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MARKET STUDY AND BUSINESS MODEL DEFINITION FOR CIUDAD REAL INTERNATIONAL AIRPORT

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Abstract

The purpose of this paper is to perform a market study on the three different business strategies that could be implemented at Ciudad Real International Airport (Castilla La Mancha, Spain): becoming an executive aviation airport, an industrial airport, or a cargo-oriented airport. The research aims to conclude what combination of these business lines would maximize value for all stakeholders, and whether the shareholders and managing company have the necessary resources to successfully carry out the resulting business plan.

The methodology used involves a combination of literature review on the aforementioned industries and personal experience from myself having worked at Ciudad Real International Airport in the Business Development team for seven months. In order to complement the available information, there has been direct contact with the managing company's Business Development team throughout the making of this paper, including several interviews with the airport's Director.

Extensive market research suggests that the current landscape in the aeronautical industry is very positive for Ciudad Real to evolve into a major aviation hub in Southern Europe, with strong potential to ramp-up its executive aviation operations, develop an industrial hub capable of generating substantial business with major socioeconomical impact in the area and revenue generating potential, and establish an air cargo and logistics center currently missing in Castilla La Mancha.

For future analysis, the demand scalability potential achieved by investing in developing an intermodal logistics hub by connecting the airport to the adjacent high-speed railway should be meticulously analyzed, as the possibility to connect the maritime ports of Algeciras and Valencia at Ciudad Real would be a market-changing investment.

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1. HISTORY AND BACKGROUND OF CIUDAD REAL INTERNATIONAL AIRPORT

Ciudad Real International Airport (IATA code: CQM) was inaugurated in 2008 after an initial investment of c. € 1.1 billion by a consortium of private investors. The Project was initially conceived as an alternative to the expansion of Madrid-Barajas airport which was deeply saturated at the time. CQM was to be connected to the high-speed railway connecting Madrid with the South of Spain, and being only 50 minutes away from Madrid by train it should have been a viable low-cost travel alternative. However, the airport's construction was delayed due to several administrative impediments such as being placed on a Special Bird Protection Zone. By the time these setbacks were solved, Madrid-Barajas airport had already finished its new T4 terminal, therefore capturing all the airline demand that was forecasted to operate from Ciudad Real.

Ciudad Real operated as a passenger airport from December 2008 to April 2012, when it had to shut down due to little demand from airlines to operate at CQM. After a long judicial process and a later public auction, the airport was acquired in 2016 by Ciudad Real International Airport SL (CRIA), who managed to reopen the airport in September 2019 with a new strategic focus: developing the industrial, logistics, and executive aviation business lines. However, half a year after relaunching the project, the Covid-19 pandemic struck and paralyzed the development of several industrial projects that should have been started at Ciudad Real that year. Nevertheless, throughout the pandemic CRIA was able to establish itself as a long-term parking (LTP) alternative for all the commercial airplanes whose flights were cancelled due to Covid.

2. INFRASTRUCTURE ANALYSIS

2.1. Location and ownership

As can be seen in Exhibit 1, in Spain there are currently 53 airports, 48 of which are managed by AENA (Aeropuertos Españoles y Navegación Aérea), 2 by Aeroports de Catalunya, and 2 by their respective Autonomous Communities (Aena, n.d.), meaning that CRIA is the only 100% privately own airport which is open to public use.

Exhibit 1: Map of Spanish airports (Aena, n.d.)

Being the only privately owned airport in Spain translates to fast decision making which is key to adapting to new market trends and to updated customer needs. Furthermore, it allows CRIA to provide customized services which highly standardized public organizations can't deliver. This aspect is strongly related to having flexibility to build partnerships with different suppliers and customers in the industry. For instance, as stated by CRIA (2023b), Sabena Technics has established a joint venture with them to carry out MRO (maintenance, repair, and overhaul) services at CRIA's facilities, and this kind of agreement would not be possible without private ownership.

Private organizations are far more cost efficient than public ones due to the need to maximize financial performance and shareholder value. CRIA has proved its cost effectiveness by cutting maintenance costs by 25% and also reducing security costs by 42% in 2021 by creating their own private security company instead of outsourcing these services as is usual in the airport industry (CRIA, 2023b). Access to public funding and less strict financial performance requirements allow public airports to make capital expenditures and investments that may not necessarily be fully justified by future cash-flow projections. Also, having 48 airports, Aena has a strong network which allows it to have negative financial results at some of its locations which are outweighed by other profitable airports. In terms of competition this is an important threat to Ciudad Real which must deliver positive financial performance to attract investment and remain active.

Ciudad Real's climatological characteristics are also a key competitive advantage since it is located in the driest region of the Iberian Peninsula as can be seen in Exhibit 2 (Hume Ingeniería, 2015), allowing

CRIA to provide long-term parking (LTP) services without the need for hangars. Airlines and aircraft leasing companies consider weather as one of the main variables when choosing airports to store their aircraft, as adverse climatological conditions may cause significant damage to their airplanes' fuselage, engines, and electrical systems.

Exhibit 2: Average annual relative humidity in Spain (Hume Ingeniería, 2015)

2.2. Existing infrastructure

Ciudad Real Airport land use is dictated by its Airport Master Plan (AMP) (Appendix 1) which was conceived as an intermodal industrial and logistics macro complex of 1,234 Ha, dividing the premises into three main areas:

- Airport and logistics activities area (448 Ha): area reserved for aeronautical-related activities including the passenger area, logistics and transport, MRO services (maintenance, repair, and overhaul), general aviation, airport services and commercial areas. As stated by the MP, this shall be the first area to be developed as companies and business partners start establishing themselves at Ciudad Real. This area was already urbanized by the airport's previous owners and therefore has built roads, lighting, water, and electricity.

- Airfield (433 Ha): area where the runway and taxiway are located, this is where active aircraft activity and handling takes place, take-off, landing, refueling, and in-line maintenance.
- Airport Reservation Area (296 Ha): reserved for future airport expansion.

When it was initially designed as a secondary airport to Madrid-Barajas, Ciudad Real was built as a first-class airport with the following characteristics (CRIA, n.d.):

- Passenger terminal: 28,000 sqm building with 10 boarding gates, 24 check-in counters, 4 baggage claim carousels, and a VIP executive aviation area. Both the airport and the terminal were initially conceived to receive an average traffic of 3 million annual passengers in its initial phase which could build up to 10 million.
- Cargo terminal: 7,200 sqm in total, 4,000 of which are prepared for dry cargo handling and 2,100 sqm for cold cargo (e.g., perishables). The cargo terminal also hosts 1,100 sqm of office space and a 12,000 sqm parking space. This cargo terminal has a strong competitive advantage as it offers customs services and has a Border Inspection Point (PIF). Having a PIF allows CRIA to be an import hub for food, plants, animals and related products which need to undergo sanitary and phytosanitary checks when entering the European Union.
- Runway and taxiway: featuring a 4 km long runway classified as 4E type, CRIA has the second-largest runway in Spain with just Madrid Barajas having one only 200 meters longer, for comparison's sake, Barcelona El Prat's runway is 3350 meters long and it is the next longest one in the country (Ministerio de Transportes y Movilidad Sostenible, 2022). Next to the runway, is a 3,000 m taxiway which during the Covid-19 pandemic was also used as a long-term parking apron to increase the airport's capacity. Having a 4E-type runway according to the International Civil Aviation Organization (ICAO) Aerodrome Reference Code allows Ciudad Real to host any type of aircraft such as the Boeing 747 or Airbus A380 while meeting all the safety requirements (Skybrary, n.d.). The airport's runway characteristics are particularly suitable for cargo aircraft which often need longer take-off and landing distances, especially when heavy loaded. It is also a main restriction faced by large aircraft (e.g., Boeing 747) owners when choosing a maintenance airport.
- Control tower: 50m high tower offering Aerodrome Flight Information Service (AFIS) which means that controllers are in communication with operating aircraft and provide them with information such as weather situation, runway status, air traffic, and any kind of relevant information which might increase safety (IVAO Documentation Library, 2022). However, AFIS does not provide the tower operators any control over the flying aircraft, it is just an on-demand information service. This system is suitable for airports with less

traffic such as Ciudad Real which do not require regular controllers. It is a good example of cost optimization that has been implemented at Ciudad Real as CRIA is trying to adequate its fixed costs to the reality of airport operations.

2.3. Environmental sustainability

Ciudad Real Airport was built on a Special Bird Protection Zone (ZEPA) and it must therefore meet strong ESG and sustainability standards to ensure that it does not negatively impact the ZEPA. To comply with this EU regulation, the airport owns 564 hectares solely dedicated to agriculture and to provide a suitable living environment for wildlife.

Moreover, CRIA's main ESG initiative is becoming the first airport to rely on hydrogen power for its day-to-day operations. The project involves becoming a hydrogen producer, consumer, and wholesaler due to the large access that CRIA has to the two main resources needed to produce H2: electricity and water. CRIA will allocate 301.06 Ha to the construction of a 150 MW photovoltaic park for electricity production, 50 to 100 MW of which will be in a later phase used to produce H2. This hydrogen will be commercialized (wholesale and retail) and destined for self-consumption at the airport (CRIA, 2023b).

3. CURRENT SITUATION

3.1. Active business lines

CRIA has been able to consolidate four core business lines since the airport's reopening in 2019:

- MRO: maintenance, repair, and overhaul operations must be carried out periodically. As stated by Rodrigues and Lavorato (2016), these are mandatory checks and operations that must be performed to verify and ensure the aircraft's airworthiness according to the relevant regulations depending on the airplane's location and flight plan.

  "Despite the extensive market and process knowledge, MRO service is a world relatively unexplored by Aircraft Original Equipment Manufacturers (OEMs), such as Airbus, Boeing, Bombardier, Embraer, Gulfstream and others. Usually, contracts negotiated with System Suppliers are focused on the aircraft development and production, and they fail to take advantage of relevant aftermarket business opportunities. Due to the restrictions to certify an aircraft, the aeronautical supply chain base is very limited. Basically, system suppliers not only provide system/parts to the aircraft OEMs but also to their competitors as sub tier suppliers.

This restricted suppliers' availability, if compared to, for example, the automotive industry, negatively impacts the negotiation results. In fact, OEMs are not alone in being affected by the lack of stronger commercial agreements covering MRO. To illustrate, the spare part prices paid by airlines, business jet owners and governments are significantly higher than the production prices, reflecting an expressive MRO cost for those organizations. Looking for opportunities to reduce costs and be more competitive, airlines are partially or fully outsourcing their MRO activities to repair shops, system suppliers and eventually aircraft OEMs" (Rodrigues and Lavorato, 2016).

CRIA has identified the market opportunity to address this high cost issue and provide MRO services at Ciudad Real due to the cheaper yet highly skilled labor available in the region and has formed a joined venture with Sabena Technics to provide airframe and component MRO services (excluding engine maintenance) at Ciudad Real (CRIA, 2023b), the first airplane to be serviced by the newly formed joint venture (an Airbus A350-900) arrived at CQM in November 2023 (Aviación Digital, 2023). Sabena is a French MRO provider which ranks amongst the biggest in the world with over €650 million turnover and more than 3,000 employees, they operate at 16 different airports worldwide with their latest addition being Ciudad Real (Sabena Technics, n.d.). Sabena has identified a terrific opportunity to create one of the largest maintenance hubs in Europe at Ciudad Real due to three main factors:

  - Private ownership: Sabena has taken advantage of the flexibility and fast decision-making that CRIA has to offer when reaching an agreement on the conditions of the joint venture.
  - Climate conditions: the high altitude, being far from the sea, and dry conditions are ideal for storing and working on aircraft and making sure that corrosion does not happen.
  - Capacity for expansion: having over 1,000 Ha of available industrial means that Sabena and CRIA can gradually adapt to growing demand.

- Aircraft dismantling and recycling: after their useful life period comes to an end, or whenever there is no demand from airlines to lease or buy older airplanes, these aircraft are sent to recycling facilities whose business is to acquire them at scrap prices, disassemble them, and sell a) materials such as metal alloys and composites that can be recycled and b) components such as electrical systems, seats, or landing gear that can be used for spare parts on operating aircraft that require changing these pieces (Fortune Business Insights, 2023).

  The evolution of the aeronautical industry towards more efficient and sustainable airplanes has caused a surge in demand for older aircraft dismantling as airlines are leasing new

generation airplanes to reduce fuel costs and comply with ESG mandates. CQM has been granted a license to dismantle 24 aircraft per year, and operations have already started with a private company carrying out the dismantling services and renting the premises to CRIA (CRIA, 2023b).

- Long-term parking and in-line maintenance: during Covid, two-thirds of the world's airplanes where grounded as commercial flying was prohibited for public health purposes, generating an unprecedented demand for airport parking spaces which were not enough to store as many as 16,000 passenger jets which had being grounded (Kotoky, Stringer and Saxena, 2020). The issue is that "aircraft can't simply be dusted back into action. They need plenty of work and attention while in storage, from maintenance of hydraulics and flight-control systems to protection against insects and wildlife — nesting birds can be a problem. Then there's humidity, which can corrode parts and damage interiors. Even when parked on runways, planes are often loaded with fuel to keep them from rocking in the wind and to ensure tanks stay lubricated" (Kotoky, Stringer and Saxena, 2020). While CRIA had just managed to start operating the airport, its business plan was frustrated due to the pandemic, but it managed to make the most out of the LTP business line by parking up to 82 airplanes in November 2020. Even though aviation has already recovered from the pandemic and airlines are set to make record revenues in 2024 with commercial flying being normalized again (Bloomberg, 2023), the pandemic helped consolidate CQM as an optimal long-term parking and maintenance location in southern Europe, in fact, CRIA plans to further expand their LTP aprons to be able to accommodate a larger number of aircraft (CRIA, 2023b).

  In-line maintenance refers to routine maintenance checks and operations that must be carried out on airplanes before and after regular flights to ensure the correct functioning, reliability and performance of all systems and comply with safety regulations imposed by EASA (European Union Aviation Safety Agency). This may include replacing some components when they reach their maximum recommended hours of use, making minor adjustments or updating the systems' software. It is often of a preventive nature since it is aimed at identifying potential issues that may rise. At CQM there are two companies which are compliant with EASA regulation (EASA, 2021) and who carry out these necessary checks to ensure the airworthiness of the aircraft that are stored and parked at Ciudad Real.
- Executive aviation: due to CQM being located in a hunting region in Spain, during the hunting season (September through March) there is a high demand of operations from private jets. Although there are several small airfields closer to the main hunting areas, customers prefer landing at Ciudad Real due to the additional safety and services that are provided. Executive

aviation operations provide revenues from landing, take-off, handling, and refueling, and having grown from 58 flights in the 2019-2020 season to c. 200 expected for the 2023-2024 season (CRIA, 2023b) it represents a substantial revenue stream for the airport. CRIA's main competitive advantage for executive clients is that it offers passport control and weapon intervention service, which allows international flights to land at Ciudad Real without the need to make a stop at a larger passenger airport in order to get their passports and weapons cleared by the respective authorities.

