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Study on the Integration of Public Passenger Transportation Intercity: An Case of Guangzhou–Foshan Urban Region

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Abstract: With the economic globalization and regional integration, administrative boundaries become the main obstacles to regional coordinated development. It is an important significance to promote regional integration, which researches on intercity regulatory measures. Firstly, the theoretical basis of regional governance in the world was summarized, including regulatory agencies, channel construction, incentives. Secondly, the developmental route of Guangzhou–Foshan was combed, and macro-measures and specific traffic measures of regional integration were summarized from four stages. Finally, the current situation and the problems of public passenger transportation intercity were analyzed, and five typical cases were chosen to analyze from urban planning, road construction, rail transportation, public passenger transportation, and success reasons of the case were analyzed deeply from regulatory agencies, channel construction, incentives. Moreover, some development strategies were proposed from management mechanism, participants, information sharing, laws and regulations, which would provide certain integration of public passenger transportation in China at regional scale. **DOI:** 10.13813/j.cn11-5141/u.2018.0104-en

Keywords: intercity traffic; public passenger transportation; region governance; Guangzhou–Foshan urban region

0 Introduction

Megalopolis governance has always been a hot topic of regional planning, development and public policy, and some cities in Europe and the United States have already had successful experiences. For example, the New York metropolitan area was formed by an inter-governmental compact and agreement. It is an autonomous community with community-based public management and has an institutional framework for collaborative public administration. Its goals are to fundamentally solve institutional barriers and to integrate the mechanisms among different cities related to incentives, restraints, benefit-sharing, and compensation [1–2]. Another example is the public transport complex built in Berlin–Brandenburg metropolitan area. It coordinates the management of regional public transport policies regarding capital allocation, information systems, fare systems, service standards, and others [3–4].

For a long time, Chinese cities have been dominated by a relatively closed management model within the administrative regions, and it is difficult to achieve co-construction across cities and regions. With the rapid economic development and the acceleration of urbanization, functional links in many areas such as in social economy have been continuously enhanced despite the existence of spatial seperation and administrative system barriers in some developed regions, such as the Pearl River Delta, the Yangtze River Delta, and Beijing–Tianjin–Hebei. In some geographically similar cities such as GuangFo ② city and Xixian city [5], the trend of urbanization ① including spatial integration, industry collaboration, and facilities convergence, has emerged. In recent years, there are mature cases of large-scale regional (metropolis circle or metropolitan area) governance model in foreign countries, and regional traffic integration in economically developed regions of China has been studied. However, there are relatively few studies on the passenger transportation integration for middle-scale regions. Therefore, using Guangzhou–Foshan city as an example, this paper focuses on the analysis of the development context of Guangzhou–Foshan city, the problems existing in the integration process of passenger transportation, and relevant countermeasures, which will provide enlightenment for the development of passenger

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transportation integration in China.

1 Research methods and theoretical basis

1.1 Research methods

Four methods were used in this paper, including literature review, questionnaire, data mining, and non-structural interview. In order to summarize and sort out useful information, the literature review method was used. The periodicals, books, government documents, news reports, and other materials were reviewed to gather relevant theories, policies, cases, and other information of GuangFo City. Survey method was used and questionnaire was designed to collect information regarding the satisfaction, current situation, problems, and suggestions of passenger traffic modes of GuangFo City. Random survey was conducted on 400 GuangFo citizens (including 250 residents and 150 bus and taxi drivers), and 385 valid questionnaires were returned. The respondents included civil servants, business employees, science and education staff, private owners, and students. The data mining method analyzes, checks, and supplements survey data using information technology. Twenty two consecutive days of mobile phone data and surveys were used to measure and adjust the exchange volume of passenger traffic between Guangzhou and Foshan. The OD distributions between two cities and the traffic operation status were explored by using one week of taxi GPS and meters data. The OD distribution and cross-section traffic volume of public buses and GuangFo intercity railways were analyzed by using two weeks of IC data. The non-structural interview method was used during the discussions with the representatives from municipal transportation departments and passenger transportation companies (including buses and taxis) in Guangzhou and Foshan [(3)]. Operational methods and coordination modes of the relevant departments were discussed, and existing problems and suggestions on the development of cross-city passenger transportation were reviewed.

