EXECUTIVE SUMMARY

RIO BRANCO AIRPORT
PLÁCIDO DE CASTRO
SBRB/RBR

July/2020

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INTRODUCTION

The Infrastructure Ministry published, in the Union Official Journal, in the Edition Number 52, on March 18th, 2019, the Public Call Notice 2/2019, with the main goal to select projects, surveys, investigation and technical studies to subsidize the modelling of the concessions for the expansion, exploitation, and maintenance of the following airports:

South Cluster

Curitiba/PR – Afonso Pena;
Foz do Iguaçu/PR – Cataratas;
Navegantes/SC – Ministro Victor Konder;
Londrina/PR – Governador José Richa;
Joinville/SC – Lauro Carneiro de Loyola;
Bacacheri/PR;
Pelotas/RS;
Uruguaiana/RS – Rubem Berta;
Bagé/RS Comandante Gustavo Kraemer.

North Cluster

Manaus/AM – Eduardo Gomes;
Porto Velho/RO – Governador Jorge Teixeira de Oliveira;
Rio Branco/AC – Plácido de Castro;
Cruzeiro do Sul/AC;
Tabatinga/AM;
Tefé/AM;
Boa Vista/RR – Atlas Brasil Cantanhede.

Central Cluster

Goiânia/GO – Santa Genoveva;
São Luís/MA – Marechal Cunha Machado;
Teresina/PI – Senador Petrônio Portella;
Palmas/TO – Brigadeiro Lysias Rodrigues;
Petrolina/PE – Senador Nilo Coelho;
Imperatriz/MA – Prefeito Renato Moreira.

According to the Public Call Notice 2/2019, the Grupo de Consultores em Aeroportos (GCA) presented the following reports for each airport: **Market Reports, Engineering Studies, Environmental Studies and Economic and Financial Evaluation**. Furthermore, it presented a complementary Economic Financial and Evaluation Report, for each Cluster, which aimed the economic financial feasibility assessment of the airports that form the Cluster.

The purpose of the Executive Summary is to present the main arguments, information and conclusions of each one of the Rio Branco Airport/AC Plácido de Castro – SBRB/RBR report. For a better understanding of the studies, it is recommended the reading of the reports.

1 MARKET REPORT

This section presents a Summary of the Market Report for the **Rio Branco/AC Airport – Plácido de Castro** (IATA RBR or ICAO SBRB), which processed 309 thousand passengers in 7 thousand operations in 2018.

Following a request by the National Civil Aviation Secretariat, the Study was updated between May and July 2020 to take into account the new demand prospects given the impact of the COVID-19 pandemic on the aviation sector.

In summary, three types of impacts on the demand have been considered: (i) reduction of demand due to restrictions on movement of people; (ii) impact on the economy, materialized in national and global GDP projections, and (iii) cultural factors, representing the permanent impact of behavioral changes in the airport demand. The assumptions for measuring the impact of the pandemic on demand were defined in the second week of May 2020, from studies and external sources referenced throughout the Market Report for the Rio Branco/AC Airport – Plácido de Castro.

1.1 Overview

The Airport lies in Rio Branco, the state capital and most populated city in Acre. The municipality's economy is based on natural resources extraction, particular note being due to rubber and timber, the state's main export good. The region's agriculture relies on small plantations and includes cassava, fruits and sugar cane, among other crops. Rio Branco is also a significant producer of Brazil nuts.

Manufacturing in the region operates mainly in the food, wood, ceramics and textile industries. The Airport lies 12 km distant from the Rio Branco Industrial District, the city's manufacturing hub.