4. MARKET RESEARCH - POSSIBLE BUSINESS LINES TO BE DEVELOPED

This business plan's objective is to analyze the different business lines and strategies or combination of them that CRIA could implement at Ciudad Real International Airport to ramp up its business and become one of the main aviation hubs in Southern Europe. As explained in section 3.1, CRIA is currently exploiting four main revenue streams: MRO through its joint venture with Sabena Technics (maintenance, repair, and overhaul), LTP (long-term parking) and in-line maintenance, dismantling, and executive aviation operations. These activities fall into two different airport business models: industrial airport and executive airport, but for the purpose of expanding CRIA's business, this paper also analyzes the possibility of becoming a cargo airport.

In this section, the three business models will be analyzed by studying market trends and forecasts, PORTER and SWOT analysis, comparing CQM to its main competitors in each of the different industries, and carrying out a brief revenues, costs, and investment analysis.

4.1. Executive aviation

4.1.1. Introduction

The executive aviation business line refers to the already existing private jet operations. As explained in section 3.1, most of them are private jet owners or rental jets who come to Ciudad Real for hunting since the airport is located in one of the main hunting regions in Spain. Although during the most restrictive months of the pandemic there were no business jet operations at Ciudad Real, CRIA has still managed to position itself as a safer option to private airfields that some jet owners have in the proximities of CQM due to its 4,000 meter runway, navigation systems, and safety equipment and procedures.

Before CQM was reopened by CRIA in 2019, many of the international private jet flights which had final destination at some of the hunting sites in Castilla la Mancha were forced to divert to either Adolfo Suárez Madrid-Barajas airport or to Granada airport to first carry out weapons intervention and passport controls. This diversion would mean incurring in higher fuel consumption and longer travel times, which significantly increased especially when choosing to comply with these requirements at Madrid-Barajas airport as it is the busiest airport in Spain and therefore waiting times for take-off and landing are much longer than at Ciudad Real. At the same time, since Madrid airport has many different runways and jets may be assigned to take off at one which is not particularly close to their parking spot, taxiing time through the airport's taxiways can mean over 15 minutes of fuel consumption and increased travel time. These factors have made jet operators quickly switch to CQM as their preferred airport both as a final destination and as a passport and weapons check pit stop.

4.1.2. Market trends and forecasts

According to Mordor Intelligence 2023 market report, the Europe business jet market size is circa USD 4.47 billion in 2024, and it is estimated to reach USD 5.59 billion by 2029, meaning that it is expected to grow at a promising 3.66% CAGR. However, Spain is the slowest growing country in terms of the private jet market, with a CAGR estimate for 2022-2028 of 0% as can be seen in exhibit 3. The worldwide expected growth for the business jet market is also over the 3% mark (Statista, 2023).

This consistent growth can be explained by the following factors:

- Economic recovery: the worldwide economy has recovered from the pandemic shock and an increase in economic activity is a key driver for growth in the executive aviation sector.
- Health and safety concerns: during the pandemic, demand for private jets rose due to the lower number of people and interactions that clients have when flying private jets compared to regular commercial flights. A large percentage of these clients who presumably flew commercial before the pandemic have stuck to private jets even after the covid-19 outbreak has recessed.
- Globalization of business: executive aviation is a fast alternative for sending c-level employees to work around the world.
- Technological advancements and ESG concerns: engineering and technological advances are making planes more fuel efficient and the development of sustainable fuels for aviation is well advanced on solutions such as electric or hydrogen-powered aircraft. These new power solutions are being implemented first on private jets due to their lower weight and smaller

size which makes it easier and cheaper to test engines and systems on them rather than on larger commercial aircraft. On the other hand, technological advances such as remote working have, in some cases, eliminated the need for workers to travel for meetings, therefore effectively lowering executive flight demand.

- Increase in high net-worth individuals: Credit Suisse found in 2021 that the number of individuals with a net worth over $50 million was at an all-time high (Neate, 2022), which is a direct increase in the customer base for private jet ownership or rental.

Exhibit 3: Europe Business Jet Market CAGR, %, by country, 2022-2028 (Mordor Intelligence , 2023)

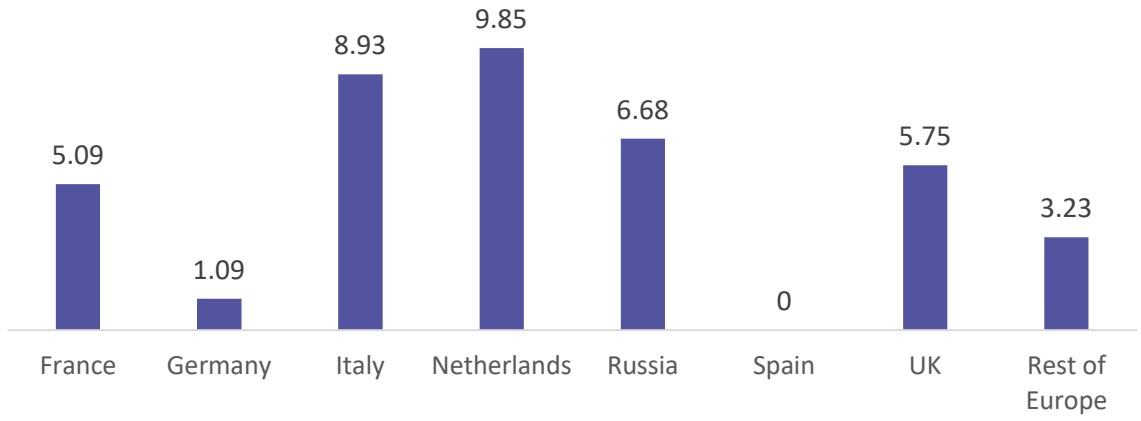
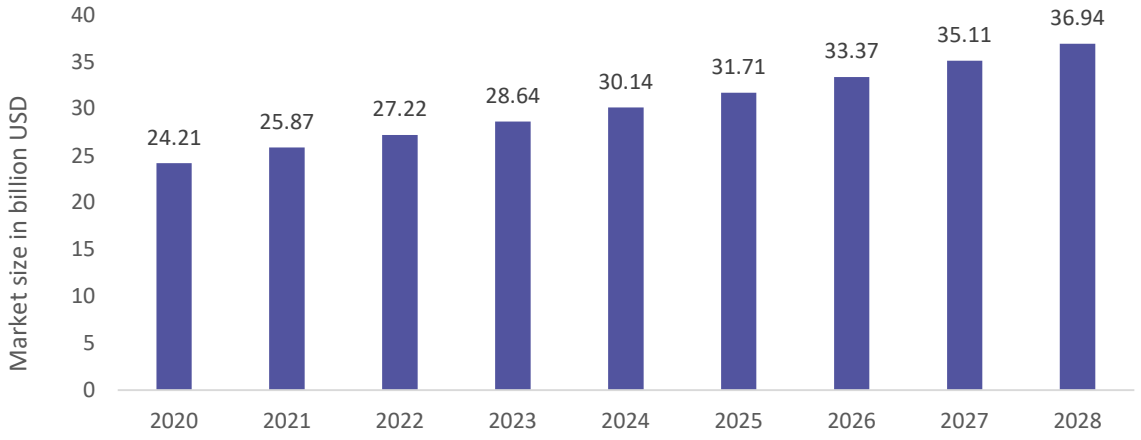


Exhibit 4: Size of the business jet market worldwide from 2020 to 2028 (Statista, 2023)



4.1.3. Porter's five forces analysis

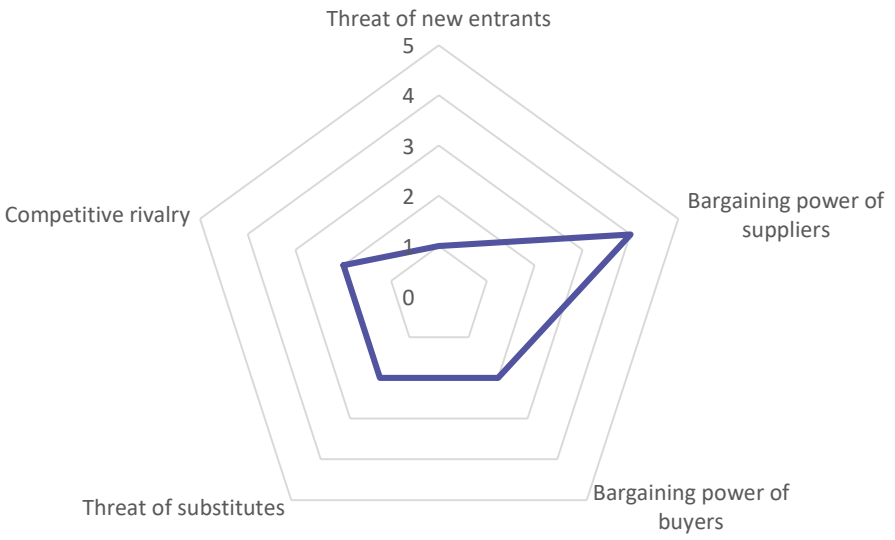
In 2008 Michael E. Porter stated that "the extended rivalry that results from all five forces defines the industry's structure and shapes the nature of competitive interaction within an industry". Porter explains how competition arises in 5 dimensions:

- Threat of new entrants: this variable is very low regarding the possibility of new executive aviation airports being built and establishing themselves as private jet FBOs (fixed base operators) near Ciudad Real due to the high capital needs of such project. For instance, CQM's infrastructure cost was estimated to be c. €1 billion (Diaz Villanueva, 2011), and the current projected expansion of Madrid-Barajas will cost c. €2,400 million according to Spanish Prime Minister Pedro Sánchez (Zanón, 2024). An executive aviation focused airport would not need such a large investment as Ciudad Real was designed as a large capacity passenger and cargo airport, but it would still be a significantly high cost.
- Bargaining power of suppliers: the aircraft services sector is very concentrated with just a few suppliers for each different service that airplanes require, such as fuel, in-line maintenance or MRO. According to Mordor Intelligence's 2023 MRO market report, the industry is dominated by 5 main players: Lufthansa Technik, Raytheon Technologies, Safran, AAR, and GE Aviation. This factor gives suppliers significant bargaining power over their clients which are forced to pay high tariffs for their services. However, suppliers are interested to work at Ciudad Real to get access to the other larger aircraft that operate there, and for that reason they may offer better tariffs at CQM than at a solely executive-aviation-oriented airport.
- Bargaining power of buyers: this factor refers to the capacity of private jet owners and users to push CRIA's prices down or to easily switch to other airports. The switching costs of changing airports for long-term parking or maintenance operations are very low as these activities are very standardized and can be carried out at any airport, as a result, the price competition between airports in this matter is very high as it will be the key factor for jet owners to decide where to leave their aircraft. Ciudad Real has a competitive advantage when it comes to prices as it has lower operational and labor costs than other larger airports in main cities and it can therefore offer more attractive prices.

  However, switching costs when it comes to travel destinations are much higher as the decision of where to land is much more affected by proximity to the client's destination than by a matter of prices. Moreover, studies show that only airport facilities significantly affect passengers' choice of airport but, if facilities are taken as a given, location is the main driver behind destination decisions (Prentice and Kadan, 2019). As such, CRIA's executive operations demand is highly concentrated on clients who want to arrive to Castilla La Mancha, and these clients will be willing to pay slightly higher costs for being able to land at Ciudad Real and not having to go to airports such as Madrid or Granada and then take a longer car ride to their destination.

- Threat of substitutes: other transportation methods such as high-speed trains, helicopters, passenger airlines' business class flights, or cars are real alternatives to flying private jets especially in a small and well-connected country like Spain. Nevertheless, 70% of the private jets arriving at Ciudad Real are international flights, which are much less threatened by these substitutes (CRIA, 2023b).
- Competitive rivalry: since service differentiation is particularly difficult in the industry, most differentiation lies on location and pricing strategies. Ciudad Real has a particularly good location as it is close to Madrid and close to the main hunting lodges in the country. Its location is also a great differentiator in terms of weather conditions which is a unique selling point when it comes to aircraft storage and maintenance, and particularly important for take-off and landing operations as weather greatly affects safety.

Exhibit 5: Executive airport competition Porter's five forces analysis summary



Overall, the threat of competition is relatively low due to high entry barriers pushed by a very large initial investment need, suppliers being fairly concentrated and having the capacity to choose who they work with and set high prices for their services, and the high relation between customer base and location. On the other hand, private jet services such as fuel and maintenance being very standardized and customers being able to easily switch airports pushes prices down and forces airports to provide custom solutions to their clients in order to enhance loyalty.

4.1.4. SWOT Analysis

The SWOT analysis is a "framework to help assess and understand the internal and external forces that may create opportunities or risks for an organization" (Peterdy, 2022).

Strengths:

- Strategic location: CQM is only 2 hours away from Madrid by road and one hour by high-speed train. Most importantly, it is located within Spain's most active hunting region and most of the private jets arriving at CQM have a hunting site as their destination.
- Private ownership and customization: several private jet owners have reached out to CRIA about the possibility of building private hangars for them to store their jets in Ciudad Real (CRIA, 2023b). These projects are only possible due to CRIA being a privately-owned company which can build customized solutions for its clients.
- Infrastructure: Ciudad Real International Airport's existing infrastructure is very oversized for executive aviation, meaning that there is no need for further capital expenditures or large investments.
- Climatological advantage: as stated before, Ciudad Real's dry climate is perfect for aircraft storage and a USP (unique selling point) of CRIA.
- Exclusive services: the availability of passport control and weapon intervention service at CRIA allows international flights to land directly at CQM and not have to make a stop at another Spanish airport to comply with existing immigration and weapons regulation.

Weaknesses:

- Market awareness: since Ciudad Real Airport was closed before CRIA took over the infrastructure, some private jet owners and charter companies may not be aware that it is now open to the public.
- Volume of traffic and scalability: main airports such as Madrid, Barcelona, or Málaga have a much higher traffic volume due to their larger populations and those cities being Spain's core business and tourism centers. Ciudad Real's executive aviation customer base is restricted to around 1,000 operations which is the total number of private flights taking place in all of Castilla La Mancha's airstrips per year. However, as an LTP and maintenance center this restriction does not exist since switching costs are very low and Ciudad Real can engage in price competition with the bigger airports.

