

Research on Marketing Strategy of Intercity Railway in Wuhan Metropolitan Area

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Abstract. The intercity railway is a new type of short-distance and large-capacity transportation. In recent years, many cities within the Wuhan metropolitan area have successively built and operated various inter-city railway lines. In the course of operation, problems of weak competitiveness of transport products, low passenger occupancy rate have appeared in partial intercity railway lines. From the perspective of consumer behavior, this paper will conduct research on intercity Railway in Wuhan Metropolitan Area, and formulate reasonable strategies for intercity railway marketing, which will be conducive to improving the service level of the intercity railway in Wuhan Metropolitan Area.

Keywords: Intercity railway; Wuhan Metropolitan Area; Marketing strategy.

1. Introduction

Intercity railway refers to a fast, convenient and high-density passenger dedicated railway that specializes in inter-city or urban agglomerations and has a passenger train design speed of 200 km/h or less. The intercity railway is a passenger dedicated railway connecting adjacent cities or urban agglomerations. It has the following characteristics compared with other transportation intercity railways: short transportation distance, the length of the line is generally between 50 km and 200 km; using multiple unit train and operating in the transportation organization model of "High density, Small unit and Public transportation"; high traffic density; small station spacing, dense station arrangement, the average station spacing does not exceed 20KM. The intercity railway is an important part of comprehensive transportation system of a city. It mainly undertakes commuter traffic between adjacent cities or urban agglomerations in the region. The service targets are mainly short- and medium-distance passengers, and the one-way time is usually short, with special emphasis on the speed and convenience of passenger travel.

Wuhan Metropolitan Area refers to the urban group centered by Wuhan - the largest city in central China - consisting of 8 large and medium-sized cities of Huangshi, Ezhou, Huanggang, Xiaogan, Xianning, Xiantao, Qianjiang and Tianmen around Wuhan, with Wuhan as the center city, Huangshi is the sub-center city. The Wuhan Metropolitan Area occupies more than half of Hubei's population and more than 60% of GDP. It is one of the largest urban groups in central China and will be built into an important integrated transportation hub in the country, a modern service industry center in the central region, and an important growth pole to promote the rise of the central region.

In order to further strengthen the links of cities within the Wuhan Metropolitan Area and promote regional economic development, Wuhan City and China Railway Corporation have jointly planned a number of intercity railways. This paper will conduct research on intercity Railway in Wuhan Metropolitan Area, and formulate reasonable strategies for intercity railway marketing, which will be conducive to improving the service level of the intercity railway in Wuhan Metropolitan Area, and making the intercity railway transportation mode more effective in serving the social and economic construction.

2. Overview of Intercity Railway in Wuhan Metropolitan Area

As of 2018, the opening intercity railways included Wuhan-Xianning, Wuhan - Huanggang, Wuhan - Huangshi, Wuhan - Xiaogan, Wuhan - Tianmen (Xiantao) lines. The basic situation of each intercity railway is shown in Table 1.

Table 1. Basic Situation of Each Intercity Railway

Intercity railway line	Length (km)	Numbers of trains (pairs)	Operating time (minutes)	Numbers of station	Max speed (km/h)
Wuhan-Xianning	90	8	54-97	13	250
Wuhan-Huangshi	97	11	46-77	9	200
Wuhan-Huanggang	36	12	26-52	7	200
Wuhan-Xiaogan	61	11	34-55	10	200
Wuhan-Tianmen (Xiantao)	76	20	45-55	8	200

The intercity railways that have been opened have all been operated by EMUs, with Wuhan as the center, radiating to Xianning, Huangshi, Huanggang, Xiaogan and Tianmen (Xiantao). The operating speed is between 200-250 km/h, and the operation time is generally between 06:00 to 20:00.

3. Consumer Behavior Survey and Result Analysis

In order to objectively understand the consumption behavior of intercity railway passengers in Wuhan Metropolitan Area, improve the intercity railway attendance rate and service quality, this study conducted a sample survey on passengers of major intercity railways in Wuhan Metropolitan Area from March 2018 to September 2018. The steps are:

- (1) Determine the overall target of sampling.
- (2) Randomly issue questionnaires for passengers taking the intercity railway EMUs at Wuchang, Hankou and Wuhan railway stations.
- (3) Recycle questionnaire to obtain data.
- (4) Perform statistical analysis of the data.

