

The Exploration of Diversity of Rural Road Landscape Forms

Yuan Liu^{1,2,3}

¹ The school of landscape architecture, Beijing University of Agriculture, Beijing, China

² Beijing Rural Landscape Planning and Design Engineering Technology Center, Beijing, China

³ Beijing Laboratory of Urban and Rural Ecological Environment, Beijing, China

ABSTRACT. Rural road landscape is a form of road landscape limited by villages. Through the study on the diversity of rural road landscape forms, it can guide the construction of rural ecological environment, beautify the appearance of villages, highlight the visual beautification of landscape and the suitability of environmental experience. Rural road function does not only refer to the basic function of traffic, but also should meet the functional requirements of ecological and diversified use. Based on the diversity use function of different objects, the diversity of rural road landscape forms is particularly important. The road system, the concept of ecological road, the use needs of residents, and the use needs of tourists can make the road landscape form more abundant.

KEYWORDS: Rural Road, Landscape, Ecology, Function, Diversity

1. Introduction

Rural landscape is a landscape type that defines the region on the basis of landscape and takes the countryside as the object of discussion. With the development of China, people have more and more new understanding and requirements for landscape, and people hope to improve their living environment. Not only cities but also villages are facing the problem of landscape renovation and upgrading. Rural landscape covers a wide range of areas, and rural road landscape is also an important part of it. Through the study of the diversity of rural road landscape forms, it can guide the construction of rural ecological environment, beautify the appearance of the village, highlight the visual beautification of the landscape and the suitability of environmental experience. In order to promote the harmonious coexistence of human and nature, build harmonious villages and towns, carry out ecological, folk, tourism and a better rural life to lay the foundation.

2. Functions of Rural Roads

2.1 Meet the basic functions of transportation

Rural roads refer to roads distributed within and between villages. It includes not only the pavement with use function, but also the whole space including road greening and various road facilities in the interfaces on both sides. As a rural road, its most basic function is to meet the traffic needs of rural residents in production and life. Rural roads connect provincial roads, county roads and other large and medium-sized highways, and extend to rural households. They are the basic part of the road network, mainly including the external communication roads between rural areas and rural areas, tourist roads, rural internal main roads, branch roads, household roads, field roads, and other infrastructure directly serving rural life, tourism and tourism.

2.2 The important function of connecting man and nature and constructing ecological harmony

Rural roads are not only the infrastructure to meet the needs of rural transportation, but also an important part of building a harmonious rural ecological environment. Different from the man-made ecological environment in cities, vast rural areas have a large base of natural ecological environment. Ecological study of road planning and design is also an important content. This is of great significance to the natural ecosystem, the utilization and protection of natural resources, the protection of animals, plants and various natural characteristics, places of interest and scenic beauty, etc. The application research of landscape ecology and agricultural or rural landscape planning in foreign countries are mainly carried out in some European countries. Since the 1990s, a large number of documents about "road ecology" have appeared. Scholars in the Netherlands and Australia took the lead in studying the interference and destruction of road network and traffic corridor to natural ecosystem, and gradually put forward the design idea of ecological road.

2.3 On the basis of ecological road, meet the diverse use function of different people

Rural roads are important carriers connecting villages with villages, villages with cities and villages. It is a higher level design requirement for rural road planning and design to meet the diverse use functions of different target groups while minimizing the interference and destruction to the natural ecosystem. In fact, the use of rural roads is very diversified. It is not only limited to local rural residents, but also includes a large number of passers-by, short-distance tourists, long-distance tourists, foreign settlers and other specific users. Therefore, in a specific range, how to meet the needs of different groups of people, so that rural roads are not only limited to their basic traffic functions, but also based on the design concept of ecological roads,

to enrich the form of roads and the diverse experience of users, is also a problem we need to think about.