Opportunities:

- Market growth: the private jet sector is set to grow at 3% CAGR (Statista, 2023) and this new demand will have to be captured by existing airports.
- Sustainability and technology advancements in the aviation industry: as ESG becomes a growing concern in the aviation industry, companies are already developing aircraft based on sustainable fuels such as hydrogen. Since Ciudad Real has started a project to become a hydrogen producer this could become a huge competitive advantage when it comes to hosting hydrogen-powered jets that would benefit of a lower-price hydrogen which would be produced on-site.

Threats:

- Economic downturns: the private jet sector is deeply affected by economic downturns. In fact, during the 2008-2010 financial crisis, business jets dropped 28% in market value. However, this drop was concentrated in the lower-end cheaper jets taking a 57.1% dive (Solon, 2011).
- Regulatory changes: the private jet industry faces severe public scrutiny due to the emission of greenhouse gasses to the atmosphere. For instance, Greenpeace (2023) currently has a website where people can sign a petition to ban private jets where it states that "just 1% of the global population is responsible for half of the world's aviation emissions". Although this suggestion has been presented to the pertaining regulatory bodies on several occasions, it has always been ruled out, the last time being June 2023 when the EU Transport Commission stated it had no intention on banning or restricting the use of private jets (Limb, 2023).
- Technological substitutes: the pandemic has made the number of remote workers skyrocket to 12.7% in the US in 2023, and 28.3% of the workforce being partly remote workers (Haan, 2023). The rapid increase in remote working and particularly video conferencing is a direct threat to the aviation industry, which is deeply reliant on business travel. However, it is likely that new developments in these technologies are more damaging to conventional commercial airlines than to the business jet industry, since the latter are used by higher level individuals who still may require physical presence at their meetings and business trips.

4.1.5. Comparison with reference airports and competition

Airports specialized in executive aviation are usually close to points of interest for the traveler, where operations are mainly carried out for business or leisure activities. In Europe, Paris Le Bourget airport is the biggest executive airport, hosting over 52,000 operations from November 2022 to 2023

(European Business Aviation Association, 2023). Some of its major features include having specialized handling companies that offer catering, transport, and aircraft cleaning services who have much greater profitability than in other aviation segments. Le Bourget and all other main executive airports share a key common characteristic which is the existence of a well-equipped VIP terminal or area for private jet users which includes all necessary amenities for them, including the possibility of carrying out fast documentary procedures, passport control, and weapons intervention in a non-crowded terminal. CQM already has an area of the passenger terminal reserved for private jet users and equipped with all these characteristics; therefore, it does not require any further investment to properly compete with the larger, existing executive airports.

According to the European Business Aviation Association's November 2023 report, Spain is the fifth European country with the most private jet activity, with 108,213 YTD operations in November 2023. Most of these take-offs and landings are concentrated in five airports in the period ranging from December 2022 to November 2023: Palma de Mallorca (16,714 operations), Ibiza (14,037 operations), Madrid Barajas (13,655 operations), Malaga Costa del Sol (12,983 operations), and Barcelona (11,354 operations).

These airports are very different to Ciudad Real in terms of hinterland and business and tourism activity. As a result, Ciudad Real does not compete with them in terms of attracting more flights, but it can compete with them on having more attractive rates and conditions for long-term parking and maintenance. Private jets can be parked and maintained at Ciudad Real and fly off to pick up their respective owners or customers whenever they are required to, and if their LTP and maintenance prices are low enough at CRIA then it can still be a cheaper and more attractive option for airplane owners.

CRIA's demand of executive aviation flights is restricted to private flights who come to Ciudad Real for hunting and, therefore, its competitors are the private airstrips that some hunting states have on their land. CQM has some clear competitive advantages over these private airstrips that CRIA aims to exploit in order to increase its market share: it has full-time fuel service, it will soon obtain verification to operate its navigational aids which will make it an operational airport in low visibility or bad weather conditions, and it has passport control and weapons intervention. Also, its 4,000-meter runway allows any kind of aircraft to land at CQM, whereas some of the smaller runways that competitors have are very restrictive in terms of airplane size and weight.

Exhibit 6: Private aviation operations in the Ciudad real region (CRIA, 2023b)

Aerodrome	Aerodrome Type	Runway dimensions (m)	Fuel	Navigational Aids	Passport Cont. & Weapon Int.	Nighttime	Nº operations by season
La Cuesta	Restricted use	1,942 x 23	On demand	✗	✗	✗	350
La Perdiz	Restricted use	1,917 x 23	On demand	✗	✗	✗	250
Ciudad Real	**Verified**	**4,060 x 45**	✓	✓	✓	✓	**200**
La Caminera	Restricted use	1,400 x 23	On demand	✗	✗	✗	100
La Calderera	Restricted use	1,468 x 23	On demand	✗	✗	✗	100
El Castaño	Restricted use	1,400 x 30	On demand	✗	✗	✗	20

4.1.6. Revenue, costs, and necessary investments

Revenues are generated through the executive aviation business line from three main sources:

- Aircraft handling and landing fees: whenever private jets land at CQM they must pay landing fees, aerodrome traffic service fees, and parking fees which vary depending on MTOW and stay period (long-term parking is significantly cheaper than shorter stays). These service fees are shown in Appendix 2.
- Fuel sales: business jets pay a higher price for fuel than commercial and cargo aircraft, with a margin of around 30% for the airport (CRIA, 2023b).
- MRO: revenues from MRO services offered to executive aircraft.
- Hangar and office rentals: although this not an existing revenue stream for CRIA at the moment since it has not built and rented out any private jet hangars yet, the Company has been approached by several private jet owners regarding the possibility to build such facilities in order to be able to store their personal aircraft at a safe and well-equipped infrastructure such as CQM (CRIA, 2023b).

Most of the costs of running CQM that CRIA must face are fixed costs such as personnel, infrastructure maintenance, water, gas, electricity, air-traffic controllers, weather report system, or real estate tax (IBI). There are also marketing and sales costs from contacting potential customers and positioning the airport as a private aviation hub in aeronautical magazines and related communication and media strategies. These costs are then allocated to the different business units, however, there are also some relevant direct costs from executive operations such as:

- Fuel provisioning: CRIA buys and resells fuel to aircraft, additionally charging clients for the cost of storage and fuel handling.
- Direct operational costs: such as the costs incurred when carrying out MRO services to these aircraft in terms of necessary personnel or spare parts.

Since Ciudad Real airport is already operating as an executive airport at the same time as its other business lines, and it was in fact designed for a much larger-scale operation than it has at the moment, there is no need for any major investments in infrastructure in order to be able to exploit this business line.

4.1.7. Conclusion

Ciudad Real International Airport's infrastructure is well suited to host executive aircraft operations and LTP and maintenance of these aircraft. In fact, the airport currently receives circa 200 private flights per year, most of them related to the hunting activities that take place in Castilla La Mancha, which is actually one of the main limiting factors for the scalability of this business line in terms of receiving visiting flights: CQM will never be able to take market share from the larger airports such as Madrid since the main factor behind airport choice is location and proximity to final destination. However, CRIA could position itself as a low-cost LTP and maintenance center for private aircraft. At the same time, CRIA's infrastructure has several competitive advantages in terms of safety and navigational aids compared to other airstrips in the region which should allow it to increase its market share of hunting flights arriving at Castilla la Mancha.

Market forecasts show a positive 3% annual growth in the executive aviation sector (Statista, 2023), with Spain falling behind its peers at a 0% growth (Mordor Intelligence, 2023), nevertheless, CRIA should be able to capture the international growth since many of its incoming flights are international clients who take advantage of the passport control and weapons intervention available at Ciudad Real.

The PORTER's five forces analysis reveals a manageable competition environment for CRIA since it has good existing relationships with suppliers who may even accept charging private jets lower tariffs as far as they have access to the rest of the aircraft operating at the airport. Moreover, benchmarking against Paris Le Bourget airport reveals that Ciudad Real has all the necessary infrastructure and amenities needed to offer a premium service to its executive clients.

The most important conclusion is that, although scalability of this business line is limited due to a reduced customer base, it can be combined with other operations such as cargo or industrial activities being carried out at the same time and, since there are no major investment needs, there is no reason why CRIA should not keep offering executive aviation services.

4.2. Industrial airport

4.2.1. Introduction

An industrial airport is one whose main operations are related to supporting the aeronautical industry's manufacturing, maintenance, and logistical needs. Typical examples of these activities include MRO activities, engine maintenance and testing, aircraft painting, conversion, or recycling.

Industrial airports may follow two different business models:

- Service provider business model: the airport may choose to provide these services themselves and can create separate companies for each of them. Via this method, it is the airport itself who charges customers for these services, having full responsibility for their actions and incurring specific costs for each business they enter. CRIA has implemented this approach for its MRO services by creating a joint venture with Sabena Technics which has contractual exclusivity to conduct these operations at CQM. By doing this, CRIA makes a profit from the actual MRO operations that take place at CQM instead of simply renting out hangars and parking space to Sabena Technics and having them run the operations. This strategy is riskier as the airport is affected by the financial performance of each of its industrial companies and it bears responsibility for anything that may happen related to those activities.
- Real Estate rental business model: airports may rather "outsource" industrial services by renting land and facilities to third parties. The airport can rent hangars, warehouses, parking space, offices, or raw industrial land where the lessee can develop their own infrastructure customized to their specific needs. This strategy bears much less risk than the first since it only faces payment risk from the companies who rent out the real estate. Inevitably, a lower level of risk implies lower potential returns on investment, however, since airport space is scarce it still has very attractive returns. For this reason, this paper studies the implementation of a real estate rental strategy within the industrial airport business model rather than a first-hand service provider strategy.

The airport and logistics activities area of 448 Ha in the northern part of Ciudad Real' premises and the 433 Ha airfield are reserved for aeronautical-related industrial and logistics activities. According to CRIA (2023), they have held conversations for hangar rentals with companies operating in the following sectors:

- MRO service providers: CRIA has already established the joint venture with Sabena Technics to carry out MRO operations at Ciudad Real, but since the SPV is owned in an 85%-15% basis by Sabena and CRIA respectively, the joint venture also pays monthly rental fees to CRIA. The

current expansion plans of Sabena Technics include the construction of two widebody (these are twin-aisle wider aircraft such as the Boeing 747 or Airbus A380) hangars and renting them from CRIA.

- Engine maintenance and testing.
- Surplus parts management businesses: these companies buy old, decommissioned airplanes and aircraft components and resell them as spare parts.
- Aircraft conversion and dismantling businesses: already established at Ciudad Real, these companies' business model is to acquire airplanes and either repurpose them (such as converting a passenger airplane to a cargo one) or dismantle them to recycle the parts. Teruel airport is Ciudad Real's main competitor as an industrial airport in Spain, and its core business is aircraft conversion and dismantling done by specialized company Tarmac Aerosave.
- Aircraft painting: it is common for airplanes to switch airlines when leasing contracts expire, and in the process the plane must be fitted with the new airline's livery and color scheme. Aircraft painters need particularly big hangars to fit the machinery needed for painting and therefore pay higher yields than any other lessee.

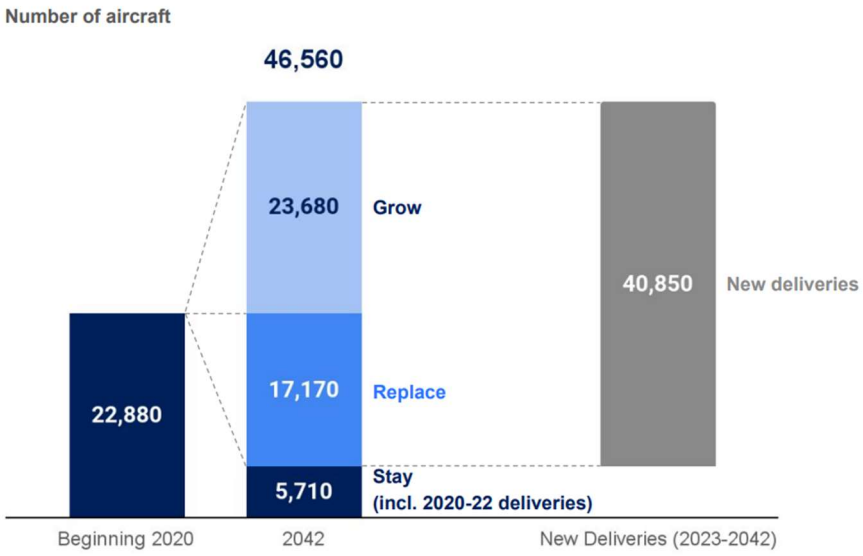
In Appendix 3, the hangar and warehouse distribution that CRIA plans to have in the northeastern part of the airport can be seen. This area is part of the airport and logistics activities area, but it is adjacent to the airfield with the aim of optimizing taxi time for incoming and outgoing aircraft that operate in those hangars, therefore reducing fuel costs and increasing efficiency. As CRIA expands its industrial airport business model it would then build hangars in other areas which are further away from the airfield.

4.2.2. Market trends and forecasts

Demand for aeronautical industrial services is mainly driven by the number of aircraft in service. According to Airbus' Global Market Forecast 2023 there are currently 22,880 aircraft in service, of which only 5,710 (25%) will still be flying by 2042, and the remaining 17,170 (75%) will be replaced by newer models. Apart from this large turnover rate, there will be an additional 23,680 new aircraft which will increase the number of active aircraft to 46,560 in the year 2042. In total, this means that there will be 40,850 new deliveries in the next 20 years, 42% of which will replace existing aircraft and 58% will grow the number of airplanes in service. Furthermore, 80% of the new deliveries will be narrowbody (single aisle) airplanes and the remaining 20% will be widebody. Geographically, these new deliveries will be unevenly distributed around the world, with around half of them going to Asia,

and the USA and Europe getting circa 7,000 units each. Latin America, Africa, and the Middle East will purchase two, one, and three thousand aircraft respectively (Airbus, 2023).

