

Research on the Supply of Rural Public Transportation Services in the County-Level City of L

Gao Ning

School of Political Science and Law, University of Jinan, Shandong, China

Abstract: The increasing demand for public transport services in rural areas because of the economic and social development has become an important issue, and the supply of public transport services has increasingly shown its importance. For example, the "Strategic Plan for Rural Revitalization (2018-2022)", clearly proposes improve rural transportation infrastructure and enhance the level of rural public transport services. The "14th Five-Year Plan for the Development of a Modern Comprehensive Transportation System" emphasizes need to perfect the rural transportation infrastructure network and improve the level of inclusive and shared transportation services. This paper takes the supply of rural public transport services in City L as the object, which provides a feasible direction for the development of rural public transport services in City L to meet the travel needs of rural residents. Based on the theory of new public service, goods theory, and government purchasing public services theory, this paper mainly uses questionnaire survey method to study the supply problem of rural public transport services in City L. The article begins with a of the basic situation, geographical location, population size, and economic development level of City L, and interprets the actual situation of relevant policies, capital investment, infrastructure creation, operation in detail. According to this paper's research, there are some problems in rural public transport services in City L, including lack of policy pertinence, insufficient capital, poor infrastructure, and a single operating entity that greatly affect the quality and level of services. Exploring the underlying reasons, it can be summarized as four points: policy formulation is perfunctory; financial budgets are tight; infrastructure is not sound; is a monopoly in operation and improper planning. In view of these problems, this article puts forward

solutions respectively: strengthen the policy research and propaganda; apply for superior subsidies and broaden channels; improve infrastructure; introduce multiple operators. In response to these problems, this paper provides solutions from four aspects: policy, infrastructure, and operation, hoping that these strategies can effectively improve the service capability and level of rural public transport in City L and improve residents' travel conditions.

Keywords: Rural Areas; Public Transport Services Supply

1. Introduction

1.1 Research Background and Significance

1.1.1 Research Background

The rural revitalization strategy not only requires improving the rural economic development environment, it also needs to improve the convenience of rural residents' life. As an important link that connects urban and rural areas, public transportation provides convenient travel conditions for rural residents, promotes the flow of resources and economic interaction between urban and rural areas, which are key links in narrowing the urban-rural gap and promoting common prosperity.

With the acceleration of urbanization in China and the deepening advancement of the rural revitalization strategy, national policies are beginning to tilt towards rural areas. Economic and social development in rural areas drives an increased demand for public transportation services; therefore, providing rural public transport services has become one of the most urgent challenges. The national and local governments have gradually realized that rural public transportation is important in promoting economic development, and they have introduced a series of policies to promote it. For example, the "Rural Revitalization Strategic Plan (2018-2022)", clearly proposes to improve the rural transportation infrastructure and enhance

the level of rural public transport services; The "14th Five-Year Plan for the Development of a Modern Integrated Transportation System", emphasizes improving the rural transportation infrastructure network and enhancing the inclusive level of public transportation services.

In recent years, L City has continuously promoted the construction of rural passenger transport "Warm Buses" with some achievements. However, the needs for rural passenger transport have been constantly changing because of the continuous improvement of the level of economic and social development in rural areas and the steady improvement of road conditions. The rural passenger transport in L City has changed from "being able to travel" to "moving well." "The transition to 'sustainable' development still faces significant challenges." First of all, the infrastructure in rural areas is relatively lagging; the distribution of bus stops is uneven; the vehicles are old and not sufficient in number. According to L City Transportation Development Co., Ltd., L City has 165 urban and rural buses, 58 routes, and 861 administrative villages, which is far from meeting the travel needs of rural residents. Second, the service level of public transportation in rural areas is relatively low. With few services and insufficient route coverage, bus routes only serve the township center. For example, the villagers of Wangbuzhuang Village need to ride five kilometers to take a bus. Finally, the operational efficiency is low. Because of the restriction of rural residents during busy farming seasons, the passenger flow is not stable; therefore, the bus company has high operating cost with weak profitability. The rural public transportation in L city depends on government subsidies for its operation without any incentive from markets which makes it hard to improve the service quality. Based on a questionnaire survey, this paper identifies practical problems in the supply of rural public transportation services in L City, proposes optimization principles and reasonable suggestions, and provides a feasible direction for the development of rural public transportation services in L City to meet the travel needs of rural residents.

