more attention to people’s experiences in different urban open spaces during different periods of their life and just as she claimed, this typology (see Table 3) was addressed from the point of view of the users, not the planners, designers or managers (2003, p75).

### Summary:
After studying the three different typologies, the purpose of building a typology of urban open spaces can be summarized as: to provide a theoretical basis for urban planning, development of urban spaces strategies and further academic researches. They may group urban open spaces based on different focuses: Mark Francis tried to focus on how the spaces are owned, managed and their potential functions; Clare Marcus and Carolyn Francis aimed to provide guidelines for designers, so they paid more attention on urban open spaces’ users, management and accessibility. Their typology was framed up from the angle of being a designer, a planner or a manager; While Helen Woolley chose to consider more about the quality of the space and the users’ experiences about the spaces. She respected people’s daily urban life and had the user as the focus of attention. The three typologies described some similar types of urban open space in different ways. They all made a series of main groupings with different focus, and then provided a more detailed classification to address their own theory. Some types of urban open spaces, like farmers’ market, which were treated as innovative ones with potential value to develop by Francis in 1987 finally turned to be the regular types in Woolley’s typology in 2003. All of them pointed out that there surely will be more types of urban open spaces which will be developed in the future.

### Table 3. Helen Woolley’s Typology of Urban Open Spaces

<table>
<thead>
<tr>
<th>Main Types</th>
<th>Subtypes</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>Housing</td>
<td>Open spaces which are physically associated most closely with the home and socially are likely to be used mainly by the family, friends and neighbors.</td>
</tr>
<tr>
<td>urban open</td>
<td>Private gardens</td>
<td></td>
</tr>
<tr>
<td>spaces</td>
<td>Community gardens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allotments</td>
<td></td>
</tr>
<tr>
<td>Neighborhood</td>
<td>Parks</td>
<td>Open spaces that are physically not directly related to the home but to the neighborhood and community within which one lives. Socially, these spaces will be used not only by family, friends and neighbors but also, predominantly, by others within the community who are likely to live within the vicinity of the space.</td>
</tr>
<tr>
<td>urban open</td>
<td>Playing fields and sports</td>
<td></td>
</tr>
<tr>
<td>spaces</td>
<td>grounds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>School Playgrounds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Streets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>City farms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incidental spaces and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>natural green spaces</td>
<td></td>
</tr>
<tr>
<td>Civic urban</td>
<td>Commercial</td>
<td>Open spaces that are set within the urban context but which are, usually, physically farthest from the home or are places at strategic or specific locations. Such spaces are more of a social mix where one is most likely to meet people from different walks of life and from a different physical part of the conurbation.</td>
</tr>
<tr>
<td>open spaces</td>
<td>Health and education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recreational</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4: Typology

4.3 Typology of Nightscape in Nanjing

Combining the results of theoretical studies on typology of urban open spaces and the practical situations of Nanjing city, in this section this thesis will frame up a typology of urban open spaces in Nanjing. The typology is addressed following the framework of Helen Woolley’s work and is presented as below (see Table 4), and the possible nightscape lightings are also listed out according to different kind of urban spaces.

The framework of the typology of urban open spaces cannot be directly used for building a new typology of nightscape, since there are still some differences between the two concepts. As a branch of the concept “landscape”, nightscape still has the characters of landscape. Entity and space are two main factors in both urban design and architecture design (Yan Hua, 2001). The entities like architectures, structures, roads, plantations build the physical environment of a city together. While the exterior spaces on a street or a square are defined as urban spaces. While landscape, as a general concept, includes all the entities and the exterior spaces, even the human and human activities. Therefore, the concept of landscape can be much wider than urban spaces. The grouping of different types of landscape can be done according to the similarities of the appearance in a certain area (Yu Kongjian, 1998). So the typology of nightscape is not about urban open spaces, the objects can be much larger. The nightscape of a city can even be described as a type. But this thesis aims to address a new typology of nightscape in a city. It will be about how a whole district or an area with similar characters in a city means to the citizens. Each type of nightscape may contain several different kinds of urban public spaces. A typology of nightscape is presented based on available literature and the practical situations of most Chinese cities as below.

<table>
<thead>
<tr>
<th>Main Types</th>
<th>Subtypes</th>
<th>Nightscape Lightings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic urban open spaces</td>
<td>Housing frontages</td>
<td>Architecture lighting</td>
</tr>
<tr>
<td></td>
<td>Private gardens</td>
<td>Garden lighting</td>
</tr>
<tr>
<td></td>
<td>Community gardens</td>
<td>Garden lighting, Square lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Parks</td>
<td>Park lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Playgrounds</td>
<td>Garden lighting</td>
</tr>
<tr>
<td></td>
<td>Playing fields and sports grounds</td>
<td>Garden lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Schoolyards</td>
<td>Garden lighting, Square lighting, Road lighting, Ads and signs lighting</td>
</tr>
<tr>
<td>Civic urban open spaces</td>
<td>Business pedestrian streets</td>
<td>Architecture lighting, Business street lighting, Square lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Roads</td>
<td>Road lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Civic squares</td>
<td>Square lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Historical districts</td>
<td>Architecture lighting, Street lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Waterfronts</td>
<td>Garden nightscape lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Green spaces</td>
<td>Garden nightscape lighting, Ads and signs lighting</td>
</tr>
<tr>
<td></td>
<td>Recreational zones</td>
<td>Architecture lighting, Street lighting, Special structure lighting, Ads and signs lighting</td>
</tr>
</tbody>
</table>
Chapter 4: Typology

1. Downtown/Central Business District: in most Chinese cities, downtown area is the main carrier of most commercial activities and social activities. It is usually located in the central area of a city with most prosperous streets and districts. The public facilities of downtown area are often better than other places. Municipal buildings, banks, hotels, shopping malls, high-level office buildings, squares, pedestrian spaces and other entertainment places can often easily be found in downtown area. Since the land price in downtown area is usually the highest of the whole city, the architectures there are usually designed as tall buildings or even skyscrapers in high density. The ground floor of most buildings will be used as shops, restaurants and so forth. Another character of downtown area is that it has a high accessibility for people to get. Therefore, the traffic condition usually is complex with bus lines, subway system or even ports. The flow of vehicle traffic and pedestrians keeps on a high level during both day and night.

The nightscape of downtown area is usually the brightest in a city with outstanding landmarks. This makes the nightscape of a city’s downtown area recognizable for people. A lot of dynamic and dramatic lighting methods can be seen in a downtown nightscape, creating a lively consumption environment. Due to the tall buildings and skyscrapers, architecture lighting in downtown is usually settled on both ground floors and the higher parts to make the buildings visible from far away. Square lighting can also be seen to provide a comfortable pedestrian environment where people can have more chances to enjoy their social life. Advertisements and signs lighting plays a dominate role here. They can be seen on almost all buildings’ façades and pedestrian spaces. Since most public places in downtown keep open till late night, some even be open all day for 24 hours, most of exterior lightings in downtown area also keep on whole night.

2. Pedestrian Streets: they are areas of a city or town reserved for pedestrian only use and in which some or all automobile traffic may be prohibited. Pedestrian streets provide the consumption environment where people can enjoy shopping and other services while walking. Most places along the streets are retail stores and services shops for business activities. Usually there will be parking lots and bus stations next to the entrances of the streets to facilitate people to get. Some pedestrian streets are planned to have some particular kinds of services or places to be their most attractive brand to people.

The nightscape of pedestrian streets is designed in human dimension and focuses mainly on the pedestrian spaces and shopping environment. Lighting facilities are usually settled around street entrances, street sides, squares, public infrastructure, shops’ frontages and windows, building facades, advertisements and signs. Architecture lighting, street lighting, square lighting, advertisements and signs lighting are the common types of nightscape lighting on a pedestrian street. Sometimes, there will be some special structures as landmarks located on the street, where special structures lighting might also be needed. The duration of lighting on pedestrian street usually depends on the opening time. In most situations, most public places will be closed by the midnight except some bars and nightclubs. Unlike big shopping malls, the lighting of small shops and other stores will be turned off when the places are closed. But the traffic lighting and some decorative lighting will be kept till the dawn.

3. Commercial Streets: like pedestrian streets, a commercial street also has retail stores, restaurants and services shops for different activities but vehicle traffic is permitted. Different from pedestrian streets, the stores and shops are usually arranged according to the urban planning. Places with similar functions will be in a continuous sequence along the streets. In this way, the street can be divided into several parts with different key factors in each part. A commercial street can provide multiple functions, services and experiences for people. Most commercial streets may also have their special brands, which usually are some particular wares or services known by people, like nightclubs, high-tech productions, restaurants and so forth.

A commercial street nightscape usually exists as a scene in which there will be traffic roads in the middle and pedestrian spaces on both sides. A commercial street is often wider than a pedestrian street, with taller buildings along it. There usually are street trees or shrubs or fences to keep the vehicle traffic away from pedestrian spaces. Since the width of commercial streets is usually enough for people to watch the whole façade of the buildings on the other side, architecture lighting in commercial street nightscape can be designed both on the frontages, ground floors, windows and higher places. Road lighting
Chapter 4: Typology

becomes an important part in it. Nightscape of commercial streets always needs to balance the relationship between traffic lighting and the other types of lighting to make sure neither the traffic road nor the pedestrian spaces will interfere with the other. Architecture lighting, street lighting, advertisements lighting and signs lighting are also widely used in commercial streets. But there is rarely any special structure or square on a commercial street. And in most situations, the public places along commercial streets will be closed before midnight. After that, only road lighting and some necessary signs lighting will be kept on for basic need of lighting and security.

4. **City Squares**: in most Chinese cities, the municipal government usually divides city squares into four groups: transit squares, municipal squares, community squares and monumental squares. Square is a typical form of urban open space. It can be located within or next to a community, commercial districts and civic parks or beside the roads.

According to the function of the square, its nightscape usually needs to show its particular theme. The density of lights will be lower than street nightscape. In a square nightscape, the entrances, traffic paths and public gathering spaces will be highlighted, while the grass or bushes will be less. Basic functional lighting is often used to provide a convenient walking environment for people so that they can see the ground clear enough for walking, especially the places with slopes, steps, stairs and other kind of elevation changes. The lighting of square nightscape is usually designed in smaller scale. Some lights can be designed as lamps with a lower height or even buried in the ground or grass. In this way, ground can be easily lightened for walking with gentle lights. Special structure lighting, square lighting, advertisements lighting and signs lighting are the common types of illuminations on city squares. And they are usually kept on throughout the whole night. Festival lighting can also be seen in square nightscape occasionally.

5. **Historical/cultural Scenic Districts**: this type of nightscape can be seen in many Chinese cities which have regional well-known histories, historical heritages, festive customs or artistic technologies. Usually a historical district is an area in the city with a long history protected and developed by the municipal government. But sometimes it can also be a new built district with historical street patterns, architectures and other landscape elements.

The nightscape of a historical district aims to reproduce the night view of how a urban space looked like centuries ago. It usually focus on lighten up the historical characters to enhance the artistic effects. Therefore, lights designed in traditional patterns are usually settled on architectures’ contours and special structures. Architecture lighting, special structure lighting, street lighting and signs lighting can be seen in a historical district nightscape. In most situations, the public places in historical district will be closed before midnight. After that, only road lighting and some necessary signs lighting will be kept on for basic need of lighting and security.

6. **Civic Parks**: like square nightscape, park nightscape is also quite familiar to public. Civic parks can also be divided into different types, including community parks, children parks, arboretums, zoos, sports parks and so forth. It usually consists of grass, woods, plants and other kind of soft landscape elements. Usually located next to residential areas with different types of facilities for dynamic activities like sports, games, walking or jogging, and quiet activities like sitting, sunbathing, resting.

A park nightscape also needs to fit with its particular functions or theme. Most lights will be designed only along the paths and around some public spaces. The lightened objects usually include hard landscape like hills, rocks, paths, landscape architecture; vegetation like grass, bushes, trees; waterscape like rivers, waterfalls, lakes, fountains and so on. It usually highlights the entrances, the traffic paths and the public gathering spaces. Park nightscape also has basic functional lighting to ensure the ground can be seen clearly by pedestrians, especially the places with slopes, steps, stairs, children playgrounds and other kind of elevation changes. Lighting in parks is also designed in small scale so that it will not harm the vegetation by lights or facilities installations. In a park nightscape, architecture lighting, special structure lighting, square lighting, garden lighting and signs lighting can be found. And they are usually kept on throughout the whole night. Festival lighting can also be seen in square nightscape occasionally.

7. **Traffic Roads**: traffic roads in Chinese cities usually have green belts with
Chapter 4: Typology

trees, bushes, grass which can avoid dusts, reduce traffic noise and improve driving environment. Sometimes there can be also a green island designed in the middle of road crossings to slow down the traffic flow and beautify urban landscape.

This kind of nightscape is quite different from the others. It must obey a lot of strict regulations to provide a safe traffic environment. The artistic effects of it are limited by many rules about the luminance, light colors, forms of luminaires and so on. Lighting are always designed in big scale so that the density of lights can be lower. It usually exists as a linear space with a repetition of road lamps in an appropriate rhythm, which feels dynamic and enjoyable. It basically only uses architecture lighting, road lighting, advertisements lighting and signs lighting. The lighting of traffic road nightscape is controlled by the department of traffic. The duration is decided according to the situations of seasons, weather and the actual driving visibility to ensure the traffic security.

8. Innovative Industrial Districts: as a new developed type of urban space in Chinese cities, innovative industrial district is usually an open space found in redevelopment areas, where abandonment has occurred, or in undeveloped areas. The place used to be old factories, harbors or other kind of industrial areas. It is usually redeveloped by the municipal government with policies which encourage investors to turn the abandoned place into galleries, shops, restaurants.

Since in most situations in Chinese cities, the innovative industrial districts are located in outskirt areas of a city, the accessibility is often in bad condition. The artistic functions of innovative industrial districts and the hidden defect of security usually define it as a public space better to be open only during day time. Therefore, present nightscape of innovative industrial districts in Chinese cities is still at its beginning. In most situations, it only keeps its basic traffic lighting and necessary signs lighting on during the night.

9. Waterfronts: Since the increasing awareness of waterfronts as urban open space, many cities are working to increase public access to waterfront areas by developing waterfront parks. Waterfronts usually contain the shoreline areas by the sea or rivers and the public spaces by lakes or ponds in civic parks.

The waterfronts nightscape is designed in the biggest scale. It usually has the perfect opportunity to present the skyline of a part of a city’s nightscape from a long distance. The reflection of the water plays an important role in waterfronts nightscape. Since it is usually designed in city scale, some detailed lighting will not be visible in waterfronts nightscape. In most situations, only architecture lighting and special structure lighting can be identified in waterfront nightscape. The lights are often settled on landmarks, skyscrapers and tall buildings and the lighting can be kept on for whole night.
Chapter 5. Nightscape Analysis

After addressing the typology of nightscape in Nanjing, in this chapter this thesis will choose several typical sites in Nanjing which can show different types of nightscape in Nanjing. However, since the construction of nightscape in Nanjing has not been consummated everywhere, some types of nightscape are still difficult to find. Therefore, the site choosing takes the official lighting planning as reference (Figure 1). According to the overall framework of landscape lighting plan in Nanjing (Shen & Qi, 2010), five sites are chosen to be analyzed in this thesis: Xin Jiekou (as downtown nightscape), Urban Plaza of Drum Tower (as city square), Hunan Road (as pedestrian street), Confucius Temple (as historical scenic district), and City Park of Xuan Wu Lake (as civic park). It is noteworthy that analyzing or evaluating a nightscape can hardly find an easy mode to follow. It might need a lot of photometric measures and knowledge to get the objective data of the lighting quality. Additionally, as a particular kind of landscape, nightscape is quite hard to find another case to compare. Besides, people can always have different opinions on the effects of a nightscape, which might base on their personal taste, experiences and knowledge. In this thesis, the evaluation is proceeded from the view of urban designing. Therefore, this thesis also takes some surveys and researches, which are done by other scholars from other subjects, as references to help evaluating the sites.

5.1 Indicators Structuring

This section lists out the indicators that will be used in the following evaluations and gives explanations to them. In this part, the indicators are divided into two groups: physical indicators and mental indicators. The physical indicators are chosen according to <The Terminology and Definition of Nightscape Lighting> (Xiao & Zhang, 2004).

