Research on Current Development and Proposals for Public Transport in Guiyang

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Abstract. The paper aims to study current development of public transport in Guiyang, analyze the problems in the policy of Public Transport Priority, make proposals to promote Public Transport Priority in Guiyang, and provide technical support for strategy of public transport development and relevant specific plans, etc. in Guiyang.

Introduction
In recent years, as Guiyang facilitates its urbanization and mechanization, the urban space is expanded rapidly, and Jinyang New Area is basically completed, in particular, connections among the downtown, the new part of the city and new clusters nearby are enhanced. With the new pattern established, Guiyang will face more problems in urban transport. As a result, it is necessary to organize and guide urban transport in the multiple-cluster model, which is dominated by the public transport.

Current Development of Public Transport in Guiyang
Gradually reform transport management institution. In December 2015, Guiyang established the Commission of Transport, thus gradually setting up the management model of integration of urban & rural road transport. This model, featured by separation of government from enterprise (Public Transport Corporation and other large companies are still owned and administered directly by the Municipal Government), separation of government from affairs (separation of law enforcement from management), and transport administration adopting the uniform management system, which can alleviate such problems in Guiyang as difficult law enforcement, rising fiscal expenditures and the people not knowing which office to resort to, caused by overlapped transport administration by a few departments in transport, urban construction and municipal service, etc.

Keep optimizing and adjusting public transport network. By 2016, Guiyang had 276 public transport routes, whose network density stands at 2.17km/km2, lower than the national standard 3-4km/km2. Because of the irrational arrangement of road grades, most public transport routes in Guiyang are concentrated in trunk roads and express roads, featuring high service duplication coefficient. The public transport network density in the downtown reaches 3.5km/km2. As a result, most of the public transport routes are seen in downtown area, which has higher road connectivity, and outbound channels in the downtown area. In the newly-developed regions (e.g. Jinyang), the network has low density.

Considering the length of public transport routes, the medium and long-distance routes, whose length ranges between 10 and 20km, take the highest proportion at 66.67%. The short-distance routes, whose length is smaller than 10km, take 25.6%; and the long-distance routes, whose length is more than 20km, is 30.09%. The long-distance public-transport routes take higher proportion, thus impacting on the operating efficiency of public transport to some degree.
In accordance with data gained in the survey made by the project team, the average travel speed in road network in the core region of 1st Ring Road and Gui’an New Area in morning rush hour. The average speed in road network in the direction towards the city stands at about 25.8km/h, and that in road network in the direction outward the city is about 28.3km/h.

The Planning & Emergency Dispatching Center was established. Through the many transport monitoring systems, it monitors the transport operation and collects data in Guiyang, learns law of transport operation in the city, provides reference for residents to properly arrange travels, provides data support for analyzing the transport economic operations, managing the industrial operations, serving the public and making government decisions, and providing science-based reference for Guiyang to make transport planning and evaluation of transport influence.

Problems Existing in Public Transport in Guiyang

Through constant development of public transport system, Guiyang has basically built facilities and established transport model oriented towards public transport, thus laying the solid foundation for greater development. However, as the city expands, travel demands rise, and better service quality is required, public transport in Guiyang is confronted with some problems and challenges, including:

Top-level design of public-transport priority development needs to be optimized. Guiyang city has compiled a few public-transport plans, such as Public Transport Design in Guiyang for 2012-2020, BRT Plan in Guiyang, among others. The contents in these plans and researches are limited, lacking the senior-level systematic documents that completely integrate transport information and that are open to the public. As a result, the following problems are caused. First, it reduces work efficiency. Information of transport system is spread in different reports, thus making it difficult to retrieve them. Second, lack of public supervision. Urban transport principally serves the public. However, contents in the report are only open to staff in relevant departments. As a result, the public has little knowledge of current development, trend and other information of transport development in Guiyang. Their cognition, involvement and supervision of transport are not sufficient. As a result, development of urban transport is prone to deviating from the people’s actual needs. Third, execution process is not smooth. When planning and implementing other projects, the Commission of Transport needs to coordinate with a few other departments, such as the Bureau of Planning, Development and Reform Commission, the Bureau of Housing & Construction and the Bureau of Public Security, etc. Cooperation among departments is not good enough, thus hindering the work from making progress.

Institutional reform in transport management needs to be deepened. The Commission of Transport in Guiyang integrates the responsibilities of road transport, highway management and maritime & harbor management, etc. In general, however, transport in Guiyang is still featured by supervision by a few administrations. There are such problems as overlapped management, multiple
supervising bodies, difficult control of transport force, and poorly-developed supervising mechanism, policies, laws, regulations and standards.

Intelligent management of transport needs to be improved. Guiyang city works hard to develop big data. At present, the city has established the Transport Planning and Emergency Dispatching Center, which is used to monitor transport operation in Guiyang. It is also able to collect the data, providing service for the public to make travels, providing data support for transport planning and government decision making in Guiyang. However, it still needs to enhance depth of data mining and upgrade its application in actual transport operation.

