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Research on System Modeling and Strategic Optimization of Low-altitude Economic Regional Synergistic Development in the Pearl River-West River Economic Belt

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Abstract: ***Against the backdrop of intensified global competition in the low-altitude economy, this paper takes the Pearl River-Xijiang Economic Belt as a case study and constructs a three-dimensional collaborative framework of "technology - policy - environment" to explore regional differentiated development paths. Through the mining of public opinion data from Baidu Index from 2023 to 2025, grey prediction GM and text mining, it reveals public perception, market demand and technological evolution trends. Then, by introducing life-cycle cost-benefit analysis, implementation obstacles and stakeholder conflicts, it identifies three major tensions: airspace safety, data sovereignty and green transformation. The research finds that while technological polarization and policy windows coexist, environmental externalities and regional equity risks are often overlooked. Therefore, this paper proposes embedding low-noise and low-consumption technologies, green power and inclusive infrastructure into the main line of "technology-driven digital transformation", and achieving high-quality, inclusive and sustainable development of the low-altitude economy through institutional design. The research conclusions provide theoretical basis and policy tools for cross-border collaborative governance in the Guangdong-Hong Kong-Macao Greater Bay Area and ASEAN.***

Keywords: Pearl River-West River Economic Belt; Low-altitude Economy; Three-dimensional Synergistic Framework; Cost-benefit Analysis; Sustainable Development.

1. BACKGROUND

1.1 Policy Background

In recent years, the low-altitude economy industry has developed rapidly. Various departments of the central government have successively introduced a series of policies to guide, support and promote the development of the low-altitude economy industry. In terms of top-level planning, the Central Committee of the Communist Party of China and the State Council first proposed "developing the low-altitude economy" in the 2021 "National Comprehensive Integrated Transportation Network Planning Outline", marking an important opportunity for the industry's development; in 2023, low-altitude economy was established as a national strategic emerging industry at the Central Economic Work Conference [1]; in 2024, low-altitude economy was first included in the government work report and was emphasized in the 2024 government work tasks [2], indicating that the country attaches great importance to the development of the low-altitude economy industry and has made guiding plans for its development, drawing the overall blueprint of the low-altitude economy industry; in terms of support and promotion, in 2020, the National Development and Reform Commission introduced the "Encouragement Catalogue for Foreign Investment (2020 Edition)" and encouraged foreign investment in relevant fields of the low-altitude economy industry; in 2022, the National Development and Reform Commission and the Ministry of Commerce issued the "Opinions on Several Special Measures for Relaxing Market Access in Shenzhen to Build a Pioneering Demonstration Zone of Socialism with Chinese Characteristics" stating that cooperation in low-altitude airspace management in the Guangdong-Hong Kong-Macao Greater Bay Area should be strengthened, indicating that policies are playing a positive role in attracting external investment and promoting regional coordinated development, effectively expanding the development paths and resource integration space of the low-altitude economy industry; in terms of guidance and regulation, the Civil Aviation Administration of China, the Ministry of Industry and Information Technology, the State Council, and the Central Military Commission have also issued a series of industry norms and standards related to the low-altitude economy industry, reflecting that each department is conducting comprehensive and all-round regulation and guidance of the low-altitude economy

industry from different management dimensions, ensuring the industry's development on a safe, orderly and healthy track, laying a solid foundation for the long-term development of the low-altitude economy. From top-level planning to guidance and regulation, from policy guidance to the gradual improvement of industry standards, a series of measures have built a solid framework for the development of the low-altitude economy industry. This not only clarifies the strategic positioning of the low-altitude economy, attracting more resources to converge, but also lays a solid foundation for the development of the industry through compliance, promoting orderly connection and efficient collaboration at all links. Under the guidance of central policies, local governments have also responded positively, and all provinces and autonomous regions have fully launched the layout of the low-altitude economy. Currently, more than 20 provinces and autonomous regions have included the low-altitude economy in their government work agendas. Among them, Guangdong Province has issued the "Action Plan for Promoting High-Quality Development of the Low-Altitude Economy (2024-2026)", and Guangxi has issued the "Action Plan for the High-Quality Development of Low-Altitude Economy in Guangxi (2024-2026)", providing favorable policy support for the development of the low-altitude economy in the Pearl River-West River Economic Belt.