**Luminance:** In the field of photometry, luminance is a measure that is used to characterize emission or reflection from surfaces. According to the <Lighting Design Glossary>, luminance indicates how much luminous power will be detected by an eye looking at the surface from a particular angle of view. Luminance is thus an indicator of how bright the surface will appear (Mischler, 2004). In this thesis, luminance will be used as an indicator of how bright the light source emission or the reflection from lightened objects surfaces is, correlate with human brightness perception.

**Reflectance:** Reflectance means when the incident light illuminates the surfaces, how much luminous power will be reflected (Xiao & Zhang, 2004).
Chapter 5: Nightscape Analysis

By analyzing the reflectance, it will be easier to judge if the lighting design fits with the objects surfaces.

**Luminance contrast:** Luminance contrast is used to describe the luminance differences between the lightened object and the surrounding background.

**Color contrast:** Color is also a key character in lighting design, especially sometimes multicolor lighting or dynamic lighting is used. This indicator will be used to demonstrate people’s feelings when they observe different colors in their sight on the same time or with a certain order.

**Spill light:** Usually in lighting design, lighting facilities are settled with a particular target. Sometimes due to wrong installations or lighting design, the lights will illuminate a wider range or a farther distance. In that case, the lights that illuminate other places outside the designed target area will be described as spill light (Xiao & Zhang, 2004).

**Obtrusive light:** When the amount, direction or other characters of the spill light makes people in a certain situation uncomfortable, distracted or decrease their visual ability temporarily, this kind of spill light can also be called as obtrusive light (Xiao & Zhang, 2004).

**Glare:** It is a kind of visual phenomena that usually due to inappropriate brightness distribution or lighting range, or even extreme contrasts, so as to cause a feeling of discomfort or a temporary decrease of the ability to observe details or target.

**Light pollution:** Light pollution is usually caused by obtrusive light or other excessive artificial light. It can bring adverse consequences to human health, vegetation and ecological environment. Recent years it has been pointed out that light pollution can also interfere with astronomical observations. And there might be even more adverse effects which are still not known yet (Xiao & Zhang, 2004).

**Curfew:** In some situations, since the lack of technology or detailed planning, the obtrusive light cannot easily be avoided. To make it under control, sometimes there will be a curfew to add some limitations to the duration of the lighting.

Besides the indicators above, during the evaluation, the particular lighting modes, like dynamic lighting, will also be taken into consideration. And the maintenance status of lighting facilities in both day and night will also be an indicator. Since this thesis is written from the angle of urban design, the evaluation will be human-oriented. In this case, the following sections will be shown with an emphasis on human dimension and human behaviors. The data are collected from the author’s practical observations and some interviews or informal conversations between the author and citizens, with their vocations and other basic information recorded. There are also some other data that are collected from some surveys and researches which are done by other scholars from other fields but about the same sites.

5.2 Case A: Xin Jiekou Business District

5.2.1 Location

Xin Jiekou, the biggest commercial center of Nanjing with a lot of skyscrapers in it, has a variety of business and commercial buildings like shopping malls, banks, small shops, restaurants and the biggest underground shopping street of Nanjing. It is always one of the brightest places during the night in Nanjing, which can also be a problem (Figure 2.1). As illustrated in Figure 2.2, the core area is basically around the crossing of Hanzhong Road and Zhongshan Road, surrounded by the skyscrapers like Deji Plazas (A), Jinling Hotel (C), Cen-best Plaza (H), East Mall (G) and so forth. Xin Jiekou is treated as the third biggest business district in China, while the density of buildings here is the highest (Zhou, 2011).

5.2.2 Overall Nightscape Status

Through the field survey and observations, the overall nightscape status in Xin Jiekou could be described as below. The spatial structure in this district is mainly propped up by the skyscrapers and large commercial complexes. Most of them are designed as multifunctional buildings with shopping malls on the first five or more floors and office uses in the higher part. This character also
Chapter 5: Nightscape Analysis

makes an effect on the buildings lighting design. Almost every tall building in the district has interior lighting inside the shop windows on ground floor to show on sale wares or the interior shopping environment. On the height from second floor to fifth floor or more, where can still be seen by people from a short distance, the facades of buildings are always taken by advertising lighting, neon signboards, LED screens or other kinds of decorative lighting. The facades of the higher part of the buildings are usually lightened by contour lighting or floodlighting, just showing the outlines and building structures. On the top of the skyscrapers, because they are usually designed with some special structures or attractions there, there are some extra accent lighting settled, like contour lighting for the top floor or neon lights on the buildings’ signboards on the top. In the pedestrian spaces around the Fashion Lady Plaza (Figure 2.2, L), a lot of advertising light boxes and road lamps are designed there. Some sculptures and plants also have lights with a gentle luminance. Most decorative lightings of the buildings are designed quite bright to be the most prominent one, even though the luminance of each single lighting might be within the stipulated range, the overall effect still has some problems. This is because the lighting design of each building did not take others into consideration. Most of these skyscrapers in Xin Jiekou district are modern architectures with lots of glass curtain walls as their façade materials. The reflected lights among this high density district cause a rather bright cross irradiation, which makes this area and the sky above it much brighter than anywhere surrounding. During the interviews, some citizens especially drivers complained about the extreme luminance contrast in Xin Jiekou. Zhou Changchang, a professor of the School of Environment in Nanjing University, pointed out that “due to the bright building lighting and advertising lighting, the traffic lighting barely serve its designed purpose.” During the field observations, the author also found out that sometimes the road lamps and some other ground lights are not even in use.

In 2011, the School of Environment in Nanjing University did a questionnaire survey about the satisfaction and citizens’ advices on the nightscape in Xin Jiekou. It turned out that most citizens thought "unreasonable energy distribution " and "lack of integrity" are two major problems in Xin Jiekou. The interviewees pointed out that the regional commercial lighting (building facades lighting, neon signboards, advertising light boxes, electronic screens,
Chapter 5: Nightscape Analysis

etc.) is obviously brighter than that in other regions, and the role of road lighting is almost negligible. Meanwhile, people thought the quality of the lightings are uneven; some facilities were damaged for a long time without any repairing. The survey results showed that the majority of interviewees believed that the overall nightscape brightness in Xin Jiekou district was acceptable, but it still had some problems, such as waste of energy, lack of regional features and overall planning, lack of aesthetic value. In their study, they also pointed out that most Nanjing citizens thought blue and green could be the theme colors in Xin Jiekou nightscape, and some of the building façade lighting can be reduced (Tan, 2011).

5.2.3 Detail Nightscape Status

A. Deji Plaza

Located on the northeast corner (Figure 2.2, A), Deji Plaza defines itself as a high-end commercial shopping mall with a lot of global brands in it. The lighting method used at the entrances and ground floor is interior lighting. Through the glass curtain walls, the interior spaces and commodity inside shop windows can be seen clearly by pedestrians. The front façade has an extra layer to put the lights inside it so that the façade lighting will not be too dazzling (Figure 2.3). The lighting facilities can be found on the other facades of the building are all advertising boards with the brands on them (Figure 2.4). Although the plaza gives each store inside it the right to remodel the facades and interior spaces in some degrees, the façade lighting of the whole building is still well organized. On the other part of building facades, there are not glasses or any other kind of materials that can provide lighting from the interior space. In this way, Deji Plaza keeps its façade lighting in a gentle brightness and cold colors without causing any obtrusive light. On the frontage of the plaza, the road lamps and other ground lights cooperate with the building lighting very well to create a comfortable pedestrian space.

B. Tianshi Tech Plaza

Tianshi Tech Plaza, unlike Deji, is not a shopping mall but an office building with many companies in it. It is located behind the historical site of Industrial and Commercial Bank (Figure 2.6). As an old tall building that has been built for decades, Tianshi Tech Plaza has not changed its appearance very much. In factor, it barely has any nightscape lighting except the huge LED full-color screen on its west façade. The plaza gets quite a lot of profits from the screen, but it is still not a good lighting design. The height and the size of the screen make it impossible for people to watch the contents on it from a short distance. The nearest open public space is the square in front of Deji Plaza and the historical ICBC. But people on this square are unable to look upon the screen. The second open public space is a small city square on the opposite side of Zhongshan Road, while the screen is still out of human dimension for people on that square. The luminance of the screen is quite high and the colors are usually very bright. Hu Xiaohong, a taxi driver, complained about the over-
Chapter 5: Nightscape Analysis

sized LED screen “It is too bright that sometimes I cannot see the traffic lights. Especially when the screen flashes, I might be unable to see anything for a short while.”

C. Jinling Hotel

![Figure 2.7: Night view of Jinling Hotel (C), Nanjing](http://img1.ddmapimg.com/poi/970439_093365_76.jpg)

Jinling Hotel was built in 1983 on the northwest corner of the main crossing (Figure 2.2, C). It was once the tallest building in China, being considered as an important symbol of Nanjing. The lighting design of Jinling Hotel is extremely simple (Figure 2.7). On the top of the buildings, there are only simple white neon lights showing the name of the hotel. There are not any decorative lights on the facades but the interior lights from each window. Since the thirty sixth floor of the hotel is a rotating restaurant, the façades on that floor are designed as glass walls to make this floor distinguished from the others. The lighting design of Jinling Hotel is considered as a successful example for many citizens. Another reason that makes it so successful is that the color of the building itself is white, which makes it still visible in night. And the lighting that comes from other buildings just works as a kind of floodlights for the hotel. All these factors make Jinling Hotel very impressive in people’s both sight and mind.

D. Jinlun Plaza

![Figure 2.8: Night view of Jinlun Plaza (D), Nanjing](http://timg.ddmapimg.com/topic/129230342015.jpg)

Jinlun Plaza was built in 2008. Since the location of the plaza is almost at the west end of Xin Jiekou district (Figure 2.2, D), Jinlun plaza is not as popular as the other big shopping malls. Generally, it is not a big plaza; it only has four floors above the ground and one under the ground which is connected with the subway system. But it still has its own characters with a lot of restaurants, chain stores and shops. The columns at the main entrance are designed into an artistic form with neon lights on them which can be easily recognized in the day time (Figure 2.8). But in order to reduce the cost of lighting, the lights on the columns are only turned on during festivals. The façade lighting of the building also shows a feeling of disorder. On its ground floor, interior lighting is used to show the on-sale products through glass walls. The higher part of the facades is taken by advertising light boxes in different types with different brands on them. For the biggest advertising board above the main entrance, a lot of small floodlights are designed to provide accent lighting. But the effect is not good enough: the luminance of the board is uneven; the middle part of the board is not lightened well.
Chapter 5: Nightscape Analysis

E. Golden Eagle Plaza

As the third tallest building in Xin Jiekou district, even is also located on the west end of the district (Figure 2.2, E), Golden Eagle Plaza can still be treated as one of the landmarks of downtown in Nanjing. Just like its name, the night view of the building shows a general color as golden (Figure 2.9). Golden Eagle Plaza uses interior lighting on the facades of both ground floor and second floor. With the glass curtain walls at the main entrance, the interior spaces can be clearly presented to the public. From third floor to fifth floor, there is no lighting on its facades, but since the material of this part is glasses with high reflectance, the lighting of other buildings can still be reflected by it, which can cause spill light sometimes. For the higher part, there are floodlights settled at the positions where the architecture style changes, forming a gradient lighting effect on the facades. And at the top of the buildings, neon lights are also used on its signboard.

F. International Commercial Center

Located on the southwest corner of the central crossing in Xin Jiekou, International Commercial Center is another outstanding skyscraper (Figure 2.2, F). Unlike other buildings, International Commercial Center is mainly used as an office building with companies, institutions, restaurants and hotels in it. Even though it is the tallest skyscraper in Xin Jiekou, it only has its east façade can be seen by people in this district. All these factors decide that the lighting design of it can hardly impress the public a lot. On its east façade, there are a lot of neon lights showing the names of the companies, restaurants or hotels in it. The neon lights are designed to be either in yellow or white, this helps to make the overall effect harmonious. As illustrated in Figure 2.10, the east façade of International Commercial Center is designed to be a huge LED screen for advertising. However, because of both lack of investors and light pollution, the screen was stopped by the municipal government. Therefore, now the building’s façade lighting only relies on the interior lighting.

G. East Mall

Like Deji Plaza, East Mall defines itself as a high-end commercial shopping mall with a lot of internationally renowned brands in it, too. East Mall was built in 2000 next to the International Commercial Center (Figure 2.2, G). The night view of East Mall is quite different from the others. That is because it chooses to use contour lighting with yellow linear lights to show its outlines and architectural structure (Figure 2.11). The overall lighting effect of East Mall is in warm yellow and not quite prominent. On the first floor, interior lighting can be also seen through the glass walls. For the upper part, it
uses low-luminance floodlights which are settled in the frontage to create a uniformly lightened façade without disturbing the pedestrians or the traffic flows. East Mall also has a LED screen for advertising, which is on its north façade, but the size is smaller than the others that can be found in this district.

H&I. Cen-best Plaza
Located on the southeast corner of the main crossing in Xin Jiekou (Figure 2.2, H), Cen-best Plaza is the shopping mall that has the longest history in this district. The building was constructed through three phases. The first and second phases are the construction in 2007 of the shopping mall part as its base six floors and the underground floor. The third phase is the office building part which was completed in 2010, making itself another skyscraper in Xin Jiekou (Figure 2.2, I). Cen-best Plaza has one of the best locations in the central district, with the shortest distance to the main crossing. The night view of Cen-best Plaza is always treated as the window of the whole nightscape of Xin Jiekou. After a project of renewal in 2011, the night view of Cen-best Plaza now presents an appearance of modern architecture (Figure 2.12). The podium building has an extra façade with gentle lighting inside it on each side. Only a few advertising boards are designed on the facades. However, the new façade lighting does not work very well. During the field surveys, the quality and current status of the lighting facilities shows some problems like uneven luminance. Invalid lights can be easily found on each façade, damaging the overall artistic effect a lot. On the ground floor, it does not choose interior lighting to show the spaces inside, but only makes a show corridor along the façade with models in it. At the main entrance, a neon signboard is settled on the top and a LED screen takes the place of main façade. Ma Liangqi, the director of the department of Nanjing cityscape, introduced how the LED screen is ran “Usually it is owned by the mall owners but ran by advertising companies. The screen on Cen-best Plaza’s main façade provides sixty presentations with fifteen seconds for each. It brings hundreds of thousands profits for the plaza each week, which makes it the most expensive LED screen in Nanjing” (Li, 2013). The higher part, which is used as office building, shows a beautiful night view with contour lighting presenting its structural features. And an outstanding neon lighting signboard is on the top saying “Nanjing Center”, highlighting its importance in the whole district.

J&K. Century Commercial Center
Century Commercial Center is the tallest skyscraper in Xin Jiekou district (Figure 2.2, J&K). Its podium building changed into Suning Expo Shopping Mall since 2012. As a brand new mall, Suning Expo focuses on selling appliances and high-tech products. It has to be admitted that this shopping mall is always less popular than the others. The overall night view of Suning Expo shows a colorful picture with a feeling of disorder (Figure 2.13). On
Chapter 5: Nightscape Analysis

its façade lighting, it uses white contour lighting to highlight each floor. While the advertising boards on its facades are in different colors and styles, and even use different lighting methods, making the façade lighting quite inharmonious. Unlike the façade lighting, the lights at its main entrance are all in warm colors. The LED screen above the entrance is rented to present the advertisements of alcohol or estate which has no relationship with the shopping mall itself at all. On its northwest corner, it uses six different colors in the interior lighting on each floor but without any contents shown to the public. For the higher part of Century Commercial Center, there are a lot of small lights arranged along the windows’ pattern on its facades (Figure 2.14). These blue lights make the façade lighting very regular and uniform. But it might still be too many, which also costs a lot of energy and budget. On the top of Century Commercial Center, neon lights with high luminance highlight the top structure with red warm lighting, announcing this is the top point in the whole district.