1.1.2 Significance of the Study

In terms of theoretical significance, studying the background, current situation, and problems of rural public transportation service supply in L City, and analyzing the causes of these problems,

not only helps identify shortcomings in the current development of rural public transport but also provides policymakers with scientific evidence to promote sustainable development of rural public transportation. In addition, it also has a certain theoretical significance for improving the supply level of public transportation in rural areas and safeguarding the basic public transportation rights of rural residents, which provides a theoretical reference for transportation industry management departments at all levels to develop rural public transport services.

In terms of practical significance, this paper takes L City as an example to study the supply issues of rural public transportation services, describes the current situation of rural public transportation service supply in L City, deeply analyzes the problems and causes, and proposes several countermeasures to improve the supply of rural public transportation services in L City, thereby meeting the travel needs of rural residents and enhancing travel convenience for rural residents.

1.2 Research Approach and Methods

1.2.1 Research Approach

This paper focuses on the supply of rural public transportation services in City L. Based on public goods theory, new public service theory and government procurement of public service theory, it constructs a systematic research framework according to the progressive logic: current situation-problem-cause-suggestion. This paper takes the supply of rural public transport service in L city as the research object. based on the theory of public goods, the theory of new public service and the theory of government purchase of public service, it establishes a systematic research framework, following the logic of 'current situation-problem-cause-recommendation'. First of all, by conducting literature research and field research to fully comb the current situation of rural public transport services in L city from aspects such as supply subject, operation route, policy support and infrastructure, clarify their characteristics and shortcomings, laying a foundation for problem analysis. Secondly, by means of questionnaire survey and interview method, combining both quantitative and qualitative analysis to identify the core problems (single supply subject, low public participation and insufficient line coverage) accurately, analyze

the root causes of the problems in terms of government, public and infrastructure. Finally, based on theoretical and empirical analysis, it puts forward some targeted recommendations such as increasing government support, unblocking public participation channels, improving infrastructure etc, so that the supply system of rural public transport services can be optimized in L City. The research is focused on combining theory with practice, striving to provide a scientific basis and feasible path for the sustainable development of rural public transport in L city.

1.2.2 Research Methods

(1) Questionnaire survey method

The questionnaire survey method is a quantitative research approach that systematically collects feedback from research subjects by designing structured questionnaires. This study designs the "L City Rural Public Transport Supply Service Survey Questionnaire" for rural public transportation service supply in L City, using the Wenjuanxing platform for online surveys combined with offline face-to-face surveys to obtain feedback data on residents' service satisfaction, line coverage, and station facilities, providing broad and reliable quantitative evidence for identifying supply issues.

(2) Literature analysis method

Mainly consults domestic and international literature on rural passenger transport services through databases such as CNKI and Baidu Scholar, conducts comprehensive analyses of these sources, compares viewpoints and conclusions between different sources, and learns theoretical knowledge related to this paper, providing strong theoretical support for the writing of the paper.

1.3 Innovations

Innovation in research perspectives. In the field of transportation for a long time, there are more studies about urban public transport management and development than rural public transport service supply issue; More focus on the travel needs of urban residents rather than rural residents' travel needs. This article will conduct a specific study from the perspective of the L City government providing public transportation supply services, aiming to accelerate the urban-rural integration process in L City while also providing momentum for rural revitalization.

2. Definition of Related Concepts and Theoretical Foundations

2.1 Definition of Related Concepts

2.1.1 Public Services

Yu Ting et al. (2022) defines public services mostly based on its attributes and functions. It holds that public services are government-led, non-exclusive, non-competitive services to meet the basic social needs and promote fairness. It further points out that public services are aimed at equalization; they solve market failures via resource allocation; and they protect citizens' basic rights. According to the above research, we define public services in our paper as follows: Products/services led by the government or other public institutions which provide to members of society via resource allocation aiming to meet their basic needs and promote social equity and well-being. Its connotation emphasizes public welfare and government leadership, including basic services like education, healthcare, and transportation, which aims at clarifying the theoretical basis for public services as rural transportation supply in this article and avoiding ambiguity.