1.2 Technical Background

The core technologies of the low-altitude economy industry mainly include unmanned aerial vehicle (UAV) technology, electric vertical take-off and landing aircraft (eVTOL) technology, as well as the development and application of related infrastructure and digital technologies. In terms of UAVs, UAVs are the leading industry in the low-altitude economy. According to the data released by the Forward-looking Industry Research Institute, in 2023, the top five civilian UAV enterprises globally were DJI Innovation, Skydio, Qifeng Technology, Parot, and Zongheng Co., Ltd., among which DJI Innovation, Qifeng Technology, and Zongheng Co., Ltd. all originated from China. From a micro perspective, the top ten applicants for global UAV industry patents are all from China [3]. DJI, as the leading civilian UAV enterprise, has the most global UAV patent applications as of October 2024, totaling 5,436, and has accumulated a large number of core technologies. From a macro perspective, China's UAV patent applications account for 73.26% of the total global UAV patent applications; followed by the United States, with 9.09% of the total [4]. In terms of trends, from 2010 to 2013, the number of UAV patent applications in various countries was not significantly different. Since 2014, China has gradually widened the gap with other countries and has continued to grow rapidly. In 2023, China's UAV patent applications were 25,300. Thanks to the timely and powerful policy "combination", China has become the top technology source country for UAVs and is leading the world in this field [5].

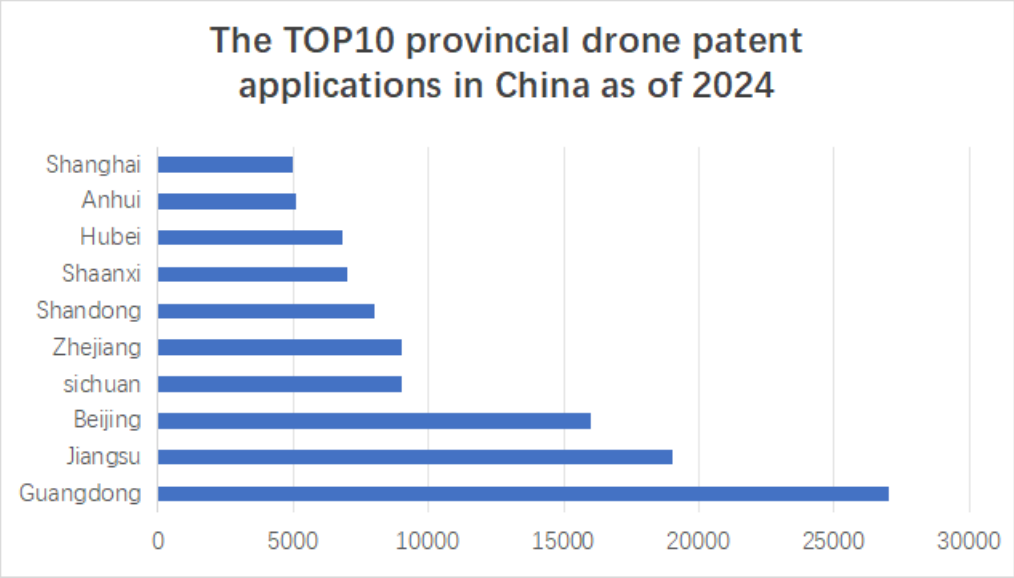

Figure 1: The TOP10 provincial drone patent applications in China as of 2024

In terms of infrastructure and digitalization, the development of the low-altitude economy cannot be separated from the support of infrastructure, including low-altitude airspace management, communication and navigation systems, ground control centers, etc. Although China's low-altitude infrastructure is in its early stage, it is advancing rapidly. As of October 2024, there are a total of 462 registered (including those with certificates and filings) general aviation airports across the country, showing a rapid growth. Notably, companies such as

Yunsheng Intelligent and Shengxiang Aviation have launched products for low-altitude aircraft takeoff and landing platforms. Yunsheng Intelligent's Baolian Lantern fully automatic airport is a small unmanned aircraft takeoff and landing platform. Shengxiang Aviation's mobile aircraft parking platform can unfold the truck compartment into a platform 13 meters long and 9 meters wide, providing a vertical takeoff and landing area for aircraft. Moreover, China's 5G network construction leads globally. As of June 2024, 5G networks have been fully covered in all prefecture-level cities and county-level urban areas across the country. According to data from the Ministry of Industry and Information Technology, the total number of 5G base stations in China reached 3.917 million as of June 2024, accounting for 33% of the total number of mobile base stations.