1.2 Theoretical basis

With the economic growth and spatial expansion of cities, the regional public issues are gradually emerging. It is hard for a single city government to deal with complicated regional public affairs alone, so it becomes necessary to transform gradually into a metropolitan area with complex functions. Existing studies have examined the types, pros and cons, policies, coordination strategies, motivation mechanism and space control of cross-border collaboration in urban integration [6–11], and have summarized the research overview, progress and development strategy of China's urban integration [12–13]. Literatures [14–16] summarized three common characteristics of metropolitan regional governance in other countries: 1) establishing a permanent management institution (regulatory body) to reduce the disputes and frictions of participants based on the regional win-win principle, which coordinates and instructs the approval of cross-regional project library, the discussion and revision of important plans and documents; 2) establishing a multi-level governance system for regional cooperation and governance so that policies and measures are made through negotiation among relevant provincial, regional (metropolitan areas), municipal, district and county governments; 3) encouraging multiple entities to participate (incentive) in the establishment of an effective interest distribution and compensation mechanism and promote the active participation of governments, enterprises, and citizens in common management and win-win cooperation [14–16].

2 Development context of GuangFo City

Historically, Guangzhou and Foshan belonged to the Nanhai and Panyu counties, sharing the same root of culture and link together geographically [17]. The central districts of the two cities are about 20 km apart and the border is about 200 km long. From the perspective of urban spatial structure or administrative boundaries, the western part of Guangzhou is closer to the center but the geographical structure is not complete, and the location of Foshan's city center is not clear. Therefore, only when Guangzhou and Foshan integrate, can a complete core-edge structure be formed to become a complete economic geography unit. The development of GuangFo City mainly experienced four stages: growth period, development period, dormant period and icebreaking period, as shown in Figure 1.

2.1 Growth period (1990–2000)

The inflow of foreign capital has rapidly accelerated the economic and urban development and led to the continual expansion of Guangzhou and Foshan built-up area. The bidirectional development of town construction in GuangFo transitional area such as Liwan, Nanhai, Baiyun, Sanshui, Panyu and Shunde, plus the establishment of upstream and downstream relationships between Guangzhou's heavy chemical industry and Foshan's traditional manufacturing industry, resulted in continuous urban spatial development. As the economic and social interaction between the two cities intensified, the transportation links were also getting closer. The strengthening connection of industry and transportation has fostered the adherent development in border area where some people started to live in Foshan and work in Guangzhou, or live in Guangzhou and work in Foshan. This group of people became the earliest "GuangFo migratory birds".

2.2 Development period (2000–2010)

Specific measures in urban planning, industrial cooperation, transportation facilities, and environmental protection

were proposed for GuangFo City. The approval of *Pearl River Delta Regional Reform and Development Planning Outline (2008–2020)* has elevated Guangzhou–Foshan urban integration from a regional cooperation issue to a national strategy, thus leading to the fastest growing period for the GuangFo City. In the aspect of urban planning, Guangzhou has proposed a development strategy to "connect to the west" since 2000 in its Master Plan (2001–2010), and Foshan has implemented a development strategy to "undertake the east" since 2003, which includes zoning adjustments to undertake the impact from Guangzhou. These strategies have strengthened the connection between Guangzhou and Foshan. In the aspect of policy, a coordination and management mechanism was established and *GuangFo City Construction Cooperation Framework Agreement* was signed. This coordination and management mechanism employed joint meeting as the core, project library as the carrier, and formal and informal communication of various functional departments as the supplement. In the aspect of transportation infrastructure and management, they both have facilitated the process of Guangzhou–Foshan urban integration by constructing GuangFo New Trunk Road, Haiyi Bridge, the Xiqiao Section of Foshan Sihang Guangming Expressway and GuangFo Metro, and implemented several management measures, including the co-construction and co-management model of cross-city rail transit, the cooperative planning and construction model of roadway systems, the mutual recognition of annual passes, and the setting up of designated areas for returning taxis to wait for passengers.

2.3 Dormant period (2010–2014)

In this period, Guangzhou's outward development focus shifted to the eastern part of Guangdong Province, and its inward development focus shifted to internal adjustment. Due to this shift, the inconsistent economic interests, and large gap in land requisition and relocation costs between Guangzhou and Foshan, it was difficult to make progress on the projects. For example, the upgrade of Longxi Avenue and the second phase of GuangFo New Trunk Road project were suspended due to the high cost of land acquisition and relocation compensation, as well as the difficulties in financing. The construction cost in Guangzhou was about ten times more than that in Foshan. Meanwhile, the opening of Guangzhou–Foshan Intercity Rail Line and Guangzhou-Zhuhai Intercity Rail Line, as well as the completing of GuangFo intercity bus routes have made a great impact on highway passenger transportation between the two cities. The "city bus" and "express bus" proposed in 2009 conflicted with the existing intercity rail line and intercity buses, and have led to severe homogeneity of transportation options in the corridor. However, it was difficult to promote changes in transportation modes and management as it involved corporate interests and management systems.