2.1.2 Public Transportation Services

Regarding public transport services, Wang Jian et al. (2022) focused on its social functions and inclusiveness; they defined public transport services as a shared service using public transport as the carrier to protect residents' travel rights, emphasizing its networking and sustainability. In addition, it also emphasizes that public transport services should pay attention to the accessibility of vulnerable groups and promote the flow of urban and rural resources. Based on this, we define public transport services as: inclusive travel services provided by the government, enterprises or social organizations, with public transport as the carrier, and for the public, aimed at protecting basic travel rights, optimizing urban and rural transportation networks, promoting resource flows. Its connotation highlights publicity and systematicness, and its extension is limited to bus, passenger transport and other service forms, which defines the scope of this study.

2.1.3 Rural Public Transportation Service Supply

The definition of rural public transport service supply is less, which is considered to be led by the government to provide low-frequency and long-distance travel services for rural residents

in order to solve the traffic market failure; emphasizing its role of supporting rural revitalization, balancing public welfare and efficiency are needed. Based on this, we define the supply of rural public transport services as: inclusive and sustainable travel services provided by the government, market or social organizations to rural residents through resource allocation and institutional arrangements in order to satisfy their low frequency and long distance travel needs, promoting the flow of urban and rural factors for supporting rural revitalization. Its connotation focuses on public welfare and regionality, and its extension is limited to the supply process of rural public transport and passenger transport, so as to avoid confusion with urban traffic services.

2.2 Theoretical Foundation

2.2.1 Public Goods Theory

The theory of public goods is an economic framework for analyzing the supply of products and services. Its core is to divide the responsibility boundary between the government and the market based on the exclusive and competitive characteristics of products in order to solve the problem of market failure. Public goods are non-exclusive and non-competitive; therefore, it needs a government-led supply to ensure fairness. This study uses the theory of public goods to analyze the quasi-public product attributes of rural public transport services in L City. The analysis focuses on their limited exclusivity (such as fare subsidies) and weak competitiveness (such as low-frequency routes). It is used to identify the problems of single supply subject and insufficient financial input, support the logical framework of the analysis of problems and causes in Chapter 4, and explain the key role of the government in making up for market failures.

2.2.2 New Public Service Theory

The new public service theory proposed by the Denhardtts advocated that the government should change from 'helmsman' to 'server', emphasized democratic consultation and citizen participation in the public interest, paid attention to the humanistic value of service. Based on the new public service theory, this study analyzes the phenomenon of insufficient public participation in rural public transport services in L city, focuses on the lack of citizen expression mechanism in service decision-making, and strengthens the democracy of service process.

2.2.3 Theory of Government Procurement of Public Services

The theory of government purchasing public services originated from the New Public Management Movement advocating that the government outsourced the production of public services to markets or social organizations by contract while keeping funding and regulatory responsibility in order to improve efficiency and optimize resource allocation. This study uses this theory to analyze the problem of single supply entities due to lack of purchasing strength in rural public transportation services in L City, clarifies the supply mechanism for multi-stakeholder collaboration and enhances the relevance of the research.

3. Current Supply of Rural Public Transportation Services in L City

3.1 Basic Information of L City

L City, a county-level city under Shandong Province, is located in the central part of the Jiaodong Peninsula and is one of the coastal counties and cities designated by the State Council for opening to the outside world. The overall terrain trend is higher in the north and lower in the south. The north is low mountain and hilly; the center is gentle hilly plains; the south is dish-shaped depressions. Total area: 1,568.2 square kilometers. Administering 8 towns, 3 subdistricts, 1 community (and a provincial-level economic development zone), for a total of 861 administrative villages; By 2025, the permanent population will be 720,100 and about 331,000 are rural residents (accounting for 46%) out of a total population.

3.2 Supply of Rural Public Transportation Services in L City

3.2.1 Relevant Policies and Implementation

The "Guiding Opinions on Deepening the Development of Rural Passenger Transport", The "Shandong Province 14th Five-Year Plan for Comprehensive Transportation Development" emphasizes upgrading the quality of rural roads, improving the rural road traffic safety and management facilities, and proposes a new path for hardened rural roads to comprehensively cover rural streets and alleys. These policies focus on improving rural residents' travel conditions, promoting urban-rural integration, and ensuring equal access to public services. Its goal is to comprehensively

optimize the service level and coverage of rural public transportation, achieving sustainable development goals.

