The study on create transit metropolis promotion mechanism and model-Guiyang case

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Abstract. The sharply develop for urbanization has caused the emergence of urban congestion problem, however, this emergence issue is hampering the process of urban development. Therefore, government gives priority to the development of transit metropolis as an important means to improve the level of urban public transport services, meet basic travel demands for people, as well as, alleviate city traffic congestion and the pressure of the resource issues will surely play an significant roles in new urbanization strategies and building livable cities. On the one hand, this report introduces the transit metropolis, as well as, summaries some experiences of creation and exploit the transit metropolis in overseas countries. On the other hand, it takes Guiyang City as a case study, through research of the progress for creating and promoting transit metropolis to reflect the experience and present existing problems. This provides a strong guarantee and strong support for setting up the national model city of ‘transit metropolises.

1. Introduction

With the Continuous development of the economic society and the increase for the demand of people travelling in recent years, cities needs to face the plenty of issues that includes security, congestion, environment, energy, and service etc. These factors have become increasing prominent in relation to the vital interests of urban residents, seriously affected cities exploitation and the living standard for people. Therefore, government gives priority to establish transit metropolis as an important means to improve the level of urban public transport services, meet basic travel demands for people, as well as, alleviate city traffic congestion and the pressure of the resource issues. These will surely play significant roles in new urbanization strategies and building livable cities.

Transit Metropolis is a significant livelihood project that meets the basic travel services of the people. It is one of the most important foundations related to smooth promotion and carry out of the new urbanization strategy and achieving good implementation results. In order to further implement the priority development strategy for transit metropolis, the Ministry of Transport initiated the demonstration project for the construction of transit metropolis at the end of 2011. It aims to select a number of cities across the country for establishment transit metropolis. Meanwhile, to use this as an opportunity to explore methods and conclude actively summarize construction experiences to implement the priority development of public transport. Furthermore, it sets a benchmark for transit metropolis to other cities across the country and promotes the healthy development for public transport. [1] Therefore, the demonstration project of transit metropolis construction is a major measure to implement the country priority development strategy of urban public transportation, regulate and guide traffic demand, ease urban traffic congestion and resources pressure, as well as promote the sound and rapid development of urban public transport in China new era. There were a total of 87 cities for the
three bathes of Transit metropolis establishment approved by the Ministry of transportation at the end of 2017. [2]

Guiyang is the central of the political, economic, cultural, educational, transportation and tourism service as the capital of Guizhou Province. Meanwhile, it is a significant transportation hub, regional commercial trade and logistics center in the Pearl River Delta and the Yangtze River Delta in the southwest region of China. Furthermore, Guiyang has become an important central city within the ‘Qianzhong Industry Belt’, ‘South Guizhou-Kunming Economic Belt’ and ‘Pan-Pearl River Delta Economic Zone’ identified by the State council. In 2013, Guiyang became the second batch of transit metropolis which was approved by the Ministry of Transportation. Therefore, Guiyang City shoulders the important role of supporting the city’s overall planning goals, as well as, a good leader and pioneer in scientific development of transit metropolis construction in the Guizhou province. So, this report takes Guiyang create a ‘transit metropolis’ as a case study to display the implement of the priority development strategy for public transport, as well as analyze the present existing problems in the process of creating the transit metropolis.

2. Main Body

2.1. The Awareness of Transit Metropolis and Summery For Its Foreign Experience

Transit metropolis reflects a kind of public transport which provides a city development mode with comprehensive efficient and benefit of social environment. It makes city public transport as motorized travel subjects and guides the layout structure for urban development-oriented. Meanwhile, it is a best shape of city construction which limited by resources, environment and other conditions. Transit metropolis recommends urban public transport driving and guiding the urban development and social environmental benefits. After that, it emphasizes the relationship and harmony between transport and urban human settlements, environment, structure functions and spatial layout. In summary, it changes the integrated management of traffic efficient which rely on its own characteristic such as a high proportion of urban public transport sharing, compact city spatial layout with diversified service network and base the transport priority policy. [3, 4]

In nowadays, there are plenty of cities which have complement transit metropolis around the world, such as Paris, London and Hong Kong. Through the study of their development experience, concluding that transit metropolis construction needs to find the suitable regulations and development strategies. This provides the protection for promoting the creation transit metropolis. The creation of transit metropolis shall pay more attention on develop public transport, set up the connection urban network which has a great region, high efficient, performance and combine many transport types. With the basic of closed connection in main region transport network, gradually become the leader factor in urban space development. It can help to support of optimizing space structure and rising urban ability. Transit metropolis guides the attention of passenger to public transport. For instance, based on the TOD (Transit Oriented Development) mode, it had an extensive utilize in the practice of urban development in the late 1950s. TOD mode changed traditional thought of urban planning that focus on utilizing lands. It addresses the mix and high density land using. Through set up the urban group around public transport lines to promote the concentration of land exploitation which consist by commercial, culture, education, living and other factors, as well as, achieving the change from traditional ‘passive adaptability’ to ‘active inductility’. Therefore, it has a benefit to improve the using rate of the land where near by the transport infrastructure and lead the in order development of urban new region, as well as, decrease the civil travel cost. Meanwhile, it is good for raise money in different channel to help transport establishment and operating and change city ecology environment.[5,6]

