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TRANSPORT ECONOMIC AS A FUNCTION OF DESIGN, CONSTRUCTION AND SUSTAINABLE DEVELOPMENT FOR SPORT-SCHOOL AND COMMERCIAL AERODROME

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Abstract:

Transport economics in developing aerodrome infrastructure focuses on optimizing costs, benefits, and economic impacts to create efficient, sustainable air transportation systems that foster regional development and connectivity. The distinction between sport aerodromes, which are minimal recreational facilities, and commercial aerodromes, which are large-scale airports supporting high-volume passenger and cargo operations, is crucial in planning and resource allocation. Developing a new aerodrome involves a strategic master plan that includes site selection, feasibility studies, stakeholder engagement, and phased construction, emphasizing safety, scalability, environmental sustainability, and technological integration. Funding, regulatory compliance, and logistical coordination are integral to ensuring timely, cost-effective implementation, resulting in a resilient facility capable of accommodating future air traffic growth while supporting local economic development.

Keywords:

transport economic; sustainable development; optimization; benchmarking; aviation management

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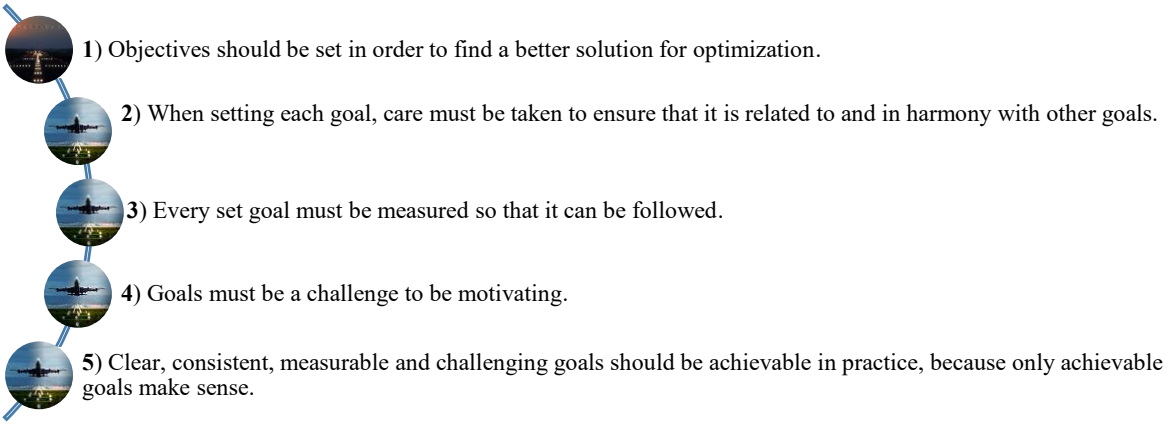
1 Introduction

The evolution of air traffic, particularly within the European Union, highlights the importance of unified regulation and the need for efficient, customer-centric management systems, especially given its international scope involving passenger and livestock transport. As the industry advances, there's a growing emphasis on client satisfaction, mirrored by the development of feedback mechanisms and consumer protection efforts. However, current systems often face challenges like slow response times and dissatisfaction due to inflexible processes. To optimize air traffic management, it is crucial to adopt modern, adaptable mechanisms that focus on quick, effective responses to user feedback, ensuring that these systems are integrated into the operational framework to meet contemporary demands and improve overall service quality.

Fig. 1 Setting the target to work



Aims at research: The primary objective of this research is to develop an air traffic management system that ensures an economical, safe, efficient, and consistent flow of air traffic across Europe, tailored to meet diverse user demands while aligning with national security requirements. It aims for global harmonization, ecological sustainability, and adherence to unified principles to create a functional framework capable of satisfying the evolving needs of the European airspace, thereby enhancing overall operational effectiveness and security.

Setting a research target: Optimization, derived from the Latin "optimus" meaning "the best," refers to the process of enhancing a program or service to improve performance, efficiency, and resource utilization. This involves adapting existing platforms or applications to work more effectively within specific environments or in conjunction with other applications, ultimately aiming to increase execution speed, reduce resource consumption, and enhance overall quality.