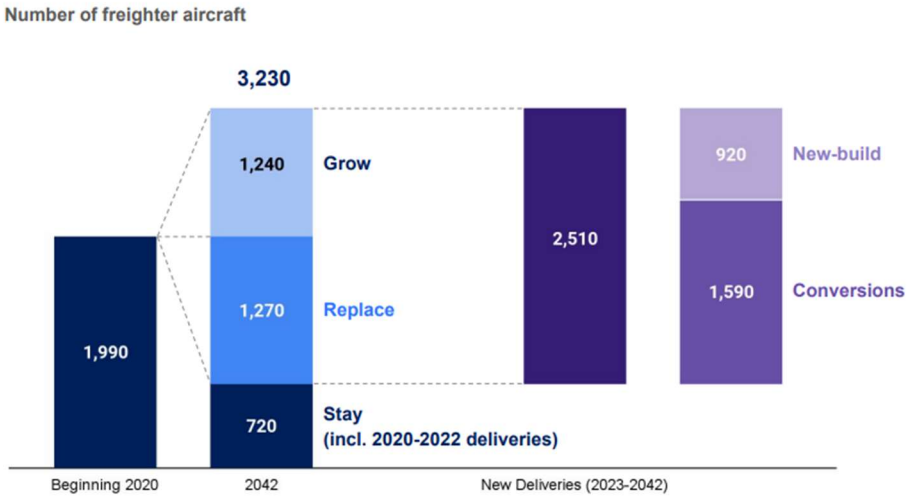
Exhibit 7: Aircraft demand from 2022-2042 (Airbus, 2023)



This 58% increase in the number of active aircraft provides a perfect opportunity for new airports to establish themselves as industrial hubs and capture the excess demand. Another key indicator of the rapid growth of the aviation industry and consequently the aeronautical industrial services sector is the current high demand for aircraft maintenance technicians (Reed, 2022).

In its 2023 Global Market Forecast, Airbus estimates that there will be 2,510 new freighter aircraft in the world by year 2042, adding up to a total world freighter fleet of 3,230 aircraft. What's especially relevant for the aeronautical industry and particularly for aircraft conversion companies is that, out of those 2,510 new airplanes that are set to be produced in the next 20 years, 63% will be reconversions from used or decommissioned passenger planes.

Exhibit 8: Freighter aircraft fleet evolution 2020-2042 (Airbus, 2023)



ESG concerns are currently pushing airlines to renew their fleets. By 2022, only 25% of airlines' fleets were composed of latest generation aircraft, which have up to 25% lower fuel consumption and CO2 emissions due to better engine efficiency and higher percentage of SAF (Sustainable Aviation Fuel) used (Airbus, 2023). Inevitably, the need for more efficient aircraft inevitably causes a ramp up to the dismantling and recycling businesses.

4.2.3. Porter's five forces analysis

It is important to acknowledge that Porter's five forces analysis must be carried out from a Real Estate rental point of view: the buyers being industrial companies who rent these spaces, and not airlines who are the final customer of the value chain.

- Threat of new entrants: barriers to entry for the industrial airport business are extremely high for several distinct reasons. Firstly, ESG and environmental regulations regarding airport construction are extremely strict due to the large amount of pollution generated by operating aircraft, therefore, governments are generally reluctant towards granting new airport construction permits. This difficulty is further intensified by the major initial investment needed for such a large infrastructure, pushing risk metrics up and in turn making it hard for private investors to get involved. Nevertheless, the Community of Madrid has recently granted permits to build a secondary airport to Madrid-Barajas at the Casarrubios aerodrome, 30km to the south of Madrid. The project, called Air City Madrid Sur, is set to require a total investment of c. € 2,500 million in the next 25 years. Although Madrid's new airport may be seen as an important threat for Ciudad Real, it will focus on becoming a secondary passenger

airport to Madrid Barajas, with a 10,000 square meter passenger terminal (the passenger terminal at CQM is 28,000 sqm), but it will only have 50,000 square meters dedicated to hangarage and industrial activities (Mesones, 2023), which is just enough for only four widebody hangars. As a result, CRIA industrial sector's market share in the middle of the peninsula will not be threatened by Air City Madrid Sur.

- Bargaining power of suppliers: suppliers would be those companies or institutions who allow CRIA to provide the necessary infrastructure and services to its lessees. For instance, utility providers for essential services such as water and electricity would be a main supplier, however, their bargaining power is relatively low as their product is heavily standardized.

  The hangar construction market is heavily concentrated since there are not many specialized companies. This factor could derivate some bargaining power when it comes to price setting for hangar construction, but it should not cause a major impediment.

- Bargaining power of buyers: limited hangarage space in existing airports gives CRIA a strong negotiating position against industrial companies wanting to establish themselves at Ciudad Real. A survey carried out by the Aircraft Owners and Pilot Association has found out that 71% of airports have a waiting list for hangar rental (Tulis, 2021). This factor is further proved by the high rents that the hangar rental market is at, with yields in the 10-20% range depending on each hangar's individual customization. As discussed before, CRIA's premises are unique in terms of scalability possibilities and weather conditions, strengthening its market positioning and bargaining power against buyers.

  Moreover, the bargaining power of industrial companies at Ciudad Real will be exponentially decreasing over time as more of them establish bases at the airport. Since currently there are only a couple companies operating at CQM (e.g., Sabena Technics) other industrial players may bargain on their market making capabilities to negotiate lower prices and better conditions; however, as CRIA becomes an industrial hub in the medium term, the situation will be turned around and it will be the companies who will want to benefit from CRIA's industrial hub and economies of scale.

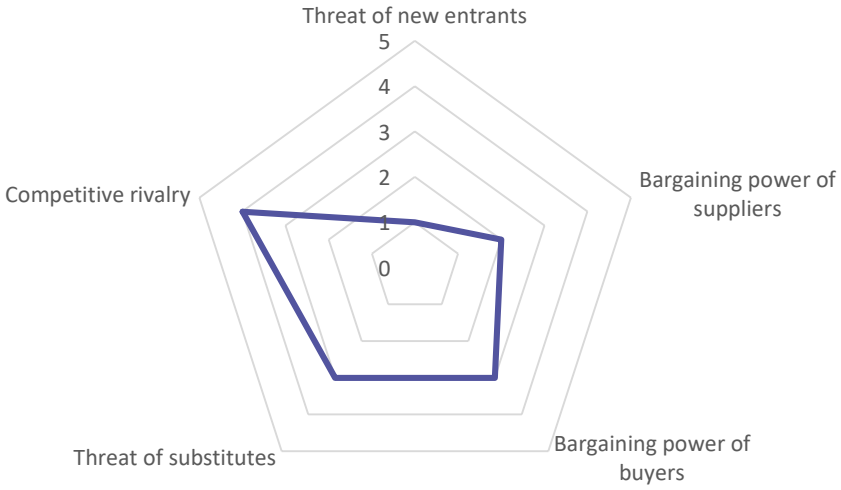
- Threat of substitutes: some potential industrial clients for CRIA may not need to be as close to the runway and could set up their warehouses at traditional industrial macro complexes or logistics parks. Ciudad Real is among the top three Spanish regions with the most built logistics parks in the past few years, together with Madrid and Barcelona (El Español, 2022). Although this could pose a threat for a small percentage of CRIA's potential industrial clients, if the Company's objective is to become an aeronautical industry hub in Southern Europe it should

focus on attracting traditional aeronautical businesses who make use of the runway and airport facilities as this generates even more revenue in terms of landing and parking fees.

- Competitive rivalry: CRIA's competitive position against other existing aeronautical industry hubs will strengthen as players start establishing themselves and operating at CQM; however, at an initial stage of the project CRIA will be forced to offer very competitive prices and conditions for industrial companies to be willing to take the risk of being the first ones to operate at the airport. Thankfully, competition is not as fierce as it should be due to physical space restrictions in existing airports which force companies to find new locations to build or rent facilities; the large amount of industrial land available at CQM is a unique selling point which no other airport can match. For comparison's sake, Spain's second largest commercial airport in terms of surface is Barcelona El Prat at 1,300 ha, which is around the same as Ciudad Real (Arroyo, 2002).

  There will be increased rivalry when it comes to attracting high value tenants such as Airbus or Boeing, as these companies act as market makers once they establish themselves at any location, attracting other smaller players to the same airport due to the possibility of engaging in economies of scale with them. CRIA has made a giant leap forward in this spectrum by making a joint venture with Sabena Technics which is one of the world's major MRO providers.

Exhibit 9: Industrial airport competition Porter's five forces analysis



The overall conclusion form Porter's analysis is that since Ciudad Real International Airport has little reputation and history as an industrial aviation hub it will be hard to attract customers at early stages of project development, however, this threat is offset by the low availability of hangarage and warehouse space in existing airports such as Madrid Barajas. Also, it is particularly important to

acknowledge that Madrid's new secondary airport project (Air City Madrid Sur) will have very limited industrial space and shall therefore not become a substantial threat to CRIA developing this business line.

4.2.4. SWOT analysis

Strengths:

- Strategic location with unique multimodal access and suitable weather: Ciudad Real airport has a unique transportation connectivity situation since it is adjacent to the high-speed railway, the highway, and it has the runway itself, making for perfect location for industrial players who may need to use all three of these infrastructure for transportation purposes, and it is also a perfect logistical node for international logistics players. At the same time, weather in the region is suitable for long-term aircraft storage and maintenance in non-corroding conditions.
- Existing infrastructure and availability of industrial land: the existing infrastructure is in perfect conditions and was designed to become a major industrial complex, in fact, the airport and logistics services area is already urbanized, which substantially lowers construction times and costs for new customers. Furthermore, the vast industrial land extension available at CQM allows for as much scalability as needed.
- Private ownership: allowing CRIA to offer tailored solutions.
- Capacity for development without environmental constraints or bureaucratic delays and building permits: the airport's Master Plan (Ministerio de Transportes y Movilidad Sostenible, 2006) already acknowledges the construction of an aeronautical industry hub in the airport's premises. Moreover, the environmental impact plan which rules CRIA's operations was calculated when the airport was first designed in the early 2000's and establishes environmental countervailing measures for 10 million yearly passengers, as a result, regulatory bodies shall impose no restriction to the construction of hangars since the environmental impact of these industrial activities is much lower than expected.

Weaknesses:

- Need to establish relationships with main industrial players: as stated in section 4.2.3., it will be key for CRIA to capture some major industrial players in the early stages of project development since they might be reluctant to establish themselves at a new airport.

- Investment needs: hangars are expensive to build at 1,000 €/sqm, and widebody hangars are over 10,000 sqm (CRIA, 2023b). As a result, CRIA will have to either a) find financing to build the hangars and later rent them to industrial companies or b) make long-term land leases to those industrial customers (at lower yields than a finished hangar) and have them pay the construction costs.

Opportunities:

- Sector in constant growth: as forecasted by Airbus (2023), in the next 20 years there will be 20,000 new aircraft delivered, doubling demand for aeronautical services, creating a major opportunity for CRIA to become a key market player.
- Global interests in logistics and transport investments: phenomena such as the rapid increase in e-commerce after the pandemic have collapsed air freight and investors are now particularly interested in the aviation industry and particularly logistics (Abadeer, 2023), as air freight and its supporting industries such as MRO expand, demand for hangars and industrial space will rise exponentially.
- Support from the regional government: Castilla La Mancha's regional government are keen supporters of the industrial aviation hub project as it will have a positive socioeconomic impact around the airport's location.
- Increasing demand for sustainable fuels and ESG practices in the aviation sector: as airlines feel forced to renew their fleets demand for industrial services rises rapidly. At the same time, CRIA's hydrogen production project will position itself as the best alternative for hydrogen-powered aircraft.

Threats:

- Competition from existing industrial airports: Teruel airport has established itself as the main industrial airport in Spain and has specialized itself in the aircraft dismantling business by having Tarmac Aerosave at the airport. Ciudad Real and Teruel are direct competitors in the industrial airport business model and Teruel has a slight advantage since it has already managed to be profitable.
- Economic downturns: the airline industry is particularly sensitive to economic downturns, therefore imposing economic risk on any aeronautical industry project.
- Technological advancements: as engineering developments are made the need for extensive servicing and spare parts may slowly decrease over time, which would have a direct impact on the market size of aircraft maintenance and servicing sector.

4.2.5. Comparison with reference airports and competition

Spain's main purely industrial airport and Ciudad Real's competitor is Teruel airport, where Tarmac Aerosave has established an aircraft recycling and dismantling base with current capacity for 250 aircraft (Tarmac Aerosave, 2023) which is expected to be increased up to 400 parking spaces by 2030 (Teruel Airport, 2023). PLATA (Plataforma Aeronáutica de Teruel), has a total extension of 340 Ha, of which 120 are dedicated to parking space. Moreover, there is 33 Ha of industrial land which is used for carrying out maintenance services and building hangars. In March 2023, PLATA inaugurated Spain's biggest double widebody hangar with a total surface of 18,000 square meters and capacity for two Airbus A380, the total construction cost added up to 23 million euros (De Santos, 2023). Moreover, Tarmac dismantled 20 aircraft in 2021 and 24 the year after (Rajadel, 2022).

PLATA has managed to attract several key players in the aeronautical industry and has created a major industrial hub where the following companies offer their services (Teruel Airport, 2023):

- Tarmac Aerosave: long-term parking, aircraft dismantling and recycling, and maintenance.
- Elson Space Engineering: new technologies in the space travel industry.
- PLD Space: Spanish start-up aiming to provide affordable access to space travel.
- BP Oil: fuel supplier at PLATA.
- Delsat Aeronautics: drone manufacturer and operator offering services to different industries such as surveillance, farming, or tourism.
- Eco-oil: recycling of plastic material from aircraft.
- Airbus: operates two logistics facilities at PLATA.
- IAC: aircraft painting.
- Sceye: design and manufacturing of geostationary platforms.

Apart from these companies' services, Teruel Airport itself has the possibility to carry out executive aviation and cargo operations, as well as pilot training and advertisement activities.

When compared to Teruel, Ciudad Real International Airport is clearly superior in terms of infrastructure and growth potential as an industrial aviation hub:

- Transport connectivity: having access to the high-speed railway at CQM is a major competitive advantage as an industrial hub since it improves supply chain efficiency by being able to import and export materials by train, it gives access to workforce in higher radius than only by road, and it provides a fast way to travel to the airport for clients or any stakeholders.

- Industrial land availability: CQM's Master Plan considers 1,234 Ha of industrial land (Ministerio de Transportes y Movilidad Sostenible, 2006), which is four times more than that available at PLATA.
- Economies of scale: by conducting executive, cargo, and industrial operations at Ciudad Real, industrial players can benefit from the presence of suppliers and clients at the airport.
- Safety and certification: Teruel does not have a control tower like CRIA does, and it does therefore not provide AFIS service to incoming and outgoing aircraft. Furthermore, it is only authorized to receive flights with up to 19 passengers onboard (De Santos, 2023), while Ciudad Real is authorized to receive any kind of commercial flights as it was initially purposed as a passenger airport.