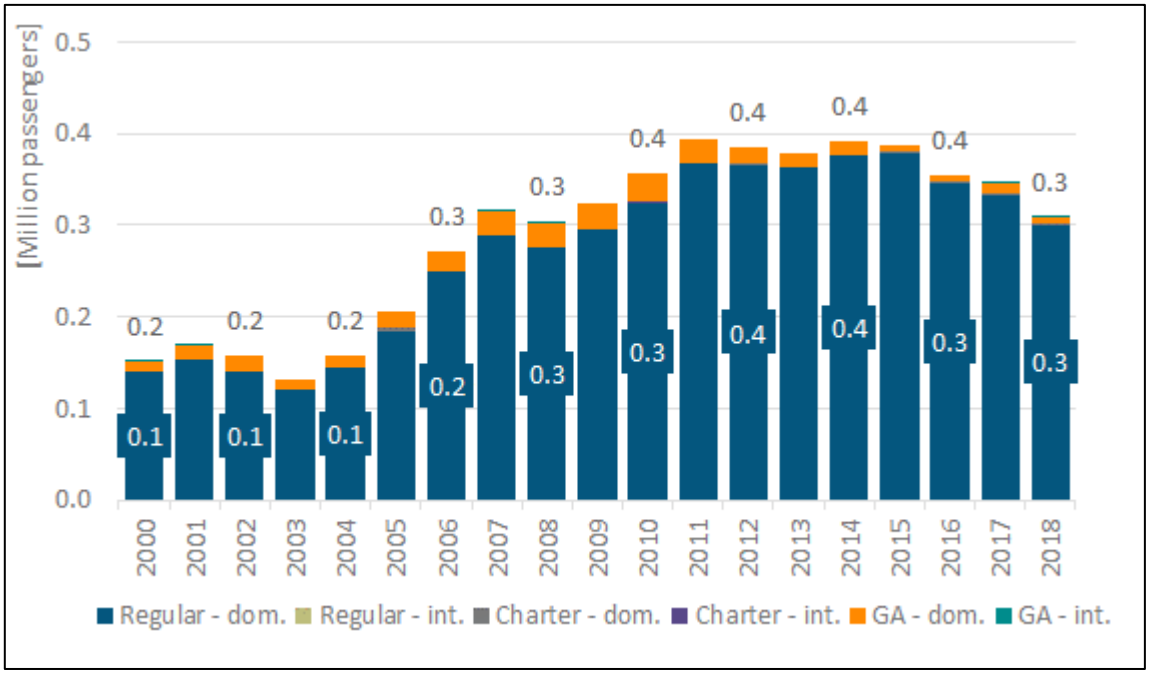
Figure 1-1:Rio Branco and surrounding areas

Source: Google Earth

SBRB's passenger throughput doubled from 2000 to 2011, when it processed 394 thousand passengers. Between 2011 and 2015, total passengers hovered near this level, and decreased since

2015 to 309 thousand in 2018, under impact from reduced operations in 2016 (4.0% average annual growth rate in 2000-2018).

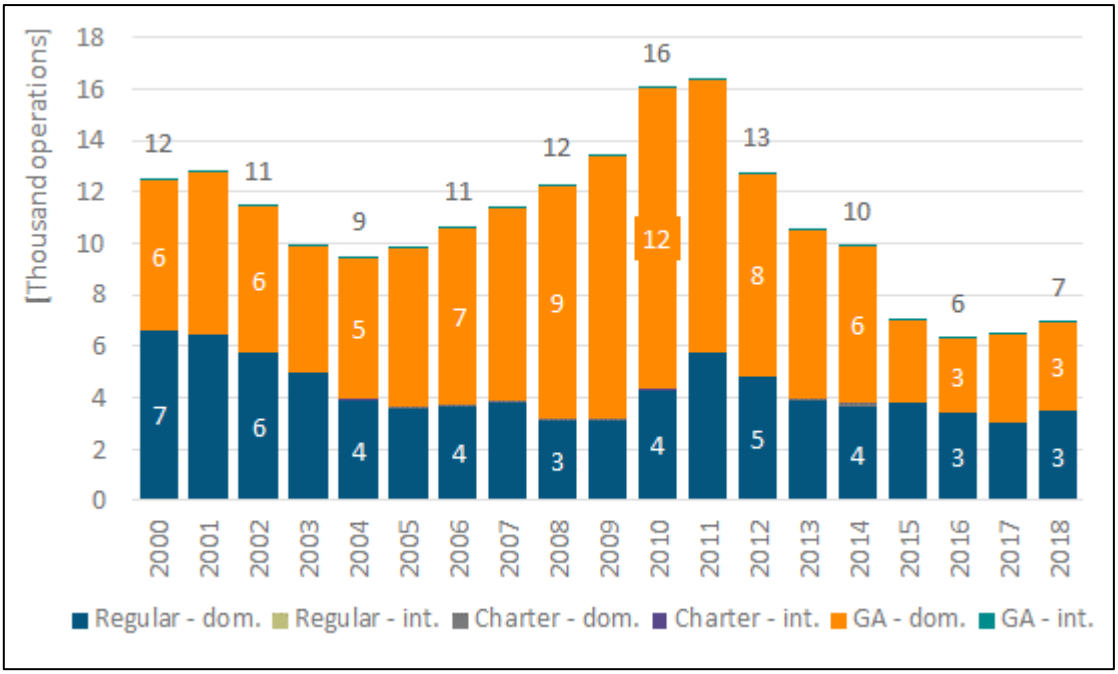
Figure 1-2:Passenger history (origin, destination and connections) for the Airport



Source: Infraero

The Airport had 7 thousand aircraft operations in 2018, of which 50% were regular domestic and 49% were domestic general aviation flights (Figure 1-3).