The problem of insufficient investments in public transport is yet to be solved. Guiyang is now one of the most important capital cities in Western China. Though per capita GDP in Guiyang has been rising steadily, investment in public transport needs to be strengthened. The main reasons for insufficient investment are as follow: firstly, shortage of subsidy mechanism meet with the actual public transport operation and promote the development of public transport; secondly, less direct investment to public transport from municipal government; thirdly, enthusiasm of social capital for participating the investment on building and operating public transport is not high.

Countermeasures and Proposals on the Development of Public Transportation in Guiyang

First, Cultivate Transit-Oriented Model of Urban Traffic Development.

To continuously optimize the public transport infrastructure system. It is recommended to insist on the construction of large and medium-capacity public transport network such as rail transit and rapid transit, scientifically set up bus lanes, and fully develop a traffic transfer network centered on public transport hubs; promote the overall transformation of terrestrial bus functions and networks by road right priority and line network synchronization adjustment; create a urban public transport system with rail transit and Bus Rapid Transit (BRT) systems as the main artery, and regular intra-group ground transportation as the main body and a variety of transportation transfer methods; build a road network system in which backbone highways, trunk road networks, and branch road networks are organically connected.

To take measures to effectively control the urban traffic congestion. It is suggested to study and formulate a package of measures for urban traffic congestion management. Guiyang shall make comprehensive use of economic, legal, scientific and technological, and necessary administrative means, with big data and other means, to carry out scientific transformations on the expressways, main roads, road sections and intersections of the Central City, to enhance the road capacity and the attractiveness of public transport, and to scientifically control the development of individual motorized traffic.

To effectively solve the "Three One-Kilometer" problem. It is recommended that to form an Integrated "Bus + Slow Traffic" Seamless Transfer System. Extend the scope of public transport services, and surrounding units, build a comfortable and convenient continuous walking space, and strengthen the pedestrian contact channels for large-scale residential communities, public places, etc. to public transport stations, so as to shorten the time to bus stop and track site and improve the urban micro-circulation network. A city road network that is conducive to improving the bus services should be established to ease traffic pressure on main roads and improve the overall capacity of the road network. Meanwhile, new roads should be established and traffic connections should be improved to increase the density of road network around the bus station, and strengthen the connection between the bus station and surrounding residential, commercial and industrial plant areas.

Second, Constantly Optimize the Top-Level Design of Urban Public Transport with Priority.

To conduct urban traffic surveys. The municipal finance bureau sets up a special fund to establish a traffic investigation system for urban traffic. Through on-the-spot investigations, the issuance of online questionnaires, and the collection of information by various departments, the annual contents
include but not limited to urban economic and social development, vehicle preservation, road
construction, resident trip characteristics, urban traffic operation, congestion, public transport
construction, public transport service level, traffic intelligence construction, policy issuance,
government action and soft power construction, so as to timely grasp the status quo of the city's
traffic development and clear the focus and trends of the recent traffic development.

To introduce a white paper on urban transportation. It is proposed to establish a leading group
under the leadership of the deputy mayor in charge, strengthen departmental collaboration, combine
the overall planning of the city and the preparation of comprehensive transportation planning, and
use public transportation priority and integrated management as the core to compile the annual
traffic development white paper of Guiyang City that makes a scientific summary on urban traffic
development and top-level design on development policies and strategies.

To formulate and improve regulations and standards. Based on perfect legislation for traffic
demand management and parking management, Guiyang shall formulate corresponding local
standards for the establishment of public transport facilities, parking management and bus lanes to
provide standard basis for priority development of public transportation.

Third, Effectively Promote Comprehensive Traffic Management "Improvement on Weak
Links".

To improve the service level of public transport. Implement mechanisms such as line operation
rights and service specifications through innovation management system and reform of public
transport system mechanism; make implementation of vehicle real-time arrival information release
service of bus waiting facilities, reduce vehicle platform delays, reduce passengers waiting for
vehicles and departure time to effectively solve the difficulties during public transportation, and
further enhance the attractiveness of public transportation.

To give priority to the protection of public transport rights. Scientifically plan bus lanes,
establish local standards for bus lanes,; suggested to strengthen the supervision on bus lanes, and to
increase the penalties for illegally occupying bus lanes, ensure that bus lanes are dedicated to
“dedicated uses”, reduce the waiting time for buses at signalized intersections, and increase the
on-time rate by fixed electronic monitoring point on bus lane and bus lane video capture and other
means.

To scientifically reform the public transport infrastructure. It is necessary to improve bus station
settings aiming at solving bus jam problems at station due to high bus repeating coefficient at transit
corridor and inadequate bus stop demands of regular site settings. It shall increase stop capacity at
the station, adopt off-road parking, set port-type bus stops; It's suggested to plan bus parking by
lines and locations, to regulate vehicle parking behavior and reduce intertwined interference; Both
people and vehicles shall be separated to avoid passengers’ occupation on road, to reduce vehicle
parking delays, and to provide guarantee for outbound road rights, to avoid blocking from front car
and reduce outbound delays.