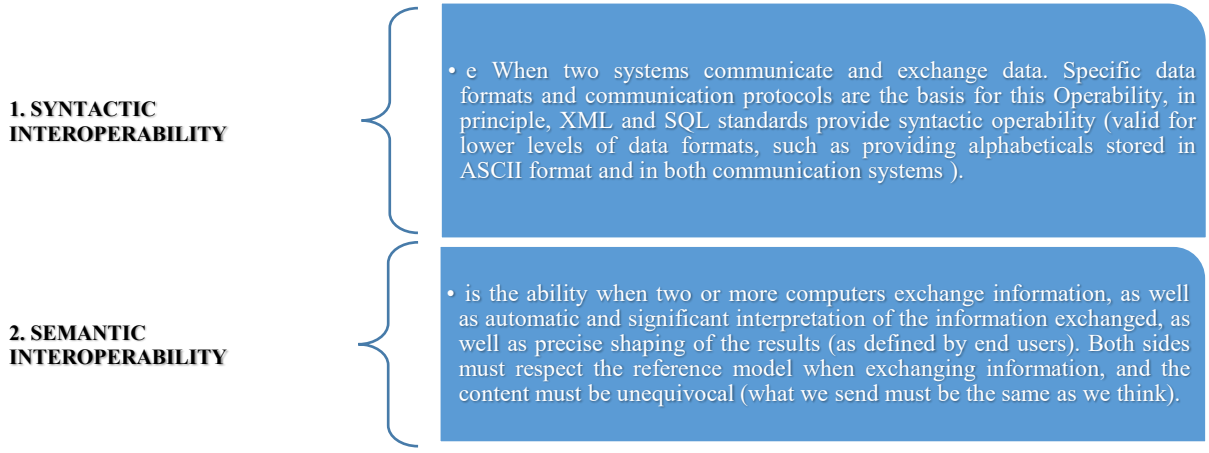
2 Optimization of air traffic

The international legal framework for civil aviation is shaped by several key conventions: the Warsaw Convention (1929) established the foundational airline passenger document and liability principles; the Chicago Convention (1944) introduced the "five freedoms" of aviation and affirmed

airspace sovereignty, enabling global air travel and airport commerce; the Geneva Convention (1948) set rules for airline liability in case of accidents; the Hague Protocol (1955) updated liability regulations concerning baggage, emphasizing airline responsibility for unprotested checked luggage; and the Paris Protocol (1956), which further refined rights related to non-scheduled and charter flights, facilitating more flexible aviation operations.

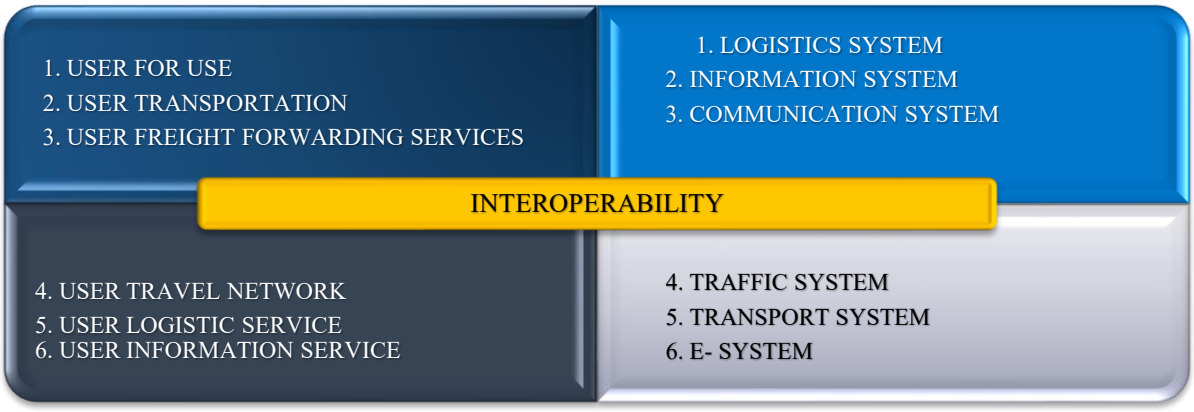
International civil aviation is governed by a complex framework of organizations and agreements, with the ICAO based in Montreal setting global standards through legislative and judicial functions, complemented by IATA's efforts to promote fair competition and professional organizations like pilot and controller groups advocating for industry interests. Regional entities such as the European Common Aviation Area (ECAA) aim to unify airspace, standardize safety, and enhance security across Europe, supported by legislative measures and cooperation through EUROCONTROL. Air transport contracts regulate the responsibilities of carriers and shippers, emphasizing timely delivery and proper handling, with legal distinctions between domestic and international flights. National agencies oversee compliance, certification, and safety standards within their jurisdictions, working with European and international bodies. Interoperability in logistics and air traffic systems ensures seamless communication and operation across diverse platforms, boosting efficiency and service quality in the global aviation network.

