WEP Warwick Evans Publishing

International Journal of Social Sciences and Public Administration

ISSN: 3005-9836 (Print), ISSN: 3005-9585 (Online) | Volume 2, Number 1, Year 2024
DOI: https://doi.org/10.62051/ijsspa.v2n1.16
Journal homepage: https://wepub.org/index.php/IJSSPA/index

Attracting Tourists to the Region: Analysis on Macau's Transportation System

Weihan Huang

Macau University of Science and Technology, Macau, China

ABSTRACT

This essay provides a comprehensive analysis of Macao's transportation system, focusing on aviation, railways, buses, and ferries, and offers suggestions for improvement. The aviation sector is examined in terms of airport location, capacity, current status, and future development plans. The railway system is evaluated for its convenience, environmental impact, accessibility, and passenger safety measures, while also highlighting areas for improvement such as consumer experience and design. The public transport network is assessed for its coverage, vehicle condition, service quality, and resilience to major environmental changes like epidemics and financial crises. The reliability, frequency, comfort, and economic contribution of ferry services are also scrutinized. The essay aims to propose measures to enhance Macao's transportation convenience, tourist experience, and sustainable tourism development.

KEYWORDS

Macao; Transportation system; Tourism; Sustainability.

1. INTRODUCTION

The rapid growth of tourism in Macao has placed a significant demand on its transportation system. This paper critically examines the various modes of transportation in Macao, including aviation, railway, bus, and ferry services, and their role in catering to the needs of tourists. The study delves into the location and capacity of the airport in the Greater Bay area, the current state of the airport, and future construction ideas for Macao's aviation industry. It also evaluates the convenience, environmental contribution, accessibility, and safety measures of Macao's railway system, while highlighting areas of improvement such as consumer experience and overall design. The paper further assesses the coverage, vehicle condition, and service quality of Macao's public transport network, and the impact of major environmental changes on the system. Lastly, the reliability, frequency, comfort, and economic contribution of ferry services between Macao and neighboring regions are examined. The paper concludes with suggestions for improving the current situation in each sector, with the ultimate goal of enhancing transportation convenience, tourist experience, and sustainable tourism development in Macao.

2. AIR TRANSPORTATION SYSTEM IN MACAU

2.1. Analysis of airport positioning and airport capacity in the Greater Bay Area, current airport situation

Macau International Airport is the main aviation hub in the region, and its capacity is close to the limit.

Table 1. 2019 Guangzhou--Hong Kong--Macau Greater bay airport design bearing capacity and utilization table

Airport	Passenger throughput		Cargo and mail throughput		Takeoff and landing sorties	
	Design bearing capacity (W)	Utilization rate in 2019 (%)	Design bearing capacity (WT)	Utilization rate in 2019 (%)	Design bearing capacity (W)	Utilization rate in 2019 (%)
Hong Kong International Airport	7000	101.84	670	70.21	42.0	99.95
Guangzhou Baiyun International Airport	8000	91.72	250	76.80	62.0	79.23
Shenzhen Baoan International Airport	4500	117.63	240	53.48	37.5	98.72
Macau International Airport	780	123.22	32	13.19	6.0	148.33
Zhuhai Jinwan Airport	1200	102.36	60	8.5	10.0	89.00
Total	21480	102.18	1252	63.90	157.5	91.92

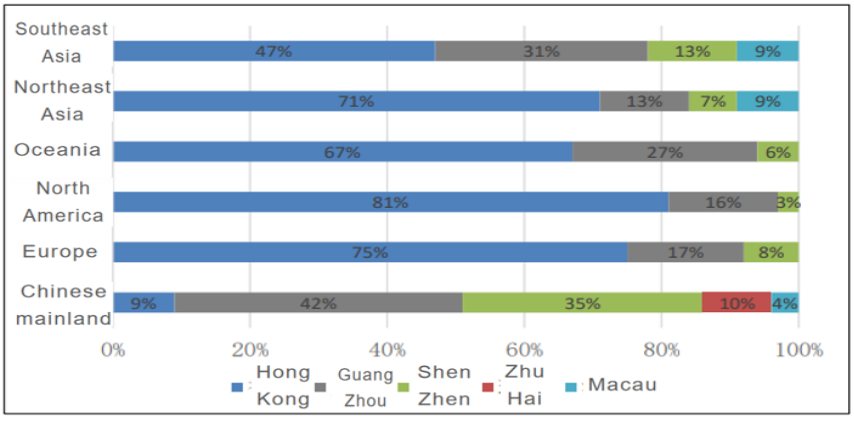
In 2019, the passenger throughput and take-off and landing flights of Macau International Airport reached 9,611,400 and 77,000 respectively, and the design load utilization rate has reached 123.22% and 148.33% respectively, resulting in huge operational pressure on the airport. In October 2022, the China Government approved the countermeasures and suggestions for the expansion and reclamation of the Macau International Airport and the enhancement of the coordinated development level of the airport cluster in the Guangdong-Hong Kong-Macao Greater Bay AreaTap into the potential of transportation support to improve the efficiency of airport operations（2）.