After sorting out the recycling questionnaire, the results are input the computer for data analysis, and explained from the perspective of consumer behavior factors.

3.1 Overall Satisfaction of Customers

The respondents were generally satisfied with the overall intercity railway system in Wuhan Metropolitan Area, samples that selected very satisfied and basically satisfied accounted for 79%. Among them, the Intercity Railway with highest satisfaction is from Wuhan to Huangshi, that with lower satisfaction is from Wuhan to Xianning. This shows that the intercity railway system as an emerging mode of rapid transportation between cities is recognized by consumers as a whole.

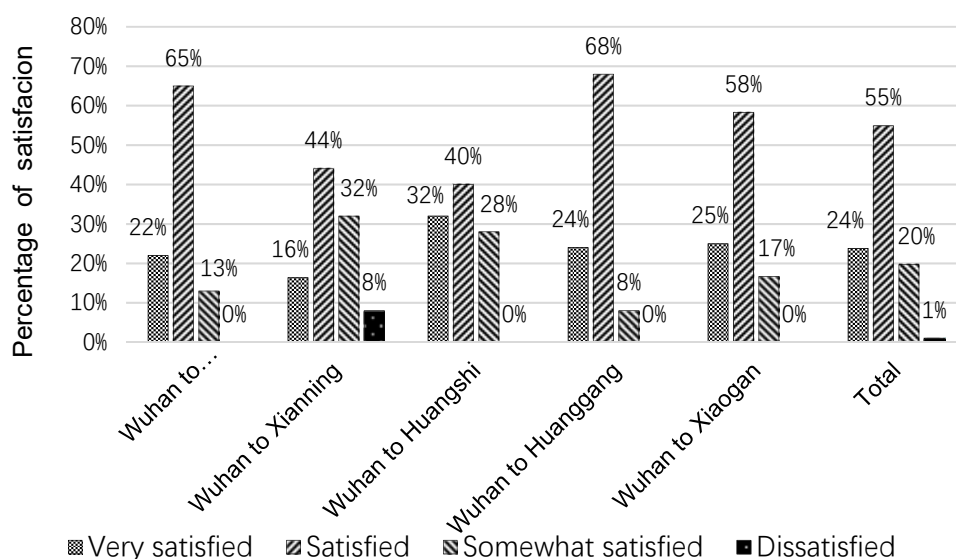


Fig. 1 Overall satisfaction of customers of major intercity railways

3.2 Motivation of Passengers Choosing Intercity Railway Travel

The reason why the respondents chose the intercity railway as the mode of travel was mainly the speed and comfort. The number of samples selected for these two items accounted for 67% and 59% of the total number of respondents. This shows that speed and comfort are the core competitiveness of intercity railways relative to other modes of transport. Among the respondents, the samples with high satisfaction on the service quality of intercity railway system accounted for 6% only, indicating that the service level of the intercity railway still has room for improvement.