Fig. 2 Division of interoperable



The interoperability framework in traffic and transport settings focuses on creating standardized technical protocols, data formats, and communication systems that facilitate seamless integration across different modes and organizations, promoting real-time data sharing and coordinated operations. This includes deploying interoperable signaling, shared information platforms, and unified procedures to enhance efficiency and decision-making. Equally important are addressing social, political, and organizational factors to align policies, encourage stakeholder cooperation, and adapt to diverse regulatory environments, thereby boosting the resilience and performance of transport networks within complex supply chains.

Fig. 3 Arhitecture interoperable



Interoperability requires consistency based on technical, semantic and institutional parameters.

Table 1. Consistency of interoperability

Level of interoperable	*Prerequisites for the realization of interoperable*	*Current status*
Institutional	Willingness for interoperability	Mostly different and silent
Models of information	Formalization and data descriptors	The early stages of development
Data scheme	Accepting Database Standards	Very dependent on the sector traffic and transport
Data exchange	Applicable standards	Availability in expansion
Networks	Standard network protocols	Adoptions are widely used

Integrated transport systems, such as intermodal freight transport, aim to enhance efficiency and reliability by seamlessly combining different modes under a single carrier, reducing fragmentation and fostering cooperation among transport segments, primarily focusing on cargo movement without altering units. The European Union's air transport strategies seek to manage growth, improve safety, and promote environmental sustainability through initiatives like airspace restructuring, harmonized regulations, and environmental restrictions. Sustainable development in transportation emphasizes reducing emissions and pollution through energy-efficient systems and renewable energy integration, balancing social, economic, and environmental goals, with particular attention to social impacts on vulnerable communities. At aerodromes, implementing

environmental management systems like ISO 14001 is vital for systematically controlling environmental impacts, ensuring sustainable growth while safeguarding natural resources and meeting societal needs.

3 Market Positioning Factors in Air Company

The airline industry's success hinges on the intricate balance of optimizing air traffic, flight scheduling, and market coordination to adapt to rapidly shifting consumer preferences and global trends. Strategic planning must integrate long-term market analysis with real-time operational adjustments, focusing on revenue growth, productivity, and efficiency amidst low profit margins. Effective flight scheduling, constrained by external factors like airport capacity and regulations, requires maximizing passenger and cargo demand while controlling costs. Simultaneously, aligning marketing efforts with operational capabilities ensures resource allocation and capacity adjustments are responsive to market fluctuations, thereby enhancing competitiveness and profitability in a highly dynamic environment.