Macau International Airport (MIA) has exceeded its design capacity in terms of both the number of passengers and the number of flights, but its cargo capacity utilization rate is only 13.19%, which is related to the unique positioning of Macau, as well as the design and decision-making issues of the airport, which will be mentioned later. These data show that Macau Airport is already overloaded and unreasonable.

At the same time, there are many airports around Macau Airport, such as Zhuhai Jinwan Airport and Hong Kong International Airport, which are only about 20 kilometers away, and their functions will overlap in many cases, which will affect Macau Airport, Zhuhai Airport has more domestic flight options, more airlines, and Hong Kong Airport has more space and scale, and also has more international flights.

Schematic diagram of the transportation share of the five major airports in the Guangdong-Hong Kong-Macao Greater Bay Area Airport Group in 2019.

Table 2. Map of main regional passenger traffic share of the five major airports in the Guangdong-Hong Kong-Macao Greater **Bay** Area Airport Cluster in 2019



This chart shows the share of passenger traffic in each major area of the major airports in the Greater

Bay Area, and you can see that the proportion of Macau International Airport is actually very small, which is also related to the size of the airport. In the future, if the developing Macau region wants to attract more international tourists, it will have to provide more international flights, which will also help the development of the region's gaming industry and tourism industry.

2.2. The future construction concept and development suggestions of Macao's aviation industry

Although the construction of a transit hub is the primary choice for the development of airports in the small hinterland, such as Dubai Airport, Atlanta Airport and Singapore Airport, all of which belong to the small hinterland to build a large hub, in the context of the integrated development of the airport cluster in the Guangdong-Hong Kong-Macao Greater Bay Area, it is not the best choice for Macao Airport to build an international hub. There are several main considerations here: first, there is already a mature international hub airport in Hong Kong, and at the same time, Guangzhou Airport is actively investing, and Shenzhen Airport is trying to catch up, so it is easy to cause vicious competition; second, it can be seen from the figure that Macau Airport has less than 10% of the overall international business share of the Guangdong-Hong Kong-Macao Greater Bay Area airport group, and international flights only go to Southeast Asia and Northeast Asia. Guangzhou also has a large gap between China Southern Airlines and a lack of leading hub construction, so although the international hub has great potential, it is not suitable for Macau Airport.

In view of the above realities, the following suggestions are made for the functional positioning of Macao Airport: First, make full use of the policy of opening up the franchise of Macau Airlines, take Macao's positioning as a "world leisure and tourism center" as an opportunity to introduce mature low-cost airlines, open up routes to Northeast Asia, Southeast Asia and the Mainland, and open up Macao's tourism market with preferential fares, because low-cost airlines can take advantage of extremely low fares to stimulate the travel demand of passengers and quickly expand the tourism market. For example, on the London-Strasbourg route, the local government has introduced Ryanair, Europe's largest low-cost airline, to stimulate new demand with low fares and increase the passenger flow of the route. The introduction of mature low-cost airlines is to attract non-local passengers to choose Macao Airport as the departure airport, and the facilitation of customs clearance is to expand the location of the airport's hinterland, these two strategies complement each other, but at the same time, it is also necessary to pay attention to the pace of progress, and should first build a strong low-cost airline airport, and then expand the airport hinterland.

3. THE RAILROAD SYSTEM OF MACAU

3.1. Advantages of the Macau Light Rail Transit

3.1.1. The convenience of Macau's railway system

The LRT system has an exclusive right of way that avoids congested surface roads. Trains are absolutely unaffected by road traffic conditions during their journey. At the same time, the use of a fully automated train control system ensures that train services are punctual and that service frequency can be increased according to actual needs, thus facilitating travelling by residents. The introduction of LRT is expected to reduce the number of people travelling by car or motorcycle, and through the integration of LRT as the main mode of public transport, supplemented by buses/taxis, it will help to increase the incentive for residents to travel by public transport, thereby alleviating the pressure of road traffic congestion in the long run.