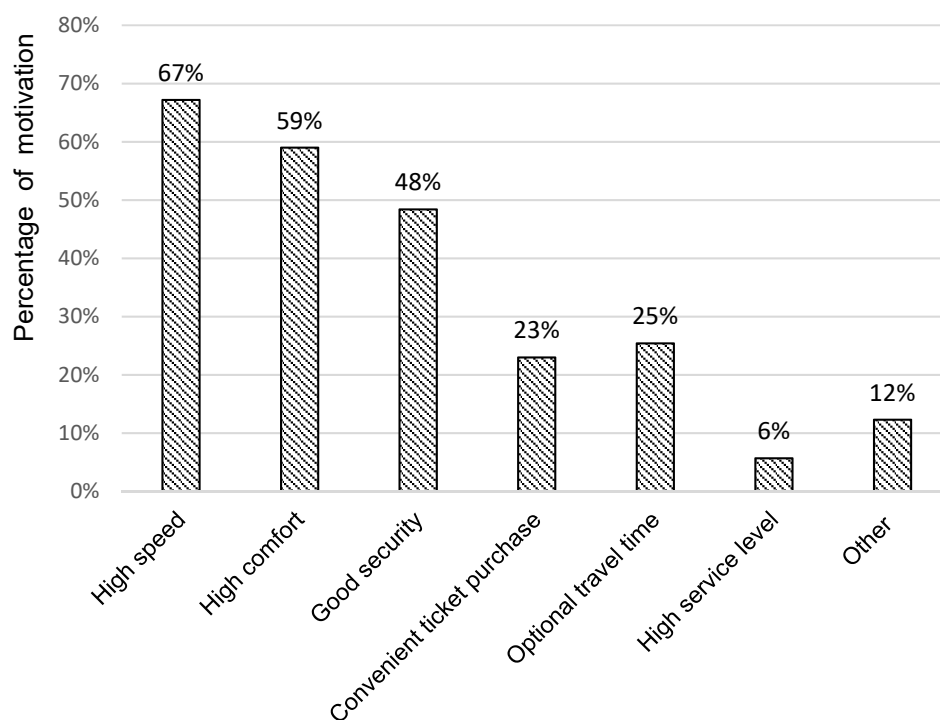


Fig.2 Motivation of Passengers Choosing Intercity Railway Travel

3.3 Unsatisfactory Factors for Passengers

The respondents believe that the problems in the intercity railway system in Wuhan Metropolitan Area are mainly reflected in the few trains and the high fares. The total number of samples selected for these two items accounted for 84% of the total sample. These are also the two major factors affecting the competitiveness of the inter-city railway market. Some inter-city railway lines have fewer trains per day, and too many stops result in lower actual train speed, the fares are equal to those of bus, and the comprehensive cost performance is not high, resulting in the loss of passenger flow. In this survey, the number of samples selecting few shifts and high fares from Wuhan to Xianning Intercity Railway was the highest, especially for the problem of too few shifts, the number of passengers who choose this item was as high as 96%. The dissatisfaction item of the intercity railway from Wuhan to Huangshi was low.