After the policy was implemented, the level of rural bus services in L City has been improved; vehicles have been updated, frequency is higher, and ticket price becomes more reasonable which makes it easier to travel for people living there, especially beneficial to students and the elderly. However, problems like capacity shortage in peak periods and long intervals between buses during off-peak periods are still unresolved; the long-term sustainability of this policy is challenged. In particular, when facing economic fluctuations or significant fiscal pressure, it becomes an important issue to ensure its stable operation.

3.2.2 Investment and Use of Funds

In the supply of rural public transportation services in L City, government allocations occupy a major position, with funds coming from central, provincial, and local levels. Central special funds and transfer payments provide basic support for L City, and these funds are used for large-scale infrastructure construction and vehicle purchase subsidies. Provincial finance allocates special funds for L City according to the regional difference in order to subsidize route operations and transform public transit. Local governments use their own budgets and non-tax revenue from land transfers to fill funding gaps. The multi-level allocation system guarantees a stable fund, however, there is room for improving the allocation efficiency (shown in the table below).

Based on the funding allocation for rural public transportation services in L City, we can see that the allocation is uneven and hard to satisfy their real needs. In terms of usage efficiency, the effectiveness of rural public transport service funds in L City is not ideal. Some projects suffer from duplicate creations and resource waste, and there is a lack of a scientific outcome evaluation mechanism, resulting in a gap between actual results and expected goals. Newly built roads or station facilities that do not effectively meet residents' travel needs will lead to idle resources, slow fund turnover, complicated approval processes, and slow budget execution. Some funds will remain in accounts for long periods and cannot be invested in projects in time, affecting overall capital utilization efficiency. To solve these problems, it is urgent to establish a more complete fund management system and

hire third-party evaluation agencies for full-process supervision and evaluation.

3.2.3 Infrastructure Construction

According to relevant information, bus routes in L City generally pass through many stops, meaning they pass through many villages, and the entire route takes a long time, resulting in insufficient travel needs for residents. See Table 1 for details.

Table 1. Information Table of Rural Operating Routes in L City

Line code	Number of stations	Total route time per minute	Total route length
101	38	100	56
103	51	180	58
104	38	160	59
105	46	140	60
503	44	180	85
504	39	200	86
903	23	120	109

Source: www.laixi.gov.cn "L City Urban and Rural Bus Route Information"

3.2.4 Operational Status

There are obvious shortcomings in the planning and frequency arrangement of rural public transportation services in L City. In terms of coverage, the majority of bus routes concentrate on main roads that connect township centers to major production areas.

According to Table 3-2, the longest operating distance of rural public transport routes in L City is up to 109 kilometers, has 23 stations, takes 2 hours for traveling, and operates just two vehicles. Route 504, even though the total journey time is 200 minutes, only one bus is assigned.

3.3 Questionnaire Survey on the Supply of Rural Public Transportation Services in L City

3.3.1 Questionnaire Design

The purpose of the questionnaire is to ensure that the data on rural public transportation service supply in L City are accurate and effective. The questions are closely centered around rural public transport, and by asking about ride frequency and age groups we can get a deeper understanding of their riding habits as well as the needs and preferences of different groups with regard to public transportation. The questionnaire mainly consists of four parts: first, a statement of the background and purpose of the survey, and a confidentiality of the information is indicated to respondents; Second,

basic information of respondents (age, purpose of travel, frequency of rides); Third, to collect surveys on the respondents' understanding of L City's basic public transportation policies, as well as their satisfaction in various aspects.; Fourth, sincerely thank the respondents for their patient participation and support. See the appendix for details.

3.3.2 Distribution and Collection of Questionnaires

This paper takes L City as the research object. In order to get first-hand information about rural public transportation supply in L City, we design a survey questionnaire named "L City Rural Public Transport Supply Service Survey Questionnaire". Through online surveys by Questionnaire Star and face-to-face offline surveys, the paper further understands the supply situation and existing problems of rural public transportation services in L City. During the selection of residents, a stratified sampling method will be used, using administrative divisions as the standard to select towns and villages step by step. The questionnaire distribution will use the self-completed questionnaire method through personal relationship connecting with survey participants. When distributing the questionnaire, respondents are asked to complete and collect it on the spot. A total of 160 questionnaires were distributed, 144 were collected, and a large number of blank questionnaires and those with short completion times were removed, resulting in 136 valid questionnaires.

