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Review Suggestion to the Design on Road Cross-Sectional of Urban-Rural Fringe

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Abstract: Summarized the traffic characteristics of the urban-rural fringe and the research status of the road cross-sectional design, and has carried on the analysis on the basis of the discussion, summarizing the lack of the urban-rural fringe of road cross-sectional design, and putting forward the future research direction.

Keywords: Urban-rural fringe; Road cross-sectional design; Traffic problem

1. Introduction

Road cross section is a very important step in road linear programming, Because of the different properties of land use[1], the design of road cross section should have their own characteristics, but all road cross section design in our country is in the same way, without reasonable design.

Along with the outward expansion of the city, the property of land located at urban-rural fringe of urban and rural transition has changed. Meanwhile, due to the concept blurring, most of the road construction at the urban-rural fringe has the characteristics of spontaneity and blindness, thus leading to the serious mixed line of various modes of transportation at the road junction, reducing the traffic capacity of the road and increasing the risk of roads[2].

Currently, many scholars consider that the transition areas between the urban and rural should correctly handle the relationship with the overall urban planning, its planning must be included in the overall planning of urban and rural transportation planning; as a transition zone between urban and rural areas, not only to convenient for dredging the city's external traffic, but also having a better accessibility with the surrounding rural areas; Its cross section construction should make full use of the existing road foundation conditions, making the old and new compatible, as far as possible to avoid the demolition work is too large, saving the investment; Strengthen planning implementation and management.

Therefore, a reasonable road cross section design for the urban and rural fringe has an important impact on easing the traffic pressure, increasing the residents travel comfort and improving the environment et.al.

2. Road Cross Section Design

Road design has a close link with road grade, road speed, traffic composition, sunshine ventilation and other factors, must be adapted with the road level, both sides of the land use and the local economic situation. The road cross section can be divided into single road, two road and three road, the road environment and traffic conditions adapted to various cross sections are different to each other.

Meanwhile, there are many influencing factors in the road cross section. Firstly, Transportation mode has an important influence on the design of cross section. The traffic on roads in rural areas in China is largely composed of non motor vehicles such as bicycles[3]. Many rural families have their own cars nowadays. The number of motor vehicles on the road will increase. At the same time, the village bus also gradually popularized in rural areas, the villagers travel choice is also increasing diversely, cross section design of the road has also needed to make corresponding changes.

Secondly, land use has a profound impact on the design of road cross sections. Road planning is attached to the land use status of the region. Reasonable road design can maximize the level of the use of land in the area. The functional of the road and the land use pattern on both sides should be supplementary to each other and complement of each other, moreover, the function of the road and the design of the cross section are linked to each other inextricably[4].

Finally, road planting[5,6] also affects the design of the road. The degree of road planting has a close relationship with the regional environment. If the road central separating belt and the non separation belt greening facilities could better collocate with the green space , there will form a charming landscape in the inner region. At the same time, road planting could also be used as the induced wire of driving, reenable and ecology friendly, reducing the temperature inside the area and the heat island effect[7].

3. Traffic Characteristics of Combination of Urban and Rural Areas

At present, the construction of the urban and rural combination has the characteristic of spontaneity and blindness in many parts of our country, the development of the

urban and rural combination is better than that of the rural areas, traffic composition is complex, the overload cars and van is very much on the road. Some vehicles' running speed is very fast. In the meantime,

Most of the rural population is elderly and children, it is very easy to occur risk. At the urban and rural combination, road without canalization, and the various mixed vehicle such as motorcycles, bicycles and other vehicles have a serious impact on traffic safety. At the same time, many rural areas generally cast a large set[8] at the rural and urban combination, the road is very crowded for a short time, the vehicles come and go are stuck in the road, it is very difficult to pass[9].

The road located on the rural and urban combination is lack of foundation installation, the road pavement is in bad repair all the year round, there are a large number of damage phenomenon such as cracks, rutting, mud and dislocation. The traffic flow on the road is in an unstable state, the time of on and off duty and up and down study is the obvious peak period all the day, in the usual time the traffic volume on the road is commonly, it is the flat peak. On the other hand, the public transportation system connect between the rural and the urban combination is not as developed as the the urban area, passenger traffic can not meet the travel volume demand in the rush hour, leading to overloading phenomenon is very obvious, although the traffic police in the holidays are also increased monitoring strength, but the phenomenon is still failure to prohibit repeatedly, unable to get a radical cure at all.