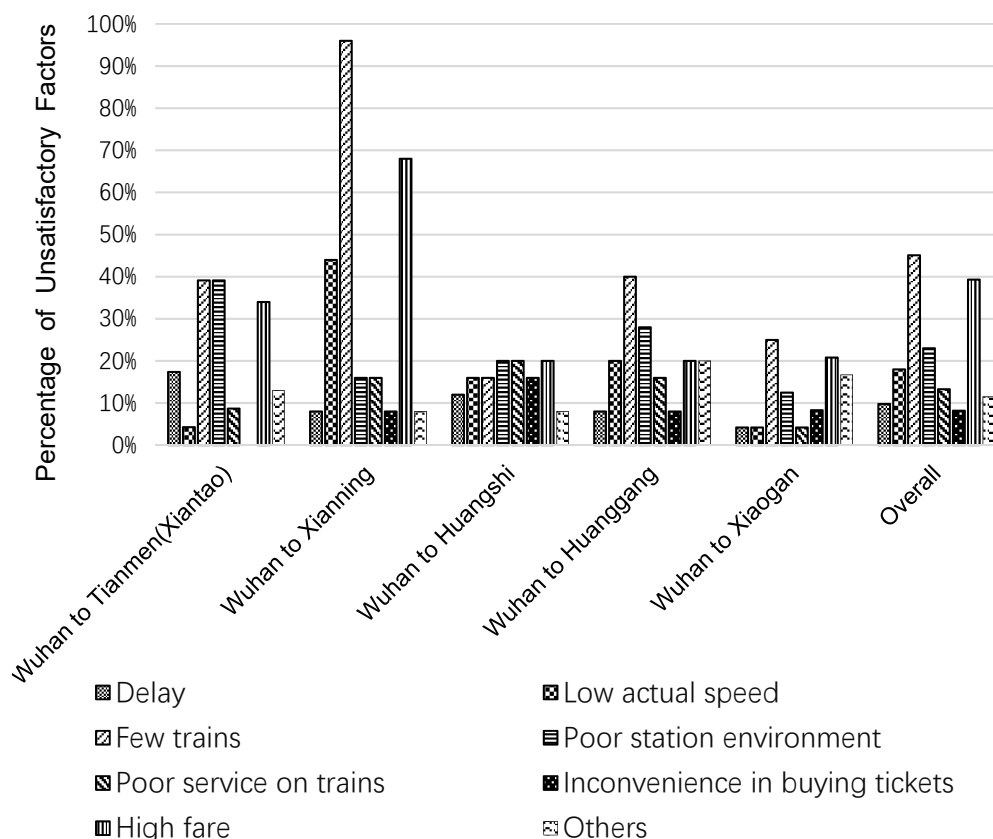


Fig.3 Unsatisfactory factors for passengers on various intercity railway lines

3.4 Trip Purposes

The main trip purposes of respondents was to visit relatives and friends and travel shopping. The purposes of 47.5% and 46.7% of the respondents were chose the above two Items. The number of respondents who chose travel for purpose was 23%, while the number of passengers using the intercity railway as a commuter tool was relatively small, accounting for only 9.8%. It shows that the current intercity railway passenger flow in Wuhan Metropolitan Area is mainly based on the visits and shopping flows between the central city and the surrounding small and medium-sized cities, while more than half of the passengers in the western developed countries such as Japan and France choose commute as purpose. It shows that the induction of commuter passenger flow by the inter-city railway in Wuhan Metropolitan Area needs to be further strengthened.

3.5 Ticket Purchase Channels

According to the analysis of the ticket purchase channels of the respondents, 87% of the respondents had their intercity railway tickets purchased through the 12306 network. On the one hand, the above two phenomena indicate that in the era of Internet economy, consumers of railway systems are also increasingly inclined to use network clients to purchase tickets through PCs and various mobile devices. On the other hand, it also shows that the current intercity railway system lacks a convenient ticket purchase mode, and it is impossible to realize the payment using the recharge card similar to that used in the subway system for travel at anytime.

4. Marketing Strategy of Intercity Railway System in Wuhan Metropolitan Area

4.1 Product Strategy

By analyzing the results of the survey, it can be seen that the overall development of the intercity railway in the Wuhan Metropolitan Area is in good condition and the passenger satisfaction is high.

However, in some aspects, there are still some problems to be improved. As a kind of transportation mode with large volume of transportation, the intercity railway system should realize the public operation under ideal conditions, and enable passengers to travel at anytime. However, according to the current mode of intercity railway trains, it is difficult to realize public operation. Take the Wuxian Intercity Railway as an example. At present, only 8 pairs of trains are put into operation in one day. In the morning, 5 trains will depart from Wuchang Station, the departure time is 6:24, 7:29, 8:15, 10:35, 11:50. And 2 trains from Xianning Station at 7:48, 9:21 respectively. Such a departure density is not only unable to achieve public operation, but also has very few trains during the 6:00-8:30 period of commuting passenger flow. During this period of time, there is only 1 train departed from Xianning Station, with completely abandoning the commuters. This is extremely unfavorable for the passenger flow cultivation of an intercity railway, and objectively, it forms a vicious circle in which the attendance rate is gradually decreasing. In response to the above problems of intercity railway transportation products, this paper proposes the following strategies:

1. To optimize the intercity railway operation map, taking into account ordinary passenger flow and commuter passenger flow. For routes with a large number of potential commuter passengers, such as the Wuxian Intercity Railway and the Hanxiao Intercity Railway, the frequency can be properly encrypted at 6:00-7:00 am and 17:00-19:00 pm. For the sections where commuter passenger flow is concentrated in some lines, such as the Wuchang-Zhifang section of the Wuxian Intercity Railway and the Hankou-Tianhe Airport section of the Hanxiao Intercity Railway, the method of increasing the short-distance train can be used to increase the capacity of the passenger flow in the peak period, and cultivate more commuter passenger flow, thereby increasing the attendance rate of intercity railways.

2. To optimize transportation vehicles. At present, the inter-city railway in Hubei Province is operated by CRH2 EMU. The design of this EMU is mainly for medium and long distance ordinary high-speed railways, which is not suitable for inter-city railways with the characteristics of large-capacity, low-cost and high-frequency operation. There are disadvantages such as high transportation costs and low passenger capacity in single coach. Moreover, China has developed CRH6 series EMU that is more suitable for intercity railway. This model is characterized by large capacity, fast start and stop speed, convenient and fast parking, quick and effective dredging, comfortable ride, safety and reliability, energy saving and environmental protection. Therefore, when conditions permit, the replacement of operating vehicles should be used as much as possible, and CRH6-type EMUs that are more suitable for intercity railway operations should be adopted. At the same time, in view of large passenger commuter flow, public transportation of passengers, shorter ride time, free seats can be set up in some coaches of the intercity railway EMUs, that is, no seat limitation and allowing overcrowding, to meet the needs of passengers traveling at anytime, and increase transport capacity while ensuring safety.