The process of forming airline tariffs involves analyzing market dynamics, demand elasticity, regulatory frameworks, and competitive factors, with a focus on balancing profitability and accessibility. Pricing strategies are tailored to trip type, distance, and passenger segments, considering the varying elasticity—long-haul and international flights tend to be less elastic, while regional and intra-European routes are more sensitive to fare changes. Deregulation and liberalization, especially in North America and Europe, have shifted pricing from rigid IATA-regulated models to more flexible, competitive strategies, including dynamic pricing and fare segmentation. Carriers such as low-cost, cargo, and charter services face unique considerations, influenced by operational models and regulatory environments, with cargo pricing often based on shared or dedicated freight services. IATA's historical role in setting collective international airfares aimed to ensure airline profitability while promoting demand through privileged tariffs, but recent trends emphasize market-driven, demand-responsive pricing that leverages elasticity insights to optimize revenue, market share, and passenger accessibility.

The passage highlights how airline deregulation, initiated by measures like the US Airline Deregulation Act of 1978 and the UK’s independent efforts, spurred increased competition, lower fares, and the rise of Low-Cost Carriers (LCCs) such as Ryanair, EasyJet, and Southwest, which operate with reduced costs and innovative market strategies. Deregulation facilitated international liberalization through policies like Open Sky, enabling more route freedom and market expansion, especially between Europe and the US. This environment fostered market concentration among major airlines, but also intensified price competition, benefiting consumers through cheaper tickets and increased passenger volumes. Concurrently, revenue management—focused on strategic pricing, inventory control, and overbooking—became crucial for maximizing airline revenues, especially as LCCs adapted these systems to their operational models, ensuring profitability and growth despite economic fluctuations. Overall, deregulation and liberalization

fundamentally transformed the airline industry into a more competitive, cost-efficient, and demand-responsive market.

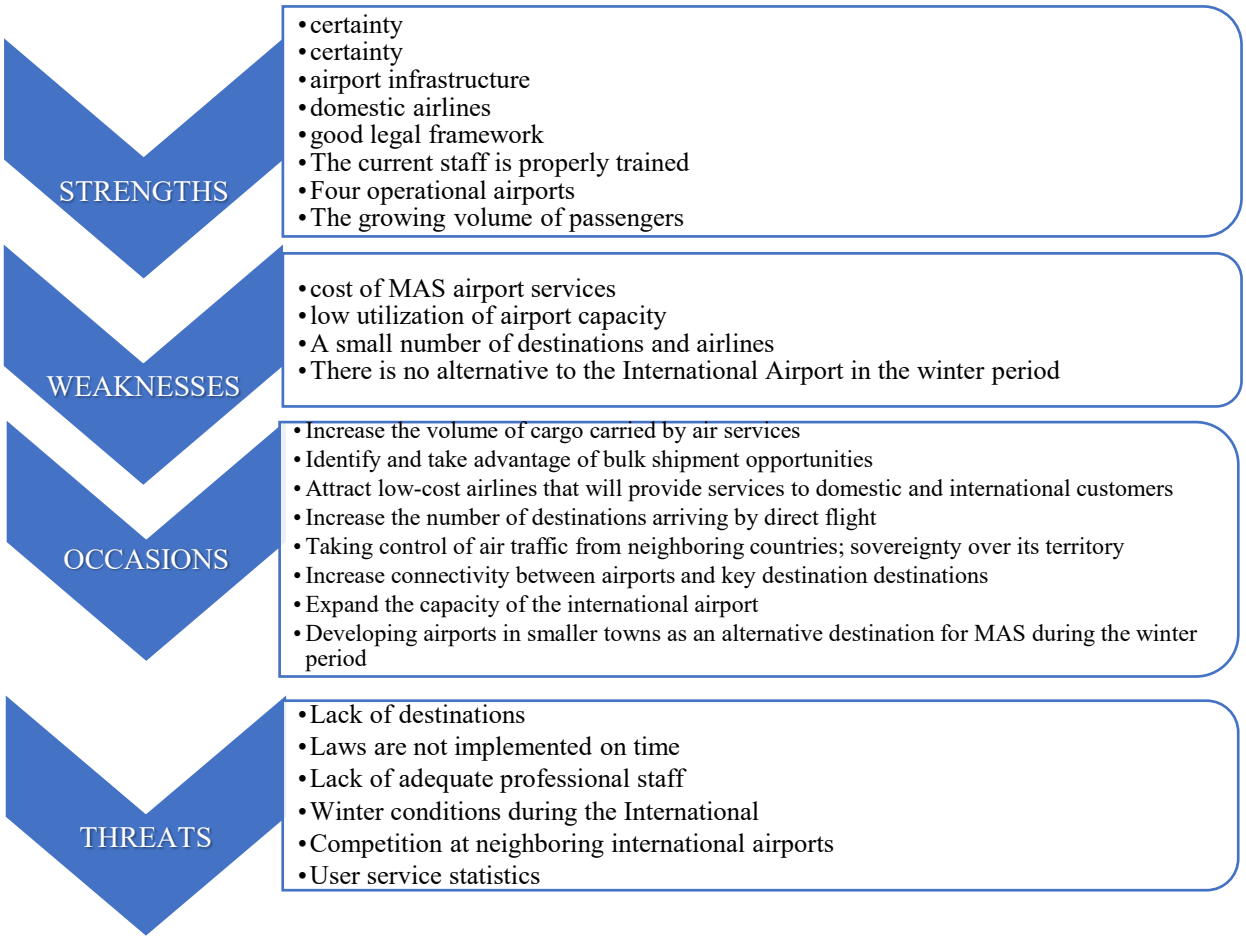
Airlines are increasingly shifting from traditional, costly CRS and GDS systems—incurring up to 6% of sales in reservation fees and commissions—toward electronic distribution channels like online booking, e-tickets, and smart cards to reduce costs, improve efficiency, and enhance direct engagement with customers. This transition allows airlines to bypass expensive intermediaries, leverage faster and more accessible internet-based platforms, and better meet the demands of modern travelers. Additionally, internal intranet systems support operational efficiency by providing vital information to staff. These strategic adjustments enable airlines to optimize revenue management through more flexible pricing, inventory control, and overbooking practices while fostering a more sustainable and responsive distribution model in a rapidly evolving industry landscape.