L. Fashion Lady Square

Fashion Lady Square is an open public space surrounded by the tall buildings like Cen-best Plaza, Century Commercial Center, and Central Shopping Mall (Figure 2.2, L). The main entrance of Fashion Lady Underground Plaza is also located on this square with a huge tensioned membrane structure covering it (Figure 2.15). This square and the streets that are connected to it make up the pedestrian spaces in the area. The lighting for the pedestrian spaces mainly comes from the surrounding building façade lighting. Some tall lamps are put on each corner of the square with low luminance which can still provide basic square lighting when the shopping malls are closed after midnight. The tensioned membrane structure is one of the biggest attractions in this area. Floodlights are settled around it, providing a cross lighting to make it the most prominent node. The color of the lights can be changed due to different seasons and festivals. Around the special structure, there are also some lights around the street furniture or other landscape facilities. There are barely any other street lamps, ground lights or square lights can be found, because they will not be useful compared with the building façade lighting with high luminance. But this situation also makes the pedestrian spaces boring and lack of lighting in human dimension.
Chapter 5: Nightscape Analysis

M. Central Shopping Mall
Like Cen-best Plaza, Central Shopping Mall also has a long history since it was built in 1936 (Figure 2.2, M). It was the first shopping mall in Nanjing. But this historical character also makes the building look a little worn out. Therefore, in 2011, together with Cen-best Plaza, Central Shopping Mall also started a project of renewal to have a completely new appearance for the public (Figure 2.16). Like Cen-best Plaza, the façade lighting of Central Shopping Mall also uses an extra layer to provide a gentle interior lighting. In this way, the façades will look modern and uniform and the lighting facilities are hard to be recognized in the day time. Considering the interior spatial structure of this old shopping mall still does not fit for being shown to the public through glass walls, only at its entrances can the interior spaces be visible from outside. However, some similar problems also appear here. During the field surveys, uneven luminance can also be found on the facades. Quite a few invalid lights on each façade damage the overall artistic effect a lot. Even part of the LED screen above its main entrance has been out of work for a long time without repairing.

N. Dayang Plaza
Dayang Plaza is usually described as located at the south end of Xin Jiekou district (Figure 2.2, N). But its underground floor is connected with the subway system which keeps its accessibility. Different from other buildings, Dayang Plaza has an outstanding icon on its façade. The overall night view of Dayang Plaza takes red and white as its main colors (Figure 2.17). It uses red contour lighting to show its structural features and red neon lights to highlight its signboard and icon. Regular advertising boards on the facades are also kept in a unified style with black and white as main colors. The interior spaces on the ground floor can be seen clearly on each side from outside.

5.2.4 Conclusion
As the chosen downtown site in Nanjing, Xin Jiekou District shows a nightscape of high density commercial district with bright illumination system. The high density of commercial buildings also becomes one of the main causes of the domination of building lighting and advertising lighting in this district. The functions of road lighting and ground lighting are quite unnoticeable for vehicles and pedestrians. The façade lighting and signboard lighting of shopping malls and stores provide most of the illuminations in Xin Jiekou. Cross lighting happens a lot among the spaces between adjacent buildings. There is also a lack of overall lighting planning: the commercial buildings have completely different lighting facilities, lighting methods, luminance and colors. Another problem is the abuse of advertising lighting. There is a huge amount of neon lights, advertising lighting boxes, LED screens and other kinds of façade advertisements on the buildings. These advertising lightings all have high luminance which makes the whole area much brighter than surroundings. And these advertising lightings also cause a waste of
energy and light pollution. Generally, the nightscape of Xin Jiekou District can be concluded as below:

**Strongpoints:**
- The whole district has plenty of lights for all kinds of activities to be carried out in the urban spaces;
- The nightscape shows a diversity of different lighting methods and lighting designs;
- The overall night view of Xin Jiekou District successfully creates a picture of the city center of Nanjing with strong modern commercial atmosphere;
- The façade lighting and decorative lighting of most skyscrapers help emphasize the unique architectural characters, making the tall buildings more recognizable to people as landmarks.

**Shortcomings:**
- The luminance of the whole district is in a much higher level than the surrounding urban spaces;
- Some building lightings use inappropriate lighting methods or lighting design which cause over-bright cross lightings to the pedestrian spaces;
- There is a lack of street-scale lighting design;
- Traffic lighting and pedestrian spaces lighting are covered over by the building lightings;
- Most of the lighting facilities are out of human dimension;
- The abuse of huge LED screen with high luminance happens on most of the commercial buildings;
- Disorderly advertising lightings take over most parts of the building façades;
- There are a lot of glares, spill lights and light pollution produced in this district.

### 5.3 Case B: Urban Plaza of Drum Tower

![Night view of Urban Plaza of Drum Tower, Nanjing](http://www.flickr.com/photos/magiccube/3338238982/)

![Map of Xin Jiekou, Nanjing](http://map.baidu.com/)

Figure 3.1: Night view of Urban Plaza of Drum Tower, Nanjing
Source: http://www.flickr.com/photos/magiccube/3338238982/

Figure 3.2: Map of Xin Jiekou, Nanjing
Source: http://map.baidu.com/
Chapter 5: Nightscape Analysis

5.3.1 Location

The site is located in the central area of Drum Tower District. With three city roads going through and the subway station, it could be defined as a transit oriented area. Urban Plaza of Drum Tower is on the northeast corner of the crossing, mainly serving the surrounding residents and tourists. With the historical drum tower, Zi Feng skyscraper (the tallest building in Nanjing) located next to it, Urban Plaza of Drum Tower is one of the most important urban public spaces for citizens in Nanjing. There are also a lot of different companies’ buildings nearby, like the Postal Building, banks, hospital, Fire-fighting Building, hotels and so on. The multifunctional character also makes the nightscape of the urban spaces around the urban plaza quite complicated.

5.3.2 Overall Nightscape Status

The nightscape of this area is very easy to recognize, since it has the tallest building Zi Feng Tower and the historical drum tower as landmarks. The spatial structure here is in large scale with lower density than Xin Jiekou district. The traffic at the central crossing is always busy in most time of a day. As illustrated in Figure 3.2, there are also several other tall buildings located in this area, like the Multimedia Building (A), Telecom Building (B), Red Cross Hospital (F), Postal Building (G) and so forth. But unlike the skyscrapers in Xin Jiekou, LED screens or advertising boards are not settled on each building. Since there is a central greenery island at the crossing, the central area always has a higher luminance than the surroundings. Traffic lighting, square lighting and building lighting make this area another bright node in Nanjing city (Figure 3.1).

In the municipal lighting planning, the nightscape of this area around the Urban Plaza of Drum Tower is designed to be a picture with splendid skyscrapers, beautiful landscape in the park and the central island, citizens enjoying the urban infrastructures on the city square and orderly traffic flows on the roads. But in the field observations, the outcomes did not work out as what the municipal planning. The glare pollution happened in most places of this area, making the night here like day time. Both pedestrians and drivers complained about the bright lighting here. The designed waterscape and artistic lighting facilities are out of work for a long time. And city square was almost empty after 20 o’clock, especially the west part of it. In 2010, a group of master degree students from Nanjing Forestry University made a survey on the behaviors of the users of Urban Plaza of Drum Tower. They found out that throughout the whole day; the west part of the plaza was barely used, while the east part was apparently the users’ favorite place. But when night fell, the amount of users decreased rapidly. “Even it was the time right after dinner for most families, the number of citizens who walks on the east part of the square is less than twenty within a period of half an hour.” (Zhang, Hong & Wang, 2010) As a conclusion, they pointed out one of the biggest weakness of the plaza is “The design of this square did not take the surrounding factors into consideration. Surrounded by three heavy traffic roads, the public spaces on the square are exposed without necessary protection like vegetation or other facilities, especially on the west part with only grass there. During night, the bright lights coming from every direction just illuminate most places in the square, making people feel like they are standing on a stage to be watched by others. That would be a terrible mental experience for the users in the night.”(Zhang, Hong & Wang, 2010)

5.3.3 Detail Nightscape Status

A. Multimedia Building & B. Telecom Building

In the municipal lighting planning, the nightscape of this area around the Urban Plaza of Drum Tower is designed to be a picture with splendid skyscrapers, beautiful landscape in the park and the central island, citizens enjoying the urban infrastructures on the city square and orderly traffic flows on the roads. But in the field observations, the outcomes did not work out as what the municipal planning. The glare pollution happened in most places of this area, making the night here like day time. Both pedestrians and drivers complained about the bright lighting here. The designed waterscape and artistic lighting facilities are out of work for a long time. And city square was almost empty after 20 o’clock, especially the west part of it. In 2010, a group of master degree students from Nanjing Forestry University made a survey on the behaviors of the users of Urban Plaza of Drum Tower. They found out that throughout the whole day; the west part of the plaza was barely used, while the east part was apparently the users’ favorite place. But when night fell, the amount of users decreased rapidly. “Even it was the time right after dinner for most families, the number of citizens who walks on the east part of the square is less than twenty within a period of half an hour.” (Zhang, Hong & Wang, 2010) As a conclusion, they pointed out one of the biggest weakness of the plaza is “The design of this square did not take the surrounding factors into consideration. Surrounded by three heavy traffic roads, the public spaces on the square are exposed without necessary protection like vegetation or other facilities, especially on the west part with only grass there. During night, the bright lights coming from every direction just illuminate most places in the square, making people feel like they are standing on a stage to be watched by others. That would be a terrible mental experience for the users in the night.”(Zhang, Hong & Wang, 2010)
Chapter 5: Nightscape Analysis

side of the city square (Figure 3.2, A & B). Both of them are office buildings, while Telecom Building has a podium part as its business hall serving the public during the day. On the south and west facades of the podium building of Telecom Building, there are two big LED screens which work the whole day and night presenting advertisements of cell phones and telecom services. A smaller LED screen can also be found on the south facade of Multimedia Building, illuminates the east part of the city square from a short distance. The whole south facade of Telecom Office Building was designed with colorful lights which can create a dynamic effect during the night (Figure 3.3). But this facade lighting was shut down by the Urban Management Bureau in 2011 to reduce the light pollution in this area. Now the Telecom Office Building has no facade lighting at all and is completely dark during night, which becomes another problem. Multimedia Building’s facade lighting mainly uses interior lighting with contour lighting in low luminance and blue color, achieving a nice overall effect in night.

C. City Square

Figure 3.4 is a photo taken from the Zi Feng Tower towards the city square. As it is illustrated, compared with the traffic lighting and building facade lighting, the square lighting can be barely found. The west part of the city square is much brighter than the east part. Figure 3.5 shows the night view inside east part of the city square. Obviously, under the bright lights around the central crossing, the star sky is completely invisible in this area. The lights on the city square mainly use two colors: yellowish lamps along the paths and green ground lights around trees. The big contrast between these two colors makes the night view strange, even horrible for pedestrians. And the northeast part of the square shows a lack of enough lighting for basic needs.

D. Zi Feng Tower

The construction of Zi Feng Tower was finished by the end of 2010. As the tallest building in Nanjing, the original lighting design of Zi Feng Tower
Chapter 5: Nightscape Analysis

tried a lot to make it as prominent as possible in the night. There were a lot of floodlights settled both on its frontage and its facades to provide itself spotlight from different directions. Laser technology was also used in its lighting design. But that lighting proposal was terminated by the municipal government since it caused too much glare pollution. For now, Zi Feng Tower stops using any laser illuminations and most of the floodlights. The night view of Zi Feng Tower can be divided into three parts. For its podium building, it uses ground floodlights for its façade lighting. For the middle parts, it only uses the interior lights without any other decorative lighting. For the higher parts, which are above the seventy second floor, a lot of LED lights are designed to present façade lighting mainly in purple and yellow colors, highlighting its structural features.

E. Park of Drum Tower

Drum Tower was built in Ming Dynasty (BC 1382). It is located on a hill which is right on the east side of the central crossing (Figure 3.2, E). The park of Drum Tower was built in 1923 with two pavilions and Drum Tower in it. But the park is only open between 8 o’clock in the morning and 5 o’clock in the afternoon. Since the park is always closed in night, the lighting of it usually only keeps basic lights at the entrance. Only in some important festivals, the neon lights settled on the rooftop of Drum Tower will be turned on as its contour lighting (Figure 3.7). The lights on Drum Tower are all designed into warm colors and as floodlights.

G. Postal Building

Postal Building is located on the southeast corner of the central crossing (Figure 3.2, G). It is another special case in this area: it only uses several floodlights around it to provide the façade lighting. The floodlights are specially designed with a height over three meters to avoid disturbing pedestrians. On its northeast façade, which is right facing Zi Feng Tower and the central greenery island, there is a huge LED screen (Figure 3.9). This screen is rented by a newspaper company to present daily news. The news is always presented in extremely bright colors with a fast speed when the news changes. It is one of the biggest problems in this area, causing a lot of glare pollution to pedestrians, drivers and even residents (Figure 3.10). During the interviews, almost every citizen complained about the screen. A 67-year-old retired citizen said “when the screen flashes, my eyes feel very uncomfortable and I must wait for a while
to be able to see things clearly again.” Xu Xiang, a bus driver, explained “the biggest problem about this screen is not its size, but its luminance and colors.” Besides, as a transit oriented area, usually the messages on this screen cannot be possible for most people to finish reading. And there is not a big square or other place for the audience to stay and read on its facing direction.

5.3.4 Conclusion

According to <Encyclopedia of China (Architecture, Landscape and Urban Planning Volume)>, the squares can be seen in Chinese cities can be divided into six types (1988):
1. Municipal Square: square which is mainly used for political activities, cultural gatherings, celebrations, processions, rituals and festive events;
2. Transportation Square: square which is located beside the main transit nodes of vehicles, aircrafts or ships in the city;
3. Commercial Square: square which is located in the commercial district, mainly used for shopping or leisure activities;
4. Memorial Square: square which is built to commemorate some particular person or event;
5. Religious Square: square which is located in front of temples or ancestral halls, mainly used for celebrations, gatherings and processions;
6. Entertaining Square: square which is mainly used for relaxing, resting, gathering or amusing activities.

Since different types of squares have different functions and landscape features, one of the basic principles of city square nightscape design is helping the square fulfill its duty during night and presenting its nightscape features. Urban Plaza of Drum Tower has the characters of transportation square and entertaining square. It is located right next to Drum Tower transit node with three main city roads and one subway station in this area. Another special character of Urban Plaza of Drum Tower is there are two landmarks located beside it: Zi Feng Tower and historical Drum Tower. The nightscape status of Urban Plaza of Drum Tower is in bad conditions. On one hand it is because the lighting designs of surroundings have much higher luminance than the plaza. On the other hand, the lighting design inside the plaza fails to cover the whole area, making the east part of the plaza almost dark during the night. And the plants lighting in the plaza chooses green as its lighting color, which creating a creepy atmosphere for the plaza. The distribution of lighting luminance in the area is extremely unbalanced. As an important node for urban traffic systems and urban landscape, the lighting design in this area needs to be improved immediately. Generally, the nightscape status in the area can be concluded as below:

**Strongpoints:**
• The central crossing gets fully illuminated by the traffic lighting and surrounding building lightings;
• The overall lighting effect of the urban plaza is capable to provide a calm night space for people.

**Shortcomings:**
• The distribution of lighting luminance on the plaza is unbalanced. The east part of the plaza has a lack of plenty lights for basic night activities, while the west part is over-lighted by the surroundings;
• The colorful vegetation lighting on the plaza is inappropriate and creates uncomfortable atmosphere for pedestrians;
• The square lighting has a lack of artistic design for its style and overall planning, only providing basic square lights;
• The spill lights coming from traffic roads and surrounding buildings damage the night view in the plaza;
• The huge LED screen on the main façade of Postal Building creates a lot of glares and light pollution to both the traffic roads and the square.
Chapter 5: Nightscape Analysis

5.4 Case C: Hu Nan Pedestrian Street

5.4.1 Location

Hu Nan Pedestrian Street is a special street which is usually known as the place with the most famous Nanjing restaurants on it. The pedestrian street is a branch of Hu Nan Road, located at the middle part of the road. Along Hu Nan Road, besides the pedestrian street, there is also a military base, 125 clothes shops, 7 jewelry shops, 13 shopping centers, 9 hotels, 4 book stores and a light art tunnel on the opposite of the pedestrian street. The chosen site is also named as Lion Bridge Food Street. It used to be a farmers’ market before 2000. At the beginning of 2000, the municipal government invested 8.8 million yuan to transform this site into a brand new pedestrian street. In the transform project, all the ground pavements changed into granite paving. No wires or poles are kept on the street any more. And a lot of new street furniture and landscape facilities like ground fountains, flower pots, landscape lamps, lounge benches and public phone booths are added. All residential buildings along the street gained unified facades with lighting facilities on them. And two memorial arches are put on both entrances of the pedestrian street, which have already become the landmarks of this site. Nowadays this pedestrian street is well known by people from all over the country as an attractive street with charming landscape, excellent services, and the famous catering culture in Nanjing. These complex regional conditions also make the nightscape here show a diversity of different characters.