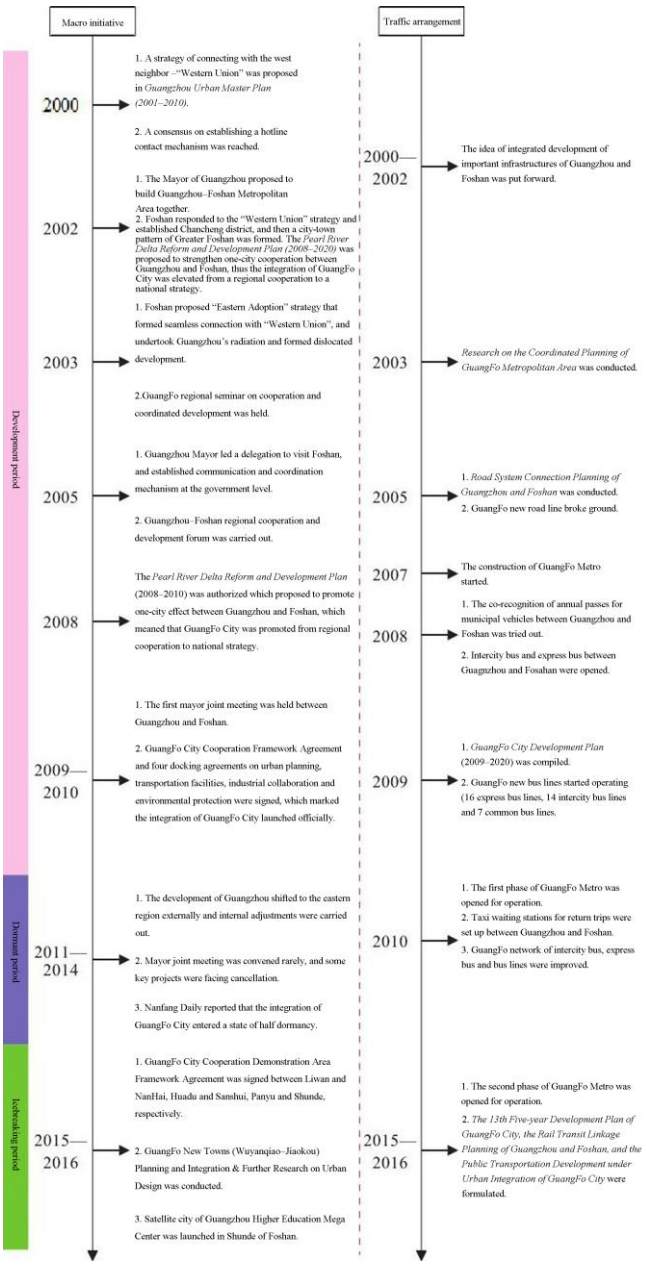


Figure 1 Development stages of GuangFo City

2.4 Icebreaking period (2014–2016)

The good news in this period was that the upper-level planning elevated the development of GuangFo City. Speeding up the pace of Guangzhou–Foshan urban integration and promote the development of GuangFo growth pole were proposed in the *State Council's Reply to Zhujiang-Xijiang Economic Belt Development Plan*. The State Council's replies to the *Master Plan of Guangzhou (2011–2020)* and the *Master Plan of Foshan (2011–2020)* also proposed to speed up the deep integration of GuangFo City [④] and strengthen the high-end service collaboration between the two cities. At the same time, the framework agreement on GuangFo City Cooperation Demonstration Area was signed between Liwan and Nanhai, Huadu and

Sanshui, Panyu and Shunde, respectively. The planning integration and urban design research of GuangFo New Town (Wuyanqiao–Jiaokou) were deepened, and a satellite city of Guangzhou Higher Education Mega Center was launched in Shunde, Foshan. Development plans and studies such as *The 13th Five-year Development Plan of GuangFo City*, *Guangzhou–Foshan Rail Transit Connection Plan* (which proposed to build 10 rail transit lines between Foshan and Guangzhou), and *Public Transportation Development Under Urban Integration of GuangFo City* were formulated to strengthen the transportation development strategy of GuangFo City, which helped to solve the problems in planning and management linkage between Guangzhou and Foshan and promote further development of the GuangFo City.

