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A REGIONAL NIGHTSCAPE LIGHTING DESIGN MODEL FOR METROPOLITAN AREAS OF SHANDONG PROVINCE

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This paper discusses the design strategy of urban nightscape lighting from the perspective of regional structure. Based on the development status and spatial location characteristics of regional cities in different provinces, the study summarises three types of strategies for night-time image shaping. A three-level design model, which consists of regional structure, design strategy and lighting expressiveness, has been developed. It reveals the influence of regional scale on the way of night-time image shaping and clarifies the progressive connection between night-time landscape lighting from a macro-regional context to a specific presentation.

Key words: *Nightscape Lighting; Visual Communications Design; Cities of the Shandong Province; Urban Visual Image; Design Strategy; Regional Innovation Design.*

INTRODUCTION

Nightscape lighting as the visual medium of urban public space plays an important role in the shaping of urban visual image and the creation of spatial experience. Through the effective presentation of the nighttime light environment in the urban landscape, buildings and public spaces, the context of the city's development and its positioning are clarified, and the city becomes more visible at night. Issues such as the aesthetic and functional qualities of these urban public spaces are becoming increasingly important as the amount of demand from people in the city at night grows [1]. It also shows that the formation of a holistic night-time image system relies on a night-time lighting that meets public needs and has a recognizable visual expression. Taking these factors into account, this paper divides the cities of Shandong Province into three metropolitan areas represented by the cities of Jinan, Qingdao and Linyi, in order to be able to coordinate the synergistic approach to night lighting on a regional scale.

PURPOSE

The purpose of this work is to develop a model for designing night-time lighting in the context of shaping the urban visual image in different regional spatial contexts. This study focuses on conducting the expression methods of night-time lighting comparative analysis of night-time lighting in the three metropolitan areas of



Shandong Province to clarify the characteristics of the type and orientation of night-time lighting design in different regions.

RESULTS AND DISCUSSION

In the urban nighttime environment, light is seen by people as a tool that can provide assistance in their activities and lives in the space they occupy [2]. Lighting design not only undertakes the basic lighting function, but also attracts the attention of designers as an important way of shaping the image and improving the quality of space at night. A sophisticated and modern night lighting design is able to create an enjoyable and effective communication atmosphere in the urban environment [3].

Nightscape lighting also needs to be optimised from a purely basic lighting function to an integrated design system with visual image expression and shaping functions, and its construction also tends to have certain regional differences, as is the case in Shandong province cities. In order to clarify this difference, and taking into account the growing public demand for aesthetic levels and the accelerating pace of modern urban construction, this paper proposes a regionally based design strategy model (Fig.1) to form a framework that can be used for regional analyses and comparisons. The model has three layers, namely the regional structural layer, the design strategy layer and the lighting expression layer. One design type is found in each of these three metropolitan areas in Shandong Province.

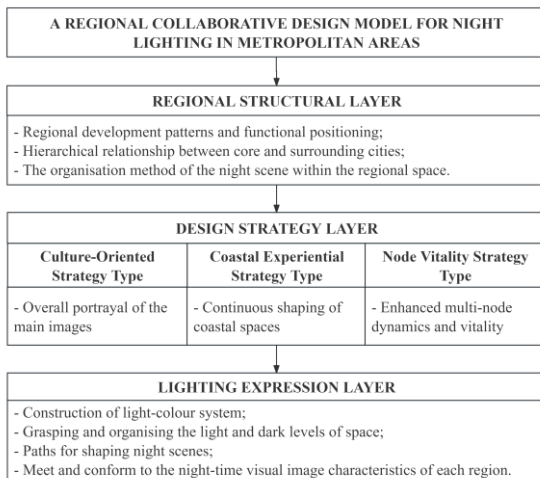


Fig. 1. The collaborative model for regional design of night lighting

Cultural-Oriented Strategy Type. The formation of the cultural-oriented type mainly comes from the area where cultural resources are rich and concentrated, where the expression of the city's image is clearer, and where the presentation of cultural imagery in the night-time environment is emphasised. The overall landscape remains stable in terms of visual expression, giving the city's night-time image a distinctive cultural identity. This type is mainly categorised in the provincial



capital metropolitan area, which includes the capital city of Jinan, as well as the cities of Zibo, Dongying, Liaocheng, Tai'an, Binzhou and Dezhou. By concentrating light sources and fine spatial layout, night lighting design can highlight the core city's culturally symbolic buildings and landmarks, making its nighttime image more prominent. This type also emphasises that the night light environment between core city and surrounding cities should be coordinated, and strengthen the key lighting of the main cultural images, allows the visual image of the regional city to be shaped with stability and restraint. This strategy type emphasises the holistic planning of night-time lighting, thereby enhancing the spatial expression of the metropolitan area at night, so that the night-time image is visually and emotionally consistent with the cultural experience.