5.4.2 Overall Nightscape Status

The spatial structure of the pedestrian street is designed to fit in with human dimension. With a length of 330 meters, the width of the street is kept between 12 to 16 meters. Most of the buildings on both sides along the street have a height less than 20 meters. All the spaces on the ground floor of the residential buildings are taken to be used as restaurants or shops with lighting signboards. Most signboards and advertising lighting use neon lights or LED lights with warm color like red and yellow to attract customers. Usually the lighting boards outside the restaurants which have traditional brands are in bigger size and higher luminance. Some traditional elements can be also seen in the nightscape of the street like lanterns. Because of the scale and the bright building lighting, there is few ground lighting and lamps designed on this street. The lighting for the pedestrian spaces is mainly provided by building lights.
Chapter 5: Nightscape Analysis

lighting and advertising lighting. With all the restaurants and stores trying best to get pedestrians’ attention, the building lighting on the ground floor shows a prosperous picture with various colors and styles. For the residential buildings, only a few blue contour lights with low luminance are settled. With the luminance contrast on the facades between ground floor and residential floors, the overall nightscape lighting design successfully draws pedestrians’ attention onto the commercial spaces and keeps the residents in this area away from light pollution.

5.4.3 Detail Nightscape Status

A. Suning Universal Shopping Center

Suning Universal Shopping Center is located on the opposite side of the north entrance of the pedestrian street (Figure 4.2, A). It was built in 2004, 4 years later than the transformation of the street. Wang Min, a master degree student from Southeast University, pointed out that the night view of Suning Universal Shopping Center still need improvement after her field survey on the shopping environment on Hu Nan Road (Wang, 2008). During the interviews done by the author in 2013, the lighting design of Suning Universal Shopping Center still did not satisfy most citizens. Most interviewees complained that the lightings on its west façade and south façade have a huge contrast. It is true that there is almost no façade lighting on its west façade (Figure 4.3). And on its south façade, the lighting is quite bright with interior lighting on its ground floor and a lot of advertising lighting from third floor to sixth floor; the advertisements on sixth floor are already out of pedestrians’ sight. And on its top floor, it uses pink and red lights to be decorative lighting without any particular lightened contents. On the main façade above its main entrance, there is a big bright LED screen and a series of neon lights designed as special patterns. The neon lights can be easily recognized during the day time on the glass wall, which make bad influences on the building’s appearance during the day. What makes the lighting design of this building such a failure? Some of the reasons can be seen through an analysis of its process of changes. As illustrated in Figure 4.4, in 2004 when the building was just constructed, there was not any special façade lighting designed on it. The architectural style was quite concise and clear. But later, since more and more people started to realize the importance of the nightscape, the shopping center installed the neon lights on its front façade in 2004; and its signboard had blue lights on its name with a low luminance (Figure 4.5). In 2008, based on the former lighting design, more neon lights were added onto the signboard as background with multi colors (Figure 4.6). And the advertising lightings on south façade appeared as well without a unified style. Then in 2010, like most of other shopping malls, LED screen came into the owner’s sight. The old signboard was replaced by a big LED screen which can bring more profits (Figure 4.7). It can be seen that nightscape lighting was treated as a method not for beautifying the building’s night view but for bringing more profits and attracting more customers. The reason that there is no façade lighting on west façade is that the west façade does not facing any traffic flow or pedestrian spaces. This profit-driving understanding on nightscape lighting leads to this overall night view of Suning
Chapter 5: Nightscape Analysis

Universal Shopping Center today: dark west façade, old-fashioned neon lights on front façade, big LED screen with high luminance towards traffic flow, and disordered advertising lighting on its south façade.

B. Light Art Tunnel

![Image of Light Art Tunnel](https://www.flickr.com/photos/christopherleung/3271826510/)

![Image of Light Art Tunnel inside](https://www.flickr.com/photos/gooooder/301879903/)

The Light Art Tunnel was built in 2001, right after the transformation of the pedestrian street to be as its frontage (Figure 4.2, B). Besides Suning Universal Shopping Center, this tunnel is 52 meters long with a width of 15 meters. The height of the columns is 13 meters and the top of the arch is 26 meters high above the ground. The construction of it cost 8.3 million yuan in 2001. It has more than 30000 lamps and 10000 neon lights on it. In 2006, the municipal government invested 0.8 million yuan to renew the tunnel with higher luminance and more dynamic effects. The tunnel can create an extremely gorgeous picture with different colors and dynamic effects (Figure 4.8). But despite all these advantages, the tunnel also has some problems in its design. Since the tunnel is constructed above the branch traffic road and it has high energy consumption, for most situations except some festivals, the lights are kept off. This makes the tunnel always exists as a huge structure without any colors or lights during the night. Besides, there are no effective cleaning methods for this tunnel either. Lack of cleaning and repairing, coupled with being barely used, all these factors make the tunnel unable to get the best effects when the lights are all turned on (Figure 4.9).

C. High Hope International Building

Located beside the north entrance of the pedestrian street, High Hope International Building was built in 2011 (Figure 4.2, C). The building has 20 floors and it is divided into two parts: podium building on its first three floors and office building as the higher part. The spaces in the podium building are rented by different stores. These stores use interior lighting through shop windows to show their interior spaces on the ground floor and put lighting signboards on the façade of second floor with their brands or shop names. On the top of the podium building, neon lights and floodlights are used for advertising lighting (Figure 4.10). But the advertisements in floodlighting show a lack of uniform luminance and artistic effects. For the office building part, it only use simple linear contour lighting with orange color. And the signboards on the top and north façade of the office building choose red on its icon and yellow on its name, which are in harmony with the main colors of the pedestrian street.
Chapter 5: Nightscape Analysis

D. Hu Nan Road Signboard

This road signboard is located right beside the north entrance of the pedestrian street (Figure 4.2, D). It was built at the same time as the transformation of the street. The municipal government spent more than 6 million yuan to build this landscape structure. It is 30 meters high and the signboard on the top has a width of 20 meters. It has more than 7000 neon lights on it. The signboard was designed like a burning torch with the name of the pedestrian street and a golden lion on each side as the icons on it. In the original design proposal, there were four laser lights settled in the eyes of the two lions. The laser lights can go through the whole street for a long distance. But later it was proven as a bad idea with a lot of light pollution for the city. Now the laser lights have been removed already. Nowadays, this special lighting structure becomes a landmark of the pedestrian street with its warm red lights (Figure 4.11). But there are still some citizens thinking it causes light pollution for the surrounding residents who live on high floors. Another problem of this signboard is similar with the light tunnel: it needs regular cleaning and maintenance to keep itself in best condition.

E. Memorial Arch

The memorial arch is located right at the north entrance of the pedestrian street (Figure 4.2, E). It is also called “99 Lions Memorial Arch”, because there are 99 lions carved on it with different gestures and styles from one to another. It was built during the transformation of the street. It used white granite as its material. The middle arch is 10 meters high with a width of 8 meters. Each side arch is 8 meters high and 4 meters wide. Due to its materials and structure, there are no lighting facilities installed onto it. The lighting mainly uses floodlights from ground to illuminate its structure and the top part with warm yellow light. In some traditional festivals, some lanterns will be hanged on the arches temporarily to create a joyful atmosphere (Figure 4.12).

F. Street Lighting

As illuminated in Figure 4.13, the nightscape in Hu Nan Pedestrian Street shows a harmonious picture with diversity in it. Neon lights and signboard
Chapter 5: Nightscape Analysis

Lights are the most popular lighting facilities here. Though different restaurants and shops use lights in different sizes, colors and shapes, the lighting facilities are still in similar style and colors. Most of the commercial spaces use interior lighting to make pedestrians able to see their interior environment. Contour lighting is also a common lighting method used on the building facades, especially those restaurants or shops with a long history and a traditional form of storefront. Due to the proper dimension of the street spatial structure and harmonious building lighting, there is basically no need for extra street lighting like lamps or other kind of ground lights. Therefore, there are not many lamps or ground lights around the street furniture and facilities. In Figure 4.12, it can be seen that the lamp is designed in a low height with faint yellow light showing the advertisement on the lamp. It works more like an advertising light than a street lamp.

5.4.4 Conclusion

During the site analysis, the nightscape in Hu Nan Pedestrian Street satisfied most of the citizens. The nightscape design in Hu Nan Pedestrian Street can be generally treated as a successful example. It managed to make a unified overall night view image, and at the same time, it also kept a diversity of the building lighting and created a comfortable pedestrian street in human dimension. Both the modern characters and traditional cultural elements get emphasized by the lighting design in a harmonious way. However, there are still some minor problems like the disorderly advertising lighting on the surrounding building, unused mega lighting facilities, lack of maintenance and the spill light towards residential buildings. Generally, the nightscape can be concluded as below:

Strongpoints:
• The overall lighting design manages to make a unified overall night view image;
• The diversity of the buildings get kept by the lighting design. Both the modern characters and traditional cultural elements get emphasized by the lighting design in a harmonious way.
• The lighting in pedestrian spaces creates a comfortable commercial environment in human dimension;
• The advertising lightings and signboards lightings have a unified style and proper luminance and colors.

Shortcomings:
• Disorderly advertising lightings on the surrounding building;
• Unused mega lighting facilities which have a lack of maintenance;
• There are still some spill lights produced on the street towards residential buildings.
5.5 Case D: Confucius Temple Historical Scenic District

5.5.1 Location

Confucius Temple District is an area with mixed uses including commercial, tourism and residential functions. The Confucius Temple Historical Scenic District means the area located along Qinhua River with the Confucius Temple as its center. It includes the ancient buildings, business markets, waterscape and shorelines along Qinhua River, and the streets, houses, and monuments on both sides of the river. With historical buildings and the Qinhua River in it, Confucius Temple District is famous all around China as a historical and cultural scenic district. It has both attractive business spaces and beautiful waterfront spaces. No matter in the history or nowadays, nights are always the peak periods when people come to visit this area. The nightscape of this district can be described as the most important attraction.

5.5.2 Overall Nightscape Status

The overall nightscape in Confucius Temple District shows a variety of different characters in the same picture (Figure 5.1). With historical buildings, Qinhua River and modern shopping markets in the same area, the nightscape can be divided into three different styles. The historical area uses quite a lot contour lighting to highlight the special structural features of the historical buildings. Most of the lights are designed in red or yellow color. Lanterns and other traditional forms of lighting can be seen frequently in this part. Another important character in the historical area is that most of the lighting facilities are designed as part of the buildings or structures, which makes them hard to be recognized during the day time. While the nightscape in modern shopping market area is quite different. In this area, there are a lot of individual stores which usually sells food, clothes, handcraft products and so forth. These stores mainly use neon lights and signboards lighting with high luminance, making the whole area brighter than the surroundings. The styles of the lighting facilities are quite different from one to another. For the shorelines along the river, more contour lighting can be seen here. Lanterns become the key factor in this area. Some floodlights can also be found on the south bank. Red is the most prominent color along the river, with the reflections on the water, this area has the most beautiful night view.

With both landscape and business functions in the same area, the lighting in the region is mainly dominated by scenic decorative neon lights and store signboards lighting. As an area with mixed uses, the integration of
commercial lighting and landscape lighting in Confucius Temple District need to be designed very carefully. In the questionnaire survey made by the School of Environment in Nanjing University in 2011 about the satisfaction and citizens’ advices on the nightscape in Confucius Temple District, as a conclusion, it revealed that the nightscape lighting throughout the whole area felt a little gaudy and messy to the citizens. Most interviewees thought the overall brightness of the Confucius Temple District was satisfying, but still needed more improvement on aesthetic aspect. Their survey showed that the adverse effects were mainly caused by the commercial lighting with overly bright colors. The survey also pointed out that most people chose colors like red and yellow to be the primary colors in this district, since these colors can reflect the ancient characters. They suggested preserving the scenic decorative lights, while the neon lights and signboards lights of the stores should be appropriately reduced (Tan, 2011).

5.5.3 Detail Nightscape Status

A. Jiangnan Examination & B Mingyuan Tower

Jiangnan Examination is the name of a group of buildings in this district that were used as the largest imperial examination place including Mingyuan Tower, examination museum and 40 examination rooms (Figure 5.2, A & B). At the entrance of the examination area, there is a memorial arch (Figure 5.3). It uses attached floodlights on its top and columns to highlight its structural features. The color of the lights on the columns is white with low luminance. The lights on its top are yellow with higher luminance. There is a row of small LED lights illuminating the tablet on the arch. Some yellow LED lights are also used in its contour lighting with low luminance. These lights are attached on the tiles of the arch so that the lighting facilities will not be recognized in the day time. With these lighting facilities, the historical arch becomes an attraction to the public that most tourists choose to take photos with it. Since the examination area is not open to the public in the night, only the main building, Mingyuan Tower, has nightscape lighting (Figure 5.4). Mingyuan Tower has three floors with three layers of roof. The material of the façade on ground floor is bluestone, while the other floors are wooden. The tower has lanterns hanged on each roof. It uses yellow contour lighting to highlight the structure of the roofs. And two white floodlights can be found on its frontage, illuminating the façade of ground floor with a high luminance. However, the lights reflected by the bluestone façade shows a cold blue color, which has a big color contrast with the lighting on higher part.

C. Dacheng Palace
Chapter 5: Nightscape Analysis

Dacheng Palace is the central palace of the Confucius Temple (Figure 5.2, C). The palace is 16.22 meters high with two layers of roof. On the top of the roof, there is a sculpture of two dragons. There is a statue of Confucius on its frontage, which is the biggest Confucius statue in China with a height of 4.18 meters. The palace uses both small LED lights and lanterns to be its contour lighting. Attached floodlights are also settled on the rooftop to illuminate the dragons sculpture. Other floodlights can also be found under the tablet, under the columns and under the Confucius statue. The lighting design creates a stately atmosphere for the palace in the night.

D. Zunjing Tower

Located behind the Confucius Temple, Zunjing Tower is used as a museum which presents traditional handcraft products (Figure 5.2, D). Since only the ground floor of the tower is used as museum, the lighting design focuses only on the ground floor, while the higher part is completely dark during night (Figure 5.6). The tower uses floodlights to highlight the tablet and its columns. Two lamps are settled on the top of its corridor to provide lighting to the windows of ticket office. But all the lightings on the tower are in yellow except the floodlights on its columns. The column lights are designed in white, which do not fit into the overall image very well.

Figure 5.6: Night view of Zunjing Tower (D), Nanjing
Source: http://img.itc.cn/photo/jN8v1vHBx7q

E. Kuiguang Pavilion

Kuiguang Pavilion is one of the buildings in the district that has the best position to enjoy the night view of Qinhuai River (Figure 5.2, E). The pavilion has three floors with three layers of roof and a corridor surrounding itself. It has lanterns under each layer of roof with red lights (Figure 5.7). Linear LED lights are used to highlight its contour in bright yellow. Outside the fences of the corridor, there is a linear blue light which is extremely bright and it has a strong color contrast with the surroundings. During the interviews, most tourists thought the blue linear light outside the corridor has no particular use but damaging the overall nightscape image. In this case, this linear light could be described as spill light for the waterfront and the river. On the top of the pavilion, it has a brighter LED light which makes itself outstanding from the surroundings.

F & M & N. Memorial Arches

Beside the memorial arch in Jiangnan Examination, there are also three other memorial arch in this district. Wenshu Arch is located right in front of the Confucius Temple (Figure 5.2, F). It is the biggest historical memorial arch in this district. Since Wenshu Arch is located on the square of Confucius Temple, the luminance of its lighting is kept in low degree not to disturb the pedestrians (Figure 5.8). The lights on Wenshu Arch are all in small size. It uses yellow LED lights to constitute its contour lighting. Attached small floodlights are
Chapter 5: Nightscape Analysis

installed under its roof structure to show the structure features of the roof. For the column lighting, it uses ground lights instead of floodlights to illuminate the columns from every direction. But in the tablet lighting, it chooses white as the color of floodlights, which not only makes the characters on the tablet hard to see but also undermines the overall tone of color.