One major difference between CRIA and PLATA is ownership structure. Whilst CRIA is a 100% privately owned company, Teruel Airport is owned by a public consortium composed of the Government of Aragon (60%) and Teruel Townhall (40%) (Ruiz, 2023). Inevitably, being a public entity gives PLATA some advantages such as easier access to public financing from Spain or the European Union, easily being granted licenses and permits for the operation of the different business established at the airport, or the capacity to develop fruitful relationships with all kinds of organizations. Although CRIA has a very close relationship with the regional government of Castilla la Mancha, who are keen to provide the necessary permits and licenses and are proactive in helping CRIA develop relationships with key stakeholders, it is access to public financing where Teruel has a very significant competitive advantage over Ciudad Real.

4.2.6. Revenue, costs, and necessary investments

The Real Estate rental business model where CRIA does not get involved in the actual service delivery has two main revenue streams:

- Rents: the core revenue source is the facilities rental payments. Market research done through Idealista (2023) platform reveals that real estate profitability for logistics warehouses in Ciudad Real is at around 10% yield, considering the scarcity and exclusivity of airport hangars, capitalization rate would easily be in the 12-15% range for CRIA's real estate assets.
- Variable fees on maintenance activities: those industrial activities which do not require the use of hangars or warehouses, such as in-line maintenance, may pay CRIA a variable fee per serviced aircraft or a percentage of the revenue they generate from operations at Ciudad Real.
- Aircraft landing and parking fees and fuel.

Most operational costs allocated to the industrial business line are generated by the constant maintenance and technological upgrades that must be carried out on the assets, as well as utilities services and security.

The biggest obstacle to the successful implementation of the industrial airport business model is the initial investment needed to build hangars at Ciudad Real. According to information provided by CRIA (2023b), average hangar construction cost is in the 800-1000 €/sqm range for normal hangars such as the ones used for MRO or dismantling. Aircraft painting hangars are even more expensive at c. 1500 €/sqm due to specific design characteristics. These prices provided by CRIA are in line with Teruel's new double maintenance widebody hangar which has incurred a total construction cost of €23 million for 18,000 sqm (1,277 €/sqm) (De Santos, 2023). Narrowbody hangars are much smaller at around 1,500 sqm but still add up to an approximate total cost of 1,5 million euros.

The initial investment needed depends on the number and type of hangars that CRIA wishes to build, but in the most conservative case it would require a total investment of almost 50 million euros in the first 3-5 years of project development to create enough synergies and traction for future growth potential:

- Two widebody hangars for Sabena Technics at a total cost of €8 million each (10,000 sqm at 800 €/sqm)
- One widebody aircraft painting hangar at a total cost of €15 million (10,000 sqm at 1500 €/sqm)
- One widebody aircraft dismantling hangar at a total cost of €8 million (10,000 sqm at 800 €/sqm)
- One widebody aircraft conversion hangar at a total cost of €8 million (10,000 sqm at 800 €/sqm)

4.2.7. Conclusion

Ciudad Real International Airport meets all the necessary requirements to become a major industrial airport in southern Europe, and when compared to Teruel Airport which is currently the leading competitor in this sector, Ciudad Real comes out as significantly better location due to its core characteristics.

However, the Real Estate rental business model requires a major investment of at least €50m over the next 3-5 years to build hangars and warehouses and set up a proper industrial aviation hub. The success of the project heavily relies on CRIA's ability to finance these construction works, however,

CRIA could explore alternative options to making the investment itself such as exploring a concessionary business model by which a third party (most likely a Real Estate developer or infrastructure investment fund) would pay an annual concession fee to CRIA for the right to exploit the Real Estate business. By doing this, CRIA would eliminate the need for financing a big initial investment, and it would also outsource the engineering, administrative, and marketing work needed to develop these assets.

4.3. Cargo airport

4.3.1. Introduction

CRIA has a ready-to-use 7,200 sqm cargo terminal, which is divided into 4,000 sqm of dry cargo area and 2,100 sqm for cold storage of perishables. The building has not been used since 2020, during the pandemic, when an international freighter imported sanitary equipment through CQM, making CRIA 2,6 million euros in revenues due to the landing and handling fees of the cargo, this represented over 50% of the Company's revenue that year. Such figures act as a reminder of the revenue-making potential that the air freight and logistics business line could provide for CRIA.

The cargo terminal at CRIA has a total handling capacity of 70,000-90,000 tons according to CRIA (2023), which at the current 0,06 €/Kg rate would represent a potential yearly revenue of around 5m euros.

Although Ciudad Real has not started operating with air cargo yet, there are several favorable factors that make it worthwhile to explore the business line:

- No need for initial investment since the cargo terminal is ready to use.
- 4E airport certification allows any size cargo aircraft to operate at Ciudad Real.
- The possibility of developing an intermodal logistics node due to the convergence of highway, high-speed railway, and air traffic in the same location.

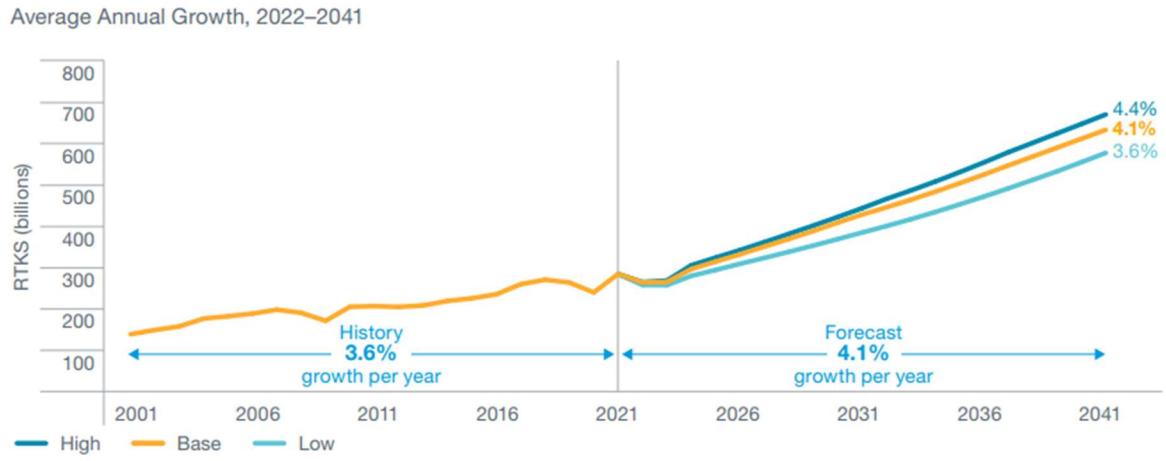
Air cargo is defined as the transportation of goods through air travel, but this may take two different formats (Popescu, Keskinocack and al Mutawaly, 2010). Firstly, cargo-only carriers operate airplanes which have been converted from passenger aircraft to full-freighters by taking away the seats and doing some other necessary modifications to fit as much cargo as possible. This type of freighter specializes in long-distance or intercontinental freight forwarding and represents around 10-15% of total air freight; an example of a cargo-only carrier would be DHL. Secondly, there are "combination carriers", this term is used to define regular airlines who fill the extra space in their airplane's bellies

with cargo. Since CRIA is currently inactive in passenger flights, the air cargo market share it would need to capture has to come from cargo-only carriers.

4.3.2. Market trends and forecasts

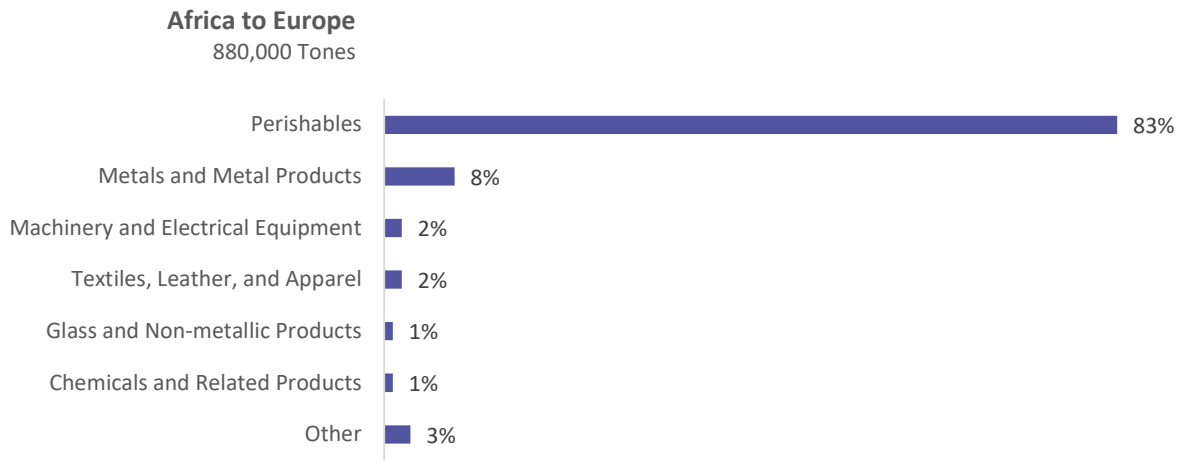
According to Boeing's 2022-2041 market forecast, global air cargo is set to grow 4.1% per year for the next 20-year period. This growth will be majorly driven by a sharp increase in e-commerce which started during the pandemic, and which is forecasted to keep growing steadily as consumers adopt new technologies.

Exhibit 10: Air freight global annual growth, 2022-2041(Boeing, 2022)



Due to its location acting as the connection between Africa and Europe, Ciudad Real's cargo terminal could become a major hub for perishables imports coming to Europe from the African continent. Boeing (2022) estimates that 83% of the products which Africa exports to Europe are perishables, and with a portion of the cargo terminal adapted for perishable goods' storage, it seems logical that CRIA could capture some market share in this area. Long-distance cargo is normally transported to main cargo hubs and from there it is redistributed to its final destination either by another air freighter or any other transportation method. Currently, Liege airport in Belgium is one of the main players when it comes to perishables goods transport, and some of the cargo travels from Africa to Liege and then is redistributed back south to countries such as France, Spain, or Italy. It would make both financial and time-saving sense to send this type of cargo to Ciudad Real as a redistributing center instead of going all the way up to Liege.

Exhibit 11: Breakdown of goods transported from Africa to Europe (Boeing, 2022)



In Spain, air cargo has thrived in the past two decades with a total increase in air freight volume of 48.6%, adding up to around 1 million tons per year. However, this increase in total volume has come together with a deeper concentration of market share by the biggest airports in the country, for instance, "the four main air cargo airports have increased from 71.1% to 90.3% of total volume between 2000 and 2017" (Escolano, Cruz-Alonso and Pueyo-Campos, 2019).

4.3.3. Porter's five forces analysis

For Porter's five forces analysis we must consider the airport's point of view, therefore considering air freighters as clients and specialized service and equipment providers as CRIA's suppliers.

- Threat of new entrants: establishing a new air cargo facility requires very high initial investment and it is unlikely that any new airports will be built in the medium term in Spain. The only airport project currently under development is Madrid's secondary airport Air City Madrid Sur which in its very early stages of development (Mesones, 2023), nevertheless, once it starts operating it could become a competitor for Ciudad Real's cargo business since it is also located to the south of Madrid.
- Bargaining power of suppliers: CRIA's main suppliers for its cargo operations would be the cargo handling personnel. Since the cargo handling industry is highly fragmented as there are many big international players (e.g., Swissport, Fraport, Aviapartner) who offer their services at similar rates (Fortune Business Insights, 2023b), these suppliers should not have significant bargaining power against CRIA. Moreover, CRIA would most likely follow its strategy of in-house services and train its own cargo handling team to reduce costs and optimize its

resources, and by doing this it would eliminate any need to negotiate with cargo handling companies.

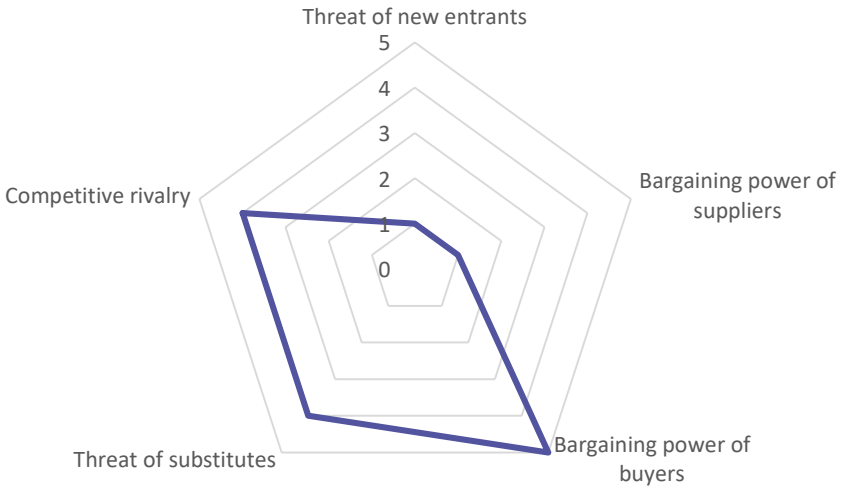
- Bargaining power of buyers: air freighters have very low switching costs from taking their cargo to neighboring airports, in fact, it is not normally their decision where they land and unload the cargo. The key factor determining which airport carriers choose is where the final client who is importing the goods is located. For example, if a forwarder such as DHL has a planeload of cargo with Madrid as its destination, it is very unlikely that it will land at any other airport which is not Madrid Barajas. This is proven by Zaragoza airport's business model which is heavily dependent on Inditex's cargo handling (Isabel and Ramos Pérez, 2010). One of the main challenges of the cargo airport business model that CRIA faces is the low demand for cargo in Castilla La Mancha compared to the major Spanish cargo centers; however, Ciudad Real has the possibility to become an intermodal logistics hub by connecting train, road, and air transport which is a unique selling point compared to any other Spanish airport.

  The latter conclusion that cargo destination is highly dependent on client location suggests that, for the accurateness of the five forces analysis' sake, cargo owners should be considered the buyers rather than cargo handling companies; therefore, the bargaining power of suppliers is extremely high.