3.1.2. Compatibility with Macau's geography

The LRT system is highly compatible with the geographical environment of Macau. Macau has a unique topography with mountains and sea interviewing, and the LRT system is designed to adapt to

this topography, with routes that pass through hills and wind around bays, allowing travelers to enjoy Macau's natural scenery and cityscape during their journey. The LRT's route allows for smaller turning radii and steeper gradients, making it more suitable for a densely populated city like Macau with more objective environmental constraints; the use of rubber tyres and running on smooth concrete pavements results in lower sound levels and less impact on the surrounding environment, making it suitable for operation in a dense urban environment.

3.2. The disadvantages of light rail

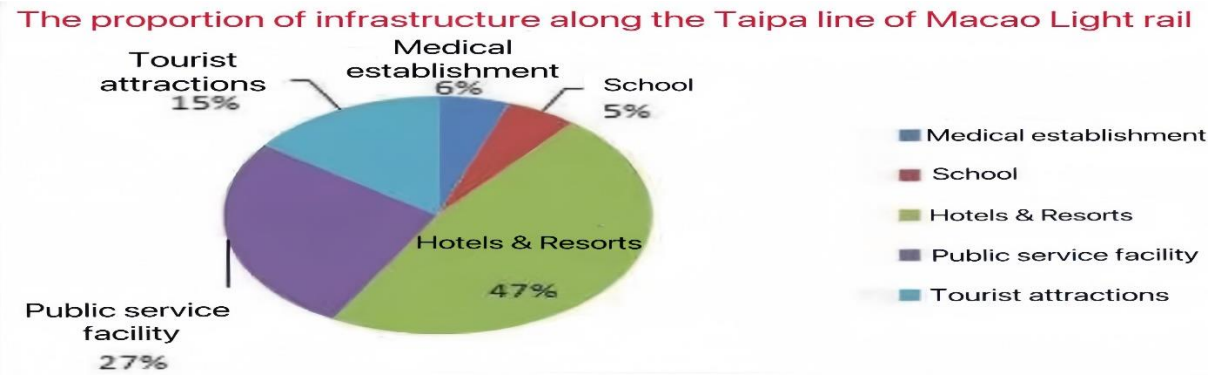
3.2.1. The construction cost of the LRT is high

At present, the investment cost of the LRT in Macao is already as high as 50 billion mop, and the taxpayers have become dissatisfied with the excessive investment cost of the LRT in Macao. Moreover, the government's lack of overall planning and attention to the construction of the Macau Light Rail Transit (LRT) has resulted in its construction period and monetary costs far exceeding expectations. At the same time, the passenger volume of the Macau Light Rail Transit System is not large. With the Taipa line expected to have a passenger flow of only 20% of the number of Taipa residents, and the problem of the beneficiaries of the LRT construction has led to the local population questioning the orientation and purpose of the construction of the Macau LRT, and to a decrease in the level of public support for the LRT. As far as the ride experience is concerned, the train travelling system is fully automated. However, its ride quality is not satisfactory, with frequent stops and track instability during the ride. The Macau LRT is expected to accommodate a maximum of 90 passengers, but in reality each carriage has 25 seats and 36 handrails, with an overall capacity of only 61 facilities to ensure passenger safety.

3.2.2. Deficiencies route planning of Macau railroad system

Data on the distribution of infrastructures along the Taipa Line of the Macau LRT(Please see chart below) show that hotels and resorts account for nearly half of the total, and most of the public service facilities are tourist-oriented infrastructures. Therefore, in summary, the target audience of the Macau LRT tends to be tourists rather than locals, and the planning of the route is not conducive to the long term development of the LRT in the area, and may exacerbate social conflicts.