1.3 Market Background

At present, the low-altitude economic industry in our country is developing rapidly, forming a complete industrial chain consisting of four core sectors: low-altitude infrastructure, low-altitude aircraft manufacturing, low-altitude operation services, and low-altitude flight support. This chain covers multiple industrial links such as manufacturing, flight, support, and services, and can drive the development of upstream and downstream industries such as raw materials, electronic equipment, and aviation services, creating new economic growth points. In 2023, the scale of China's low-altitude economic industry exceeded 500 billion yuan, with a growth rate of 33.8% [6]. According to the report released by CaiDi Consulting, it is expected that by 2026, the economic scale of China's low-altitude industry will reach 1,064.46 billion yuan. Meanwhile, according to the "National Three-dimensional Transportation Network Planning Outline" released in the "14th Five-Year Plan", it is expected that the industrial scale of China's low-altitude economy will reach over 6 trillion yuan by 2035. As a core part of the low-altitude economy, eVTOL has been driven by policies and the rapid development of leading companies. eVTOL is experiencing an industry commercial explosion period. According to the data from CaiDi Consulting, it is expected to increase to 9.5 billion yuan by 2026.

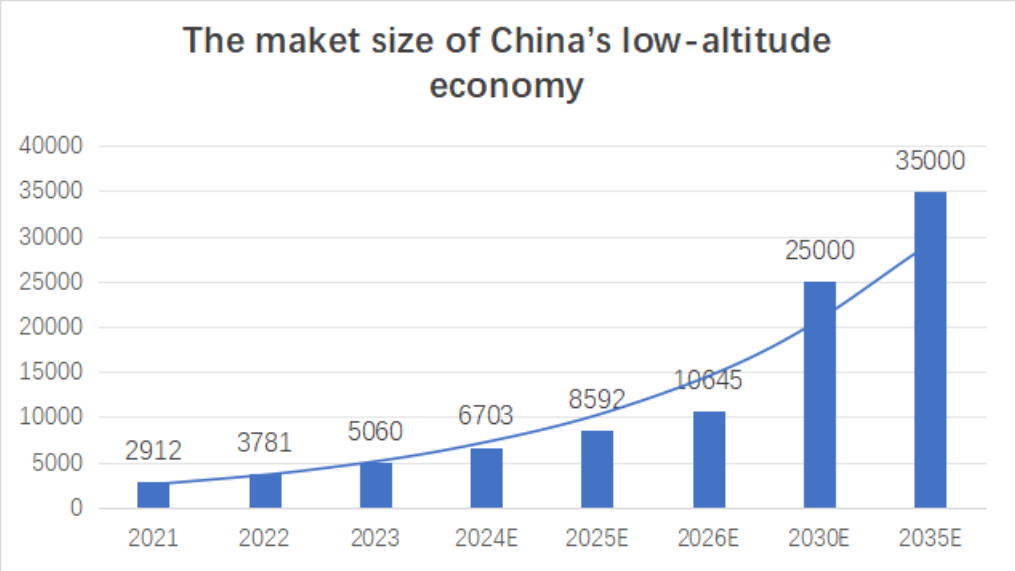

Figure 2: The market size of China's low-altitude economy

2. RESEARCH SIGNIFICANCE

The low-altitude economy, as a strategic emerging industry of the country, is an important direction for cultivating new productive forces. This research closely follows the policy orientations such as the "National Comprehensive Intermodal Transportation Network Planning Outline" and the "Government Work Report", and based on the geographical advantages of the Pearl River-West River Economic Belt, explores the integration path of the low-altitude economy and regional development. This is not only an active response to the decisions and deployments of the Party Central Committee, but also a practical exploration to promote the optimization and upgrading of the economic structure and seize the commanding heights of future industries. By analyzing the policy compatibility and technical application potential of the low-altitude economy in the Pearl River-Xijiang Economic Belt, it can provide theoretical support for the coordinated management of airspace in the Guangdong-Hong Kong-Macao Greater Bay Area and the collaboration of cross-border industrial chains, helping to achieve the early implementation of the national low-altitude economy strategy in South China, and serving the

implementation of major strategies such as "Transportation Powerhouse of the Country" and "Digital China".