3. To optimize traffic connections at intercity railway stations. In view of the large difference in the location and scale of intercity railway stations, the stations can be divided into different levels, and different levels of stations use different connection methods. This paper investigates the number of stopped trains, the distance from densely populated areas and the number of bus pairs in all intercity railway stations in Hubei Province, and uses SPSS software to systematically cluster the trains by the number of trains stopped in the station, with three different types of stations obtained. The classification scheme is shown in Table 2.

Class A stations are provincial capital hub stations, including Wuhan Station, Hankou Station. Such stations are the originating and terminating trains of intercity trains, and also undertake the transportation tasks of long-distance speed railways and high-speed railways. Therefore, such stations have a large number of buses and subways, and the connection conditions are better.

Class B stations are provincial capital city intercity railway sub-central stations and other urban central stations, including 14 stations such as Wuchang Station, Daye North Station and Huangshi North Station. This type of station has about 10 pairs of intercity trains. It is located in a densely populated area of the city. At present, there are 2 or more bus lines at such stations, which can basically meet the needs of passengers. In the future, with the growth of intercity railway passenger

flow, such stations can continue to increase bus routes. For some stations with large passenger traffic, micro-circulation buses operating around the site can be opened, and shared bicycle parking places can be set up to encourage green travel .

Class C stations are small stations located on the periphery of the city or between adjacent cities, including 23 stations such as Pu'an station and Wulongquan station. Due to the remoteness of such stations, the number of stopped trains is small, and some stations even have only one pair of trains parked a day. And many C-type stations do not have bus lines. For Class C stations, on the one hand, the inter-city railway operation department needs to increase the number of train stops, cultivate the inter-city railway market, and induce new passenger flow; on the other hand, it is necessary to make connections according to local conditions. For stations located on the edge of the city and with fewer trains, some temporary buses can be arranged to enter the station to pick up passengers according to the intercity train stop time.

Table 2. Station classification scheme of Intercity Railway in Wuhan Metropolitan

Class	Stations (number of bus lines) included
Class A station	Hankou (35) Wuhan (11)
Class B station	Gedian South Station (2) Tianmen South Station (4) Zhifang East Station (4) Xianning South Station (3) Miaoshan Station (4) Huanggang West Station (4) Huanggang Station (2) Tianhe Airport Station (3) Daye North Station (2) Ezhou Station (7) Xiaogan East Station (7) Huangshi North Station (4) Wuchang Station (46) Huanggang East Station (2)
Class C station	Henggouqiao East Station (0) Xiantao West Station (3) Nanhu East Station (3) Heshengqiao East Station (0) Minji Station (1) Shanpo East Station (1) Huahu Station (3) Tangxun Lake Station (2) Hanchuan Station (1) Mao Chen Station (1) Huarong South Station (0) Tuditang East Station (0) Zuoling Station (2) Huarong East Station (1) Wulongquan South Station (0) Xianning East Station (3) Huashan South Station (2) Pu'an Station (1) Ezhou East Station (1) Jinyintan Station (6) Huaiyin Station (4) Houhu Station (3) Tianhe Street Station (1)

4.2 Price Strategy and Promotion Strategy

According to the analysis on the survey results, 40% of passengers think that the intercity railway is overpriced because of the competition of various transportation products on the route where some intercity railways are located, and the intercity railway has no significant advantage over other modes of transportation on the same line. For example, the intercity railway from Wuhan to Xianning also takes 54 minutes to run the fastest, the time of most of the trains is over 1 hour, the fare is 29 yuan (second class), and the high-speed train from Wuhan to Xianning only takes 28 minutes. 39 yuan, even within 2 hours of taking bus, the price is about 15 yuan, the intercity railway system on this line has no advantages in terms of price and operating time, and is less competitive than other modes of transportation, resulting in a lower attendance rate of intercity railways. This paper proposes the following strategies to enhance the attractiveness of intercity railways to potential passengers.

1. For some inter-city railway lines that are not competitive, a more flexible pricing strategy can be implemented to enhance the competitiveness of transportation products. For example, through information technology such as big data analysis, passenger travel rules can be studied to find out the basis for formulating ticket fare strategies. In the period of insufficient passenger flow, the ticket discount can be implemented, and the original price or the floating ticket can be resumed during the peak hours of commuting and during the weekends, and the passengers who purchase the ticket in advance can be given appropriate fare discounts, thereby guiding the passengers to travel at different periods, and then improving the overall attendance rate of the intercity railway. At the same time, data mining technology can be used to segment the intercity railway passenger transport market according to the passenger number, ride behavior, lifestyle and customer value of passengers along the intercity railway, and formulate different ticket type strategies and fare strategies. The design scheme of the intercity railway ticket is shown in Table 3.