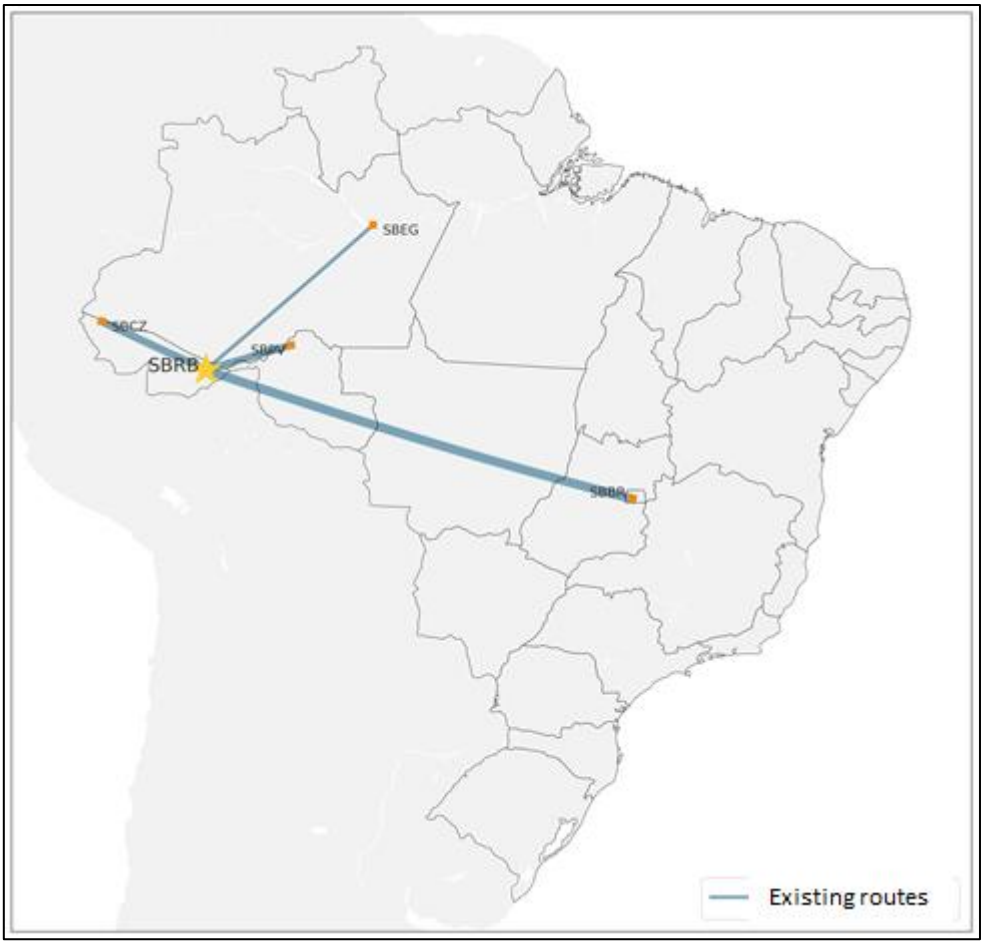
Figure 1-3:Annual operations history (landings and take-offs) at the Airport



Source: Infraero

In 2018, the Airport had 4 regular domestic routes[1] to the North and Center-West regions of Brazil, as Figure 1-4 shows (line thickness reflects relative route frequency).

Figure 1-4:Map of the Airport's domestic routes in 2018



Source: OAG and ANAC

In 2018, 36% of domestic passengers at SBRB had their origin/destination at Brasília (SBBR), 18% at Cruzeiro do Sul (SBCZ), 15% at Porto Velho (SBPV) and 9% at Manaus (SBEG). In addition, an estimated 78% of domestic passengers at SBRB flew direct, whereas 22% had stops.

Regarding the pandemic impacts, it stands out that the airport continued to receive flights from the essential airline network and, therefore, never had its operations completely interrupted. However, the demand in March and April 2020 were, respectively, 62% and 10% of the previous year.

Concerning cargo operations, the Airport handled 2 thousand tons in 2018 in the holds of commercial aircraft.