- Threat of substitutes: short-distance cargo faces a strong threat of being substituted by road and train transportation. Although these transportation methods incur longer delivery times, they produce far less pollution than air transport. This factor could at some point even prompt governments to regulate shorter-distance air freight to comply with ESG regulations. In fact, Spain's government has already stated their intention to ban passenger flights which are shorter than two and half hours whenever there is a train alternative (Gallegos, 2023). The threat of cargo switching to alternative transportation methods is sharpened by technology developments which may make those alternatives even faster and more energy efficient, such as supersonic trains or hydrogen-powered trucks.
- Competitive rivalry: air cargo demand is almost fully driven by importers and exporters' requests for getting their cargo handled at a particular location where it is more convenient for them. The perfect example of this is Zaragoza airport in the north of Spain which has recently become one of the major cargo hubs in the country due to the huge volume of imports and exports that clothing manufacturer Inditex is handling at the airport. Inditex cargo represents 80% of the c. 150,000 tons that are handled at Zaragoza yearly (Isabel and Ramos Pérez, 2010), which ranks as the third largest cargo airport by volume in Spain. As a result, competition is location driven rather than service quality driven. Consequently, the

competitive rivalry in the cargo airport industry is heavily related to the bargaining power of buyers (cargo owners).

Exhibit 12: Cargo airport Porter's five forces analysis summary



In conclusion, competition is fierce in the air cargo industry since air freighters have very low switching costs and demand is mostly driven by location preferences. To thrive as a cargo airport, Ciudad Real must secure some major exporters or importers like Inditex who are interested in getting their cargo handled at Ciudad Real due to its competitive advantages such as the intermodal location.

4.3.4. SWOT analysis

Strengths:

- Suitable location for capturing market share of main cargo routes: as discussed in section 4.3.2., Ciudad Real has a strategic location in two different ways: it can capture market share from the major international trade routes by acting as connection point between a) Europe and America and b) Europe and Africa, and being located in the middle of the Iberian Peninsula and with intermodal logistics capabilities make it a good location for establishing cargo routes.
- Existing infrastructure: the existing cargo terminal is capable of processing up to 90,000 tons of cargo per year, which would add up to almost 10% of the total Spanish cargo volume, being more than enough for as much demand as CRIA has without the need for any additional major investment.

- Potential for expansion: in case these 90,000 tons per year were exceeded, the large availability of industrial land at Ciudad Real would allow for the construction of second cargo terminal.
- Faster and more efficient handling than at larger airports: being a smaller non-passenger airport provides the potential to reduce aircraft taxi times and improve cargo handling efficiency, which effectively translate to less costs for air freighters due to lower fuel consumption.
- Capability of handling different types of cargo (dry and cold).

Weaknesses:

- Well-established competition: Porter's five forces analysis in the latter section reveals that the air cargo industry is very competitive and cargo hubs are already well established. CRIA will need to have extremely competitive prices and good conditions to attract cargo to its airport.
- Initial project success dependent on a few players: at the early stages CRIA must attract its first clients, and only major clients like Inditex will be willing to take the risk of being an airport's first client and they will have lots of bargaining power over CRIA.

Opportunities:

- Growing demand: Both Boeing and Airbus' 2023 market forecasts show optimistic predictions for the air freight sector at a yearly growth rate of c. 4%.
- Potential to improve existing cargo routes: Ciudad Real could capitalize on its good location to act as a new long-distance cargo node where goods could be imported form America and Africa and be then distributed from Ciudad Real off to Europe's different countries.

Threats:

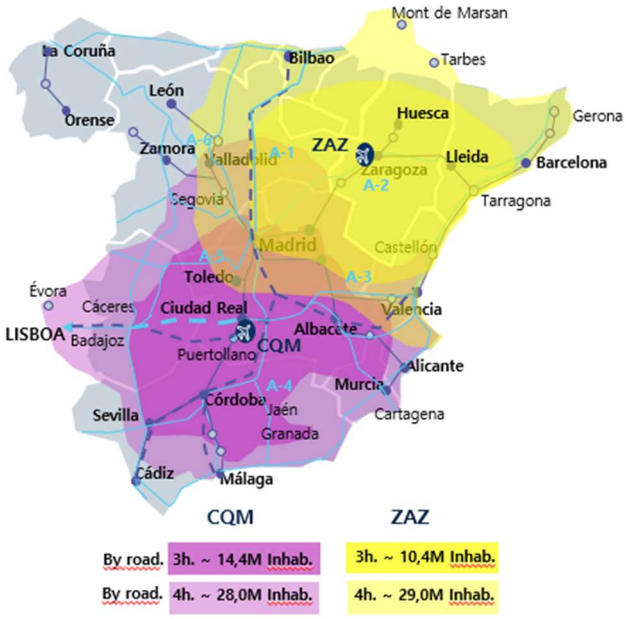
- Changes in regulation and trade policies: recent geopolitical tensions may result in changes in trade agreements between countries which would directly impact trade routes established at Ciudad Real.
- Technological developments: technological advancements making road, maritime, and train transport faster and more efficient are a real threat to the air cargo industry. Nevertheless, major OEM airplane manufacturers and some start-ups are making significant engineering progress towards delivering faster and more sustainable aircraft.

4.3.5. Comparison with reference airports and competition

In 2005, Gardiner, Humphreys and Ison described the airport selection process by air freighters as a three-stage method: location selection, operational restrictions assessment, and airport quality selection.

At the location selection stage, geographical position is of key importance as it determines both the possibility of establishing fixed trade routes between cities, countries, or even continents, and it defines the overall demand for cargo that will be generated by the hinterland (influence area around a logistics port) found around the airport at a reasonable distance for land-transportation logistics companies. A hinterland analysis carried out by CRIA can be seen in Exhibit 13, where Ciudad Real's surrounding population up to 4 hours by road distance is compared to that of Zaragoza airport. Results show that CRIA has a population of 14.4 million people living at less than three hours distance by road, while Zaragoza's 3-hour range population is 4 million people lower. At the 4-hour range both airports have a similar hinterland of c.30 million people. This data suggests that, in terms of demand from the surrounding population, CRIA has a competitive advantage over Zaragoza due to its proximity to major cities in the south of Spain such as Cordoba, Malaga, Seville, or Alicante.

Exhibit 13: CRIA and Zaragoza hinterland analysis (CRIA, 2023b)



A second major factor in the location selection stage of the process is assessing industrial and commercial activity in the surroundings of the airport and the existence of logistics centers and major logistics players in the area. Zaragoza airport is located right next to the Zaragoza Logistics Platform, where clothing manufacturer and major retailer Inditex carries out its logistics operations for exporting

products all around the world. The presence of Inditex in the proximity of Zaragoza has made it the airport's main client with over 80% of the cargo handled at Zaragoza being owned by Inditex (Isabel and Ramos Pérez, 2010).

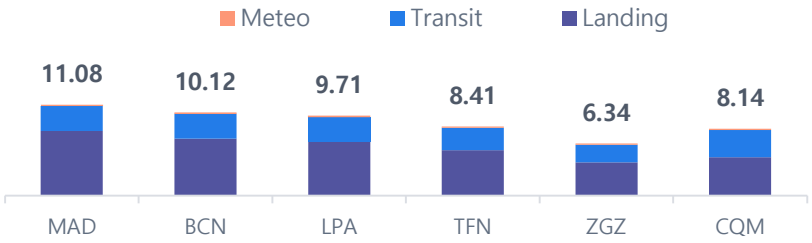
Lastly, location selection is also heavily influenced by weather conditions to minimize flight cancelations due to adverse conditions, and by the possibility of engaging in intermodal logistics operations. These factors are two of Ciudad Real's major competitive advantages and make it a serious candidate for the development of an intermodal logistics node.

At the second stage of the selection process, the operational restrictions assessments, freighters analyze factors which may impede or slow down operations at potential airports. These factors include noise restrictions and the possibility to operate during nighttime, environmental regulations, and airport certification for aircraft size; none of these factors would negatively impact the assessment of Ciudad Real as a potential cargo airport. Another key element to be analyzed is the possible existence of exclusivity agreements between the airport and competing air freighters, which is not the case at CQM.

The last stage of the selection process, airport quality selection, is highly dependent on price competitiveness and operational efficiency of the cargo handling process. Ciudad Real operational efficiency is unmatched by its competitors due to the cargo terminal being right next to the main runway, and the absence of traffic from passenger flights minimizes waiting times for take-off and landing. Price benchmark analysis (Exhibit 14) conducted on the main cargo handlers developing operations in Spain against CRIA's cargo handling rates show that CRIA has 60% lower prices than the market average. Furthermore, operating charges at CQM for landing, transit, and meteorological services are lower than at the main Spanish cargo airports; however, Zaragoza does have considerably lower prices at almost 2 euros per ton of MTOW per flight than CRIA.

Exhibit 14: Benchmark cargo terminal basic handling rates (€/Kg) (Groundforce; ACL; Swissport; WFS; IAG Cargo; CRIA, 2023)

Exhibit 15: Benchmark operating charges at cargo airports in Spain (€/t MTOW) (AENA, 2024)



4.3.6. Revenue, costs, and necessary investments

The cargo airport business model generates revenues mainly from cargo handling fees (€/kg). These revenues are complemented by storage fees when the cargo must be left at the terminal before the next handler arrives to collect it. These fees vary depending on the type of cargo, storage period, and dimensions. CRIA's cargo handling rates are currently at 0.06 €/kg (CRIA, 2023b) which, as seen in the above section, are well below market rates as an aggressive marketing strategy to attract the first customers.

As with the executive and industrial operations, CRIA would also generate revenue through landing and parking fees, as well as fuel sales.

All airport operations incur maintenance costs as well as utilities, safety and security services costs. However, the cargo terminal operations do have direct labor costs due to the workers needed to actively handle the cargo loads. CRIA (2023b) estimates that it would need to allocate around 10 employees to the cargo terminal whenever there are incoming flights.

In terms of necessary initial investments, since the cargo terminal is in ready-to-use condition, there should be no major capital expenditures at the initial stage of the project.

4.3.7. Conclusion

CRIA has some characteristics which make it a potential cargo hub in the middle of the Iberian Peninsula: competitive prices, weather conditions, operational efficiency, and significant hinterland. Most importantly, the convergence of the highway, high-speed railway, and a runway at the same location has the potential to develop a major intermodal logistics hub at Ciudad Real.

Moreover, due to the rise in e-commerce, air freight is rapidly growing at a 4.1% annual growth rate (Boeing, 2022), which will provide opportunities for new cargo hubs to be developed to accommodate the increasing demand and to create more efficient cargo routes than the existing ones. Nevertheless, Ciudad Real will have to fight the market concentration tendency which has caused 90% of Spanish cargo to be handled by a handful of airports (Escolano, Cruz-Alonso and Pueyo-Campos, 2019).

The major conclusion is that for CRIA to launch the cargo terminal project it needs to find a major logistics player that wants to handle its cargo at CQM. This strategy was the one followed by Zaragoza airport whose cargo handling operations are 80% Inditex exports and it has allowed it to become the third largest cargo airport in Spain.

4.4. Deciding on which business lines to develop – SAFE criteria

The SAFE criteria aim to provide a framework for businesses to identify optimal strategic options based on four dimensions (Johnson et al., 2020):

- Suitability: addresses whether the organisation is able to capitalize on the opportunities and handle the threats it is presented with due to external factors and internal characteristics.
- Acceptability: compares the risk-return balance of the analysed strategy. Furthermore, it assesses the strategy's alignment with the company's stakeholders.
- Feasibility: addresses whether it would be possible to implement the strategy in terms of availability of resources or the capacity to obtain them.
- Evaluation: final overview and decision making based on the previous three factors.

To decide which combination of the three possible strategies CRIA should implement (executive, industrial, cargo), a SAFE analysis will be carried out for each of the based on the previous market research.

4.4.1. Executive airport

<u>Suitability</u>

- Market trends and forecasts: with the global business jet market annual growth rate set to be 3% (Statista, 2023) there is no reason to believe that the current market environment is not suitable for CRIA to expand its executive business line.

- Porter's five forces analysis: the competitive rivalry analysis reveals positive results since the only significant force is the bargaining power of suppliers due to the high competitor concentration in the MRO industry, which CRIA should be able to overcome as these industrial players will be interested in working in Ciudad Real to have access to the other non-executive aircraft operating at CQM.
- SWOT analysis: CQM's executive aviation demand is mainly driven by its location since most of the incoming flights have Ciudad Real as their destination for hunting related activities. Although this factor ensures that CRIA will have a floor demand level, it also limits the strategy's scalability.
- Reference airports and competition: demand is primarily hunting-focused, so Ciudad Real has no comparable airports in that matter apart from local private aerodromes. However, it can compete with other Spanish and European airports to become an MRO base for private jets since it offers significantly lower tariffs than the main European hubs.

Acceptability

The revenue, costs and investments analysis performed in section 4.1.6. suggests that the risk-return balance of the executive business line is well above the minimum acceptable threshold due to there being no need for significant additional investments to ramp-up the business plan.

Feasibility

With CQM successfully operating as an executive aviation airport, it is well proven that the Company has the necessary resources to carry out executive aviation activities at its facilities.

Evaluation

Overall, the executive aviation business line meets all the SAFE criteria to be implemented by CRIA at CQM. Most importantly, the absence of any need for initial capital expenditures and the fact that this business line has been profitable for CRIA in the past few years is a good enough reason to keep pursuing this market and aim to become a private aviation hu in Southern Europe.

4.4.2. Industrial airport

Suitability

- Market trends and forecasts: Airbus Global Market Forecast 2023 suggests that the number of aircraft in service will double in the next 20 years, which is a clear indicator of market growth for the aeronautical industrial services sector.
- Porter's five forces analysis: the initial phases of the strategy implementation will be particularly difficult due to possible reluctancy of the main industrial players to be the first one to establish themselves at CQM. Nevertheless, by already having Sabena Technics working at Ciudad Real, CRIA has made a great leap forward in accelerating ramp-up.
- SWOT analysis: the airport's facilities turn out to be ideal for carrying out industrial activities. Most importantly, having a large capacity for expansion is a determining factor for companies on deciding where to establish their operations, and CQM has more industrial land available than any other Spanish airport. This factor is key given the current market forecasts suggesting that the number of aircraft in operation will skyrocket in the coming years. On the other hand, CRIA will need to make major initial investments to build hangars and warehouses, similarly to what Teruel airport has done to host Tarmac Aerosave. Thankfully, the local government is keen to help the airport thrive, and its support will ease the task of raising the necessary capital and also to attracting the first clients.
- Reference airports and competition: PLATA is Ciudad Real's main competitor as an industrial airport, and it has proven that the business model can be implemented in Spain. Although Teruel, being a government-owned infrastructure, has had significant help from the relevant authorities, Ciudad Real does have much better technical characteristics in terms of infrastructure and connectivity which should enable it to capture a major percentage of market share.