Fourth, Vigorously Promote "Internet +" Traffic Development.

To strengthen the intelligent application of public transportation. On the basis of building a
comprehensive coverage and ubiquitous interconnected intelligent traffic network & sensing
network system, promoting the application of intelligent perception covering transport
infrastructure, delivery equipment and key materials, so as to realize full-scale construction and
efficiency improvement, improve the quality of bus services and increase the attractiveness of
public transportation around the lines, vehicles, stations and stations. It is suggested to promote the
networked monitoring and management of bus lanes and to develop bus networking applications.
Network video real-time transmission and information means are suggested to be used for provide
vehicle and station congestion information services and forecasts.

To strengthen the platform and team capacity building. Taking the opportunity of building a
national big data comprehensive innovation experimental zone, it shall further promote the
construction of the TOCC in Guiyang, cooperate with international agencies and leading domestic research institutions to conduct joint research and train specialized personnel.

**To develop new technologies for car networking.** It is recommended to study and introduce policies and regulations for the promotion and application of vehicle electronic tags, and eliminate institutional and institutional obstacles. Steadily carry out pilot work on the electronic label of vehicles, realize the identity authentication system of vehicle electronic label, and build a unified management platform for city-level operational vehicle electronic labels to realize more accurate and comprehensive vehicle perception, to achieve dynamic management of vehicle trajectories and "Plate corresponds to vehicle, men corresponds to vehicle and station corresponds to vehicle", and finally significantly improve the level of dynamic traffic control. The intelligent variable signboards should be constructed to match the signal light instructions to adjust the change directing information. New video integrated detection and monitoring technologies shall be developed to improve the ability to proactively discover abnormal traffic events in a timely manner.

**Fifth, Construct Sub-Regional Green Transport System.**

*To carry out a study on the integrated development mode of walking and non-motorized slow-moving traffic.* It is suggested to consider the compilation of Guiyang Pedestrian Traffic Planning and Non-Motorized Traffic System Planning in Guiyang to build a multi-functional and integrated slow traffic pattern.

*To improve the walking and cycling environment.* Improve green travel environment through measures such as the implementation of special measures for road rights protection for pedestrian bicycles, addition of bicycle parking facilities, and promotion of public bicycle rental; and it's suggested to research and develop pedestrian street and non-motorized tourist routes connecting parks, squares and other tourist attractions with the combination of Guiyang Tourism City.

*To scientifically regulate the development of bicycles sharing,* issue the “Opinions on Bicycle Sharing Management and Implementation”, and improve the management capacity and service level of public bicycle service lease systems.

**Sixth, Promote Public Transportation Priority Protection Policies from Multiple Angles.**

*To accelerate the reform of the "One city, One transportation" system.* Starting from the institutional mechanisms of urban traffic administration, Guiyang shall seize the historical opportunities in the current stage of urban development, change the problem of lack of integration of urban traffic governance, establish a complete urban traffic administrative management system, and straighten out the contradictory questions between the national, provincial and local governments in the field of urban traffic management, and solve the institutional obstacles to the reform of the urban traffic administrative system from the perspective of institutional design.

*To rectify traffic violations according to law.* Turn its "car-based" thought into a "people-oriented" approach, rationally allocate road space and time resources, and improve the scientific level of traffic organization and management; strengthen strict normal management on violation behaviors like disorderly and illegal parking of motor vehicles and bicycles and running the red light by motor vehicles and bicycles, and improve traffic penalties.

*To establish a stable financial support system.* Standardize the quantity and quality standards for public transport purchase services, and improve the pricing system for government procurement services. If public bus services provided by public transportation companies have fully met the requirements of quality and quantity of services proposed by the government, the government should implement the model of "separation of ticket and transportation" (separation between revenue and expenditure). What's more, bus companies do not have to share the ticket income risk caused by the decline in passenger volume due to non-operating service quality factors; Full consideration shall be given to the reasonable return of the seller (bus companies) in the market-based sales and purchase relationship, and the government purchase service model shall be formulated; The government should encourage social investment projects and promote the planning, selection, and recommendation of PPP projects.
To explore the comprehensive development of urban public transport land. It is recommended to cooperate with the National Development and Reform Commission, Land Department and Finance Departments to study and formulate comprehensive development and implementation methods for newly-built public transport facilities, to promote the intensive and intensive development of land for transport facilities and to establish a comprehensive development value-added benefit feedback mechanism of urban public transportation land, and to increase and exploit potentialities of supply of public transport facilities; On the other hand, it shall increase the benefits of land appreciation, and further feed the benefits of value-added back to the construction of public transport facilities.

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References