The Ancient Qinhuaui Arch is located among the modern market area (Figure 5.2, M). Since the luminance of the surrounding shops is very bright than the other places of Confucius Temple District, the Ancient Qinhuaui Arch also uses brighter lights for its nightscape lighting (Figure 5.9). It uses bright white LED lights for its contour lighting, not only for its roof structure but for its whole main body and the tablet. Since it is located right above the pedestrian spaces, the floodlights for column lighting are settled on higher position without disturbing the pedestrians.

Unlike Wenshu Arch and Ancient Qinhuaui Arch, the new arch located at the main entrance of Confucius Temple District is a modern structure (Figure 5.2, N). The scale of new arch is much bigger than the historical ones. For its nightscape lighting, it only uses contour lighting to highlight itself (Figure 5.10). But the lighting method is completely different from the other ones. It chooses linear LED lights instead of individual lights. And the color of the lights is bright yellow with high luminance which makes itself a little gaudy and overdone. And the design of contour lighting also shows a lack of careful consideration: it lights up every part of the arch as a whole, which instead of showing the structural features but only making the structure more confusing for people to understand.

G. Star Pavilion

Located on the square of Confucius Temple, the Star Pavilion stands right beside the Wenshu Arch (Figure 5.2, G). Nowadays, the pavilion is used as tourist information center. Since the pavilion is in a smaller scale than the other buildings, the lighting of it has a lower luminance as well (Figure 5.11). Red is the major color of its nightscape lighting. It uses small LED lights in warm yellow for the contour lighting and the lights are installed as a part of the tiles on its roof. Lantern element can also be seen in its lighting design, with red lanterns hanged on each corner of the pavilion. Like the Kuiguang
Chapter 5: Nightscape Analysis

Pavilion, there is also a LED light on the top of the pavilion, making it prominent enough for visitors to find it quickly.

H. Screen Wall

Located on the south bank of Qinhuai River facing the temple, the screen wall is one of the most famous landmarks of Confucius Temple District (Figure 5.2, H). This screen wall was built in Ming Dynasty (BC1575). It is the longest screen wall all over China with a length of 110 meters and a height of 8 meters. It is the best preserved historical heritage in the whole district. The main body of the screen wall is in red color with black tiles on the top of it. On its façade, there is a traditional pattern showing two dragons playing a bead. The lighting design of the screen wall mainly focuses on the dragon patterns (Figure 5.12). With bright golden lights on it, the pattern is very impressive during the night. As decorative lighting, there are also some red lanterns in front of it. On the south bank, there are some blue linear lights which are designed to present as water pattern. But the shape of the blue linear lights does not look regular and its color does not fit into the overall screen wall lighting. Another pity is the contour lights on the tiles are too dim to present the actual structural features of the screen wall.

I & J & O & P. Bridges

There are four bridges in total can be seen in the district. Wende Bridge is located on the south of the central pond (Figure 5.2, I). It is the nearest bridge connecting the square with the south bank. Wende Bridge is a flat bridge with three openings below it for boats to get through. The night view of the bridge shows a yellow pedestrian space on the bridge and a blue boating space under the bridge (Figure 5.13). It uses yellow floodlights on the balustrades along the bridge and bright blue linear LED lights for its contour lighting. In the openings, there are also bright blue lights settled, which make the spaces under the bridge very strange.

Wenyuan Bridge is located on the north side of Wende Bridge (Figure 5.2, J). It connects Jiangnan Examination and the south bank. Wenyuan Bridge is an
Chapter 5: Nightscape Analysis

arch bridge. Like Wende Bridge, Wenyuan Bridge also uses yellow floodlights to light up its balustrades and blue linear lights to highlight its contour (Figure 5.14). But there is no lighting design for the space under the arch, making the boating space totally in dark during the night.

Different from Wende Bridge and Wenyuan Bridge, Pingjiang Bridge (Figure 5.2, O) and Zhuque Bridge (Figure 5.2, P) are not used as structures for pedestrians, but only as landscape elements for the waterscape. The lighting designs on them are in similar styles with white floodlights and blue linear lights on their facades (Figure 5.15 & 5.16). For the spaces under the bridges, they use warm yellow floodlights to enhance the artistic effects of the arches. With lower luminance, the nightscape of Pingjiang Bridge and Zhuque Bridge shows a pleasing picture and fits into the overall waterscape night view better.

K. Wanqing Tower

Located on the south bank, Wanqing Tower is an archaized building with clothes stores on its ground floor and restaurant on its second floor where the night view of the Qinhuai River can be seen (Figure 5.2, K). The lighting of it shows two completely different styles: the ground floor shows an image of modern shopping space while the second floor tries to present the appearance of traditional historical building (Figure 5.17). The luminance on ground floor is much higher than the second floor, which undermines the role of archaized building and makes the overall lighting effect confusing. On the ground floor, it uses advertising boxes with lights in them and interior lighting to attract customers with high luminance. On the second floor, there are windows on every side facilitating people’s sight through. For the lighting on second floor, it uses yellow linear neon lights to highlight its outline. Red lanterns and yellow floodlights are installed above each window to providing accent lighting onto the windows. The lighting signboard is designed into a form of three lanterns with the building’s name on them.

Shoreline Lighting

As illustrated in Figure 5.18, a series of artistic lamps are designed on the shoreline along the river. The lamps are designed as lighting columns along the fence with four mini lanterns on the top corners. On the surfaces of the lamps, there are poems and pictures with traditional patterns. The dimension of the columns is a little bigger than human dimension which makes pedestrians difficult to read the contents on the columns. But the artistic effects of the columns satisfy most citizens and tourists. In the interviews, the shoreline spaces with warm yellow lights in low luminance are praised a lot by the
Chapter 5: Nightscape Analysis

5.5.4 Conclusion

The nightscape of Confucius Temple District is one of the most famous attractions of Nanjing. During the site analysis, the lighting of clothing stores, antique shops and hotels dominated the modern commercial area. And the lighting of the Confucius Temple, Jiangnan Examination, pavilions and memorial arches takes over the historical area. The overall night view of the whole district shows a prosperous picture. But the nightscape styles in the modern area and historical area have a lot of conflicts. The modern commercial buildings prefer to use neon lights and signboard lighting with higher luminance. While the historical buildings use decorative contour lighting for their roofs. The major colors are also different in these two areas: the modern area shows bright white and the historical area is in red and yellow. Neon lights are widely used in the whole district, but some of the lights are damaged and cannot work normally, which impairs the overall effect greatly. And the lighting design of the waterscape and bridges is too dramatic that it breaks the natural scenery with the bright green and blue lights. All these factors make the nightscape of Confucius Temple District feels gaudy and messy. Generally, the nightscape in Confucius Temple District can be concluded as below:

**Strongpoints:**
- The overall night view of the whole district shows a prosperous picture;
- There are plenty of illuminations in the pedestrian spaces;
- The lighting effects on the shoreline area are very artistic;
- Most traditional buildings get necessary protections besides the lightings;
- The atmosphere of traditional culture gets enhanced by the overall lighting design.

**Shortcomings:**
- The nightscape in the modern area and historical area have a lot of conflicts in their styles, colors and lighting facilities;
- The luminance in the modern commercial area is in higher level than that in historical area;
- The lighting design of the waterscape and bridges is too dramatic that it breaks the natural scenery with the bright green and blue lights.

5.6 Case E: City Park of Xuan Wu Lake

5.6.1 Location

![Night view of City Park of Xuan Wu Lake, Nanjing](http://www.zjjcts.com/uploads/allimg/130505/1J53a0G-62.JPG)

![Map of City Park of Xuan Wu Lake, Nanjing](http://map.baidu.com/)

![Lighting Planning of City Park of Xuan Wu Lake (Yang, 2010)](http://www.zjjcts.com/uploads/allimg/130505/1J53a0G-62.JPG)
Chapter 5: Nightscape Analysis

The city park of Xuan Wu Lake is located in the northeast part of the main city area of Nanjing. The park has a long history of more than 1500 years. It used to be imperial garden in ancient time, and turned to be a public park since Qing Dynasty. Nowadays it is the biggest city park in Nanjing with Xuan Wu Lake in it. There are five islands in the lake, with bridges and dikes connecting them together as a continuous park. The park has become open for free to public since 2010. Nowadays it is one of the best places for people to enjoy their nights in Nanjing. With reflections on the lake, the effects of nightscape in the park are elevated a lot.

5.6.2 Overall Nightscape Status

According to the official lighting planning of the city park of Xuan Wu Lake (Figure 6.3), the nightscape of the whole park shows three different lighting levels (Yang, 2010). Since the park is standing beside the residential communities on its west side, the spaces on the west bank of the lake are designed with low luminance and few colors at night (Figure 6.4). On the islands, the landscape architectures and public spaces are in higher density with roads going through them. The lighting on the islands has higher luminance with more colors except the Ling Island. In the lighting planning, Ling Island is defined as ecological dim area, because there is a bird garden on the island. The lights are under strict limitations to keep the birds away from light pollution. On the east bank of Xuan Wu Lake, there is the central railway station, International Exhibition Center, mini parks and other entertaining places located along the shoreline. Therefore the night view on the east bank has the highest luminance and the brightest colors of the whole park area (Figure 6.5).

In 2011, the School of Environment in Nanjing University made a questionnaire survey about the satisfaction and citizens’ advices on the nightscape in the city park of Xuan Wu Lake. The result of the survey showed that as a famous tourist place for a large amount of visitors, the importance of the facilities in the park is even highlighted. The nightscape lighting and decorative lighting play an extremely important role due to their utility functions. The survey also revealed that most interviewees believed that the luminance and the facilities’ forms in most places of the park are very beautiful, and cause no adverse effects. But they thought some plant lighting could be appropriately reduced in the park. Additionally, in some sections the landscape lights are too dense, which might causes a waste of energy (Tan, 2011).

5.6.3 Detail Nightscape Status

A. Xuan Wu Gate

Figure 6.4: Aerial night view of the park from south, Nanjing (Yang, 2010)
Figure 6.5: Aerial night view of the park from west, Nanjing (Yang, 2010)

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Chapter 5: Nightscape Analysis

Xuan Wu Gate is one of the main gates of the ancient city wall of Nanjing city. It was the east entrance of the ancient city located right beside the Xuan Wu Lake (Figure 6.2, A). The gate now is used as the main entrance of the city park. The gate has three doors for passing through, but usually only one of them is opened during night. The lighting design of the gate has different proposals on its two sides. On its west facades outside the park, the lights on the gate are all in warm yellow color (Figure 6.6). There are linear LED lights illuminating the outline of the three doors on the gate. There are also floodlights settled inside the openings. On the top part of the gate, it uses attached LED lights for its contour lighting. The overall nightscape of the gate on west side shows a beautiful image with warm colors. But it also has some shortcomings: as an important element of the gate, the tablet has no lighting at all; and there are some floodlights on the frontage with bright cold color like white and green, which undermine the overall visual effects with the inappropriate color contrast. On the east facades, the choosing of colors and luminance are not as good as the west side (Figure 6.7). It uses bright white floodlights under the roof structure, which are too bright that it becomes even harder for people to discern the structural features clearly. The same situation also happened to the tablet above the middle door. But the design of the yellow ground lights which illuminate the balustrades on the gate has a successful effect.

B. The Ancient City Wall

Standing in the park, the ancient city wall can be seen all the way along the west side of the park (Figure 6.2, B). The city wall has a height of 12 meters with a width of 10 meters. The bricks on the city wall were made of white clay. During the construction of the city wall, all the brick makers were commanded to carve their names, hometowns and the making dates onto the bricks. The carved information is still visible on most of the bricks now, which gives the façade of the city wall more archaeological values. The lighting of the ancient city wall is mainly in white color (Figure 6.8). Floodlights are settled both on the top of the wall and on the ground next to the wall (Figure 6.9). The ground lights are installed 1.5 meters away from the wall, illuminating the façade from bottom to the higher part with an angle of 65 degree (Figure 6.10). The lights highlight the surface of the city wall and the battlement structure. Instead of warm colors that used frequently in other places of the park, the city wall lighting uses bright white color to emphasize the texture of its façade without coloring it. The position of ground lights successfully avoids affecting the nearby plants and creates a silhouetted of the plants with lighted city wall as its background.
C. Nuo Pagoda

Located on the northeast corner of Huan Island, Nuo Pagoda is one of the landmarks of the park (Figure 6.2, C). The pagoda was built in 1937 with a Tibetan Buddhism style. It has nine floors with a height of 19 meters. From a long distance away, the pagoda looks extremely gorgeous and outstanding in the night, with its golden appearance among the plants (Figure 6.11). The pagoda has six facades with bright yellow floodlights illuminating the windows (Figure 6.12). And on each corner of the nine-layer-roof there is a yellow LED light settled to emphasize its structural features. But on its ground floors, it uses bright white floodlights to illuminate the facades of the pagoda which are completely covered by the attached yellow lights. Basically, the white floodlights make barely positive efforts for the overall lighting, but only causing obstructive lights for the pedestrians on the ground.

D. West Dike

The west dike connects Ling Island with the south bank of the lake (Figure 6.2, D). It is mainly used as a secondary entrance of the park with a 572-meter-long linear pedestrian space. As the longest linear landscape on the lake, the west dike was designed as a scenic node to be watched from a long distance. When people look forward the dike from the west bank of the lake, the overall nightscape of west dike presents a calm picture with the moonlight above it (Figure 6.13). Most of the lightings along the dike are designed in cold colors like blue, green and white. With the lamps settled along the pedestrian space and the lights on the landscape structures like pavilions and bridges, the overall effects of west dike are very romantic and poetic.

E & F & G & H. Pavilions

Figure 6.11: Night view of Huan Island (C), Nanjing (Yang, 2010)
Figure 6.12: Night view of Nuo Pagoda, Nanjing
Source: http://wenku.baidu.com/view/6b05e50876c66137ee0619f8.html

Figure 6.13: Night view of West Dike (D), Nanjing (Yang, 2010)
Chapter 5: Nightscape Analysis

There are a lot of pavilions in the city park of Xuan Wu Lake. In this nightscape analysis, four pavilions are chosen as examples, they are: Lotus Pavilion on the north part of Huan Island (Figure 6.2, E), Guanpu Pavilion on the southwest corner of the park (Figure 6.2, F), Lansheng Pavilion and Wenji Pavilion on Liang Island (Figure 6.2, G & H). As presented in the pictures above, all these pavilions have a similar tone of colors in their night views. They all use warm yellow as their major color. But there are also some differences on their lighting methods. Lansheng Pavilion only uses yellow contour lighting and interior lighting (Figure 6.16). With the reflections on the ponds, the nightscape of Lansheng Pavilion is very calm and pure. Guanpu Pavilion also uses yellow attached contour lighting on its roof structures (Figure 6.18). Besides that, it also has floodlights for its column lighting and a linear lighting above the lake (Figure 6.15). Compared with Lansheng Pavilion, the night view of Guanpu Pavilion looks brighter but less beautiful since the column lighting is too bright and its waterfront linear lighting cuts itself off from the water. Lotus Pavilion and Wenji Pavilion both use attached floodlights on the rooftop and columns. Their roof lighting and column lighting have beautiful visual effects, which shows both contour lighting and floodlighting can make nice outcomes for pavilion lighting. But the weakness of Lotus Pavilion is the white light used in its interior lighting (Figure 6.14). The white light breaks the overall tone of color. The Wenji Pavilion has the similar shortcoming of Guanpu Pavilion: it also designs a waterfront lighting which decreases the prominent effects of the pavilion itself (Figure 6.17).

I. Baiyuan Restaurant

Baiyuan Restaurant is a modern building located on Liang Island (Figure 6.2, I). In order to keep the traditional style of the overall nightscape of the park, the lighting of Baiyuan Restaurant is designed with a humble attitude. The night view of it is purposely designed unnoticeable (Figure 6.19). The building has no contour lighting and no decorative lighting on its facades or rooftop.
Chapter 5: Nightscape Analysis

The major lighting method is interior lighting which keeps the building in low luminance during night. Some minor LED lights are settled on the balustrades also with low luminance (Figure 6.21). The building tries its best to hide its lighting facilities from human sight (Figure 6.20). On its front staircase, to provide necessary ground lighting, small LED lights are installed along both sides of the stairs without disturbing visitors’ viewing (Figure 6.22).