3.3.3 Purpose of Questionnaire Design

The purpose of the questionnaire is to make sure that the data on rural public transportation service supply in L City are accurate and effective. The questions are closely centered around rural public transport; by asking about ride frequency and age groups we can get a better understanding of their riding habits as well as the needs and preferences of different groups for public transportation. The questionnaire mainly consists of four parts.: first, a statement of the background and purpose of the survey, and a confidentiality of the information is indicated to respondents; Second, basic information of respondents, such as age, purpose of travel, and frequency of rides; Third, to collect surveys on the understanding of L City's basic public transportation policies by respondents, as well as their satisfaction in different aspects; Fourth, sincerely thank the

respondents for their patient participation and support.

4. Analysis of Problems and Causes in the Supply of Rural Public Transportation Services in City L

Chapter 3 is a detailed summary on the supply status of rural public transportation services in L City covering its basic information, relevant policies and implementation, capital input and use, infrastructure construction as well as operational status. Through these analyses, we have gained a relatively comprehensive understanding of the current situation of rural public transportation services in L City. However, despite some progress, there are still many urgent issues in the rural public transportation services of L City. These problems not only affect service quality and efficiency but also restrict the convenience and quality of life for rural residents. In this chapter, we will analyze the problems in the supply of rural public transportation services in City L and the causes of these problems. Through systematic investigation of these issues, we will be able to highlight the current shortcomings in service supply, thereby providing theoretical support for future solutions. In detail, we will examine whether the service supply policies are sufficiently targeted; what level of funding has been invested into service supply; and how highway construction is connected to bus operations. The issue discusses many aspects such as the current status of station setup, the status of the operating entities, and the coverage of the route in order to investigate the reasons for these problems.

4.1 Problems in the Supply of Rural Public Transportation Services in L City

4.1.1 Insufficient Policy Relevance

According to the analysis of relevant policies and their implementation in Section 3.2.1, as well as the questionnaire results of 3.3.3, the respondents generally do not understand the relevant policies of L City. This indicates that decision-makers did not consult with relevant stakeholders in detail while formulating policies; this is a clear indication of obvious problems of lack of relevance and poor execution effectiveness during policy formulation. When formulating policies related to rural public transportation service supply in City L, the specificity was clearly insufficient, and the

implementation results were poor. Policymakers likely did not take into account the geography, population, and economic development levels of rural areas which led to a large gap between policies and their actual needs. For example, the roads in remote villages are bad and their residential areas are scattered; there is a need for public transportation that is very different from those of economically developed areas but they are not differentiated by policy which makes it hard to satisfy the travel needs of local residents.

4.1.2 Insufficient Capital Investment

City L has long been suffering from a lack of funds to provide rural public transportation services and this greatly limits improvements in service quality. From a fiscal perspective, the proportion of local government budget allocated to rural public transport is small, and due to economic conditions and the scheduling of issues, it is difficult to ensure stable funding supply.

Insufficient funding will affect the service quality in terms of slow vehicle updates, unreasonable route planning, and low operational efficiency. Old vehicles are prone to breakdowns and this will increase the cost of repairs as well as cause many inconveniences for passengers. The funding shortage also makes it difficult to scientifically plan the route and causes travel difficulties for some remote villagers. These issues intertwine and create a vicious cycle: poor service quality reduces attractiveness, making financial investment even tighter. Therefore, solving the funding input issue is crucial for improving rural bus services in L City.

4.1.3 Lack of Supporting Facilities

(1) Unreasonable route arrangements

Lack of line coverage is another issue: some villages far away from the town do not belong to the bus network. Although there is an expansion of some routes that can only access the main roads but not into the village, limiting villagers' daily travel. Especially so for elderly and students that need to walk several kilometers until nearby stations. For instance, villagers of Wangbuzhuang have to ride five kilometers to take a bus. Furthermore, there is no scientific and rational basis for route planning; some areas that have a high demand are neglected as well, which makes the uneven distribution of transportation resources increasingly serious.

(2) Poor waiting environment

According to the questionnaire survey results in

Section 3.3.3, the level of completeness of bus stop facilities in rural areas of City L is low. In terms of facility setup, more than half of the stops only have simple stop signage and lack shelters. Basic equipment such as seats increase the difficulty of waiting for residents in harsh weather; Second, there are no real-time bus arrival notifications which makes it easy for residents to miss the schedule and wait blindly. Once, I followed the app's instructions and waited for a bus at the scheduled time; however, when I got there, the car was gone. It can be seen from here that the real-time bus operation information of City L does not match with the app.