3 The characteristics of passenger transportation in GuangFo City

3.1 Development status

3.1.1 Overview

After years of development, GuangFo region has gradually built an intercity public transportation system, which uses intercity railways as the backbone, GuangFo Express Bus, City Bus, normal coaches, and intercity buses as the mainstay, taxis and other modes as the supplement, as shown in Table 1, Figure 2 and Figure 3.

Table 1 Intercity public passenger transportation system of Guangzhou–Foshan urban region

	Travel mode	Function	Basic situation
Rail	GuangZhu intercity railway	Backbone	The line started operation in 2011. Its total length is 117.3 km with 13 stations. The travel time is 40 min–60 min, and the fare is CNY 36 to CNY 44. The average daily ridership is 26 000.
	GuangFo intercity railway		The line is 32.16 km in length with 21 stations and an average daily ridership of 208 000 passengers, among which 143 000 are commuters between Guangzhou and Foshan.
Roadway public passenger transportation	Highway passenger transportation	Mainstay	There are 47 routes on the highway system with a total mileage of 3 017 km, and an average mileage of 65 km per route. The daily average ridership is 28 000 passengers. They are using distance based fares, which range from CNY 14 to CNY 60.
	GuangFo express bus/ GuangFo intercity bus		They are operated in transit mode. GuangFo express buses provide high-end, fast and direct passenger services. GuangFo intercity bus companies can add stops flexibly to meet operational needs. There are 14 intercity bus routes with a total mileage of 596 km and an average mileage of 43 km per route. There are 13 express bus routes with a total mileage of 705 km, and an average mileage of 54 km per route. The daily average ridership is about 27 000 passengers.
	GuangFo local bus		There are 74 bus routes in total, including 48 in Guangzhou and 26 in Foshan. The total mileage is 1 525 km, and the average mileage is 20.6 km per route. The average daily ridership is 241 000. The largest passenger exchanges are among Chancheng, Nanhai, and Liwan districts, which have the closest transit connections.
	Taxi	Supplement	Taxis are operated within each taxi zone. There are six central taxi zones and several peripheral taxi zones in Guangzhou, and five taxi zones in Foshan. There are in total 19 returning taxi waiting stations in the two cities. Only at these stations, taxi drivers can pick up passengers to travel across the city boundary; otherwise they will be fined by the transportation department. The exchange volume between the two cities is about 6 000 cars on a weekday.
	On-call bus		There are 16 on-call bus routes, mostly operating between large communities in Nanhai, Foshan and subway stations, Guangzhou city center, and Guangzhou East Railway Station. As a supplement, they provide diversified, high-quality, and direct public transportation services.

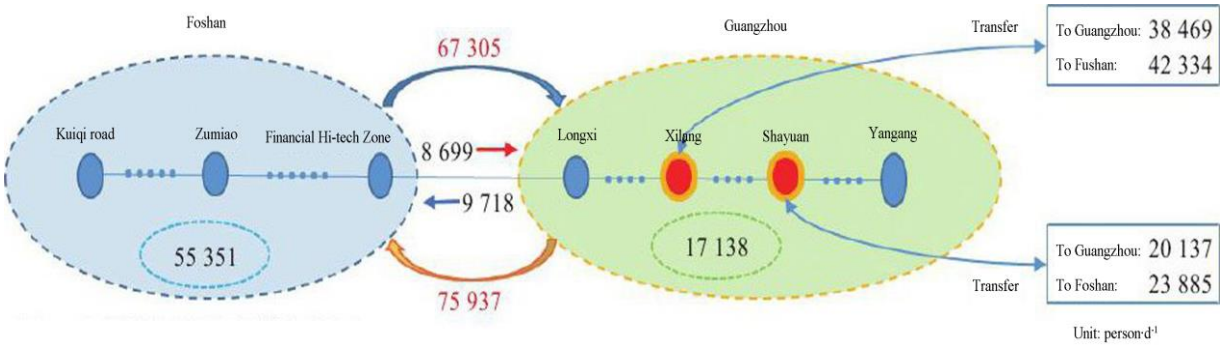
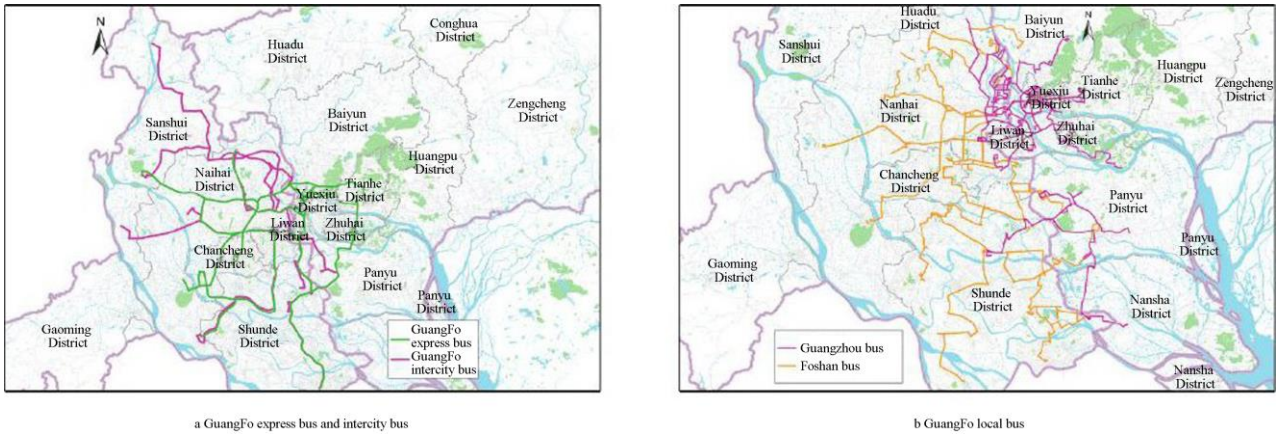