**J. Boat Marina**

The boat marina is located on the west bank of the lake, right beside Xuan Wu Gate (Figure 6.2, J). Although the marina is closed during the night, the lighting of it still plays an important role. The major color of the night view of the marina is red (Figure 6.23). Instead of adding extra lighting facilities on the marina, most lights are settled on the docked boats. The marina uses red contour lights on the boats to create a vivid picture. On the edge of the wooden paths, ground lights are put in line to remind tourists to stay away from the water.

**Shoreline Lighting**

For the pedestrian spaces on the shorelines of the lake, there are different types of lighting methods used in the park. At the waterfront of Ling Island, floodlights are designed on the ground to provide plant lighting with strange colors like blue, green and purple (Figure 6.24). During the interviews, most interviewees thought these plant lighting did nothing but making the space feels weird and even horrible. Figure 6.25 shows the night view of the pedestrian spaces on the wooden paths along the shoreline on the north bank. The plant lighting is installed directly onto the trees with a high luminance. It may not only cause spill lights but also disturb the natural growth of the plants. Along the wooden paths, small LED lights are settled on the low balustrades to provide ground lighting. There are also linear LED lights installed under the wooden paths with bright blue lighting. These lights make the night view of the shorelines extremely bright. When observing from the islands, with the reflection on the lake, the north bank looks like standing on two bright blue lines. These linear lights become the most prominent elements of the overall night view, instead of the real landscape elements on the land. To improve the overall visual effects, it would be better to reduce the luminance of the linear lights or even remove them to get the natural picture back.

**Road Lighting**

On the main roads of the park, the density of lights is very high (Figure 6.26). It has ground lights (with 1 meter between each two along the curbstones on both sides of the road), plant lights under each tree (with a distance of 5 meters between each two along one side of the road) and 6-meter-high pole lights (with 20 meters between each two along the other side of the road). The plant lighting is in an extremely high luminance that it lights the whole tree up with white color. Both the density and the luminance of the lights along main roads need to be improved. One possible solution might be removing the plant lights and reducing the numbers of ground lights. But the lighting status on the branch roads on the islands shows an opposite situation: the lights on the
Chapter 5: Nightscape Analysis

branch paths in the park are in low luminance and low density. As illustrated in Figure 6.27, the lamps are in poor conditions with dim light and obsolete appearance. During the interviews, most interviewees complained that the spaces outside the main road feel insecure and too dark for walk.

5.6.4 Conclusion

Through the site analysis, the nightscape lighting of the City Park of Xuan Wu Lake shows a scientific and reasonable overall lighting planning. It has different lighting proposals for each island in the park, according to the special characters of the islands. The lighting planning also tries to make the nightscape of the park cooperate with the surrounding urban spaces in a harmony way. In the city park, the main roads work as the traffic axis for pedestrians during night. And most of the nightscape nodes along the main roads have proper lighting effects. The architecture lighting and special structure lighting in the park are successfully kept in a unified style and color tone. For the pedestrian spaces on the shorelines, the lighting facilities are in human dimension with plenty illumination. However, there are still some problems in the nightscape of the park. Some nightscape nodes are over-lighted with too many floodlights. The road lighting still needs to be improved to have a uniform lighting luminance and density. The lighting for the plants and wooden paths uses too dramatic colors and luminance.

nightscape in the park can be concluded as below:

**Strongpoints:**
- It has a scientific overall lighting planning;
- The lighting system on each island is designed according to the actual conditions of the islands;
- Most of the nightscape nodes along the main roads have proper lighting effects;
- The architecture lighting and special structure lighting are kept in a unified style and color tone;
- For the pedestrian spaces on the shorelines, the lighting facilities are in human dimension with plenty illumination;
- The luminance distribution of the buildings in modern style and traditional style is well handled;
- The lighting design for the historical city wall has excellent effects.

**Shortcomings:**
- Some nightscape nodes are over-lighted with too many floodlights;
- The road lighting still needs to be improved to have a uniform lighting luminance and density;
- The lighting methods of some special structures (like Xuan Wu Gate) cannot present the structural features;
- The lighting for the plants and wooden paths uses too dramatic colors and luminance.
Chapter 6. Strategies

6.1 Strategies for Downtown District Nightscape Design

Based on the theoretical studies on available literatures and the site analysis, this section aims to give some strategies and advices for the nightscape design in Chinese downtown district like Xin Jiekou. And the strategies are listed out according to different lighting objects.

Buildings – choose appropriate lighting methods

1. Before making a lighting design for a building, it is necessary to proceed a site analysis about the building’s location, function, structural characters, surroundings and so forth. Usually the building lighting should create different pictures in different scales. The image in smallest scale is how the building looks like during the night from a short distance by pedestrians. In this scale, usually people can only see the first several floors on the ground. The building lighting on these floors should be designed in human dimension. The image in normal scale means the overall appearance of the whole building seen by people from a long distance. In this scale, the building lighting should focus on presenting the structural characters and creating a legible picture of the building for people to recognize it from far away. The image of a building in the biggest scale usually can be seen in the overall night view of the whole city. In this scale, the lighting of the building works as a part of the whole picture. In most situations, only the lighting on the top of the building and its contour can be seen in the biggest scale. This demands the building lighting on its top part and contour to cooperate with the other buildings in a harmonious way with similar luminance, colors and style. During the building lighting design, it is important to figure out the potential viewing spots in each direction. The facades which can be observed from the viewing spots can be designed as the main facades while the other facades can reduce the luminance and density of the lights.

2. Usually, the lighting facilities would be better to be hidden from people’s sight so that the spill light for pedestrians can be avoided. For some buildings which are not historical heritages under strict protections, it is also a good option to install the lighting facilities onto their building structures like their facades, columns, eaves, windows, or rooftops. The installation positions can even be designed during the designing of the building itself. However, in some special situations, the lighting facilities are still hard to be invisible or as part of the building structures. Then the luminaires’ shapes, sizes, colors and styles need to fit with the building itself and the surrounding environment, both in day and night. In these situations, since the lighting facilities can be easily found by people, the lighting angle and luminance must be under control without glare pollution for the pedestrian spaces.

3. The use of colorful lights and dynamic lights should be carefully chosen. When using colorful lighting or dynamic lighting, the effects need to be test first to see if it fits with the building’s façade colors, materials and the surrounding environment. BIAD (2008) illustrated the reflectance of different types of building façade materials and colors in <Code for Lighting Design of Urban Nightscape> (see Table 5). For the building façade with high reflectance, the luminance and color of the lighting should be controlled to not causing glare pollution. Additionally, for some memorial buildings or historical buildings, it is better not to use colorful lighting which may change the buildings’ appearance during the night and cause visual misleading for people.

<table>
<thead>
<tr>
<th>Building Façade Materials and Colors (BIAD, 2008)</th>
<th>Reflectance ($\rho$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White coating, white glazed facades, light cold/warm exterior coating, white marble, etc.</td>
<td>0.6–0.8</td>
</tr>
<tr>
<td>Silver or gray aluminum panels, light-colored marble, white stone, colored tiles, gray or khaki glazed tiles, etc.</td>
<td>0.3–0.6</td>
</tr>
<tr>
<td>Dark granite/stone/tile/concrete, brown/dark red glazed tiles, dark artificial granite, ordinary bricks, etc.</td>
<td>0.2–0.3</td>
</tr>
</tbody>
</table>

4. In building lighting design, the lighting methods should also be chosen according to the building’s style and characters. Through the analysis of the commercial buildings’ lighting design, it can be concluded that the buildings with multi lighting methods usually can get better effect than the ones with single lighting method. In the site analysis of the nightscape in Xin Jiekou
Chapter 6: Strategies

District, some buildings use inappropriate lighting methods which instead of promoting the effects but causing glare pollution. One of the common problems is using floodlights in wrong situation (see Figure 6.1.1). Usually floodlights are used as accent lighting only for some particular parts of a building. By illuminating the target with a higher luminance, floodlights can help emphasize the symbolic part of a building. However, in the site analysis, some buildings use floodlights for their façade lighting, which providing a uniform illumination on the façade. Using floodlights in this way makes the building façade boring without dimensional differences. What are worse, since most buildings in downtown district are modern architectures with a lot of glass walls used on their facades; the floodlights can barely fulfill its role. It is because the glass has a low reflectance and it lets most of the lights get into the interior spaces of the buildings and reflects the rest part of the lights into the sky. This misusing of floodlights causes both waste of energy and light pollution. Therefore, for the buildings with glass walls, interior lighting can be much more appropriate. Keeping a few lights on during the night can easily help provide façade lighting for the buildings. It cost much less than floodlighting and it can also make it easy to repair the facilities regularly. But the luminance and color of interior lighting still need to fit with the surroundings. Another lighting method can be used more is contour lighting, especially for those buildings which have a beautiful style. The aim of using contour lighting is mainly to highlight the outline of the building and to show the building’s structural features to people. The lights can be used in contour lighting are usually individual spot lights or continuous linear lights. When using individual spot lights, the interval between each two lights should be decided according to the building scale and the distance from potential viewing positions (see Figure 6.1.2). Otherwise, if the interval is too big, the lighting effect will be unable to outline the building; if the interval is too small, the cost of budget and energy will be too much. Same with linear lights, the size and luminance of the linear lights should also be decided properly.

5. There are a lot of skyscrapers located in Xin Jiekou District. This kind of situation that dense tall buildings are located in the downtown district of a city is quite common in most Chinese cities. Most of these tall buildings are commercial complexes which have big shopping malls in their podium part and office building in the higher part. For these skyscrapers, this strategy proposes to use “three-section-lighting”. It means during the building lighting design, the building can be divided into three sections: the podium building section, office building section, and the top floors section which are usually designed in a particular form with special functions there. Since the podium section is usually next to the sidewalk, it should focus on providing bright and comfortable lighting for the pedestrian spaces. It can use interior lighting in shop windows and decorative lighting at the entrance to attract the attention of customers. Some advertising lighting can be settled on the connecting part between podium section and office building section. For the office building section, since the height is out of human dimension for the nearby pedestrians, it can mainly focus on showing the building’s structural features for viewing from a long distance. It does not need too complex decorative lighting; just some simple contour lighting will be enough. The lighting of the top floors of the skyscrapers can be described as the peak of the overall building lighting design. In most situations, there will be a neon signboard on the top of the building.
building with its name on it. But besides it, some decorative linear lights and small floodlights with low luminance can be also used to outline the particular shape of the top section of the building (see Figure 6.1.3). This will not only make the overall night view of the building distinctive but also help constitute the city skyline at night.

Figure 6.1.3: “Three-section-lighting” for tall buildings

Pedestrian Space – emphasize human dimension
As the analyzed site, Xin Jiekou is quite representative of downtown district in most Chinese cities. It shows the fact that the lighting in pedestrian spaces in downtown district is out of human dimension. Since the building lighting and advertising lighting with high luminance have already dominated this area, most of the ground lighting facilities have been out of work for a long time. The experiences of walking on a street without street lamps or any other small scale lighting facilities are not comfortable for pedestrians. Besides, caused by the cross lighting and some dynamic colorful lights of nearby buildings, the luminance in the pedestrian spaces has big differences from spot to spot. This also makes it difficult for pedestrians to notice the stairs, gaps and other elements on the ground.

In this strategy, it argues that street lighting and ground lighting are still necessary for the pedestrian spaces in downtown district. First of all, to make the street lights work again, the luminance of building lighting and advertising lighting needs to be reduced, especially the lighting which causes cross lighting with adjacent buildings. The main reason makes the street lamps feel useless is the other lightings are over-bright. With less building lighting and advertising lighting, the street lights and ground lights can bring the night pedestrian spaces back into human dimension and reduce the cost of energy, too. Additionally, this strategy also suggests that there should be a “curfew time” for some of the building lighting. Since most of the commercial buildings in downtown district will be closed before midnight, these buildings can turn off some of its lighting facilities which cost too much energy, only keep a few interior lighting and contour lighting on. In this way, the street lights can take over the responsibility of providing necessary illumination for the pedestrian spaces to keep them still secured and comfortable for pedestrians. In this way, the glare pollution to the surroundings and the sky can be reduced a lot.

For the pedestrian space lighting, the lighting facilities should be settled at the entrances of the pedestrian street, along the pedestrian spaces, next to the public infrastructures, and so forth. Ground lights can be installed at the slopes, stairs and other kind of places with elevation changes. The light colors and the lighting facilities’ styles should fit with the surroundings. The design of the luminance and illuminating angle of street lighting should avoid causing spill lights which may disturb the pedestrians’ activities.

Advertisements and signs – reduce light pollution
In the nightscape of downtown district, the advertising lighting and sign lighting also play an important role. If they work well, they can be able to create a prosperous atmosphere in the district and make it more attractive. But during the site analysis in Xin Jiekou District, a lot of problems are found in the advertising lighting and sign lighting. One of the causes of this dilemma is that the design of advertising lighting and sign lighting were not proceeded together with the overall nightscape design. On the contrary, most the advertising lighting and sign lighting in Xin Jiekou District were added by the
owners of each building from different periods. They only focused on how the advertisements can bring more profits, ignoring that advertising lighting and sign lighting is also elements of the overall downtown nightscape. The abuse of huge LED screens can be good evidence.

Advertisements and signs have a lot of types and forms. Most advertisements and signs are designed to be seen in both day and night. Therefore, “sending messages” is one of their basic purposes. The lighting should be compatible with the contents. So first of all, the advertisements and signs should carry proper messages which are attractive or useful for people. Then the lighting methods vary based on the facilities’ materials, shapes, location and environment. To maximize the advertising effects, the facilities are generally set at transportation nodes, stations, squares, docks and buildings along streets. However, these places also have heavy traffic, large flow of citizens, and a lot of public facilities at the same time. Therefore, one of the basic principles of the advertising and sign lighting is not to produce light pollution, not to interfere with communications, not to disturb the order of transportation and other public facilities. The luminance and lighting angle must be under strict control. But in some special places, like the administrative offices, residential buildings, hospital buildings, there should not be advertising lighting, except some necessary indicative or functional signs. These places are where people work, rest, healing, so that the people in these places can get a quiet, calm, comfortable and safe environment.

6.2 Strategies for City Square Nightscape Design

Based on the theoretical studies on available literatures and the site analysis, this section aims to give some strategies and advices for the nightscape design in Chinese city square like Urban Plaza of Drum Tower. And the strategies are listed out according to different lighting objects.

**Square – serve the function of the square**

This strategy suggests that the nightscape design of a city square needs to be based on the square’s particular function. The overall night view which is made up by the landscape elements and lighting facilities should fit with the theme of the square. For examples, in a transportation square, the lighting design needs to ensure the passageways for people to get through the square is easy to find and convenient to walk. Functional lights and signs should be settled at the entrances, along pedestrian paths and vehicle roads, and at the interchanges spots. And the nightscape design in transportation squares should avoid using dynamic lighting or colorful lights which may interfere with the identification of traffic lights. While the nightscape design in a commercial square will mainly focus on the lighting of the commercial buildings, entrances, shop windows, advertising signs, pedestrian roads, street furniture and other public infrastructures. And dynamic lighting and colorful lights are quite common in a commercial square. The luminance at the entrances of a city square should be highest in the whole square. Then the space with second brightest lights should be the main part of the square which is designed for public interactive activities. The other pedestrian spaces like paths and corridors can have less luminance so that people can get a quieter place. The lighting of the green spaces like grass, bushes and trees are usually in the lowest luminance.

**Paths – create a calm pedestrian space**

The illumination of paths of a square usually does not need to be very bright, except in transportation squares. Generally, the illumination of paths in city squares will be enough to provide basic ground lighting in low density to help pedestrians be able to see the ground conditions. When there are slopes, stairs, or other kind of elevation changes, lighting facilities need to be set to inform pedestrians about the ground situation. Since most city squares in Chinese cities are located between city roads and residential communities, they also have another role which is acting as the transitional area between highly lighted traffic roads and quiet residential areas. The lights along the
pedestrian spaces in city squares would be better to use ground lights with low luminance. The lighting facilities can be installed on the ground, in the grass or on the edges of the paths (see Figure 6.2.1). In this way, the lights can be kept away from disturbing neither the traffic flows nor the residents.