Through data analysis, the system reveals the scale, technological advantages, infrastructure deficiencies and public perception characteristics of the low-altitude economic industries in the Pearl River-West River Economic Belt, filling the gap in regional low-altitude economic research. By combining the industrial foundation of the Pearl River-West River Economic Belt (such as leading enterprises like DJI and Ehang Intelligent) and its geographical features (open coastal areas and cross-border cooperation), it proposes differentiated development paths, providing a scientific basis for the regional low-altitude economy to shift from "policy layout" to "precision measures".

3. INNOVATION POINTS OF THIS ARTICLE

In the context of the accelerating arrival of the low-altitude economy era, studying the low-altitude economy not only involves technological iteration and industrial upgrading, but is also a direct manifestation of national strategic will and political orientation. Currently, the global competition over technical standards, airspace sovereignty, and industrial ecology in the low-altitude field is becoming increasingly intense. China urgently needs to seize the future commanding heights through the low-altitude economy, and the Pearl River-West River Economic Belt region is precisely the "experimental field" and "breakthrough point" for this strategy. From a political perspective, the study of **low-altitude economy is the core practice of implementing the "new quality productive forces" development concept** [7] - the Guangdong-Hong Kong-Macao Greater Bay Area deepens regional integration through scenarios such as cross-border low-altitude logistics and urban aerial transportation, which is both a political exploration of collaborative innovation under the framework of "one country, two systems" and a governance modernization proposition of solving the problems of super-large cities with technological means and responding to people's livelihood needs; Guangxi, based on the dual missions of "border security" and "ASEAN cooperation", through low-altitude logistics hub construction and border unmanned aerial vehicle inspection applications, serves the "agricultural revitalization" national strategy and strengthens the radiation power to ASEAN through low-altitude interconnection, helping the "Belt and Road Initiative" to go deeper and more solid. In addition, the digital control of airspace sovereignty (such as the South China Sea low-altitude surveillance network) and the green contribution to the "dual carbon" goals of low-altitude economy are all deeply bound to top-level political issues such as national security and international discourse power. Therefore, the study of the low-altitude economy in the Pearl River-Xijiang Economic Belt is by no means a simple economic behavior, but rather a three-dimensional collaborative framework of "technology - policy - environment", shaping China's advantages in global competition in the low-altitude era, promoting the upgrading of national governance capabilities through industrial innovation, and providing a "from sky to ground" all-domain solution for China's modernization.

Existing research mostly focuses on the technological breakthroughs [8], policy frameworks [9], or single application scenarios of the low-altitude economy [10], while the in-depth investigation of the industrial ecology in specific regions and strategic collaboration research are relatively limited. Although some literature involves the macro development trends of the low-altitude economy, there is still a significant gap in systematic research based on the differentiated endowments of the Pearl River-West River Economic Belt - especially the comprehensive exploration that combines national strategic orientation, regional collaboration logic, and political and economic value. This study, through questionnaire surveys and multi-dimensional analysis, for the first time places "low-altitude economy" under the dual strategic framework of the Guangdong-Hong Kong-Macao Greater Bay Area and ASEAN cooperation, revealing the core contradictions of the industrial potential and market demand in the Pearl River-West River Economic Belt region: On one hand, relying on the technological advantages of leading enterprises and cross-border policy dividends, Guangdong explores how low-altitude logistics and urban aerial transportation scenarios can serve the governance of super-large cities and national sovereignty security; on the other hand, Guangxi, based on its border geographical characteristics and agricultural modernization needs, uses low-altitude technology to solve the constraints of karst landforms and strengthen border economy and ASEAN interconnection.