Figure 2 Passenger flow exchange of Guangzhou–Foshan intercity railway



a GuangFo express bus and intercity bus

b GuangFo local bus

Figure 3 Transit routes in Guangzhou and Foshan

3.1.2 Cooperation and coordination mechanism

Guangzhou and Foshan have initially established a cooperation and coordination mechanism, which employs joint meeting as the core, project library as the carrier, and formal or informal communication of various functional departments as the supplement. The joint meeting adopted a vertical cooperation framework and a four-level governance mechanism to continuously reduce administrative barriers, enhance the freedom and efficiency of cross-city mobility, so as to foster the development of urban integration. Under the coordination framework of GuangFo City, a bottom-up project initialization mechanism and a top-down implementation monitoring mechanism were established to promote the establishment of project library. Based on these mechanisms, departments can develop project promotion plans through communications, as shown in Figure 4.

3.2 Typical cases

Five typical cases were selected from the aspects of urban planning, road construction, rail transit and public passenger transportation; and a systematic analysis was conducted from three aspects including regulatory agencies, channel construction, and motivation factors, as shown in Table 2.

3.3 Problems

Firstly, administrative barriers are the major obstacles in the process of urban integration. As Guangzhou and Foshan are two individual cities, administrative restraints and local interests led to the difficulties in the integration of transportation, fiscal levy, and local policies between the two cities; the difficulties in furthering the cooperation; and the obstacles in the flow of goods, traffic, information, and technology. For example, the public transportation coordination between Guangzhou and Foshan adopted the "one issue, one discussion" mode [⑤]. The whole process took a long time, especially on controversial matters that need coordination.

Secondly, the difference of management system is the bottleneck of the integrated development of public transportation. For example, the difference in taxi fares (Guangzhou and Foshan charge 50% of taxi fare as the charge of the returning trip for trips over 35 km and over 10 km respectively) caused Guangzhou taxi drivers to bargain with passengers because they felt unfair.

Thirdly, the lack of rigid constraints and restrictions from cross-regional supervisory agencies, and difficulties in coordinating common interests were the core issues that impede the integration of the two cities. At present, the agreement between Guangzhou and Foshan is only a political contract. Without the approval of the local people's congress at the same level, it is not legally binding and can only be bound by the contractual default mechanism. Without the legal restrictions, it is difficult to unify the common interests of Guangzhou and Foshan during cooperation. For example, since the bus station resources were limited in Guangzhou and there existed a big gap, it is difficult for Foshan's bus routes to enter Guangzhou. Moreover, there was a problem of unequal charges for bus routes entering Guangzhou. For instance, Foshan Route 251, Route 277 and Route 250 used Jiaokou bus station, and a service charge of CNY 0.35–0.83 per person was charged as agent fees, which accounted for 12.5%–30% of the fare (CNY 2.8 if pay by card and CNY 4 if pay by cash). This fee was relatively high, restricting the growth of public transportation between Guangzhou and Foshan.