2.2. A Case Study of Guiyang Transit Metropolis’ Mechanism and Mode

According to the introduction of the basic contents of transit metropolis and summarizing the experience of foreign countries, the problems faced in the transit metropolis creation in Guiyang will be considered. Based on the plan for it, the promotion mechanism and model will be studied. This can understand the process of transit metropolis creation and provide the lessons for other cities. It needs
to make the six main promotion mechanism in the creation progress.

First of all, it is a space corresponding mechanism. This focus on solving the TOD land development model. It mainly analyzes the Guiyang vehicle transport, public transport and other major transport modes have guiding effective on urban land use. After that, it makes the choice of process the transport mode which use the bus as the main transport mode refer to the cooperation development aim of transport and land using in Guiyang. Meanwhile, it issues the key routs of implement TOD exploit mode. The figure 1 shows the makesaffection combination of the TOD theory and transit metropolis strategy.

Figure 1. TOD idea and basic relationship for Transit Metropolis

Second area is starting the urban public transport industry development mechanism in progress. Discussion, guiding and regulating the intensive, scale of enterprise, improve service level and new competitive mechanism. Achieving the complement suggestion of urban public transport market enter and exit regulation. Finally, become into an industry development mechanism suggestion which consist of commonweal, sustainable and moderately competitive.

The third part is exploit and create the management mechanism in transit metropolis progress. This shall needs to analysis the implementation plan of significant project contribution for Guiyang transit metropolis. The study put forward a dynamic management mechanism of significant project implementation, as well as, focus on different types of significant project and identify the method, progress and promotion mechanism in progress management.

The forth is projecting statistics report mechanism, this can help analysis the implementation plan and annual objective for Guiyang transit metropolis, which combine the requirements of annual demonstration project creation report in Ministry documents. The research put forward project statistics report mechanism can identify the range of work, the cycle of statistics, subject of statistics and content requirement of statistics etc.

The fifth is public participation mechanism. In this area needs to understand how to address the public participation and supervise intensity as well as, address the supervise assessment methods and measures. The research proposes an interactive consultation system for public opinions and suggestions of urban public traffic management and public transport operators.

The last part is to carry out the safeguards and supervision mechanisms for the whole transit
metropolis. This is an organized leader and multi-sector coordination mechanism shall help to solve the problems for public traffic. Through the research to makes the dynamic examination rules of establishment demonstration project performance, make sure the responsibility of contribute firms and the system, method and progress for assessment transit metropolis performance.

2.3. Problems Still Existing In the Promotion of Transit Metropolis

2.3.1. The Defects in the Development of transit metropolis System. There are two major defects in this section; the significant one of them is the foundation of urban public traffic still has a large room for improvement. The public traffic system has overwhelmed in old and traditional urban, current road and public transport network and other infrastructure cannot meet the demands of people normal travel due to the sharp increase of the population, the amount of vehicle ownership and over 40 thousand of population density in the center of Guiyang City. Meanwhile, Guiyang has not set up the public traffic and other traffic ways as well as, the highly connective comprehensive passenger terminal. There is still not complete infrastructure, for example, the lack of first station, terminal station of bus and junction station setting, this lead to civil choose vehicle rather than public transport and cause the serious traffic congestion. Therefore, it produces a significant problems include citizens waiting for long time, waste time during the journey and comfortless that restrict service of public transport.

As for another area, there is a single ways for urban public transport service. There is a single type of product and service structure which consist of The Normal Bus Transit (NBT) and Bus Rapid Transit (BRT) as major official operation but lack of Urban Rail Transit. Although with the research and development in many years, the whole city formed the urban public transport as ‘speed combined with trunk line matching and service for 24 hours’, it still exist the gap compare with the differentiated and diverse public transport travel demands of residents. The great scale of city infrastructure contribution also has direct effective of the increase of public traffic attractive.

For instance, the table 1 and 2 reveal some data of the aim on creation transit metropolis from 2012 to 2016. During the year of 2014, the on-schedule rate of public traffic in Guiyang was 44.67%, public bus average operating speed in morning and evening rush hours was 13.31 km/h, average traffic congestion during rush hours was 102.75%, utilization of public transport card was 17.8%. Through the third party calculate and assess the public transport passenger satisfaction was 62.29%. After that, in the year 2016, public bus average operating speed in morning was 11.06 km/h and in the evening was 9.18km/h. the average speed during the two years have a sharp decrease. The on-schedule rate of public transportation was 37%, utilization of public transport card was about 27.55% and passenger satisfaction was 64.21. Compare with the aim 80%, actual data has a big gap to achieve it.