Table 3. The proportion **of** infrastructure along the Taipa line of Macau Light rail



3.3. Recommendation of railroad system in Macau

3.3.1. Balance the travel needs of tourists and residents

The government should improve the efficiency of the LRT construction to avoid the situation where the construction period is too long and the capital exceeds the expectation. Macau government can also set up small advertisements in the carriages to increase the source of operating income.At the same time, the Macau government should consider how to balance the economic benefits brought by the tourists' group and the social benefits owned by the residents' group, in order to ensure the tourists'

travelling experience as well as to protect the residents' normal travelling needs.In addition,it is necessary to take the needs of the residents as an important consideration, and try to cover the living areas of the residents to a greater extent, step up publicity efforts to increase the impression of local residents and tourists of the Macau Light Rail Transit (LRT) and to optimize the evaluation of the LRT, with an emphasis on green and smart travel, so as to increase the support and recognition of the locals for the LRT in Macau.

3.3.2. Improve route planning for Macau's railroad system

To carry out a scientific route planning to promote the connection of the Taipa Line with the light rail lines in the region of Macau's main island, and to make further considerations on the subsequent impacts generated by the connection of the lines. Moreover, improve and optimise the interior environment and driving conditions to maximise passenger comfort and satisfaction, and respond positively to passenger comments and feedback and make adjustments accordingly. For example, a clear traffic indication system should be established to enhance its guiding role when passengers transfer or get off the train, and the transfer activity space should be transformed, such as clearing obstacles, changing steps into ramps, widening roads, and unifying ground materials, so that passengers can quickly distinguish paths and pass after getting off the train. Add Bike sharing stations to facilitate transfer trips. In addition, barrier-free care should also be taken into account, including the addition of blind lanes and voice navigation, the addition of rest benches and other facilities at stations to take care of the elderly and infirm passengers, and the addition of mother and baby rooms to facilitate the care of infants and toddlers. Optimize electronic payment methods and support more barrier-free consumption such as in-app payments.

4. THE BUS SYSTEM OF MACAU

4.1. Present situation and advantages of bus system

Macau's public transport system is an important part of the region's tourism industry. According to data, there are nearly 600,000 bus passengers (DSAT,2023) every day on this small island with a population of about 680,000. In order to better serve tourists, the government is strict in the construction of the public transport system, covering most of the island and most tourist attractions. In addition, bus fares are relatively affordable, each ride can be less than 10mop, short-term repeat ride and student status can also receive discount subsidies, attracting budget-conscious passengers. According to the data listed on Macao's official public transport website, since 2015, Macao has responded to the government's call to continuously increase the proportion of new energy vehicles in buses. As of June 2023, Macao's energy buses have exceeded 60%, and their environmental protection performance has far exceeded that of other modes of transportation (Statistics of Transport Bureau).

Table 4. 2023 average daily bus capacity per month

2023 average daily bus capacity per month						
month	1	2	3	4	5	6
Average daily carrying capacity. (Unit: ten thousand)	46.52	59.15	59.10	57.94	58.27	58.61

4.2. Worries and challenges of bus system

However, Macao's public transport system still faces a series of challenges. If these problems are not solved, it may hinder its future growth and development. In recent years, with the rapid growth of tourism in Macao, a series of problems have been exposed in the public transport system. First of all, bus services in Macao often face the problem of congestion and delay during peak hours. Especially in the peak tourist season, tourists pour into Macao, the shuttle bus is often difficult to meet the needs

of tourists, resulting in passengers waiting time is too long or even unable to catch up with the vehicle, resulting in missing the trip, affecting the travel experience of tourists. To this end, Macao's public transport department needs to increase the number of public transport vehicles, especially in the peak tourist season and around popular scenic spots to meet the needs of passengers.

Secondly, there are also problems in the convenience of Macao's public transport system. It is often difficult for tourists to obtain accurate bus routes and timetable information. App "bus stop announcement" launched locally in Macao seems complicated and unclear by comparing the bus app information of Hangzhou, Beijing and other places horizontally, which brings trouble to tourists' travel. In addition, the modernization and environmental protection of the public transport system also need to be solved urgently. With the enhancement of environmental awareness, people's requirements for the environmental performance of public transport are getting higher and higher, and the public transport system needs to consider more environmental protection factors. In recent years, Macao's public transport department has been continuously implementing this demand. New energy vehicles have increased year by year from 2.47% in 2015 to 64.35% in 2023, and the total number has also reached 666 (DSAT,2023), catering to the voices of the market and the masses.