3. Problems Existing in Landscape Forms of Rural Roads in China

3.1 Lack of systematic planning and imperfect road structure

As a link between the countryside and the outside, most of the external forms of our country's rural roads are expressways, national roads, provincial roads and county roads, or extensions of these roads. As the connection framework of rural life, the main roads in rural areas in China have been developed as important projects of farmland infrastructure construction for many years, but most of the main roads in rural areas rely on agricultural production. Agricultural production roads are mainly roads aimed at production services, which belong to production infrastructure. They do not give too much consideration to the function of life services, nor do they mention the division of road grades. Rural roads that do not have too many planning and design and do not focus on the needs of life and landscape constitute the main body of the current roads. This imperfect road planning structure has become a key constraint factor in the current rural economic and social development.

The backward rural road network makes the living conditions of rural residents fail to improve synchronously with the economic development. The development of rural roads does not match the development and promotion of rural economy and rural architecture. Without a good rural road planning system, it is also difficult to fundamentally change the stereotyped image of our country's villages.

3.2 Simplification of road functions

In terms of road function, the existing rural roads have a single functional structure, and most of them are only basic functions for traffic, mainly for driving, pedestrians, farmland cultivation, mechanical transportation, etc. With the construction of beautiful countryside and the vigorous development of rural tourism, people's functional requirements for rural roads have gone far beyond the functional requirements for transportation, and also beyond the low-level goal of "to get rich, build roads first". How to improve the high-level functional requirements of rural road landscape, how to meet the functional requirements of fitness, cycling, recreation and other functions beyond the travel of rural residents, and how to meet the diversified forms of rural tourism are all the planning and design objectives of the higher level of rural road function.

3.3 The single form of landscape

In terms of landscape form, the landscape effect of existing rural roads is uneven and the form is relatively single. Both sides of the road are mainly in the form of

street trees, simple arrangement of trees and shrubs, slope protection, retaining wall, etc. One road, the same form, is the same. At the same time, the road landscape lacks regional cultural characteristics, and the road function lacks characteristics in landscape expression.

4. On the Diversity of Rural Road Landscape Forms

4.1 Forming a rural road system with complete structure

As a link between the countryside and the outside, most of the external forms of our country's rural road. In the rural road structure, dividing rural roads according to different functions can build a more complete rural road system, and clear functions can also more prominently express different landscape forms.

(1) External traffic road system

The external traffic road system is a road traffic system connecting villages and cities, villages and surrounding areas. Its road classification mainly includes expressway, national road, provincial road and county road. In terms of landscape form, this kind of external traffic roads, considering the safety, convenience and smoothness of traffic, take the regular collocation or natural collocation of plant landscape mainly conforming to local tree species as the main landscape construction method. At the same time, a variety of landscape forms of ecological slope protection are used to maintain the safety and stability of roads and terrain on both sides.

(2) Road system of scenic tour

Scenic tour road system is an important part of building rural tourism resources. Apart from some roads taking on the function of external transportation, the more important function of scenic tour roads is to build complete, convenient and rich scenic tour routes. The tour road system can be divided into: main external traffic tour road, tour route trunk road, secondary trunk road, cycling road, tour path and other tour trails.

(3) Agricultural productive road system

Agricultural productive road is to meet the needs of agricultural material transportation, agricultural cultivation and other agricultural production activities. Including field road, production road, all engineering measures to meet the needs of agricultural production activities and drainage irrigation. These roads are exclusive roads for agricultural production and should be distinguished from sightseeing roads and living roads in planning to form a complete road system and production and transportation lines.

(4) Living road system of residents

The life road system is a road system that meets the daily life of the residents in the countryside. In the classification of road system, it can be divided into main

roads, secondary roads, branch roads and minor roads. At the same time, the greenway system can also be introduced as a walking path for residents' daily fitness and recreation.