Special structures – cooperate with surroundings to present artistic pictures
In most city squares, there are statues or other landscape elements set to be landscape nodes. Usually these special structures are in small scale and set among plants. The plants work as the background of the special structures. The lighting design of the structures should include accent lighting on the main landscape elements like statues or sculptures and background lighting for the plants to complete the whole picture. For the main elements, small floodlights can be used to emphasize them. And the lights for the background plants can be in lower luminance. An appropriate luminance contrast will help get good artistic effects. Additionally, the lighting design can vary according to the theme, size and materials of the special structures. For examples, for a memorial statue, it would be better to set small white floodlights which illuminate the statue from the ground to create the memorial mood (see Figure 6.2.2). The lighting design in the public activities area, pedestrian spaces, and special landscape structures should be unified according to the overall lighting planning.

Waterscape – provide lights but hide lamps
Waterscape like fountains and artificial streams are commonly used in city squares. And the waterscape is usually designed to be the visual center of the whole square. Floodlights are usually used for fountain lighting. The lights can be set under the fountain so that when the water comes up, the lighting can be contained in it to get the artistic effects. Waterproof lamps are the common lighting facilities used for stream lighting. The lamps are usually set at the positions where the elevation of the streambed changes with low density. Since water can easily reflect the lights towards surrounding, the lighting of waterscape does not need high luminance to attract people's attention.

6.3 Strategies for Pedestrian Street Nightscape Design

Based on the theoretical studies on available literatures and the site analysis, this section aims to give some strategies and advices for the nightscape design in pedestrian street like Hu Nan Pedestrian Street. And the strategies are listed out according to different lighting objects.

Buildings – highlight the commercial spaces with harmonious style
Buildings are the main carrier of people's commercial activities on a pedestrian street. The building lighting aims to provide a comfortable shopping environment. Usually, there should be lighting design for the buildings’ entrances, shop windows, exterior signboards and other kind of advertisements. The luminance at the entrance can be higher than the other parts of the building, so that the contrast can help emphasize the entrance and attract more customers in (see Figure 6.3.1). The commercial buildings can choose a variety of light sources and light colors for their lighting, even dynamic illumination sometimes. But the lighting effects should be under control to not causing glare for the entrance area. In additionally, a building’s lighting of its entrance, shop windows, signboards and facades should be kept in an organized style.

Pedestrian spaces – emphasize human dimension and avoid spill lights
First of all, the street lighting should provide basic ground lighting which enable pedestrians to clearly see slopes, stairs and obstacles on the ground.
And the lighting should also make it convenient for pedestrians to recognize the surroundings, like the facial characters of people coming towards, nearby signs and other public infrastructures. Usually the street lighting should not use the same lighting methods and luminaires with normal traffic roads lighting. Since the lamps along traffic roads are designed with luminance and size particularly for the vehicle traffic instead of pedestrians. The traffic road lamps can hardly fit in a pedestrian space. This strategy suggests that it is better to choose street lamps in human dimension for the lighting in pedestrian spaces. It means the lamps should not be too tall. The street lighting can only use lamps with almost the same height of a normal adult; or higher lamps working together with ground lights; or in some spaces where the building lighting is brighter, the lamps can be designed with almost the same height of the knees of a normal adult (see Figure 6.3.2). For some special cases like Hu Nan Pedestrian Street where there are residential buildings above the commercial buildings along the street, the street lighting should have shading structures to avoid producing spill lights towards the residential buildings. Besides, the lamps’ shapes, sizes, colors, styles and the poles, brackets should be designed in an artistic form which can also fit with the pedestrian street.

**Special Structures – present outstanding structures without light pollution**

Like Hu Nan Pedestrian Street, most Chinese pedestrian streets have special structures like gate, memorial arch, statues or artistic sculptures at the entrances or along the streets. Taking Hu Nan Pedestrian Street as an example, there is a light art tunnel, a mega street signboard and a memorial arch at its east entrance, and another arch at west entrance. Statues are also set along the street as attractions.

It is a pity that the light art tunnel is dark for most situations. However, the financial condition and the nearby traffic roads cannot allow the light tunnel to shine every night, since the tunnel will cost too much energy and may cause a lot of light pollution by its dynamic lights. Therefore, this strategy argues that the programme of the tunnel should be rewritten. It would be better to make the tunnel have a static contour lighting system which can normally work every night. And the dynamic lights can be designed as another lighting system which is turned on only for some special events and festivals.

For the memorial arches on Hu Nan Pedestrian Street, it uses floodlights which are set on the ground as its major lighting method. But these lighting facilities on the ground also become the obstacles for pedestrians to pass through the arch. This lighting design makes the arch feels unapproachable. Besides, the nightscape design of pedestrian street should focus on the pedestrian spaces, which means the lighting angle should be controlled not to produce spill light towards sky. Therefore, this strategy suggests that the lighting design of memorial arches would be better to use small attached floodlights on the structure instead of set on the ground. And there can be extra lights for...
Chapter 6: Strategies

the tablet on the arch, too. In this way, an unobstructed passageway can be preserved for pedestrians to pass through and the spill lights can be reduced.

Advertisements and signs – coordinate with surroundings
In the nightscape of a pedestrian street, advertising lighting and signs lighting also play an important role. They are the key factors for creating a prosperous commercial atmosphere for the street. Usually, most advertisements and signs work not only at night but also during the day time. This requires the styles and appearance of them to be both attractive for people and coordinated with the buildings and the surrounding environment. The lighting design of advertisements and signs needs to have appropriate luminance, color, lighting methods and facilities to send the message to people effectively. The advertising lighting and signs lighting should be coordinated with the surrounding nightscape lighting effects. Besides, since the lighting of advertisements and signboards are usually kept on for longer time than the other lights, the lighting design needs to think about the night view of the area in its curfew period.

6.4 Strategies for Historical scenic district Nightscape Design

Based on the theoretical studies on available literatures and the site analysis, this section aims to give some strategies and advices for the nightscape design in historical scenic district like Confucius Temple District. And the strategies are listed out according to different lighting objects.

Buildings – balance the lighting of modern buildings and historical buildings
The buildings in Confucius Temple District can be divided into three different styles: commercial stores in modern styles, archaized buildings which have similar appearance with historical ones but are used as restaurants or hotels with modern facilities inside, and historical buildings which are under protections. For the modern stores, they should try to avoid large-scale using of high luminance lights or bright colors. It would be better to use the similar colors which are the major colors in the historical area, such as yellow, red and other warm colors to render a traditional cultural environment. For the archaized buildings, contour lighting and signs lighting will be suitable. In Confucius Temple District, neon lights and floodlights are widely used for the building lighting. The abuse of these lights with high luminance is one of the main reasons that making the modern commercial area over-bright. The energy cost and luminance of the lighting facilities should get controlled to avoid waste of energy and light pollution. It would be better to change the dense neon lights into energy-saving LED lights and switch the floodlights with smaller ones which produce lower luminance. By reducing the sharp commercial climate, it would help the modern area cooperate better with the historical area, creating a harmonious night view for the whole district.

While for the historical buildings, the lighting design needs to be more carefully proceeded. In most situations, in order to preserve the original architectural characters of the buildings, it is better to hide the lighting facilities so that they will not interfere with the buildings’ appearance. But occasionally, there are some situations that the facilities are difficult to be installed onto the building without being noticed by people. For these cases, the facilities should be designed with particular shapes, sizes, colors and styles so that the facilities can act as part of the historical buildings. During the site analysis, there are some wrong examples which used neon lights or big floodlights for the lighting of the historical buildings. The main weakness of using neon lights is that the lights can be very easily noticed by people, especially in the day time. Yan Xu (2010), a female scholar studying on lighting technology, introduced “LED chips” (see Figure 6.4.1) as a new lighting method which can be used for historical building lighting. The LED chips can be set into some small components like the tiles with a similar color of the tiles. In this way, it will not affect the architectural appearance in
Chapter 6: Strategies

day time. And the floodlights with high luminance often make the historical building extremely bright at night. The lighting effects of floodlights have a lack of luminance changes and contrasts, which weakens the structural features of the buildings. Besides, there are some buildings which have a particular style: the building facades are in white color and there are black tiles all over the rooftop. When the bright floodlights illustrate these buildings, the facades become extremely bright while the tiles are still in dark, which makes the overall lighting effects unsuccessful. Therefore, this strategy recommends that it would be better to use LED chips for the contour lighting or to use small attached floodlights for the rooftop lighting. And if the building has a surrounding corridors, it can install small attached floodlights onto the interior side of the columns along the corridor to provide lighting for the corridor space and emphasize the modeling of the columns (see Figure 6.4.2).

Figure 6.4.2: Lighting methods for historical buildings

Pedestrian Space – emphasize cultural factors with traditional styles in human dimension

With building lighting dominating in Confucius Temple District, especially the modern commercial area, there are few street lighting facilities in the pedestrian spaces. The experiences of walking in a scenery district without street lamps or any other small scale lighting facilities are not comfortable for pedestrians. On the Confucius Temple Square, there are a lot of ground lights acting as square lighting. But most of the ground lights are designed mainly for the architectures or pavilions on the square with a high luminance. Street lamps are still necessary for the pedestrian spaces in this district. But before talking about adding street lamps, the luminance of building lighting and advertising lighting needs to be reduced, especially among the commercial area. With less building lighting and advertising lighting, the street lamps and other kind of ground lights can bring the night pedestrian spaces back into human dimension. Additionally, adding street lamps can also make it possible to turn off some energy-consuming lighting facilities and only keep a few contour lighting on when most of the stores and historical heritages are closed by midnight. The lamps can take over the responsibility of providing necessary illumination for the pedestrian spaces to keep them still secured and comfortable for pedestrians. In this way, the glare pollution to the surroundings and the sky can be reduced a lot. For the pedestrian space lighting, the lighting facilities should be settled at the entrances of the commercial street, along the pedestrian spaces, next to the public infrastructures, and so forth. Ground lights can be installed at the slopes, stairs and edges of the bank. The light colors and the lighting facilities’ styles should fit with the surroundings; this means the lamps are better to be designed with some traditional characters or cultural patterns. The design of the luminance and illuminating angle of street lighting should also avoid causing spill lights which may disturb the pedestrians’ activities.

Waterscape – present natural scenery instead of dramatic lighting effects

Generally, the lighting design of the waterscape in Confucius Temple District is in bad conditions. The river is dominated by the glares coming from the bridges and the screen wall. The waterscape lighting should aim to present the natural scenery of the water, instead of using bright blue lights to remind people about the river. And as the important element of the waterscape in the district, the bridges need to have reasonable lighting designs.

1. Most of the bridges in a historical scenic district still have the basic function: letting people be capable of passing over the river and at the same time having spaces to go along the river under the bridges. So the lighting design must ensure that the spaces on the bridge and under it are both secured and convenient for people to pass through. All the other decorative lights must make a concession for the basic function.
Chapter 6: Strategies

2. As part of the waterscape, all the bridges have their potential viewing positions for people to enjoy the view. Usually these viewing positions are located on both sides of the bridges, and they could be on the water or on the bank from a certain distance. The lighting design of the bridges should take these viewing positions into consideration so that people can be able to see the overall night view of the bridge and also some attractive structural details from the viewing positions.

3. The lighting design should focus on emphasizing the bridges’ facades, piers and other structures, and the detail lighting should fit into the overall lighting effects. Usually the bridges in historical scenic district are designed only for pedestrians to pass through. The lighting design should avoid exposing lighting facilities or producing glare towards pedestrian spaces. If the bridge is also used for vehicle traffic, the lighting direction, luminance, colors and angle need to be controlled to avoid glare and visual disturbance.

4. The spaces under the bridge are also important. The lights on the bridges are always reflected by the water. During designing bridge lighting, the possible effects of the reflection on the water should also be considered. Since the potential viewing positions could be anywhere, the reflection on the water is likely to cause glare to people. Therefore, the luminance and colors need to be under control. Additionally, sometimes the water system might change its water level. For these situations, the selecting of positions to install lighting facilities must be proceeded carefully. Like Confucius Temple District, a lot of Chinese historical scenic districts provide similar services about night boating for tourists to explore the waterscape in a short distance. Sometimes there might be traffic lights set on the bridge for boats. Therefore, the bridge lighting should also be careful about using colorful lighting, flashes, dynamic lighting or other effects.

6.5 Strategies for Civic Park Nightscape Design

Based on the theoretical studies on available literatures and the site analysis, this section aims to give some strategies and advices for the nightscape design in civic park like City Park of Xuan Wu Lake. And the strategies are listed out according to different lighting objects.

Pedestrian Spaces – balance the distribution of luminance in different levels of pedestrian spaces

Generally the pedestrian spaces in a civic park include small squares, roads, paths, stages, yards, and other public spaces. In the lighting design of the pedestrian spaces in a park, the entrances, squares and main roads usually have particular lighting design and higher luminance to make these spaces highlighted. Besides these, the places with slopes, steps, stairs, children playgrounds and other kind of elevation changes also need extra lighting to provide a secured environment. Unlike other urban spaces, the parks have more natural landscape elements. Therefore, the lighting in parks should be designed in smaller scale and lower density so that it will not harm the vegetation by lights or facilities installations. The lighting of pedestrian spaces in parks is usually kept on throughout the whole night. Besides road lamps, the lighting facilities can also be installed on the ground, in the grass or on the edges of the paths. In this way, the lights can be kept away from disturbing neither the traffic flows nor the residents.

Special Structures – coordinate with surroundings and present pictures for viewers from different directions

In most Chinese civic parks, pavilion is one of the most popular landscape structures. The pavilions can be designed as either archaized style or modern style. During the site analysis in the city park of Xuan Wu Lake, there are a lot of pavilions can be seen in the park, most of which are in archaized style. But the lighting effects of the pavilions are quite different. Generally, since the pavilions are all in small scale, the pavilions which only use simple lighting methods like contour lighting or small attached floodlighting gain better effects, while the ones with complex lighting design look over-lighted and uncomfortable for people to stay in. This strategy suggests that it would be better to use less lighting for pavilions, like LED lights or neon lights for the contour lighting, or to use small attached floodlights for the rooftop lighting.

Statue is another common landscape element in civic parks. Usually the statues are in small scale and set among plants or in the central position of a flower pool. In the overall image, the plants or flowers work as background for the statue. The lighting design of these kinds of landscape nodes should
Chapter 6: Strategies

include accent lighting on the statues and background lighting for the plants to complete the whole picture. Small floodlights are usually chosen to emphasize the statues. A common way is setting small floodlights under the statue to let the lights illuminate upwards, so that the modeling of the statue will be strongly emphasized. But sometimes the focus of the statue might be on its higher part; the floodlights can be set on a higher position or be attached on the nearby lamps (see Figure 6.5.1). The lights for the background plants can be in lower luminance and usually without special colors. An appropriate luminance contrast will help get good artistic effects. Additionally, the lighting design can vary according to the theme, size and materials of the special structures. And the lighting design for the statue needs to fit in with the surrounding lighting effects.

Like the Nuo Pagoda in the park of Xuan Wu Lake, pagodas can also be seen in most civic parks. Unlike other special structures like statues, the shape of a pagoda is usually symmetric, which makes the view of the pagoda quite similar from different directions. In most situations, the role of a pagoda is not only a landscape element on a node; it can be treated as a landmark for the node or even for the whole park. With the advantages of its height, a pagoda can be easily seen by people from different distance and different directions. Therefore, the potential viewing positions of a pagoda could be anywhere in some degree. This requires the lighting design of a pagoda to have lights on each façade of the pagoda. The lighting design of Nuo Pagoda in the park of Xuan Wu Lake provides exactly same lighting methods, same luminance and same lighting colors on each façade. In this way, the night view of the pagoda presents the same image in every direction. This strategy proposes an alternative lighting proposal: sometimes it is not necessary to provide exactly same illumination for each façade of the pagoda, especially when there are few surrounding landscape elements nearby. The uniform lighting for an individual pagoda will easily reduce the structural modeling of the pagoda. In this situation, it can set three or four floodlights around the pagoda which can provide different levels of luminance for the facades (see Figure 6.5.2). This kind of lighting design can create different viewing experience for people when they move from one viewing position to another.