4.1.4 Single Operating Entity

Through visits, surveys, and online information searches, it was found that the development of rural public transportation services in L City is monopolized by L City Transportation Development Co., Ltd. The rural public transportation services in L City have obvious issues of single operators, creating obstacles for forming a competitive market environment and optimizing service quality. Currently, most of these services are monopolized by local government-affiliated enterprises or a few companies, which leads to the lack of market vitality and operators' lack of motivation to improve. In remote areas, there is no other operator joining in Bus routes often have very few departures with irregular departure times and outdated vehicles without maintenance. These issues greatly affect the travel experience of rural residents.

From an economic perspective, if there is a single business entity, natural or quasi-monopoly situations are easily created, which restricts improvements in service quality and resource allocation efficiency. A single entity may reduce or cut rural routes with low passenger flow for cost reasons.

4.2 Analysis of the Causes of Problems in Rural Public Transport Service Supply in L City

4.2.1. Policy formulation becomes mere formality

Policy issues mainly arise from many shortcomings during both formulation and implementation stages. In the formulation stage, there is a tendency of structural bias when designing policies with unclear goals and some redundancies without specificities. This leads to

a disconnect between policy content and reality, making implementation difficult in specific areas such as rural public transportation. Information silos and lack of interest coordination mechanisms make it impossible to guarantee the scientific nature of policies, further affect public interest orientation, and make it difficult to communicate the demands of vulnerable groups. On the other hand, strong groups can also overly influence the direction of decisions.

4.2.2 Tight Financial and Fiscal Budgets

There is a shortage of funds for the supply of rural public transportation services in L City because of tight fiscal budgets, downward economic pressure and the impact of the pandemic that makes it hard to operate businesses. As a result, the growth of taxes has slowed down; land transfer revenues have shrunk, and the fiscal strength of local governments has been cut. Demand for rigid expenditures (such as livelihood security and infrastructure construction) has increased, which makes fiscal revenue and expenditure conflicts more prominent. Moreover, local governments have a heavy burden of debts; the payment of high interests consumes public transportation funds.

Low participation from social capital is a major factor causing funding shortages. Rural public transport has a strong public welfare nature and a narrow profit range, making it difficult to attract private investment. Even if some companies want to try, because there are no policies or reasonable return mechanisms, it will be hard for them to make progress. Its financing channels are relatively single, mostly relying on government grants, there is little opportunity for financial loans such as financial loans, Special Fund, Social donations and other potential sources of funding have limited the ability to raise funds.

4.2.3 Basic Public Transportation Facilities Are Not Adequate

Low investment in station construction and lack of construction lead to poor waiting conditions. It is highly susceptible to weather conditions, once it rains or snows, the waiting experience can be terrible. The penetration of information technology devices is low, still relying on slow updates and insufficiently intuitive circuit diagrams. It caused rural people not to believe in public transportation and they chose their own car or informal vehicle which exacerbated unequal distribution of transportation resources.

It is therefore essential that we begin at the planning stage in order to improve our supporting facilities and increase service quality. Main reasons of unreasonable operating routes are: First, the number of routes offered by rural public transportation services in L City have been drastically reduced and many villages are no longer part of the current route's operation scope. Moreover, according to the urban and rural bus route information table in L City, there are too many bus stops for the currently set routes which increases residents' travel time; Second, rural residents' travel is based on seasonality; however, the schedule of City L does not reflect that, thus being disconnected with their real needs without any flexibility.

4.2.4 Monopolistic Operation and Improper Planning

Supply difficulty for rural public transportation service in City L is caused by monopoly operation and poor planning. Market structure has natural monopoly characteristics on public transportation sector. The route laying and vehicle purchases have high fixed costs that enable each enterprise to work at low cost but there is no market competition because business entities are not willing to improve their services. Government sometimes uses administrative methods to designate operating enterprises, which makes monopolies more prominent. The small and micro enterprises or new establishments have difficulty obtaining a fair opportunity for route approval and resource allocation; thus, the current business entity has long-term control of the market.