Coastal Experiential Strategy Type. Coastal Experiential Type relies on the unique coastal city coastal space conditions, night lighting is usually designed around the coastline and waterfront area layout, coastal area in the composition of the night landscape occupies an important position. This type is typical of the Jiaodong metropolitan area, in which Qingdao, as the core city, has the identity function of the main image guide, and Yantai, Weihai, Rizhao and Weifang cities together constitute a coastal multi-node system. The key lighting in this region focuses on the coastal landscape and recreational areas, with the extension of the light band in the coastal space and through the change of light colour to strengthen and shape the visual performance of the coastline. As a result, these cities have a fluid and coherent spatial atmosphere at night. Nightscape lighting in this metropolitan area also has more attributes of tourism experience and external communication, which is also due to its open city development orientation and the geographical advantage of the coast. These show that in this metropolitan area, the open and distinctive night-time visual image is shaped by the extensibility and dynamics of the light environment.

Node Vitality Strategy Type. Node Vitality type is based on the spatial pattern of multi-city distribution in the region, the night landscape design is mainly centred around the city centre and the important node space, different city nodes can form a clear visual focus in the night landscape. This type plays a major role in the Lunan metropolitan area, represented by the city of Linyi and interconnected with the cities of Jining, Zaozhuang and Heze, presenting a pattern of multi-city synergistic development. It is worth noting that the metropolitan area is located in the inland area of Shandong Province, and its night lighting should highlight the life consumption scene. In this metropolitan area, the night-time lighting design needs to focus on commercial blocks, public squares, featured street blocks and other areas, so that the structure of the visual centre of gravity presents a dispersed but orderly appearance. In addition, interaction and echo should be maintained between different nodes, which requires paying attention to rhythmic changes and hierarchical distribution in the planning of the night light environment. It can be seen that this type of strategy is committed to shaping and enhancing the spatial attractiveness of the urban night scene through the change of light and dark, and tends to create a harmonious night environment.



In short, under this framework structure, different nightscape lighting design strategies form an echoing expression system within the scope of the metropolitan area. In this way, night lighting creates a hierarchical yet coordinated overall spatial pattern at night between the cities in each metropolitan area.

CONCLUSIONS

The study examines the issue of night-time lighting in the megacities of Shandong Province. Three types of night lighting design strategies are proposed, namely: culture-oriented, coastal experience, and nodal viability. They correspond to the capital territories, the megacities of Jiaodong and Lunan, which can reveal the connection between the regional context and the representation of the night image. This article also constructs a design strategy model for the region, which analyses and examines in detail the characteristics of night-time lighting from three dimensions: regional structure, design strategy and lighting expressiveness. The model confirms and reinforces the importance of night-time lighting in the study of regional visual image.

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МОДЕЛЬ ДИЗАЙНУ РЕГІОНАЛЬНОГО НІЧНОГО ОСВІТЛЕННЯ ДЛЯ СТОЛИЧНИХ РАЙОНІВ ПРОВІНЦІІ ШАНЬДУН

У статті розглядається стратегія проєктування освітлення нічного міського пейзажу з точки зору регіональної структури. На основі особливостей розвитку та просторових характеристик міст різних провінцій у дослідженні узагальнено три типи стратегій формування нічного образу. Розроблено тривірневу модель проєктування, що складається з регіональної структури, стратегій проєктування та естетики освітлення. Вона розкриває вплив регіональності на спосіб формування нічного образу та пояснює прогресивний зв'язок між нічним освітленням ландшафту від макрорегіонального контексту до конкретної презентації.

Ключові слова: нічне освітлення; дизайн візуальних комунікацій; міста провінції Шаньдун; візуальний образ міста; стратегія проєктування; регіональний інноваційний дизайн.