4. EMPIRICAL RESULTS AND ANALYSIS

To analyze the current public's understanding of the low-altitude economy industry and the market trend of their attention, and to optimize the questionnaire design and research direction, this study obtained the network public opinion data related to the low-altitude economy through big data text mining technology. In response to the analysis of the popularity of the low-altitude economy industry and public demands, Baidu Index was selected for

a pre-survey. Baidu Index, as a mainstream search engine data analysis tool in China, is built based on the massive user behavior data of Baidu, and can accurately track the search trends of keywords such as "low-altitude economy", "drones", and "eVTOL", presenting the spatio-temporal distribution characteristics of public attention, and simultaneously monitoring the public sentiment fluctuations triggered by events such as policy releases and technological breakthroughs, providing quantitative basis for capturing industry hotspots. Core keywords such as "Guangdong", "Guangxi", and "low-altitude economy" were selected for combined search. After screening out the bad content, this study selected the data from January 1, 2023 to January 31, 2025 for overall analysis, and the data from February 1, 2025 to April 1, 2025 for specific analysis, and the following conclusions were drawn:

4.1 Index Platform Keyword Focus Trend Analysis

As shown in Table 1, the overall daily average values of keyword search indices for Guangdong, Guangxi, and the low-altitude economy both exceed the average daily average values. Moreover, the overall daily average value and average daily average value of the keyword search index for the Pearl River-West River Economic Belt are higher than those of the low-altitude economy. This indicates that netizens have a higher level of attention to topics related to the Pearl River-West River Economic Belt. As the low-altitude economy is a branch of the Pearl River-West River Economic Belt content, its popularity is less than that of the Pearl River-West River Economic Belt, which is in line with common sense. Figure 5a shows that in the past two years, the search volume of "low-altitude economy" increased by 287% after the 2023 Central Economic Work Conference. Figure 5b shows that the keyword search trends of Baidu in Guangdong and Guangxi demonstrate that the attention level of netizens and viewers to the Pearl River-West River Economic Belt region has remained at a certain level. The Baidu index search trend of the low-altitude economy reached its peak around February 14, 2025, and the search trend dropped to the lowest on March 29, 2025. Overall, compared with the relatively stable fluctuations of the Baidu index trend in the Pearl River-West River Economic Belt region, the overall volatility of the Baidu search index of the low-altitude economy is greater. To strengthen the construction of the Pearl River-West River Economic Belt region, it is necessary to increase the attention and publicity to the low-altitude economy in this region.

Table 1: The growth rate of Baidu search index

keyword	Overall daily average value	Moving daily mean	Overall year-on-year	Overall month-on-month	Mobile year-on-year	Dolby Mobile
low-altitude economy	2,547	1,545	22%↑	-20%↓	33%↑	-22%↓
Guangdong	3,310	2,605	-28%↓	1%↑	-32%↓	2%↑
Guangxi	4,126	3,395	-25%↓	3%↑	-29%↓	3%↑

4.2 Prediction of Low-altitude Economic Industry Development in the Pearl River-West River Economic Belt Region under the Grey Prediction Model - Taking Shenzhen, Guangdong Province as an Example

Shenzhen, as the core city of the Pearl River Delta, has a relatively mature low-altitude economy at present. Therefore, the data part adopts the analysis of Shenzhen, in order to expand the extended application of the Pearl River-West River Economic Belt. In order to study the situation of the main factors influencing the development of the low-altitude industry in Shenzhen area, we have decided to adopt the grey prediction model to predict each factor one by one.