5. Countermeasures and Suggestions to Improve the Supply of Rural Public Transportation Services in L City

To address the prominent problems of rural public transportation services in L City on policy supply, funding investment, infrastructure, and operating entities, we urgently need a balanced plan with fairness and efficiency as well as inclusiveness and sustainability. In this section we will put forward some specific and feasible suggestions of improving in terms of strengthening policy implementation, increasing funding, and optimizing supporting facilities so that it can offer an actual way out for City L's transformation of its rural passenger transport from "passable" to "good" and "sustainable."

5.1 Strengthen Policy Implementation

5.1.1 Emphasize Policy Research to Enhance Relevance

There are improvements that can be achieved by improving demand research or refining policies. It is necessary to organize professional teams to carry out comprehensive surveys, fully understanding the travel habits of rural residents, their frequency, special needs etc., as well as combining seasonal changes with the characteristics of economic development in order to provide a scientific basis for formulating policies. Clarify policy objectives that are consistent with local realities and development plans; improve layout routes, increase coverage in remote areas, balance services, set strict service quality standards, implement customized service models, and lower operating cost by supporting policies and updating technology.

5.1.2 Strengthen Policy Publicity

Strengthening policy publicity: using different channels to optimize the sense of recognition for rural residents on policies; establishing a feedback mechanism to timely adjust policy details; clarifying responsible entities, refining institutional duties, increasing funding investment, improving regulatory mechanisms, ensuring legal and efficient use of funds, setting up a comprehensive supervision and evaluation system, linking evaluation results with subsidy distribution, forming an effective incentive mechanism. The above measures will emphasize the precision and effectiveness of L City's rural public transportation service supply policies.

5.2 Increase the Total Amount of Capital Investment

5.2.1 Apply for Higher-level Subsidies

In order to increase the funding for supplying rural public transportation services in L City, we need to adopt a multi-level approach, make full use of relevant national and provincial policies, apply for special subsidy projects, strive to get policy support, and join in creating a demonstration county for integrated urban-rural transportation so as to secure more external funds. In terms of rural road construction and improvement of bus station facilities, we need accurate coordination and applications in accordance with the plan for higher-level special funds; strengthen communication and cooperation with higher level transportation and finance departments to ensure the approval and funding is based upon real needs. Invite higher-level leaders to inspect sites directly to visually

see what problems exist as well as their development potential, seek more policy support.

5.2.2 Broaden Financing Channels

Expand financing channels: by attracting social capital, issuing local government bonds, using financial instruments, we can provide diversified funding guarantees; through the PPP model to attract social capital to participate in infrastructure creation and operation, formulate a reasonable profit distribution plan, stimulate social capital enthusiasm, reasonably plan the scale of local government bond issuance to ensure its dedicated use, strengthen supervision so that financial institutions will update their financial products and services (such as bank lending and financial leasing) to provide more flexible funding support for rural public transportation projects. The above measures will effectively relieve financial pressure, which is conducive to the sustainable development of rural public transportation service supply.

5.3 Improve Infrastructure Construction

5.3.1 Improve the Waiting Environment

To improve bus stop facilities, we need to prioritize quality optimization. Many rural stops do not have basic waiting facilities like sunshades, seats or lighting that affect passengers' experiences. We will build standard bus shelters, install electronic display screens for displaying real-time arrival information, establish barrier-free lanes, install energy-efficient lighting and smart detection systems so that they provide a safe and comfortable waiting environment. This will effectively increase rural residents' satisfaction of public transportation services and make more people choose to take buses.

5.3.2 Optimize Operating Routes

The improvement of bus schedule scheduling is essential to improving service quality: during peak periods increase the frequency, decrease passenger waiting time and enhance bus appeal; with the help of intelligent dispatch system monitoring change of passenger flow, flexibly adjust vehicle spacing so as to achieve a reasonable resource allocation, launch express route for long-distance travel need at major stations which only stop at major stations, attracting more people to take public transport, reducing duplicate routes in urban centers, improving layout structure, preventing resource waste, and increasing operation efficiency. The above measures will bring great improvements

on rural public transportation in City L.