Acceptability

Implementation of the industrial airport strategy will require a high initial investment priced at c. €50 million to build an attractive array of widebody and narrowbody hangars to be rented by industrial players. However, thorough analysis of the logistics and industrial Real Estate market in the area (Idealista, 2023) reveals that CRIA could ramp-up to a target capitalization rate of 12-15% which should enable it to raise the necessary debt to engage in the Project. The business model's revenue generation capacity is exponential since all the landing operations from aircraft coming to Ciudad Real to be

serviced will incur in landing and handling fees paid to CRIA. Also, operational expenses are limited to the maintenance needs of the facilities which CRIA (2023) estimates to be around 3% for hangars and warehouses as can be seen in appendix 4. Overall, the Real Estate rental business model turns out to be very profitable at the stated rates so, given the possibility to raise the necessary financing, CRIA shareholders will be attracted by the risk-return profile of their investment.

Feasibility

The most important resource for the development of an industrial aviation hub is the availability of land with the necessary construction permits to carry out industrial activity, and CQM clearly excels in that matter with its large extension of ready-to-build urbanized land.

As long as CRIA is able to get the necessary debt to make the initial capital expenditures for hangar construction the Project should be perfectly feasible. Moreover, the Company would have the second option of making long-term raw land leases to industrial players and have them assume the construction costs of their infrastructure, therefore eliminating the need for a large cash disbursement in the coming years.

Evaluation

CRIA's infrastructure design makes it a clear contender for becoming Teruel's biggest competitor in the industry, and said characteristics coupled with the current positive market environment suggest that the industrial airport strategy perfectly meets the suitability criteria established in the SAFE framework. Moreover, the possibility to approach the airport's development in two different ways (raising debt or long-term land rental) and the high potential IRR (Internal Rate of Return) achieved with this business model strongly advocates for its implementation.

4.4.3. Cargo airport

Suitability

- Market trends and forecasts: the air cargo industry is projected to grow by over 4% annually in Boeing's 2022-2042 market forecast report. This consistent growth, fueled by the rise in e-commerce, will in turn be translated into a need for cargo capacity expansion in Europe. As a result, it would be a good moment for CRIA to tap into the market as a cargo hub with a strong

focus on perishables and trying to establish optimized cargo distribution routes. With 83% of the cargo being transported from Africa to Europe consisting of perishable goods (Boeing, 2022) and CQM having a fully operational 2,100 sqm cold cargo terminal, the market poses a great opportunity for CRIA to capture significant market share.

- Porter's five forces analysis: the market competitiveness assessment concludes that demand for cargo handling at an airport is highly dependent on location and individual client demands, as a result, market penetration will be a difficult task. CRIA must try to replicate Zaragoza's strategy of becoming the cargo partner of a major importer or exporter who moves enough cargo to make cargo terminal operation breakeven.
- SWOT analysis: with a current capacity for handling 90,000 tons per year, CRIA is well prepared to start cargo operations without the need for a significant initial investment. Its potential to expand the current cargo terminal or build new ones is a key strength compared to other airports, but its main differentiating factor is its capacity for fast handling due to not having too much traffic at the airport. However, competition and the current lack of clients does pose a significant threat to the initial ramp-up.
- Reference airports and competition: Zaragoza airport, having become the cargo airport partner of Inditex, is a perfect business model example for CRIA. The hinterland analysis carried out by CRIA (2023) shows a similar population of c. 30 million inhabitants within 4 hours by road, meaning that Ciudad Real should have a similar potential to generate cargo demand, although Project success will be tied to having one major initial client. For cargo airlines, Ciudad Real's handling rates which are 60% lower than the market average will be a major differentiating factor.

Acceptability

As with the executive airport project, starting cargo operations at Ciudad Real would not require a major investment from CRIA since the terminal is ready to use. However, profit margins in the early stages of the ramp-up are likely to be tied due to implementing an aggressive price reduction strategy in order to attract clients. Nevertheless, once a major client is secured it is likely that other major players and airlines will be interested in rerouting to CQM and a price escalation phase can begin, consequently increasing operating income.

Having cargo operations at Ciudad Real would have a massive effect on CRIA's enterprise value due to the potential revenue generation that can arise from that business line, and therefore implementing this strategy would add a lot of shareholder value.

Feasibility

With the cargo terminal being already built and the possibility to either outsource cargo handling to one of the major players (e.g., Groundforce or Swissport) or have an in-house cargo handling team at CQM, CRIA has all the necessary resources to start cargo operations.

Evaluation

The cargo airport business line meets all the required criteria established by the SAFE framework to advocate for its implementation. A positive outlook on the cargo market powered by e-commerce and optimizable cargo routes, the existing dry and cold cargo terminal with possibility for expansion, and good hinterland are irrefutable factors that push towards trying to make Ciudad Real a major air cargo hub in Spain.

4.4.4. Overall decision

Individually, the three business models satisfy the SAFE criteria, and the overall conclusion is that due to the airport's large availability of industrial land these activities are perfectly compatible with each other, and CRIA should pursue the three business lines at the same time. Moreover, this will increase the potential for economies of scale due to sharing suppliers and clients among the different business groups.

5. CANVAS BUSINESS MODEL

In this section, a detailed description of the Business Model Canvas for the combination of the three different business models is portrayed. Moreover, appendices 5,6, and 7 include Canvas models for each individual business line.

Value propositions:

- Industrial: CRIA will offer custom solutions to the industrial companies who establish themselves at the airport. Furthermore, they may choose between different possibilities for their facilities' location depending on their specific needs and the resources they must have access to.
- Executive: private aircraft clients can take advantage of an exclusive executive terminal where passport and weapons intervention are especially agile due to the absence of commercial

passenger flights at the airport. Moreover, CRIA offers the possibility to rent private hangars for aircraft storage and maintenance which can be tailored to each client's aircraft size and infrastructure requirements.

- Cargo: CRIA's main value-added characteristics which logistics operators and freighters will be keen to exploit is the possibility of intermodal transportation. Also, efficient cargo handling and low waiting times for take-off and landing represent significant cost reductions for air freighters. The capacity to handle cold or perishable cargo is also particularly important.

Customer segments:

- Industrial: clients include MROs, aircraft dismantling and recycling companies, aircraft painters, engine testing and maintenance businesses, space exploration companies, or any other industrial player who may need a 4E type runway.
- Executive: private jet owners and charter companies. There are two distinguishable customer segments, firstly, there are airport users who either land at Ciudad Real or use the long-term parking platform, and secondly, there is a smaller customer segment who may be interested in private hangar rental.
- Cargo: as discussed in the air cargo market research section, there are two types of air freighters: cargo-only freighters and regular commercial airlines who fill extra belly space with cargo. Due to the absence of passenger airlines at CQM, CRIA's clients will be cargo-only freighters.

Customer channels: being a B2B business model, CRIA will not need to conduct any advertising or marketing campaigns to the public apart from regular press releases or news articles that keep stakeholders up to date with the airport's operations and situation. Instead, the Company must make targeted marketing efforts such as attending industry events, fairs, and trade shows, and contacting possible customers directly hoping to establish fruitful relationships with them. As the airport develops as a major hub for industrial, executive, and cargo activities, it will become well-known in the industry and marketing activities may decrease in intensity. Nevertheless, at all stages of the business plan, it is key to maintain a well-structured website where customers can find all relevant information about CQM's facilities, services, and prices.

Customer relationships: since aviation is an industry with a relatively big fan-base, CRIA and the companies established at the airport could analyze the possibility of organizing events at the airport for the public to get to visit the infrastructure and see the parked aircraft.

Revenue streams: all three business lines share some common revenue generating activities for CRIA, such as fuel supply, landing fees, airport, and meteorological services fees, and also Real Estate rental to companies in any of the three sectors (hangars for industrial or executive aviation companies, and logistics terminals for cargo operators). However, there are also some distinct revenue sources:

- Industrial: for those companies who provide services which don't require hangar use, CRIA may agree on a variable fee such as a percentage of their revenues or a certain fee for each services aircraft; for instance, this is the case for in-line maintenance activities. Moreover, being a privately-owned company, CRIA may agree on more complex business structures such as the joint venture it has created with Sabena Technics to provide MRO services at Ciudad Real.
- Cargo: handling and storage fees paid by air freighters.

Key resources: these are the basic airport infrastructure and resources needed to carry out operations. The minimum active infrastructure that the airport must have to be able to operate are its safety systems and control tower, firefighter truck, security services, active management team, runway lighting, operational cargo and industrial facilities, available office space at the passenger airport as well as the executive section of it, and a skilled workforce capable of maintaining and operating the infrastructure.

Key activities: CRIA's main and most costly activity is the maintenance and upgrading of airport infrastructure. It must also carry out the necessary environmental protection measures as specified by the relevant authorities due to being next to a Special Bird Protection Zone (ZEPA), and it must make sure that all airport operations and infrastructure comply with the aviation regulations in place and the certifications that CQM has been granted. CRIA personnel must also undergo periodical safety training to be able to access the airside part of the airport (aircraft parking, taxiway, and runway).

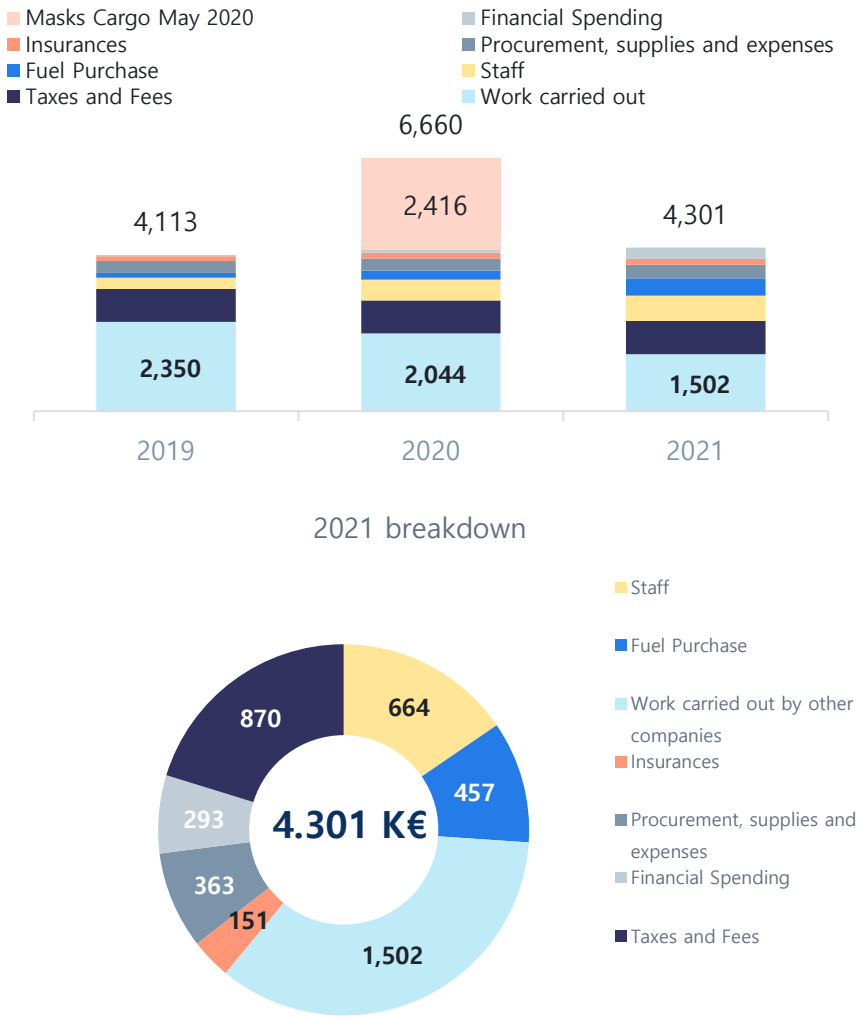
Key partnerships:

- Regional government: the government officials of Castilla La Mancha are keen to help Ciudad Real International Airport succeed and have been very supportive of developing new business models at CQM in the past.
- Air freighters and logistics companies: developing a strong partnership with a major air freighter such as DHL would help CQM become a major cargo airport. The cargo project could also be tackled in the opposite way, by establishing a partnership with a major exporter or importer who requires air freighters to operate at CQM (similar to Inditex at Zaragoza).

- Aviation associations: these organizations may be able to help CRIA with marketing activities as well as provide specialized consultancy services and help develop relationships with potential clients.
- Utilities services providers: gas, water, fuel, and electricity providers are key to CRIA's value chain.
- Railway authorities and train operators: in order to develop an intermodal logistics platform CRIA would need to connect the high-speed railway to the airport, a project which must be fully supported by railway authorities (Adif) and operators (Renfe, Iryo, and Ouigo).
- Technology providers: software providers and meteorological services providers are examples of key technological services who CRIA must have positive relationships with.

Cost structure: CRIA's past cost structure breakdown can be seen in Exhibit 16.

Exhibit 16: History of CRIA's operating expenditures for the 2019-2021 period (CRIA, 2023b)



6. CONCLUSION

The previous analysis reveals that CQM's infrastructure characteristics are unique in its asset class, mostly due to its existing facilities, its vast industrial land extension, and location. Due to its initial design as Madrid's secondary airport to Madrid-Barajas, the facilities are well oversized for the current activity levels, and it has more expansion capacity than any other Spanish airport. Moreover, with the northern part of the airport being already urbanized, classified as industrial land, and a having a large margin until the DIA (Declaration of Environmental Impact) constraints are reached, the airport makes for a prime greenfield asset to start an aggressive expansion period in the three analyzed sectors: executive, industrial, and cargo airport operations.

The aeronautical industry currently enjoys a positive outlook which is reflected in aircraft orders received by market leaders Boeing and Airbus, who estimate an unprecedented increase in the global aircraft fleet in the short and medium term fueled by growing air travel and cargo operations. This growth is inevitably reflected in the executive, industrial, and cargo sectors being explored by CRIA.

Although the number of business jet operations at CQM has a hard cap fixed by the annual flights arriving at Castilla la Mancha, there is still room to quadruple the current 25% market share until c. 1,000 annual operations are reached, with much bigger growth capacity in the industrial services that can be offered to private jets such as MRO and maintenance. Once CRIA makes the initial investment for hangar construction and industrial operators start to settle in Ciudad Real there will be significant synergies created between the different players established at the airport, and economies of scale will inevitably create huge growth momentum for the airport. The airport's technical specifications, capacity for expansion, hangar customization capabilities, and having secured a major industrial tenant like Sabena Technics set up a clear path for success in the industrial side of the business.