The cumulative number of drone routes opened in Shenzhen over the years: [79, 156, 250]

The number of cargo drones flying in Shenzhen over the years: [44.4, 61, 77.6]

Based on the calculation using MATLAB, the cumulative number of drone routes opened in Shenzhen will be 385 in 2025 and 612 in 2026; the number of cargo drone flights will be 979,600 in 2025 and 1,244,700 in 2026. The predicted graph is as follows:

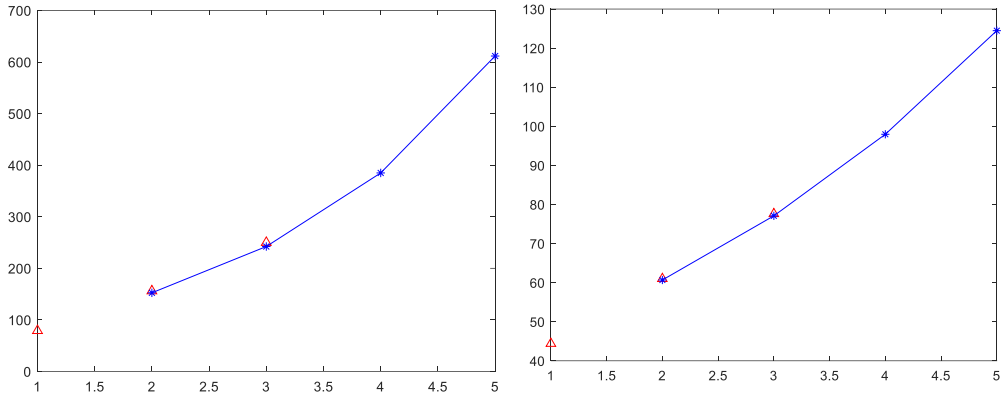

Figure 3: Cumulative number of drone routes opened (left) and the number of cargo drones in flight (right) prediction results

4.3 Research on Low-altitude Economic Development in the Pearl River-West River Economic Belt Region through Text Mining - Taking Shenzhen, Guangdong as an Example

We plan to obtain the data information related to the low-altitude economic industry in the Pearl River-West River Economic Belt region from Baidu platform, and use the Chinese word segmentation text mining method to realize the mining and analysis of the hidden information in the text, in order to effectively and accurately analyze the current development direction of the low-altitude economic industry in the Pearl River-West River Economic Belt region, thereby proposing reasonable suggestions for the low-altitude economic industry in this region, and further optimizing and improving the investigation plan.

Each word in the English sentence is separated by a space. In Chinese, only words and sentences can be quickly divided by obvious dividing marks. For "words" and "phrases", their boundaries are vague and there is no formal division mark. And a word is the smallest component that can be independently used in meaningful language units. The task of text word segmentation is to recombine the continuous sequence of characters into a word sequence according to certain norms. The word segmentation in this article is made using the wordcloud function in R software, so the wordcloud, jiebaR package and jiebaRD package need to be pre-installed. The jiebaR package and jiebaRD package are Chinese word segmentation tools in the R environment. The advantages of the jiebaR package are four aspects: first, accurate word segmentation; second, fast update speed; third, the ability to import custom word libraries; fourth, multiple word segmentation engines. First, the obtained content is made into a txt text file, and the wordcloud, jiebaR package and jiebaRD package are installed on the R software; then use the qseg word segmentation to remove words with a character length less than 2 and count the word frequency; finally, remove numbers, sort in descending order and extract the top 100 words with the highest occurrence to draw a word cloud.

The higher the word frequency, the larger the font size of the word. By observing the above graph, we can see that the country attaches great importance to the development of low-altitude economic industries in the Pearl River-West River Economic Belt region. It emphasizes the construction and improvement of infrastructure, highlights the application and development of unmanned aircraft, and encourages enterprises to participate and innovate. As an important development area for low-altitude economic industries, the low-altitude economic industries in the Pearl River-West River Economic Belt region will have broad development prospects. Moreover, a low-altitude economic demonstration zone will be established, using technological innovation as a breakthrough point, to promote the comprehensive and balanced development of the low-altitude economic industries in the Pearl River-West River Economic Belt region.