The airline industry's strategic landscape comprises network operators and niche players, each employing distinct approaches—hub-and-spoke, alliance-driven models emphasizing safety and service for dominant market control, versus point-to-point, cost-efficient models targeting specific segments for success—while hybrid carriers like Finnair and LOT blend these strategies. These approaches demonstrate the importance of aligning marketing and operational practices with economic benefits, with ongoing evolution driven by low-cost and hybrid models shaping competition. Underpinning these dynamics is the concept of economic equilibrium, which, despite being a theoretical ideal where supply equals demand, remains elusive in practice due to constantly shifting market forces; this is analogous to inflating a balloon until internal and external pressures balance, and extends into game theory with the Nash equilibrium, where strategic interdependence stabilizes outcomes when no player can improve their position unilaterally.

4 Aviation management and master plan for Gevgelija sport school and Sibenik commercial aerodrome

Benchmarking in the aviation industry is a vital process that compares organizational performance to best practices, focusing on continuous improvement and strategic advantage, utilizing frameworks like Kotler’s and Harrington’s stages to guide systematic efforts. It helps airlines identify areas for enhancement by analyzing metrics such as aircraft utilization rates across competitors like Airbus, thereby fostering a culture of excellence and informed decision-making amid external factors like customer preferences and market competition. Conversely, SWOT analysis complements this by providing a comprehensive view of internal strengths and weaknesses, alongside external opportunities and threats, enabling airlines to adapt effectively in a highly competitive, rapidly evolving sector—although its subjective nature necessitates honest and thorough evaluation, especially given the dynamic market conditions driven by infrastructure growth and competitive pressures.

Fig. 4 Diagram SWOT analysis



PEST analysis is a strategic tool used to evaluate the external macro-environmental factors—political, economic, social, and technological—that can impact a business's operations and decision-making. By systematically examining these four dimensions, companies can identify potential opportunities and threats, anticipate changes in the external landscape, and develop strategies that align with current and future conditions. This comprehensive understanding helps organizations adapt proactively, mitigate risks, and leverage external factors for competitive advantage.