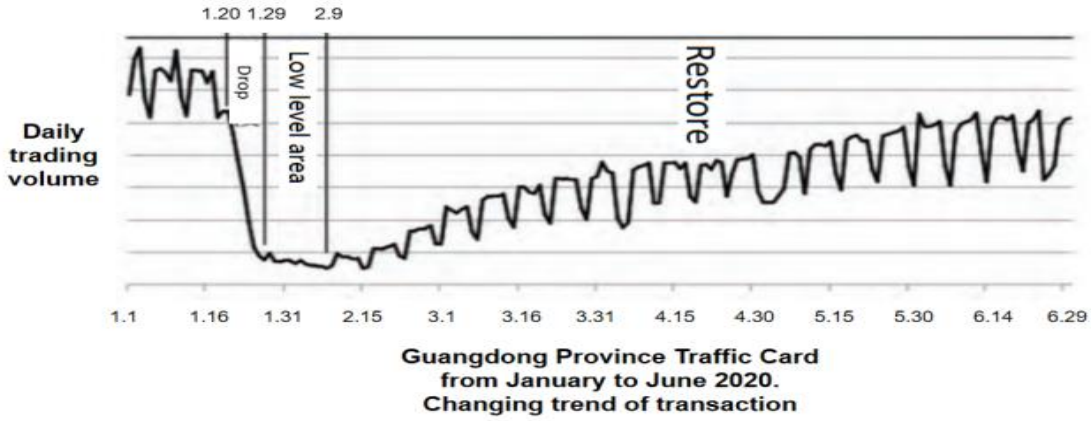
Table 5. Transformation of new energy sources for public transportation in the past decade

Number of public buses							
year	Diesel bus	Natural gas bus	Electric bus	number	environmentally friendly buses		New environmentally friendly buses
2015	790	20	0	810	20	2.47%	0
2016	822	45	0	867	45	5.19%	25
2017	828	69	0	897	69	7.69%	24
2018	844	69	2	915	71	7.76%	2
2019	839	69	2	910	71	7.80%	0
2020	921	69	10	1000	79	7.90%	8
2021	846	65	56	967	121	12.51%	42
2022	644	50	416	1110	466	41.98%	345
As of June 2023	351	50	616	1064	666	62.59%	200

4.3. Threats and opportunities of bus system

In the future development, with the popularity of private cars and the continuous development of economy, the increase in the number of private cars held by citizens and other modes of transportation such as taxis may squeeze the niche of buses. The public transport department must be prepared in advance. In addition, the impact of the economic environment, such as the epidemic, the financial crisis and other fluctuations in the economic environment will cause the government to reduce investment and maintenance of the public transport system. Under the influence of the COVID-19 epidemic, the passenger flow in 2020 will be 70% to 90% lower than that in 2019. It will also affect its operation and maintenance level, bringing difficulties to tourists (Li Zhiming, Wang Yining, Wu Jincheng, Leng Mengtian, 2021).With the threat, there are all kinds of opportunities, and the government's support for the construction of the public transport system has added more than 200 buses in 2023 alone. and the application of new technologies in the public transport system: public transport network, hydrogen-powered cars, electronic payment, the future development of public transport in Macao is still to be expected.

Table 6. Guangdong Province Traffic Card from January to June 2020.Changing trend of transaction



5. FERRY SYSTEM OF MACAU

5.1. Overview of Macau ferry industry

Macau, as a city renowned for its thriving tourism industry, relies heavily on its ferry services. The water transport network connecting Macau with surrounding areas allows tourists from different regions to conveniently reach Macau via sea routes, which positively impacts the development of the tourism industry.

5.2. Analysis of Macau tourists

Before analyzing a transportation industry, it is important to first understand the local user base. As a tourist city, Macau has many factors that attract tourists. Most tourists to Macau come for sightseeing, leisure, gambling, and entertainment.

Macau has capitalized on opportunities arising from advances in maritime transport. For instance, after casino gambling was legalized, the American Las Vegas Sands Corporation partnered with "Pearl River Shipping" to operate the passenger ferry "Cotai Water Jet" between Hong Kong and Taipa in Macau. This enhanced convenience for casino patrons. Recognizing tourism synergies, Sands also bundled ferry tickets with concert and hotel packages to attract wider audiences. This augmented Macau's accessibility without intermediate stops, fueling stronger inbound tourism momentum over the years.

5.3. Suggestions for Macau ferry industry

5.3.1. Expand the route range of Macau ferry industry

At present, the ferry passenger services in Macau are mainly concentrated on two routes: the Macau-Hong Kong route and the Macau-Guangdong port cities route. While these two major routes meet the travel needs of tourists to a certain extent, they do not fully leverage Macau's unique geographical advantage. Therefore, it is suggested that the Macau ferry industry further expands its route network. Fujian, one of the main sources of tourists for Macau, is a potential new route.