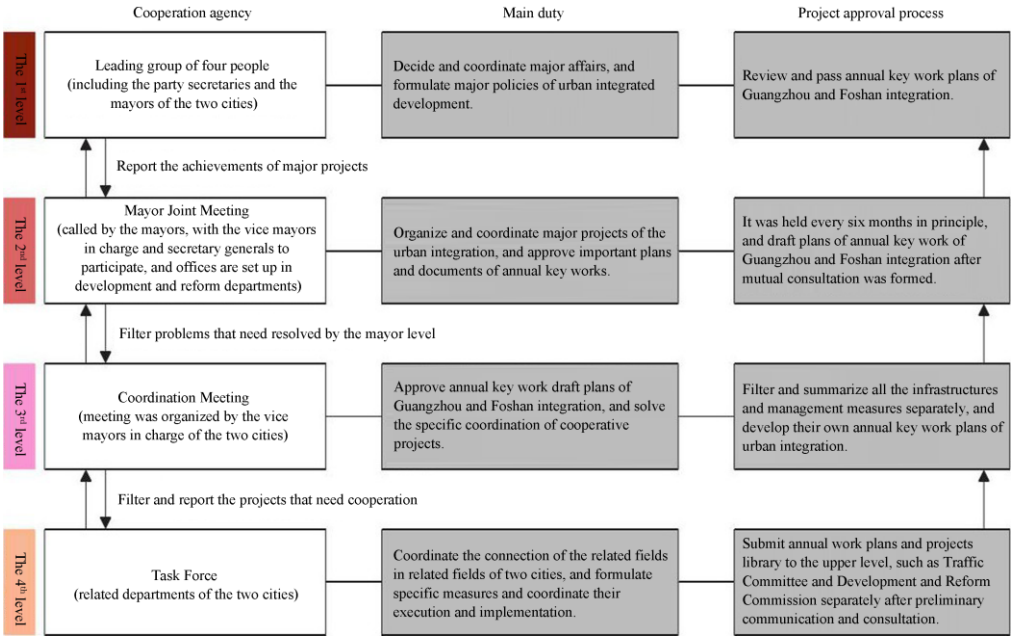


Figure 4 Cooperation and coordination mechanisms of Guangzhou–Foshan urban region

Table 2 Five typical cases under the Guangzhou–Foshan urban region cooperation mechanism

Case	Regulatory agencies	Channel construction	Motivational factors
Overall plan of Wuyanqiao area	Local governments led the interaction and cooperation of the planning departments in Nanhai and Liwan districts.	Research institute was sponsored to develop the *GuangFo New City Integration and Detailed Urban Design Plan*	Local development in Guangzhou and Foshan
GuangFo intercity railway	The cooperation was carried out under the administration of Guangdong provincial government.	A third-party company was established with 51% of funding from Guangzhou and 49% from Foshan. Guangzhou Metro Corporation was delegated for the construction and operation.	Local development in Guangzhou and Foshan, and the Asian Games
Haiyi Bridge	Local government led the interaction and cooperation of the construction departments in Nanhai and Panyu districts and the higher level government department.	The construction was managed by Nanhai District Road Construction Management Office, which was jointly authorized by Nanhai and Panyu districts. The two districts bore the expenses according to the investment ratio.	Urban development (Foshan needs to connect to Guangzhou South Station, and Guangzhou needs to mitigate traffic congestion), government performance evaluation, and the Asian Games
GuangFo express bus, intercity bus, local bus, and waiting stations of returning taxis	Transportation departments in Guangzhou and Foshan, all involved districts, and relevant enterprises	Relevant departments of the two cities communicated, coordinated and approved the plan and arrangement together.	The growth of passenger travel demand in the two cities, government performance evaluation, and the Asian Games
Mutual recognition of annual passes	Local government led the interaction.	The receipt of a paid annual pass of one city can be used to offset toll in the other city.	Common interests of the two cities

Fourthly, the functions of express bus, intercity bus, and local bus were not clear, which results in the waste of resources. Express bus and intercity bus were introduced due to the need to operate the intercity short-distance passenger transportation as a transit mode in the process of Guangzhou–Foshan urbanization. However, they were still highway passenger transportation modes in nature, and were operated according to the standards of highway passenger transportation in terms of technical standards, ticketing system and fares, and financial subsidies. With the development of Guangzhou–Foshan intercity railways and local buses, it became prominent that they were not competitive enough. Their function to provide public passenger transportation has been gradually replaced and their level of service cannot be guaranteed.