Table 1. The table for summery the down aim on creation transit metropolis

| Order | Specific indicators                                      | Unit          | indicator types | 2012                   | 2014         | Target value |
|-------|---------------------------------------------------------|---------------|-----------------|------------------------|--------------|--------------|
| 1     | on-schedule rate of public transportation               | %             | assessment index| 80.7(2013year value)   | 44.67        | 85           |
| 2     | Public bus average operating speed in morning and evening rush hours | Km/h | assessment index | 15.31(2013year value) | 13.13        | 18           |
| 3     | Average traffic congestion during rush hours            | %             | assessment index| 96.87(2013year value)  | 102.75       | 90           |
| 4     | Public transport passenger satisfaction                  | %             | assessment index| 62.42(2013year value)  | 62.29        | 80           |
| 5     | Utilization of public transport card                    | %             | assessment index| 18.2                   | 17.8         | 80           |
Table 2. The table for summery the down aim on creation transit metropolis

| Order | Specific indicators                      | Unit | indicator types | 2015 | 2016 | Target value |
|-------|------------------------------------------|------|----------------|------|------|--------------|
| 1     | on-schedule rate of public transportation | %    | assessment index | 36.45| 37.03| 85           |
| 2     | Bus entry rate                           | %    | assessment index | 37.62| 45.6 | 73           |
| 3     | Subsidy in place rate for bus operation  | %    | assessment index | 17.64| 23.87| 100          |
| 4     | Bus lane setting rate                    | %    | assessment index | 3.0  | 7.5  | 15           |
| 5     | Bus line network ratio                   | %    | assessment index | 50.4 | 52.9 | 82           |

2.3.2. The deficiency in the process of creating transit metropolis. There are also two major problems in the creation progress. On the one hand, in this progress needs to up speed to make the urban public transport subsidy mechanism. However, Guiyang as the significant city in western of china has a low amount of economic scale and the degree of openness. In 2014, the average of Guiyang GDP was the penultimate in the China GDP rank; this directly has the effect on the capital investment in public transport. During the three years from 2012 to 2012, although tried the government best to cumulative invest subsidy about 60 million, according to the third party accounting the rate of subsidy in place is only 20.69% in 2014. In the same case, after two years, government continued to invest subsidy 0.1 billion to urban public transport enterprises but the rate of subsidy in place was 23.87%. This is mainly because the municipal government has less direct investment in public transport. Instead, it uses the indirect investment methods to support the development of public transport, such as land allocations for non-profit bus companies, bus purchase loans and financial discounts. Meanwhile, at present, the pace of reforms is slow in public transport investment and financing system. The enthusiasm for social capital to participate in public transport investment, construction and operations is low. Public transport enterprises lack financing capabilities and have a weak foundation for financial sustainability. These factors led to a continuous loss situation. For a central city in an economically underdeveloped area, how to develop urban public transport with limited financial support has become a key issue that must be solved for creation transit metropolis in Guiyang.

On the other hand, it is necessary to improve the efficiency of policy formulation and significant project approval. It shall need long time since the series the preparation plans of the preliminary funding must be in accordance with laws and regulations follow the progress for reporting and disbursement. For example, the expected that the series planning and BRT network planning completed in 2014 can only be delayed until 2015. In addition, there are some resistance in the promotion of urban public transport infrastructure construction. One of the most prominent problems is levy problem, followed by financing issues; both of them have the effect on the overall progress of the project.

3. Conclusion
In summary, through the study of the experience of countries around the world, it is clear that the scientific planning for city and giving priority to the development of public transport are the most fundamental ways and effective means of alleviating urban traffic congestion. The core of transit metropolis construction is to continuously improve the attractiveness of urban public transportation systems through scientific planning and control, line network optimization, facilities construction, information services, as well as comprehensive management. Furthermore, this will reduce the reliance on cars and control the total urban transport demand and travel structure. Ultimately, it relieves traffic congestion issue by improved the efficiency of city traffic operations.

Based on the characteristics and actual conditions of urban public transportation in Guiyang City, this paper completes the investigations in Guiyang Province and identifies the current status, existing major contradictions and problems in the Guiyang transport development. Meanwhile, according to an in-depth analysis of the problem and demands faced by Guiyang City in the establishing a national ‘transit metropolis’, Guiyang City provides a strong guarantee and support for proposing transit
metropolis promotion mechanism and model establishment. Finally, ensure that Guiyang set up a national transit metropolis implementation plan in an orderly manner. The research formed Guiyang City to carry out a national ‘transit metropolis’ assessment method (proposal draft) to promote the healthy, intelligent, rapid and sustainable development of the plan establishment. It also provides reference and experience to other cities and supports Guiyang can better meets the travel demand of people.

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