5.3.3 Reasonably Adjust Departure Intervals

For the rural public transportation service sector of City L, reasonably adjust the departure interval is important to enhance its operational efficiency and service quality. In peak hours (especially morning and evening commute), where there is a large number of people gathered, shortening the departure interval to 15-20 minutes will help. For routes with high passenger flow, increase vehicle investment and use an intelligent dispatch system that monitors passenger flow in real-time, which adjusts the departure frequency based on actual conditions so that there won't be shortage of vehicles or too dense of vehicles. When passenger numbers are lower during off-peak periods, At this point, it's suitable to extend the departure interval to 20-25 minutes and make better capacity allocation by concentrating efforts more on routes and areas with higher demand. Use methods like GPS positioning and video monitoring to supervise the driver who departs on time and ensure accurate departure times. Promote the intelligent bus system to further optimize operational efficiency and offer convenient and efficient services to passengers. Pay attention to communicating and interacting with passengers, collect feedback from all channels, evaluate business performance regularly and adjust plans to meet travel needs at different times.

5.4 Introduce Diversified Operating Entities

In order to solve the problem of monotonizing rural public transportation service supply in L City, it should focus on using different kinds of business entities, relax market access, simplify approval procedures, and ensure fairness; attracting more vitality and resources from social capital. Through the adoption of PPP models, bond financing or other financing methods as well as creating risk sharing mechanisms, we can reduce investment risks, increase the enthusiasm of social capital, and improve return mechanisms. With the inclusion of reasonable pricing and policy support, social capital investment will also be promoted.

Adding a professional management team is essential for improving service quality. They are selected through open bidding and supplemented by a strict evaluation system that ensures they have certain experience and technical capability. Regular professional training can help them improve professional competence and service

awareness. A scientific performance evaluation system together with long-term cooperation mechanisms will push teams to improve operational efficiency, keep stable and sustainable services, and with further policy guidance and regulatory evaluation, rural public transport service supply will be comprehensively enhanced, which brings new vitality to rural transportation.

6.Conclusion

The study concentrated on the supply of rural public transportation services in L City and found unreasonable route arrangement and long interval between departures at off-peak period which exacerbated the difficulty of travel even more. Comprehensive countermeasures were provided for existing issues regarding the supply of rural public transportation service in City L: policies need to be more targeted and cohesive, grasping demand, refining policy content, consolidating policy connections so as to obtain long term stable result; Capital investment needs to increase the total amount and optimize its distribution structure, actively seeking support from higher authorities, broadening financing channel, allocating funds reasonably, strengthening supervision and review to improve the efficiency of fund utilization; Infrastructure creation needs to focus on strengthening highway and public transit operation connectivity, improvement of station facility layout, enhanced route planning, enhancing facility condition to enhance travel experience; Operational approach, focusing on adopting diverse entities, promoting social capital participation, employing professional team to break monopolies, expanding route coverage, adjusting departure intervals according to travel demand.

Optimizing rural public transportation service supply is not just about infrastructure improvement, but a revolution in governance concept. On the basis of empirical research based on L City's "Warm Bus", we aim to support the rural economic and social development of L City, narrowing the urban-rural living gap, promoting rural revitalization from "blood transfusion" to "blood production", truly achieving inclusive development with "people have access and people benefit".

References

[1]NISHIUCHI H, NGOCMA ,YASUNAMI

- M .Assessment of Public Transport Usage in Japanese Rural Areas with Long-term Smart Card Data: A: Transportation General[J] Journal of the Eastern Asia Society for Transportation Studies, 2024, 15193-206.
- [2]Alberto D ,Michael G ,Georg H .What can be done with today's budget and demand? Scenarios of rural public transport automation in Mühlwald (South Tyrol)[J]. Public Transport, 2023, 16(1): 295-332.
- [3]Ponrahono, Zakiah, Bachok, etal. Rural Public Bus Routing and Bus Stops Detecting Using Global Positioning System and Geographical Information System[J]. Advanced Science Letters, 2017, 23(1)
- [4]Nadimuthu Lalith Pankaj Raj, Victor Kirubakaran. Performance analysis and optimization of solar-powered E-rickshaw for environmental sustainability in rural transportation[J]. Environmental science and pollution research international, 2021, 28(26)
- [5]Liddle J .Rural transport and social inclusion: The DalesBus Initiative[J]. Local Economy: The Journal of the Local Economy Policy Unit, 2012, 27(1): 3-18.
- [6]Salau T .Public transportation in metropolitan Lagos, Nigeria: analysis of public transport users' socioeconomic characteristics[J]. Urban, Planning and Transport Research, 2015, 3(1): 132-139.