Vegetation – balance the protections and lightings

Although the vegetation lighting does not work as an outstanding part in the nightscape design of a civic park, it is still important to have some guidelines for it so that the misusing of lighting which may do harm to the vegetation can be avoided. For the lighting of trees in parks, the selection of lighting methods and installation positions need to be done carefully to avoid making harmful impacts on the growth of the trees by prolonged illumination or lighting facilities installations. For the trees which have a long age or rare species, lighting facilities must not be set in a short distance. Under normal
Chapter 6: Strategies

circumstances, the lighting design should avoid placing lighting facilities directly onto the trees. It is better to install the lighting facilities on the ground with a distance from the trees. But when the lights have to be installed onto the trees, relevant protective measures need to be taken. During the designing of the lighting, the trees’ biological characters should also be taken into consideration. In common situations, the vegetation lighting should be kept in low luminance and without special colors to prevent producing glares or light pollution to pedestrians or vegetation.

For other kinds of vegetation, like grass and flower pools, the lights would be better to illuminate the grass or flowers from the top down, avoiding spill light. The lighting facilities should be considered also as landscape elements instead of being the flaw of the overall image. The purpose of vegetation lighting is to present the natural beauty of the grass and flowers. Therefore, the lighting angles and lighting colors should be controlled so that the original colors of vegetation will not be changed by the lights.

Waterscape – avoid light pollution and focus on fitting into the night view of the city

Waterscape is one of the major attractions in a civic park, especially in a park which has a river or a lake inside it. When choosing lighting methods for a waterscape, it should be done according to the morphology of the water and the situations of its reflection. For artificial waterscape like fountains, the lighting can be designed in a dramatic way. The luminance and lighting colors should fit for the shape and height of the spray and not produce light pollution. For the natural waterscape, the luminaires should be concealed in the environment. Protective measures should be taken during the lighting design in case of changes of water level or frozen periods. Besides, on the edges between pedestrian spaces and waterscape, there should be functional lighting set in order to prevent accidental drowning.

As a civic park with the biggest lake in the city, the waterscape lighting of the park of Xuan Wu Lake has another function. There are a lot of viewing positions outside the park where people can see the overall night view of the park and the city. When viewing the park from outside, the lake and the park are just forepart of the whole picture, while the bustling night view of the city behind them is the major scenery in the picture (see Figure 6.5.).

Therefore, the waterscape lighting can help light up the shoreline. With the dim vegetation lighting, special structure lighting and the building lighting in the city, the overall night view presents a beautiful image with vivid luminance contrasts and the reflection on the lake, becoming a splendid image of Nanjing city.

Figure 6.5.: Abstract image of the night view of the park from outside (Yang, 2010)
Chapter 7. Discussion and Conclusion

At this point of this thesis the readers may already have had an overall picture of the nightscape status in the selected sites in Nanjing. After presenting the empirical data, the nightscape analysis and giving a series of strategies for future nightscape design, I attempt to have some discussions here to see if the research questions have been answered by this thesis.

7.1 What is nightscape?

At the very beginning of this research, I chose nightscape as the topic because I did find some problems in the nightscape constructions in Nanjing and I had the eager to help find out possible solutions to them. However, unlike my expectation, the theoretical part of this research did not go very well at the beginning, especially during the studies on Chinese literatures. As the key concept of this thesis, nightscape is a new-built subject and there are lot discussions on this topic. But the definition of nightscape has never been given clearly. There was even a period in which I was confused about the concepts of “nightscape” and “lighting”. The cause of this confusion is that nightscape has been treated as a topic about illumination technology for a long time in America and other developed countries. And they used the term of “lighting” for most situations instead of “nightscape” in the field of illumination technology. Meanwhile, more and more scholars have argued that the topic “nightscape” involves not only illumination technology, but also other subjects like urban design, urban planning, aesthetics, economy, psychology, engineering, and even ecology. Due to these factors, most Chinese scholars tried to study nightscape in the field of urban planning but they followed the tracks of the former western studies on illumination technology. This jump between different subjects leads to the phenomenon that in some Chinese literatures the terms of “nightscape” and “lighting” do not have any differences. Through the theoretical studies on both Chinese and other countries’ literatures, a definition of nightscape is addressed from the scope of urban design:

1. It is a concept which can be treated as a branch of landscape. It contains both natural landscape (the natural environment that are not influenced or slightly changed by human) and culture landscape (the landscape caused mainly by human activities) with natural lighting, which usually comes from the moon and other luminous planets during night, and man-made illuminating.

2. It usually appears as composite scenes with natural environment, urban elements, human activities, lighting facilities and so forth. It exists as a different representation of urban landscape from the day time which relies on the same elements and urban facilities as its carrier.

3. Nightscape aims to create a night view for a certain area or a city with artistic effects. It usually uses different lighting methods to change the appearance of urban spaces and human’s psychological feeling about them.

4. A nightscape can be designed to work for a long periods like years, but also can be temporary built for special purposes. It still has the characters of urban landscape and can be divided into different types.

The definition firstly locates nightscape as a branch of landscape. Like landscape, it can be used to describe the sum of all the objects people can see. It contains both natural landscape (the natural environment that are not influenced or slightly changed by human) and culture landscape (the landscape caused mainly by human activities) with natural lighting, which usually comes from the moon and other luminous planets during night, and man-made illuminating. But in this thesis, the nightscape mainly refers to the nightscape in urban public spaces, which usually contains urban elements like buildings, roads, parks, squares, and artificial illuminations. So secondly, the definition scales down itself into urban spaces. The third one can help distinguish the concept “nightscape” from “lighting”. As it is claimed, nightscape is used to describe the scene in a certain urban area, with a lot of elements in it. On the contrary, lighting is a concept with smaller scale. As the CIE (1989) defined, nightscape lighting refers to the exterior decorative lights for urban elements, like a building or other kind of structures. The fourth one highlights the special character of the duration of nightscape and points out that it is possible and necessary to make a typology of nightscape.
Chapter 7: Discussion and Conclusion

Through the theoretical studies, the functions of nightscape design were demonstrated by scholars in different points of view. British scholars like Marion Roberts (2006) pointed out the expansion of the night-time economy in British town and city centers in a time span of 10 years is mainly caused by the development of the new nightscape. Paul Chatterton and Robert Hollands (2002) also thought that the modern illumination system provided more opportunities for young people’s activities in bars, pubs, night-clubs and music venues within the night-time entertainment economy. Franke (2008) pointed out that nightscape design can help encourage people’s night-time activities and consumptions. Chinese scholars like Cao Xinxiang (2008), argued that cooperate with urban public facilities and business industry, the nightscape can make excellent aesthetic effects and stimulate people’s night-time consumptions. Besides the function of promoting night economy, there are also theories showing that nightscape can be helpful with creating the image of city (Lynch, 1960) and guiding human activities by influencing their mental and physical (Ashihara, 1984). And it is important to stress that the most important aim of nightscape design is to provide a secured and bright night space for citizens and to create a night view with artistic effects. Although nightscape can help the development of a city’s tourism and night economy, it still should go behind the main functions. Being aware of this fact, it will help the Chinese cities which went onto wrong paths during their nightscape constructions find the correct direction.

7.2 The typology making

During the theoretical studies, it is quite surprising to me that there was no built typology of nightscape yet. When seeking for the definition of nightscape, it has been proved to be possible to build up a typology of nightscape. And in order to achieve the final goal of this thesis—getting a series strategies for the design of different types of nightscapes—it is also necessary to have a typology. Therefore, I tried to make a typology of nightscape in Nanjing based on other relevant typologies. By studying on available literatures and official documents published by the local government, I managed to conclude the typology of lighting in Chinese cities according to <Code for Lighting Design of Urban Nightscape>. Subsequently, I brought in some theoretical typologies of urban open spaces to help build the typology of nightscape. By combining the “lighting” with the “spaces” together, a framework of the nightscape typology was made. But it was still not the final result, since there are still some differences between the concepts. As the definition demonstrated, nightscape includes all the entities and the exterior spaces in a certain area in a city, even the human and human activities inside. Therefore, the typology of nightscape is not about urban open spaces alone, the objects can be much larger. It should be about how a whole district or an area with similar characters in a city means to the citizens. Each type of nightscape may contain several different kinds of urban public spaces. Because of all these factors above, the thesis lists existing nightscape types in most Chinese cities as: downtown districts, city squares, pedestrian streets, commercial streets, historical/cultural scenic districts, civic parks, traffic roads, innovative industrial districts and waterfronts. Like the typologies of urban open spaces I mentioned in the theoretical part, this typology of nightscape cannot be a permanent one either. As the city keeps sprawling and our urban spaces develop, both the urban spaces and urban nightscape will have changes in the future. Getting this typology is an important step for this thesis. It is helpful for the site choosing and the other following parts.

7.3 The site analysis process

Although there are nine types listed out in the typology of nightscape in Chinese cities, only five sites of five different nightscape types are analyzed in this paper. That is because the site choosing is made also based on the municipal lighting planning of Nanjing city. Since the nightscape constructions in Nanjing are still at the beginning, some urban public spaces have not been set with special nightscape design proposals yet, this makes it impossible to find sites of traffic roads or innovative industrial districts. The reason that this thesis does not have analyzed sites of commercial streets and waterfronts is: among the chosen sites, the downtown district—Xin Jiekou—also has the characters of commercial streets inside it; and the civic park—Park of Xuan Wu Lake—has the biggest waterfront nightscape in the park itself. The analyses are proceeded by graphic analysis, urban night spaces evaluation, general aesthetic evaluation and interviews. Although I determined to study this topic long before and I had taken a lot of photos of the sites before I
started this research, it still turned out that my collected data was not enough for me to do the site analysis overseas. Internet helps me get access to the municipal documents and gathering images of the sites. During the image selection, I tried best to only choose the images which show the original view of the sites without additional processing. The criteria of the graphic analyses consist of physical indicators like luminance, reflectance, and spill light and so forth. Since this thesis is written from the angle of urban design, the urban night spaces evaluation is human-oriented with an emphasis on human dimension and human behaviors. The data are collected from my practical observations and some interviews or informal conversations. There are also some other data that are collected from some surveys and researches which are done by other scholars from other fields but about the same sites. Some of the aesthetic evaluations might be more personal since the aesthetic taste differs from one person to another. However, to make up for that, the thesis makes a lot of interviews to different citizens with different occupations like teachers, drivers, shop owners, children, the elderly and so forth. The interview data help make the analysis part more convincing. Through the analysis part, the thesis manages to list out the strongpoints and shortcomings of each site.

### 7.4 The links between the strategies for different nightscapes

Combining the theoretical studies on available literatures and the empirical analyses, the strategies and advices for the nightscape design are listed out according to different lighting objects in each type of nightscape. In fact, there are also some links between different strategies. Buildings are mentioned in the strategies of downtown districts, pedestrian streets and historical scenic districts. But they have different emphases due to their scales. For the downtown district with biggest scale, it is more important for the tall buildings to choose appropriate lighting methods according to their architectural styles and façade characters. But the buildings along pedestrian streets are usually lower and the main commercial spaces are often on their ground floor. Therefore, the building lighting in pedestrian streets needs to focus on creating a harmonious picture. The diversity of building styles in historical scenic district makes the balance between modern buildings and historical ones become the most important factor. As a thesis written from the scope of urban design, all the strategies pay more attention to the pedestrian spaces. Human dimension is the most important principle for the pedestrian spaces lighting in each type of nightscape. However, according to the different functions of the nightscapes, the strategies also highlight other factors, for example: in city squares and civic parks, creating a calm environment is also very important. The lighting of advertisements and signs is usually complained most by the citizens, especially in downtown districts and pedestrian streets. The main reason is that the advertising lighting usually has the highest luminance in the whole area. Although the advertising lighting can be quite helpful in creating commercial atmosphere, the light pollution and spill lights must be controlled. This situation also shows that there is a lack of relevant regulations about the advertising lightings in urban spaces in Chinese cities. Special structures are also quite common in urban spaces. It is mentioned in the strategies of city squares, pedestrian streets, and civic parks. But special structures like statues, towers, pavilions and pagodas can be also seen in other types of nightscape like downtown or historical scenic districts. Since the strategies are built based on the situations of Nanjing, special structures are not mentioned in all the strategies. But the solutions for most of common situations are already given in this thesis. And one of the most important principles for special structures lighting is to coordinate with the surroundings. Most of the lightings of waterscape and vegetation in the chosen sites in Nanjing did not get a nice effect. This is mainly caused by over-lighting. In fact, the aim of designing lightings for waterscape and vegetation is to make people able to see the natural scenery during the night. When the lightings are too dramatic or dynamic, the natural scenery will be damaged.

### 7.5 Conclusion

This thesis aims to fill the theoretical gap between nightscape design and urban design and to contribute to the future nightscape constructions in Chinese cities. As the rapid development in most Chinese cities, nightscape has become an important part of their urban planning. But taking Nanjing as an example, some Chinese cities are facing a lot of problems during their nightscape constructions. One of the causes of these dilemmas is that the theoretical studies on nightscape have fallen behind the cities’ development. To help solve these problems, this thesis seeks a better understanding on nightscape to help the further studies on nightscape in the field of urban design.
Chapter 7: Discussion and Conclusion

The final goal of this thesis is to address a series of strategies for nightscape designing in Chinese urban public spaces. To achieve that, the theoretical studies are extremely important. Due to the academic custom of Chinese scholars, the Chinese studies on nightscape always discuss the topics without digging the definitions of the key concepts. The lack of definition on nightscape makes the misunderstanding on “nightscape” and “lighting” very common in Chinese literatures. This misunderstanding also made an impact on the nightscape constructions in Chinese cities. For a long time, some Chinese cities have mistakenly thought that nightscape constructions is lighting the city up as bright as possible. The luminance competition among the cities caused a lot of light pollution and waste of energy. In the seeking of the definition of nightscape, this thesis studies on the available literatures and Chinese official documents about urban nightscape. And finally, this thesis gets a conclusion of the definition of nightscape, and manages to distinguish the two concepts: “nightscape” and “lighting”. The paper pointed out that nightscape is a branch concept of landscape which appears as composite scenes with natural environment, urban elements, human activities, lighting facilities and so forth. Nightscape aims to create a night view for a certain area or a city with artistic effects. And nightscape can be designed to work for a long periods like years, or be temporary built for special purposes. While lighting refers to the exterior decorative lights for urban elements, like a building or other kind of structures.

Following, a typology of nightscape in Chinese cities is constructed based on available literatures and municipal documents. This thesis makes a theoretical study on three different typologies of urban open spaces which were built with different focuses. Combining the similarities of the typologies with the actual situation in Nanjing, the types of urban open spaces in Nanjing can be concluded. Then another typology of lighting is concluded through document research. Based on these outcomes above, the typology of nightscape in Nanjing is addressed. The sites to be analyzed are selected according to this typology. In the analysis part, this thesis uses graphic analysis, urban night space evaluations and interviews to figure out the strongpoints and shortcomings of the nightscape in the chosen cases in Nanjing. And at last, a series of strategies are addressed for the future nightscape designs based on the theoretical studies and sites analyses. The strategies can also be treated as generic strategies for most Chinese cities which are facing the similar problems like Nanjing during their nightscape constructions.

However, due to the limitations of time and feasibilities, the analyses cannot be done with professional photometric equipment or relevant knowledge. Due to the actual situations of Nanjing city, several types of nightscape have not been analyzed, like traffic roads and innovative industrial districts. These could be the limitations of the thesis. And the author also realized that this research could be more successful if the site analysis part can be more detailed and if the interviews can involve more urban planners, urban designers and even the municipality.

Finally, this paper wishes to stimulate further discussions and researches on urban nightscape which treat it as a topic of urban design field. After achieving the main goals of this thesis, hopefully this paper could be a beginning from which we can get a better understanding on nightscape and find the right track of nightscape constructions. It is still possible to dig deeper into the typology of nightscape and there are still several types of urban nightscape need to be given strategies. And it would be interesting to move even further to discuss about the urban nightscape in bigger scale, like the overall night view of the whole city. In that context, it might be helpful for the field of urban planning.
Main references (in the order of appearance)

References List