Table 8. Visitors to the mainland provinces of Macau visit rate

Province (city, district)	2011 Attendance rate	2012 Attendance rate	2013	2014 attendance rate Attendance Rate	Average attendance rate
Guangdong	55.50%	51.99%	51.04%	49.52%	52.01%
Fujian	6.31%	5.32%	4.86%	4.96%	5.36%
Zhejiang	3.90%	4.07%	4.01%	3.82%	3.95%
Hunan	3.61%	3.85%	4.08%	4.13%	3.92%
and Hubei	2.79%	3.19%	3.45%	3.67%	3.27%
Shanghai	3.19%	3.31%	3.35%	3.01%	3.22%
Jiangsu	2.93%	3.14%	3.22%	3.20%	3.12%
Guangxi	2.24%	2.43%	2.50%	2.77%	2.49%
Jiangxi	1.96%	2.25%	2.31%	2.50%	2.25%
Henan	1.83%	2.08%	2.28%	2.80%	2.25%
Sichuan	1.94%	2.25%	2.36%	2.18%	2.18%
Beijing	2.13%	2.14%	2.22%	2.13%	2.16%
Anhui	1.17%	1.41%	1.40%	3.82%	1.95%
Liaoning	1.70%	1.72%	1.82%	1.89%	1.79%
Hebei (Province)	1.10%	1.53%	1.50%	1.92%	1.51%
Shandong	1.19%	1.43%	1.67%	1.65%	1.49%
Heilongjiang	1.20%	1.41%	1.51%	1.72%	1.46%
Chongqing	1.17%	1.27%	1.38%	1.42%	1.31%
Shanxi	1.03%	1.43%	1.35%	1.37%	1.29%
Ji Lin.	1.10%	1.16%	1.15%	1.28%	1.17%
Shaanxi	0.74%	0.95%	1.01%	1.11%	0.95%
Tianjin	0.68%	0.84%	0.78%	0.78%	0.77%
Inner Mongolia	0.58%	0.83%	0.76%	0.79%	0.74%
Standard deviation	10.98%	10.22%	10.02%	9.67%	10.22%

5) Note: Statistical results of statistics and Census Bureau of Macau (DSEC) statistical database data.

Apart from Guangdong Province, which already has close ties with Macau, Fujian province has consistently accounted for one of the highest shares of tourists visiting Macau. As a major source market located across the border, Fujian presents sizable outbound travel demand. Macau ferries provide a convenient route for Fujian residents to travel abroad via Macau as a port of departure or transit. This dependence underpins potential to further develop ferry connectivity between the two regions.

Analyzing existing travel patterns would offer valuable insights into demand patterns for expanded or customized ferry routes linking Fujian ports more directly to Macau. Leveraging its geographical advantage, Macau could tap into Fujian's outbound market by catering schedules and services to residents' travel needs. By enhancing transport access and positioning itself as a preferred gateway, Macau aims to stimulate greater tourist inflows from Fujian as well.

5.3.2. Improving Macau's ferry infrastructure

Current fleet capacity may struggle with peak demand arising from major conferences or exhibitions requiring large participant and cargo loads. The number of high-speed vessels connecting Macau to Hong Kong and mainland Chinese cities is limited too, compromising passenger convenience. Pier area facilities also fall short, unable to satisfy tourist needs for dining and shopping during transit.

In parallel, uninterrupted service upgrades are needed. Crew attitudes directly shape travel experiences, underlining the importance of regular staff training to reinforce polite conduct and service standards. Onboard enrichment like children's play areas and cinemas can additionally enhance journey quality. Advanced technology should streamline ticket purchases and boarding through convenient digital solutions.

5.3.3. Develop the MICE industry

As a hub of prosperous convention and exhibition industry, Macau relies on its robust ferry system as a key part of its logistics operations. While Macau's exhibition industry has grown, there remains room for improvement by drawing insights from Singapore's success. As a cosmopolitan hub with excellent transportation links, Singapore topped rankings in 2020 for its public transit accessibility. Its vibrant port also handles massive cargo volumes. Singapore's strengths lie in its vast international air and sea connectivity - over 200 air routes linking more than 600 destinations alongside a robust ferry industry. In contrast, Macau depends more on limited sea freight services connecting just nine countries.