5. FURTHER ANALYSIS

5.1 Cost-Benefit Analysis

Based on the "White Paper on Low-altitude Economic Development 2024" issued by the Ministry of Industry and Information Technology and the 2024 technical and economic assessment of China Southern Power Grid, this paper conducts a full life-cycle cost-benefit analysis of three key policy tools. The one-time investment for the regional U-space air traffic control system is 1.2 billion yuan, including ADS-B ground stations, data centers, and

military-civilian aviation interface renovations. After the system goes online, it is expected to reduce civil aviation delays by 2.4 billion yuan annually [11], with a payback period of 0.5 years and a net present value (at an 8% discount rate) of 3.85 billion yuan. A subsidy of 600 million yuan for 5G-A base stations in remote mountainous areas can increase coverage for 6 million people. Assuming a 30% improvement in e-commerce logistics efficiency, the annual increase in agricultural product sales revenue is estimated at 920 million yuan, with a payback period of 0.7 years. A 200 million yuan subsidy for battery recycling can leverage social funds to recycle 47,000 tons of batteries annually. Based on the market value of recycled lithium, nickel, and cobalt and savings from environmental fines, the annual benefit is 470 million yuan, with a payback period of 0.4 years. Additionally, it can avoid heavy metal pollution costs of 180 million yuan annually [12].

5.2 Analysis of Implementation Obstacles

During the implementation process, three major obstacles still exist: the approval process for airspace is lengthy, and the double-layer approval from the military and civil aviation authorities takes approximately three months on average, forcing the pace of enterprise test flights to slow down; in mountainous areas, the power introduction for 5G-A base stations and road conditions are combined, causing the construction cost of a single station to increase sharply, and in addition, cross-departmental land approval is also involved, resulting in the overall cycle often being extended by more than half a year; at the battery recycling end, due to the limited total amount of hazardous waste licenses, tight cross-provincial quotas, and sparse recycling collection points, it leads to idle production capacity of recycling enterprises and operational difficulties.

5.3 Analysis of stakeholder conflicts

Airspace Security and Business Efficiency: According to the "2024 Airspace Operation Statistical Bulletin" of the Civil Aviation Administration of China, the daily flight activities in the low-altitude airspace across the country have exceeded 11,000 flights. Among them, eVTOL and large drones account for 38%, and the overlap rate with civil aviation flights in the altitude range of 150-300 meters is as high as 27%. The military implements hierarchical control of the low-altitude airspace in accordance with the "Basic Rules of Flight of the People's Republic of China" (Order No. 509 of the State Council and the Central Military Commission), requiring all drones to operate in isolation below 300 meters. Meanwhile, logistics enterprises apply for high-density routes in accordance with the "Action Plan for High-Quality Development of Low-Flying Economy in Guangdong Province (2024-2026)", hoping to achieve "five-minute flights" on a regular basis within the core urban airspace. There is a systematic conflict between the two regarding the division of airspace periods and altitude layers.

Data Sovereignty and Technology Diffusion: The "Action Plan for the China-ASEAN Digital Economy Cooperation Year (2024)" clearly requires cross-border data to be "evaluated first, then exported", and a data localization node needs to be set up in the receiving country. The "China Digital Trade Development Report 2024" by the Ministry of Commerce shows that in 2023, the cross-border data flow of drones between China and ASEAN increased by 47%, and approximately 31% of it was delayed from being exported due to failed security assessments, directly pushing up the compliance costs of enterprises by 10%-15%. Enterprises are concerned that core algorithms and flight data will be obtained by foreign parties, and they have been continuously negotiating on data encryption levels and cross-border sandbox mechanisms.