Table 3. Design plan for the intercity railway tickets

Types	Discount situation	Use limit requirements
Ordinary ticket	No discount	No requirements
Commuter ticket	Enjoy a discount	Pay by number of rides
Group ticket	Enjoy a larger discount	Unified purchase by enterprises and institutions
Monthly or annual ticket	Enjoy a larger discount	One-time purchase, unlimited use within the specified time

2. To dig deep into the tourism resources along the intercity railway. According to the survey of passengers' travel destinations, the ratio of passengers taking the intercity railway system for tourism activities is relatively low, while a large number of tourist attractions is distributed along the intercity railway of Wuhan Metropolitan Area. Therefore, the inter-city railway marketing activities around these tourism resources can be carried out to effectively improve the attendance rate of intercity railway. The specific measures are as follows:

In the larger intercity railway stations, such as Xianning South Station, Ezhou Station, and Huangshi North Station, one-stop tourism marketing can be performed in the area. And tourist service center can be set up, connecting bus from station to scenic spot can be opened to facilitate scattered tourists to visit the scenic spots.

The inter-city railway business unit can carry out business cooperation with the travel agency, and take advantage of the speed and the high punctuality rate of the intercity railway to replace some of the road passenger transport of the travel agency. When in group travel by travel agency, connection transportation from intercity railway station to scenic spots can be opened to greatly reduce the transportation cost of travel agencies, and at the same time improve the attendance rate of intercity railways.

Inter-city railway operators can cooperate with scenic spots and tourism websites to develop combined tourism products of intercity railway tickets + tourist attraction tickets. The pricing of such products is lower than the total price of separately purchasing intercity railway tickets plus attraction tickets. It can encourage passengers to travel to the scenic spots by intercity railway and improve the attendance rate of the intercity railways.

4.3 Channel Strategy

At present, the sales of intercity railway tickets mainly come from the 12306 websites, the station window purchase and the station ticket vending machine, which can basically meet the needs of passengers. However, for the intercity railway based on commuting function, in order to facilitate commuting passengers and improve efficiency, it is still necessary to continue to expand the ticket sales channels. An intercity railway ticket system based on smart card or RFID card payment can be constructed. After the passenger purchases the card and charge, passengers can use it as one-stop solution to travel. At the same time, inter-city railway operators can place ticket vendor machines with recharge functions in enterprises, institutions and universities covered by inter-city railway stations, so that intercity railway passengers can conveniently complete ticket purchase or recharging. When the conditions are mature, it is necessary to connect the intercity railway card payment system with the city bus card payment system to realize a one-card multi-purpose integrated payment system.

It is necessary to actively try to cooperate with third-party payment platforms, open Intercity Railway Ticket Purchase Entrance in payment platforms with higher market share, such as Alipay and WeChat, simplify the process of check in, and form an integration process of Mobile Ticket Purchase – Electronic Payment – Two Dimensional Code Check in, so as to further enhance the convenience for passengers purchasing tickets.

At the same time, we can perform statistical analysis and data mining on ticket sales of intercity railway, and make Pre-allocation of Tickets for Intercity Railway Stations by auxiliary decision system, that is, before the pre-sale period begins, the data model can be used for conducting analysis and scientific prediction on passenger flow at each station on this line. Then, based on prediction

results, tickets can be allocated to each station to maximize the utilization of ticket amount and the benefits.

5. Conclusion

As an emerging short-distance transportation mode, intercity railway has the advantages of large transportation volume, low cost and low energy consumption. However, in the operation process of inter-city railways in Wuhan Metropolitan Area, there are also problems like low attendance rate and weak competitive advantage compared to other modes of transport for some lines. In a word, carrying out research on the marketing of inter-city railways in Wuhan Metropolitan Area and rationally optimizing marketing strategies in combination with modern information technology can effectively improve the service quality of inter-city railways, improve the attendance rate of inter-city railways, and further promote the benign development of intercity railways in Wuhan Metropolitan Area.

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