To boost competitiveness, Macau can take targeted actions. First of all, with the scientific use of space, the development of cross-border exhibition projects with the adjacent national free Trade zone

Hengqin, to achieve "one exhibition, two places", to achieve internal and external linkage to ease the pressure on resources in Macao, while attracting more tourists. Secondly, the relevant transport departments of the government should appropriately transform their functions, do more service and coordination work, and promote industrial integration by better coordinating the ferry and exhibition industries. A bespoke ferry service centred around the main venues can then provide direct shuttles, optimising transport for delegates. Third, expediting conference visas and customs clearance through a professional ferry service will improve the experience. Finally, increasing the capacity of the ferry fleet with larger ferries could meet the needs of major events hosting larger delegations.

5.3.4. Promoting incentive travel

Macau ferry services can draw inspiration from the successful incentive travel model used in the MICE industry. By developing customized incentive packages, adding experiential elements, strengthening partnerships, and conducting proactive marketing, ferries can attract more corporate and student groups to boost their business. This would incentivize organizations to choose ferries for travel. Experiential projects onboard and at Macau destinations, such as theme performances and craft activities, would enrich the travel experience. Deep cooperation with Macau attractions and businesses could yield bundled packages integrating transportation, tickets and services. This holistic offering improves convenience and the overall trip.

Proactive marketing should include loyalty programs where partners' staff can redeem points for ferry services or products. Targeted digital promotion encourages more organizations to utilize ferries. Constant product upgrades like diverse dining options, entertainment and optimized facilities would further satisfy target customers and enhance their time sailing. Drawing inspiration from the successful MICE industry model in this manner holds potential to tap new customer segments for Macau ferries. With customized packages, experiences, partnerships and promotion, ridership and resultant economic benefits could see meaningful gains.

6. CONCLUSION

Through the analysis and objective presentation of the relevant data and icons obtained, this paper highlights the advantages and disadvantages of aviation, bus, railway and ferry transportation systems in Macao, as well as the existing problems or opportunities and challenges in the future. Through a series of improvement measures proposed in this paper, Macao's transportation system can be further upgraded to better meet the needs of tourists and enhance tourism experience. The government, transport operators and relevant stakeholders need to work together to formulate and implement improvement plans to bring a better future to Macao's transport system. The above is a summary of the whole report.

REFERENCES

[1] Zhang, M. S. (2023). A Study on the Evaluation of Synergistic Development Level of Airport Agglomerations in the Guangdong-Hong Kong-Macao Greater Bay Area (Master's thesis, Civil Aviation Flight University of China). Retrieved from https://link.cnki.net/doi/10.27722/d.cnki.gzgmh.2023.000048.

[2] Goetz, A. R., & Budd, L. (2014). The Geographies of Air Transport. Ashgate Publishing, Ltd., p. 201.

[3] Graham, A. (2013). Managing airports: An international perspective. Routledge, p. 45.

[4] Stevens, B. (2010). Airport planning and management. McGraw-Hill Education, p. 89.

[5] Huang,Z.W,Pan,X.Y.(2020).Preliminary study on operation of Macau Light Rail Dang zai Line.Beauty And Times,835(02),123-125.

[6] Lin, R.H, Yuan,Z.W.(2008).Macau light rail system and sustainable development.The 4th Symposium on Sustainable Development of Guangdong,Hong Kong and Macau:Guangdong Science and Technology Press,414-420.

[7] Statistics of Transport Bureau (2023) Retrieved from Resource：https: //www.dsat. gov.mo/dsat/subpage. as px?a_id=1648537635 website

[8] Li,Z,M, Wang Y,N, Wu J,C, Leng,M,T,(2021),The influence of COVID-19 epidemic situation on Public Transport Travel. Analysis and exploration of factors Traffic observation in China,22(5),000-713

[9] Statistics Bureau of Macao (2021). Macao Transportation Statistics Yearbook. Macao: Statistics Bureau of Macao.52(7),000-853

[10] Zhang, J., & Zhang, F. (2012). An overview of the exhibition industry in Singapore. Contemporary Tourism, 2012(2).

[11] Xie, C., & Zhang, B. (2023). Advantages of Singapore's MICE industry and its implications for Macao, China. Journal of Guangxi Socialist University, 34(03), 99-105.