The cargo business line lays a significant challenge for CRIA in securing a major "anchor tenant" that will get operations running and drag other freighters and importers and exporters to operate at CQM. Nevertheless, market analysis concludes that CRIA has the potential to generate enough demand to breakeven in the cargo terminal use. Nevertheless, further analysis must be carried out to assess the increased demand generated from investing in a train cargo terminal at the adjacent railway to the airport to create an intermodal logistics hub that would likely create exponential revenue generating potential for CRIA. The intermodal solution would connect marine cargo arriving at the ports of Algeciras and Valencia to Ciudad Real, where it would be redistributed by air, road, or train to its destination.

Over the past three years, CRIA has demonstrated a strong cost management capacity through optimization of in use and the utilization of in-house solutions rather than contracting traditional outsourced activities such as airport security. This proficiency in cost efficiency, coupled with the low acquisition price that CRIA paid for the infrastructure, should enable the Company to generate strong returns as it increases its market share in the different areas.

7. DECLARATION OF USE OF GENERATIVE ARTIFICIAL INTELLIGENCE

Por la presente, yo, Gabriel Medem López-Brea, estudiante de doble grado en Administración de Empresas y Business Analytics de la Universidad Pontificia Comillas al presentar mi Trabajo Fin de Grado titulado Market Study and Business Model Definition for Ciudad Real International Airport", declaro que he utilizado la herramienta de Inteligencia Artificial Generativa ChatGPT u otras similares de IAG de código sólo en el contexto de las actividades descritas a continuación:

1. **Metodólogo:** Para descubrir métodos aplicables a problemas específicos de investigación.
2. **Constructor de plantillas:** Para diseñar formatos específicos para secciones del trabajo.
3. **Corrector de estilo literario y de lenguaje:** Para mejorar la calidad lingüística y estilística del texto.
4. **Sintetizador y divulgador de libros complicados:** Para resumir y comprender literatura compleja.
5. **Revisor:** Para recibir sugerencias sobre cómo mejorar y perfeccionar el trabajo con diferentes niveles de exigencia.
6. **Traductor:** Para traducir textos de un lenguaje a otro.

Afirmo que toda la información y contenido presentados en este trabajo son producto de mi investigación y esfuerzo individual, excepto donde se ha indicado lo contrario y se han dado los créditos correspondientes (he incluido las referencias adecuadas en el TFG y he explicitado para que se ha usado ChatGPT u otras herramientas similares). Soy consciente de las implicaciones académicas y éticas de presentar un trabajo no original y acepto las consecuencias de cualquier violación a esta declaración.

Fecha: 8 de febrero de 2024

Firma: Gabriel Medem López-Brea

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9. APPENDICES

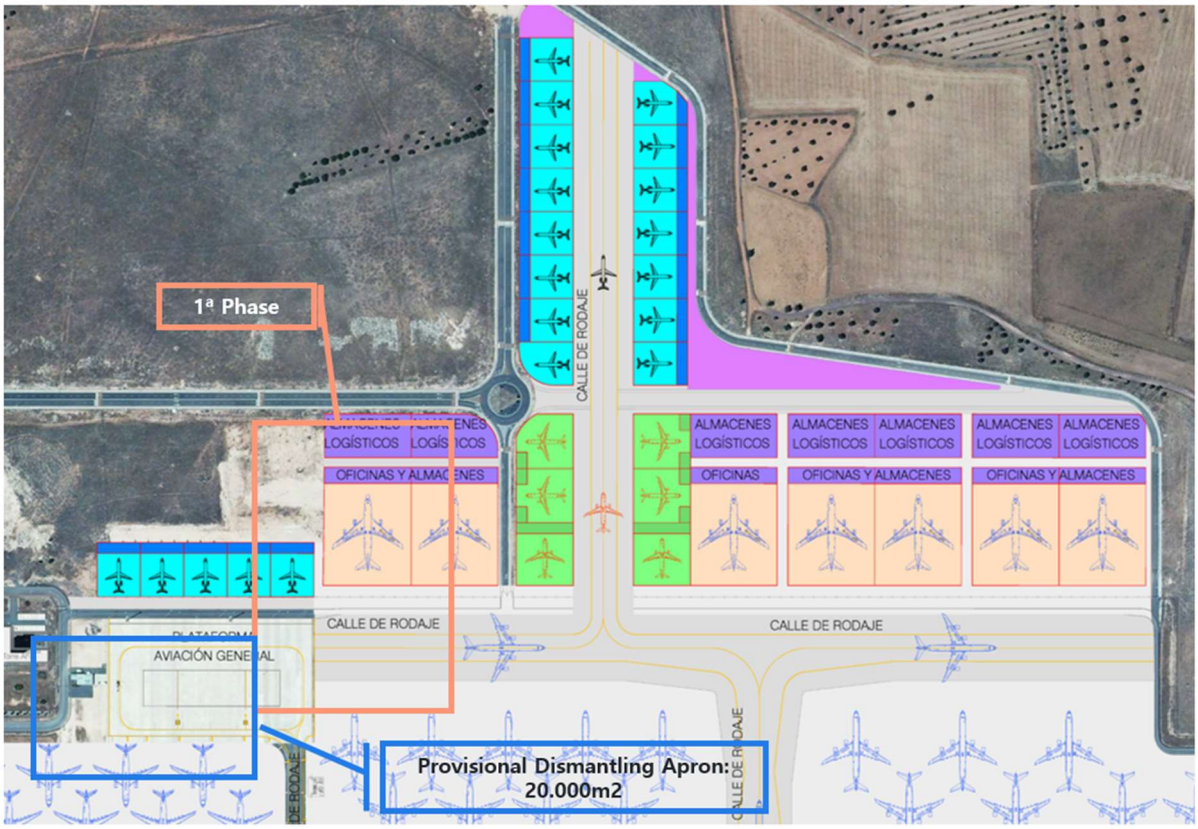
Appendix 1: Airport Master Plan (Ministerio de Transportes y Movilidad Sostenible, 2006)

Appendix 2: CRIA landing, aerodrome traffic service, and parking fees (CRIA, n.d.)

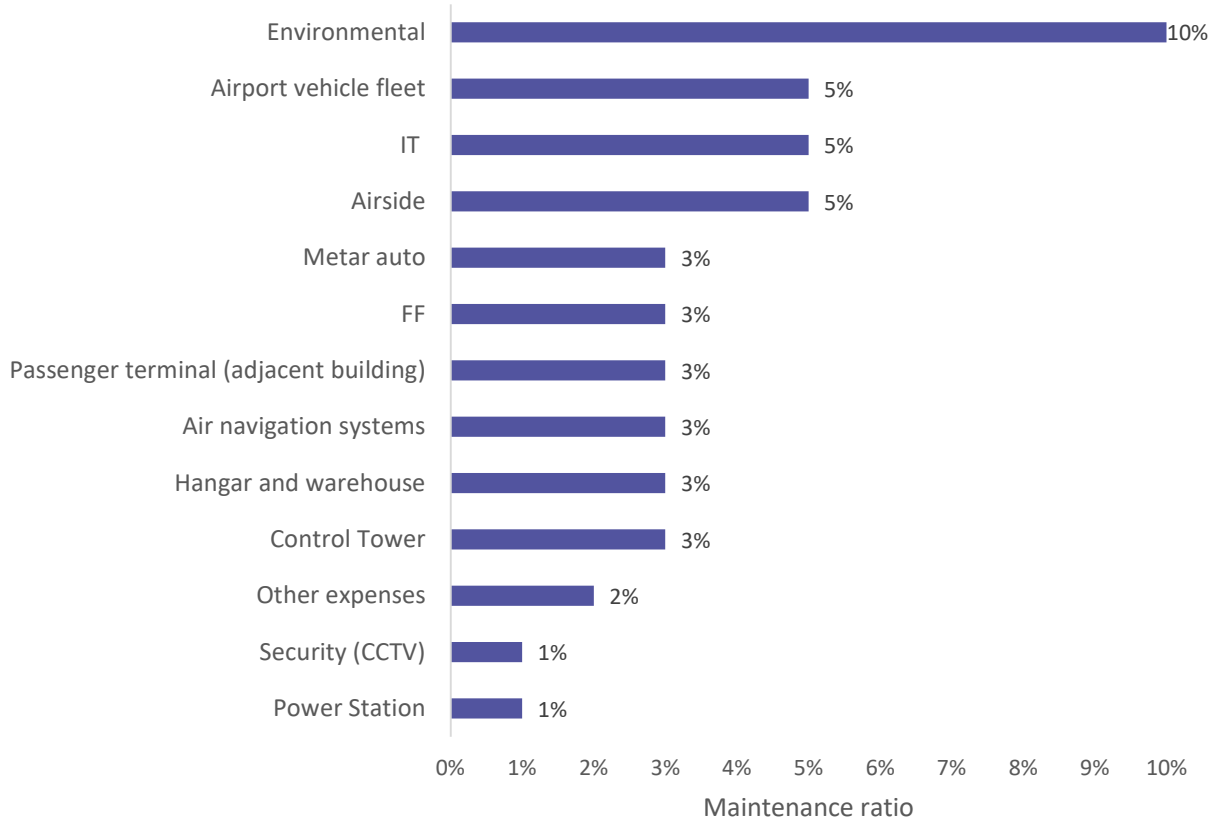
LANDING AND AERODROME TRAFFIC SERVICE FEES AT CQM				
	LANDING		AERODROME TRAFFIC SERVICE	
	€ per ton (MTOW)	Min. amount per operation	€ per ton (MTOW)	Min. amount per operation
Operating hours	4,67	800	3,30	300
Out of operating hours	50	935	3,30	300

PARKING FEES (+2 hours)			
	0 - 50 Tm (€/day)	50 - 75 Tm (€/day)	+75 Tm (€/day)
For period of stay longer than 2 hours	75	100	125
Long stay (+7 days)	31,5	47,25	0,63 x Tm

Appendix 3: Distribution of hangars for industrial operations in Ciudad Real (CRIA, 2023a)



Appendix 4: CRIA maintenance ratio (% of construction cost) (CRIA, 2023b)



Appendix 5: Executive airport Business Model Canvas

<table>
<tr>
<td rowspan="2">KEY PARTNERS
Government and authorities
Associations
Utilities suppliers
Charter companies
MRO providers
Ancillary services providers</td>
<td>KEY ACTIVITIES
Maintenance
Security and safety operations
Air traffic control</td>
<td rowspan="2">VALUE PROPOSITIONS
Executive terminal
Passport control
Customs service
Weapons intervention
Hangar rental
MRO
Long-term parking
Fuel
Handling
Weather forecast</td>
<td>CUSTOMER RELATIONSHIPS
Airport offices
Airport visits and events
Dedicated service
Loyalty programs</td>
<td rowspan="2">CUSTOMER SEGMENTS
Private jet owners
Charter companies</td>
</tr>
<tr>
<td>KEY RESOURCES
Safety equipment
Firefighters
Control tower
Security
Runway and platforms
Executive terminal
Hangars
Skilled personnel</td>
<td>CHANNELS
Press
Events and fairs
Trade shows
Direct contact
Website
Partnerships with charter companies and travel agencies</td>
</tr>
<tr>
<td colspan="3">COST STRUCTURE
Operational costs
Marketing and sales
Maintenance and capital expenditures</td>
<td colspan="3">REVENUE STREAMS
Fuel
Landing fees
Meteorological service fees
Handling fees
Parking fees
Hangar rental
VIP services
Ancillary services (catering etc.)</td>
</tr>
</table>

Appendix 6: Industrial airport Business Model Canvas

<table>
<tr>
<td rowspan="2">KEY PARTNERS
Industrial players
Government and authorities
Associations
Utilities suppliers</td>
<td>KEY ACTIVITIES
Initial hangar development
Maintenance
Security and safety operations
Air traffic control</td>
<td rowspan="2">VALUE PROPOSITIONS
Customizable hangar characteristics
Land plot choice
Synergies and economies of scale between the different established players
4E certified airport
Urbanized land</td>
<td>CUSTOMER RELATIONSHIPS
Airport offices
Airport visits and events
Long-term contracts
Custom solutions
Partnerships</td>
<td rowspan="2">CUSTOMER SEGMENTS
MRO
Dismantling
Recycling
Painters
Engine testing and maintenance
Space exploration
Any company needing an adjacent runway</td>
</tr>
<tr>
<td>KEY RESOURCES
Hangars and warehouses
Safety equipment
Firefighters
Control tower
Security
Runway and platforms</td>
<td>CHANNELS
Press
Events and fairs
Trade shows
Direct contact
Website
Partnerships</td>
</tr>
<tr>
<td colspan="3">COST STRUCTURE
Operational costs
Marketing and sales
Maintenance and capital expenditures</td>
<td colspan="2">REVENUE STREAMS
Hangar rental and land rental
Variable fees for non-hangar activities such as in-line maintenance
Fuel
Landing fees
Meteorological service fees
Handling fees
Parking fees</td>
</tr>
</table>

Appendix 7: Cargo airport Business Model Canvas

<table>
<tr>
<td rowspan="2">KEY PARTNERS
Freighters
Importers & exporters
Customs agency
Government and authorities
Associations
Utilities suppliers</td>
<td>KEY ACTIVITIES
Cargo handling
Customs control
Maintenance
Security and safety operations
Air traffic control</td>
<td rowspan="2">VALUE PROPOSITIONS
Intermodal logistics
Efficient and fast handling
Perishable cargo
Strategic location</td>
<td>CUSTOMER RELATIONSHIPS
Airport offices
Airport visits and events
Custom solutions
Partnerships</td>
<td rowspan="2">CUSTOMER SEGMENTS
Cargo-only freighters
Importers
Exporters
E-commerce companies</td>
</tr>
<tr>
<td>KEY RESOURCES
Cargo terminal
Handling personnel
Safety equipment
Firefighters
Control tower
Security
Runway and platforms</td>
<td>CHANNELS
Press
Events and fairs
Trade shows
Direct contact
Website
Partnerships</td>
</tr>
<tr>
<td colspan="3">COST STRUCTURE
Operational costs
Marketing and sales
Maintenance and capital expenditures</td>
<td colspan="3">REVENUE STREAMS
Cargo handling and storage fees
Customs services
Fuel
Landing fees
Meteorological service fees
Handling fees
Parking fees</td>
</tr>
</table>