4 The strategy to integrate passenger transportation in GuangFo City

The main strategic idea to integrate passenger transportation in GuangFo City is to start with the management mechanism, enhance the integration with facility constructions, and implement the integration with route network adjustments. Because the main obstacles to the integration of the passenger transportation between Guangzhou and Foshan were the inconsistencies of administrative systems and the difficulties in coordinating common interests as a result of administrative barriers, this paper proposed some management countermeasures.

Firstly, the mechanism for Guangzhou and Foshan to jointly prepare the public transportation annual plan of Guangzhou and Foshan should be established. It is proposed to change the current situation of "one issue, one discussion", and establish a system for the two cities to jointly prepare the *GuangFo Public Transport Annual Development Plan*, which provides an overall plan that involves highway passenger transportation, rail transit, bus (including intercity bus), taxi, and on-call bus. The transportation departments in the two cities should work together on project review and implementation to save administrative costs. All of these measures not only helped the summary and supervision on the implementation of the previous year's plan, but also made it possible to provide more specific guidance on the development of public transportation between Guangzhou and Foshan in the next year.

Secondly, a regional information sharing and coordination mechanism should be established. On the one hand, press conferences, briefings or decision-making meetings should be held on a regular or irregular basis to exchange information between the two cities. On the other hand, an information sharing platform and information exchange protocol should be established to reinforce the sharing and complementing of multi-level information between Guangzhou and Foshan and among districts. For example, the taxi dispatching platforms in the two cities should be connected to achieve data sharing and joint dispatch, and higher priorities should be assigned to returning taxis to reduce vacant taxis between Guangzhou and Foshan. This will lay a foundation for a more innovative cross-region operation model.

Thirdly, a special coordinating committee with certain administrative functions should be established. In view of the difficulties in the unified implementation of cross-border functions between Guangzhou and Foshan, and to optimize the regional governance mechanism, a Public Transportation Group of the GuangFo City should be established based on the GuangFo joint conference group. The main responsibilities of this group are to plan the development of public transportation integration, to coordinate planning and construction, distribution of transportation capacity, information sharing, fund-raising, profit distribution, incentive mechanism, assessment, and management in the course of public transportation integration, and to track and supervise the implementation of the integration in a dynamic and timely manner.

Fourthly, multiple entities should participate in the

construction, operation, and management of public transportation. Based on the characteristics of different public transportation modes (including intercity railway, rail transit, express bus, local bus and taxi, etc.) and the hierarchical structure of public transportation network, the public transportation group should learn from the successful experience of Guangzhou–Foshan intercity railway, encourage the participation of multiple entities, and encourage governments and enterprises to construct cross-city transportation facilities, so as to establish a public transportation investment and operation mechanism involving multiple entities.

Finally, the legal effect of the agreement should be strengthened. The existing cooperation agreements are not legally binding and have no specific time requirements or rigid constraints. It is suggested that laws and regulations should be established to clarify the rights and obligations of local governments in the cooperation of urban integration, so as to promote coordination among governments, make up for the lack of government mechanisms, avoid buck passing in the process of cooperation, clarify the schedule of various cooperation items, and emphasize the responsibilities.

5 Conclusion

Faced with the trend of accelerating urbanization, rapid development of motorization, and changes in transportation modes, regional governance needs to develop a good coordination mechanism (including regulatory agencies, channel construction and motivational factors) based on the cooperation and win-win development ideas. The coordination mechanism can eliminate administrative barriers and meet the growing demand for the flow of regional economic factors, including people, logistics, traffic and information. Based on the summary of regional governance theory, this paper focused on the analysis of some typical cases, such as the construction of roads and intercity railways between Guangzhou and Foshan, the integration of public transportation, and the mutual recognition of annual passes. This paper also summarized the practices and related issues in the development of GuangFo City. The experience from GuangFo city would inspire urban integration and public transportation integration in other areas of China.

Due to unique geographical advantages, Guangzhou and Foshan are well integrated, but obvious administrative boundaries are still present. The two cities vary greatly in infrastructure, public services and housing prices. In December 2016, the term "Pearl River Bay Area" was firstly and exclusively used in the *Notice Regarding Accelerating the Planning of the Urban Agglomeration*, issued by in the National Development and Reform Commission ⑥. Compared with the word "Area", "Bay Area" is more open with more prominent marine characteristics, and emphasizes more on the high-level integration, such as the San Francisco bay area ⑦. Meanwhile, the city master plans of Guangzhou and Foshan both proposed to enhance the integration of Guangzhou and Foshan, and the report of the 11th Congress of Guangzhou promoted a higher level integration. The good policy guidance will further obscure the administrative boundaries of the cities in the Pearl River Delta region, and will help build an inseparable and balanced ecosystem in the neighboring cities of Guangzhou and Foshan.