4.2 Design concept of ecological road that builds harmony between man and nature

The diversity of rural road landscape forms is also reflected in the ecological road design concept of harmony between man and nature. Under the base of such a natural ecosystem as countryside, the emergence of roads has undoubtedly split and destroyed the natural ecosystem. How to reduce the road damage to nature is a problem that we need to consider in road planning and design. In recent years, people have also made many explorations into the landscape forms of ecological roads:

(1) In the route area where animals are moving, the two sides of the road are connected by means of corridors, elevated roads and other forms, so as to reduce the separation of the road from the area and enable the areas where animals are moving to be connected again. Shrubs and grasses similar to the surrounding environment are planted on the corridors or ecological passages specially built for animals to facilitate the passage of animals.

(2) New materials, natural materials and greening measures are used to replace rigid pavement and slope protection technology, so as to reduce the damage of cement mortar to soil.

(3) Use the planning and design of terrain, such as water storage ditch, gentle slope belt and other forms to reduce the impact of hard slope protection on nature.

(4) In the aspect of road greening, local tree species are used to simulate the natural ecological configuration and reduce the impact of alien species on nature.

4.3 The exploration of diversified road landscape forms to meet the needs of rural residents

In fact, the roads used by rural residents are more developed around the road system of residents' life. The residents' living road system not only distinguishes the road grade from the road width, but also can develop more road landscape forms to meet the residents' daily living habits and needs.

(1) Combining with the landscape area in the center of residential areas and fitness venues, a fitness trail system will be formed. Functions such as riding trails and jogging trails will be introduced. Separate trails will be added or added to both sides of the roadway. Elevated roads can also be used to increase the interest and space of the road.

(2) Use the rural natural terrain to increase the landscape change effect of residential roads.

(3) Use a variety of plant configuration to increase the landscape change form of the road.

(4) Use landscape sketch and other forms, such as street lights, signs and so on, to add the regional cultural characteristics of road landscape.

4.4 Diversified landscape road development based on tourism resources to meet the needs of tourists

Diverse landscape roads to meet tourists' needs are mainly reflected in the rural landscape tour road system. Touring roads pay more attention to the variety of road landscape and different road functions. The introduction of garden elements such as plants, topography, water body and architectural sketch can enhance the richness of road landscape.

(1) In the tour road system, rich road functions can be utilized, and besides car dealers and pedestrians, animal corridors, fitness trails, jogging trails, various tour paths and other different experience roads can be added.

(2) Combined with natural landscape resources, different plant configurations and plant landscapes are utilized to form unique road landscape forms. For example, hiking trails in forests and wetland experience trails will create different road landscape effects.

(3) The use of mountains, water and other rich terrain changes to increase the richness and interest of the road space landscape.

(4) Setting up architectural sketches along the road is also a way to enrich the road landscape.

5. Summary

Rural areas are vast in territory. Roads not only carry traffic functions, but also can have very diversified road functions and various landscape manifestations in the face of different users. This paper summarizes the starting point of rural road landscape to be considered in planning and design, and suggests that a complete rural road system should be formed in planning, and an ecological road design concept of harmony between human and nature should be constructed at the same time. And from residents and tourists two parts of the use of objects, planning and design of rich road landscape forms, in order to enhance the overall effect of rural landscape.

Acknowledgments

Fund Project: Beijing University of Agriculture Youth Fund -- Project No.SXQN2016204

References

- [1] Shen Pengfei. Research on Rural Community Road Space System [D]. Zhejiang University, 2013.
- [2] Liu Yuxuan. Analysis of village road planning and design under the background of beautiful villages [C]. Academic Committee of Urban Transport Planning of China Urban Planning Society. Quality Transportation and Co-governance- Proceedings of the 2019 China Urban Transportation Planning Annual Meeting. Chinese Cities Urban Transport Planning Academic Committee of the Planning Society: China Academy of Urban Planning and Design, Urban Transport Professional Academy, 2019: 1189-1196.
- [3] Xu Dawei, Qiao Jingya. Landscape of rural roads—macro planning, micro design [J]. Low Temperature Building Technology, 2013, 35 (01): 20-21.
- [4] Liu Desong. Thoughts on issues related to ecological road design [J]. Heilongjiang Communications Science and Technology, 2013, 33 (06): 32 + 34.