Fig. 5 Diagram PEST analysis

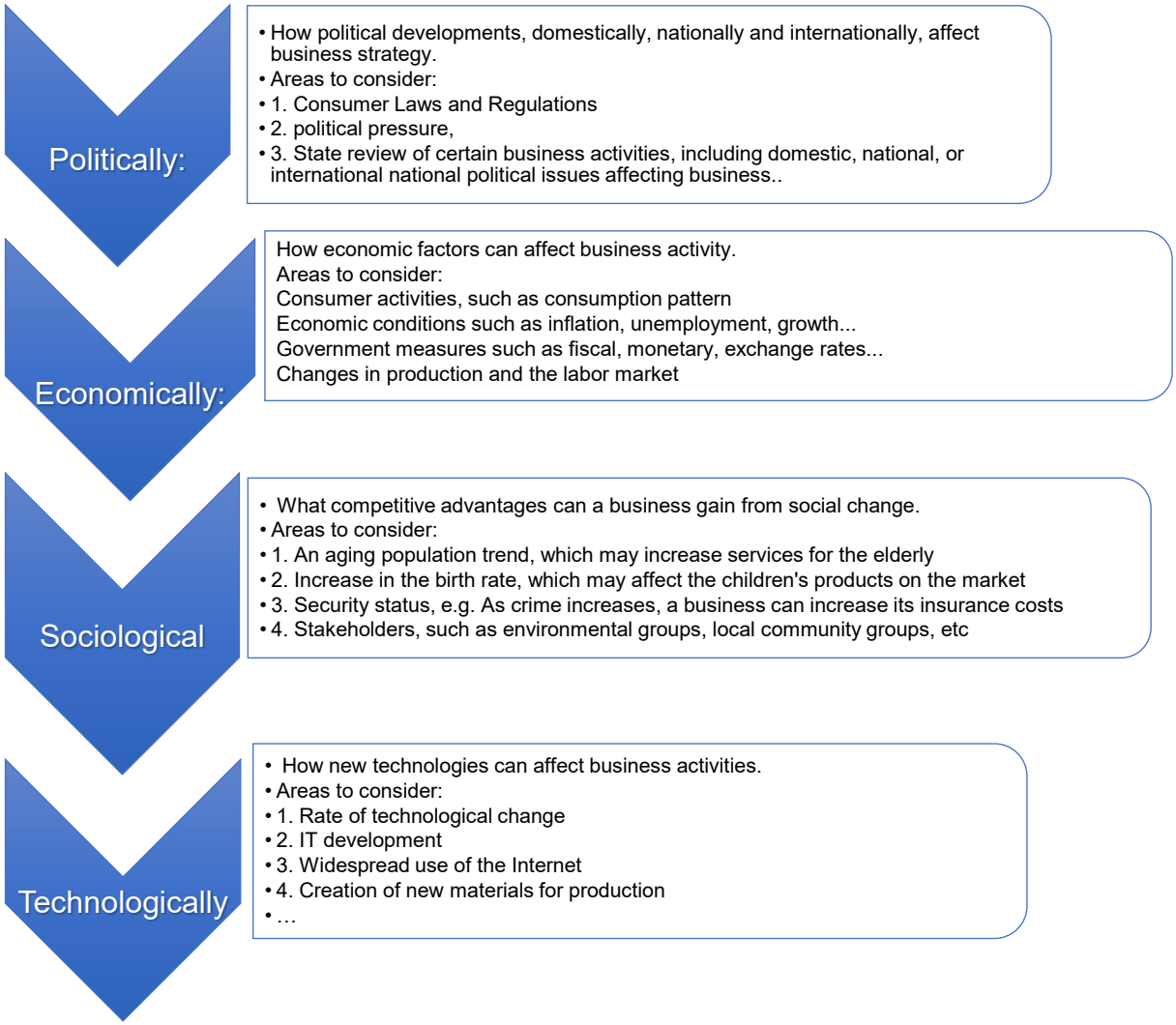


Fig. 6 Sibenik aerodrome location movement area

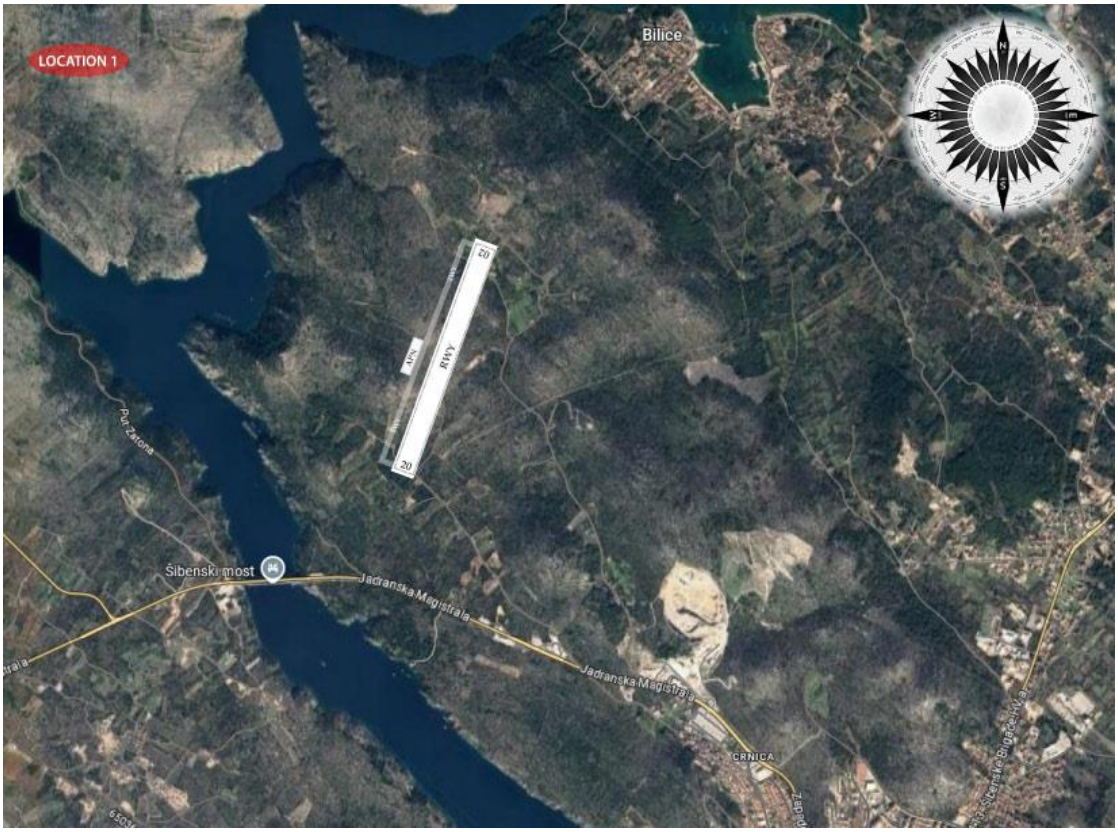


Fig. 7 Gevgelija aerodrome location movement area

5. Conclusion

The text underscores the critical importance of strategic positioning and comprehensive planning for airlines operating in a highly competitive and dynamic global aviation market, emphasizing

factors like flight scheduling, pricing, revenue management, and sales distribution, all of which require benchmarking and adaptation to change. It highlights the necessity of developing versatile business plans tailored to different models, acknowledging current research limitations primarily focused on goods and service sales rather than air traffic services, and advocates for further exploration to enhance understanding and methodology. Additionally, it stresses the need for regional coordination within Europe to address air traffic fragmentation through reforms and the implementation of a 'Single European Sky' (SES), which aims to modernize air traffic control with advanced technology and regulations to improve efficiency, reduce delays, lower costs, and meet increasing passenger demands for quality, safety, and environmental sustainability.

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