① As an important stage and advanced form of regional cooperation, urban integration refers to the process of breaking the administrative barriers and realizing the integrated development through the means of economy, market, administration, system, culture and infrastructure. Its purpose is to break down the administrative barriers between cities, to establish a good regional coordination mechanism, and to coordinate the supply of infrastructure and public services across cities. Shenzhen city government released the *2030 City Development Strategy* in 2005, which proposed in its regional development strategy to strengthen the cooperation with Hong Kong in high-end manufacturing, modern services and other fields, and to achieve urban integration with Hong Kong. This is the first time that the concept of urban integration was proposed in China.

② Many cities in China are experiencing urban integration, including Guangzhou–Foshan, Xi'an–Xianning, Shenyang–Fushun, Zhengzhou–Bianxi, Xiamen–Zhangzhou–Quanzhou, Shenzhen–Hongkong, Beijing–Tianjin, Ningbo–Zhenjiang–Yangzhou, Changsha–Zhuzhou–Xiangtan, Hefei–Huai'an, etc.

③ There are 11 districts in Guangzhou, and five districts in Foshan, including Yuexiu, Tianhe and so on. The passenger transportation department in Guangzhou City is only in charge of the central six districts, and the passenger transportation in the five peripheral districts of Guangzhou and all five districts of Foshan adopt the principle of "guided by the higher level government, and managed by the local government". Therefore, this interview includes passenger transportation department in Guangzhou, the transportation departments of the five peripheral districts of Guangzhou and the five districts of Foshan, and other passenger transportation enterprises.

④ In February 2016, the State Council's instructions on the *Guangzhou City Master Plan* indicated that Guangzhou should actively participate in the belt and road initiative, deepen the integration of GuangFo City, function as a national central city, and become a major driver of regional collaborative development. The State Council's instructions on the *Foshan City Master Plan* indicated that Foshan should play a leading role as the western wing of the Pearl River Delta and promote the integration of GuangFo City.

⑤ The "one issue, one discussion" mode is used when Foshan or Guangzhou bus routes or returning taxi waiting stations need to be adjusted or added, even if only one bus route needs to adjust. The main procedures are listed as follows: local enterprises to initiate the application, local government to review and report to the city government, city government to seek comments from related districts and the city transportation department, the transportation departments of the two cities to approve the application together, and if there are disagreements, the transportation departments of the two cities to coordinate and review the application.

⑥ In December 2016, the *Notice Regarding Accelerating the Planning of the Urban Agglomeration* was issued by the National Development and Reform Commission. It proposed to launch the planning of 12 urban agglomerations in 2017, including Beijing–Tianjin–Hebei Area, Pearl River Delta Bay Area, and Shandong Peninsula, etc. The term "Pearl River Delta" or "Pearl River Delta Urban Agglomeration" are used in several high-level plans, such as the *National Plan of Main Function Areas*, the *National New Urbanization Plan (2014–2020)* and the *Outline of the Reform and Development Plan for Pearl River Delta Area (2008–2020)*. In March 2015, it was proposed to build a Greater Bay Area of Guangdong, Hong Kong, and Macau in the *Visions and Actions to Build a Silk Road Economic Belt and the 21st Century Maritime Silk Road*. In March 2016, the vision to build a Greater Bay Area of Guangdong, Hong Kong, and Macau was clarified in the *State Council's Instructions on Deepening the*

Regional Cooperation in the Pan-Pearl River Delta Area. In April 2017, Premier Li Keqiang indicated that concerted cooperation among Guangdong, Hong Kong and Macau should reach a new height in the future, which will become an engine to enhance the overall international competitiveness of the Pearl River Delta Area with the goal to make this area a world-class city bay area.

⑦ The San Francisco bay area is a metropolitan area in northern California, including San Francisco, Palo alto, Oakland, Berkeley and other cities. The differences in infrastructure, public services, employment opportunities, consumption levels, house prices etc. in different cities in the bay area are relatively small. They are close to the status of homogeneous development and comprise an inseparable ecosystem.

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