4. Current Study Situation of Road Cross Section of Urban and Rural Combination

(1) At present, there is no special road cross section design standard[10,11] in urban and rural combination in our country, in the construction, some places use the urban road cross section design standard, some places use the standard of highway construction, and some places across to use both of them, and the phenomenon is all in confusion.

(2) Besides, the object of management[12] is not clear at the rural and urban combination of many locality, when the problem such as the pavement fallen into despair appearing, it is in a state of no management generally, the road cross-section planning not essential at this point, all kinds of vehicles do not drive in the driveway, the road and traffic conditions are getting worse and worse.

(3) There is a suddenly transition at some place between rural and urban areas, a sudden transition existed from a high - grade road to a low - grade road, design speed changed suddenly in a certain drop, in the meantime, if there is no corresponding change in the cross section design, it is very easy to lead to traffic accidents.

(4) In the early situation of the situation of construction and development efforts is not much, the construction generally in accordance with the standards of the highway, it needs to set aside enough space for development[13]. With the sustainable development of economy, it needs to conversion the design standards into the urban design standards based on the original road design standards, to meet the current needs[14].

5. Discussion on the Road Cross Section Design

At the combination of rural areas and urban areas, the traffic composition is very complicated, there existing a serious phenomenon of mixture of transportation of all manners of vehicles, the traffic characteristics are both urban characteristics and rural characteristic. With the development of economy, the combination of urban and rural areas is bound to develop into the city, there must having a long-term vision in the process of design, it is necessary to transform the original highway to the urban road to the maximum extent in the design of road cross section, the consideration of the road construction should be comprehensive for the short and long term, avoiding the shortage or waste of resources.

Firstly, local economic development level has led to changes in the trip mode of local populace, and then the need for the improvement of the road cross section design is proposed, the key of the previously preparatory work is to analyze the local traffic composition, several pieces of board adopted by the road is determined by the traffic composition, the traffic composition also determines the change of the lane width. At the same time, the passenger transport mode is not the same, the setting method of the road site of the combination of the rural and urban areas is not the same, until it extends into the interior of the city.

Secondly, Every place in the countryside will have different social customs and habits, such as markets and so on, and these markets are usually held at the local exclusive traffic arteries, and this leads to the traffic jam of the combination of the rural and urban areas. For the motor vehicles and large freight car, it is very difficult to pass in this case, so it can be solved through the cross section design, before reaching this path, changing the number of lanes on the road could be adopted to smooth transition, such as the 4 lanes at the previous time reduced to 2 lanes currently, leaving enough space for the markets, coupled with reasonable traffic control, the traffic pressure could be relieved.

Thirdly, the main roads and secondary roads and branch in rural areas just reflect the important extent of a road, there is no clear traffic characteristics and the requirements of the function use of the road. And the types of vehicles of the rural areas are more complex than the big cities, the principle of the bypass flow should be used to solve the traffic problems. The roads of the rural areas generally do not set the road markings, the traffic basic infrastructure is only street lamps, and the traffic consti-

tution is complicated, without the separation of vehicles and non vehicles, there is no requirement for the running speed of driving in the countryside, so the road design standards of highway need not to be reference, the road of combination of rural areas and urban areas could be designed according to the standard of city road.

Fourthly, Although the running speed of the city road is slower than that of the road, but according to the survey, urban road design method is more suitable for the situation of rural areas. First of all, adopting the design standard of urban road can reduce a lot of volume of the fill and cut earthwork, minimizing the cost of the road construction, for the rural construction, this is a great benefit. What's more, small shops and so on are usually seated beside the road in the countryside, as a result, the urban roads can ensure that the roads and the shops can be effectively connected, and reducing the running speed of driving, greatly increasing the safety of the road.

Fifthly, for most of the rural areas, most of them are optimized for the public transportation, at this moment, the bus right of way should to be programmed when designing the cross section of the road, the outermost lane could be widen, because the bus travel speed is relatively slow, the bus could common use a lane with pedestrians and bicycles.

6. Conclusion

The gap between urban and rural areas is relatively large in our country, the rural situation in each place is not exactly the same, therefore the design of cross section of the rural road should not follow the same pattern, its construction need to respect the local people's customs and habits.

At present, the road construction planning in rural areas is lack of the characteristic of comprehensiveness and systematization, the construction method is in confusion, bad driving condition, there is a great difficulty in supervision, the phenomenon of a mixture of transportation of vehicles and non vehicles is very serious, through the programming of the cross section, the phenomenon of a mixture of transportation of vehicles and non vehicles on the road could be effectively curbed, the traffic congestion could be effectively eased, the capacity of road traffic could be effectively increased.

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