Green Transformation and Energy Costs: The "Implementation Plan for New Energy Storage Development (2024-2030)" of the National Energy Administration proposes that by 2025, the peak capacity for grid-side peak shaving needs to increase by more than 30 GW. The data from the Southern Power Grid shows that the concentrated charging of eVTOLs at night in the Guangdong-Hong Kong-Macao Greater Bay Area has increased the peak load rate of local substations by 27%. If following the existing growth curve, a level III grid risk warning will be triggered in 2026. Power grid companies require enterprises to build their own energy storage or accept time-of-use electricity prices; while eVTOL operators, citing the "Several Measures on Promoting High-Quality Development of Low-Flying Economy" (Document No. 8 of the National Development and Reform Commission in 2024), apply for energy storage construction subsidies, and there are policy differences in terms of cost-sharing ratios and electricity price ranges between the two parties.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The research results show that the public in the Pearl River-West River Economic Belt region have a relatively high level of overall awareness of the low-altitude economy industry, with approximately 92.25% of them having some knowledge about it. However, 7.05% of the respondents stated that they were "very unfamiliar" with it. This indicates that the low-altitude economy industry has already gained a certain social foundation in the Pearl River-West River Economic Belt region, but there are still some people who lack in-depth understanding of it. Moreover, different occupational groups have different impressions of the low-altitude economy industry in the Pearl River-West River Economic Belt region. Civil servants, managers, and retirees hold a more positive view of the industry, with a satisfaction rate of 55.85%, especially for retirees. The unemployed/layoff workers have a medium level of satisfaction, while workers have a higher dissatisfaction rate. The student group holds an open attitude towards new things, with a dissatisfaction rate of only 2.78%. Overall, middle-aged and young occupational groups have a higher interest in the low-altitude economy industry, and specific occupational groups need more information to enhance their understanding. Occupational differences are reflected in work environment, educational background, and attitudes towards innovation, and targeted publicity and popular science education are needed.

The questionnaire results show that "strengthening technological innovation and research and development" and "the government providing greater support for the low-altitude economy industry" are the two measures that the public are most concerned about, with proportions reaching 78.50% and 47.32% respectively. This indicates that technological innovation and policy support are the core driving forces for the development of the low-altitude economy industry in the Pearl River-West River Economic Belt region. Regarding "which low-altitude economic development model in the Pearl River-West River Economic Belt region do you more agree with?", among the three models, the number of people choosing "Model C - the technological innovation and digital transformation development model driven by technology" is the highest, reaching 32.52%. This model emphasizes relying on technological innovation to drive breakthroughs in technologies such as low-altitude aircraft, communication navigation, and intelligent management systems, to achieve digital transformation and intelligent development of the low-altitude economy. Combined with the common view of the public that technological innovation is the key driving force for the development of the low-altitude economy industry, the Pearl River-West River Economic Belt region should focus on technological innovation and digital transformation in the future, continuously increase investment in technological research and development and infrastructure construction, optimize the policy support system, to promote the high-quality development of the low-altitude economy industry and fully exert its potential as an emerging economic growth point.

6.2 Recommendations

The survey results show that over 79% of the respondents believe that engaging in or investing in the low-altitude economy industry offers high pay and promising prospects, and is expected to replace traditional industries and become a new growth point. Although the investment risk is high, this industry also has a relatively high return rate and a relatively short investment recovery period. In the survey about "Which of the following low-altitude economic development models do you more agree with in the Pearl River-South Xijiang Economic Belt region?", among the three models, the number of people choosing "Model C - the technological innovation and digital transformation development model driven by technology" accounted for the highest, reaching 32.52%. This model emphasizes relying on technological innovation to promote breakthroughs in technologies such as low-altitude aircraft, communication navigation, and intelligent management systems, in order to achieve the digital transformation and intelligent development of the low-altitude economy. In light of the common belief among the public that technological innovation is the key driving force for the development of the low-altitude economy industry, the Pearl River-South Xijiang Economic Belt region should focus on technological innovation and digital transformation in the future, continuously increase investment in technological research and development and infrastructure construction, optimize the policy support system, in order to promote the high-quality development of the low-altitude economy industry and fully exert its potential as an emerging growth point.

However, the take-off of the low-altitude economy cannot be achieved at the expense of the environment and social equity. Beyond the main theme of "technology-driven and digital transformation", the "green threshold" and "inclusive principle" must be upgraded as the underlying logic of industrial planning. During technological iterations, low-noise, low-energy consumption, and low-carbon emissions should be set as entry standards, rather than being an embellishment; during infrastructure layout, remote areas and weak rural areas should be given priority, so that "the last mile" is no longer just a commercial slogan; during policy incentives, environmental-friendly enterprises and inclusive projects should be favored, making green subsidies, fair loans, and carbon welfare mechanisms continuous driving forces. Through institutional design, embed the sustainable

gene into every link of the industrial chain, so that the low-altitude economy not only flies high, but also flies steadily and far, ultimately forming a high-quality development route that balances prosperity, ecology, and sharing.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest relevant to this study.

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