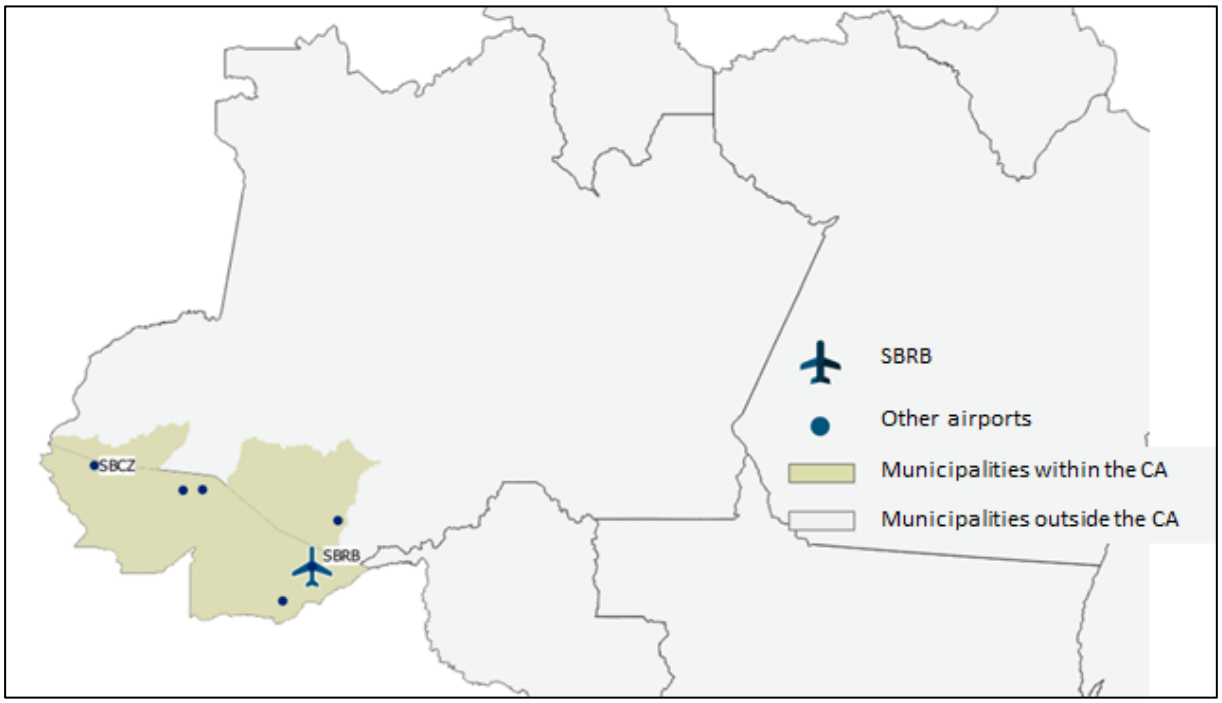
Catchment Area

[1] Only considers routes with twice-weekly or greater frequency (SBBR, SBCZ, SBEG and SBPV).

SBRB's Catchment Area (CA) is defined based on the "City Catchment Areas" ("Regiões de Influência das Cidades" – REGIC)[2] study, by the Brazilian Geography and Statistics Institute (IBGE), which comprehensively covers a range of economic and socio-cultural aspects of the population.

According to the REGIC, Rio Branco lies under the influence of Porto Velho, which, by its turn is under the influence of the Metropoles of São Paulo and Brasília. Therefore, the Rio Branco CA lies within that of Porto Velho and, more generally, those of São Paulo and Brasília. Overall, the Rio Branco CA, which Figure 1-5 shows, covers more than 25 municipalities and a total area of 250 thousand square kilometers.

Figure 1-5: Airport CA according to the REGIC



Source: REGIC, ANAC and GCA Consortium

To forecast the Airport's volumes and demand profile, the CA was adjusted for compatibility with the effective passenger catchment rea according to the origins and destinations survey published in the study Brasil Que Voa (BQV), which EPL[3] conducted in 2014.

1.2 Demand forecasts

The Airport's demand has been forecast based on multivariate regression analyses whose parameters have been selected by means of tests with several potential independent variables for each flow analyzed.

[2] Source: IBGE. *Regiões de Influência das Cidades 2007*, IBGE, Rio de Janeiro, 2008. The IBGE has published other and more current Urban-Territorial Division studies, but they reference the same hierarchical review of municipalities as produced for the 2007 study, that is, their hierarchy is simplified, but consistent with the one in the 2007 study.
[3] EPL is a Federal-government agency focused on country-wide transportation & logistics planning.

1.2.1 Passengers

Commercial aviation passengers

To forecast domestic passengers with origin or destination in the CA[4], the study ran regressions using Brazil's GDP and the North region's average fares, adjusting GDP elasticity in the long term based on the passengers-to-per-capita GDP ratio of large countries to reflect the reduction of the marginal propensity to fly as average income increases.

Once domestic demand had been forecast for the CA, the study distributed it across competing airports based on their historic market shares, among other factors. Finally, compatibility adjustments were made between forecast demand and 2019 volumes and adjustments regarding the COVID-19 pandemic.

Connecting and layover[5] passengers were forecast based on the increased capillarity of the Airport's airlines network and domestic connection rate benchmarks. No international passenger flows are expected at SBRB.

General aviation passengers

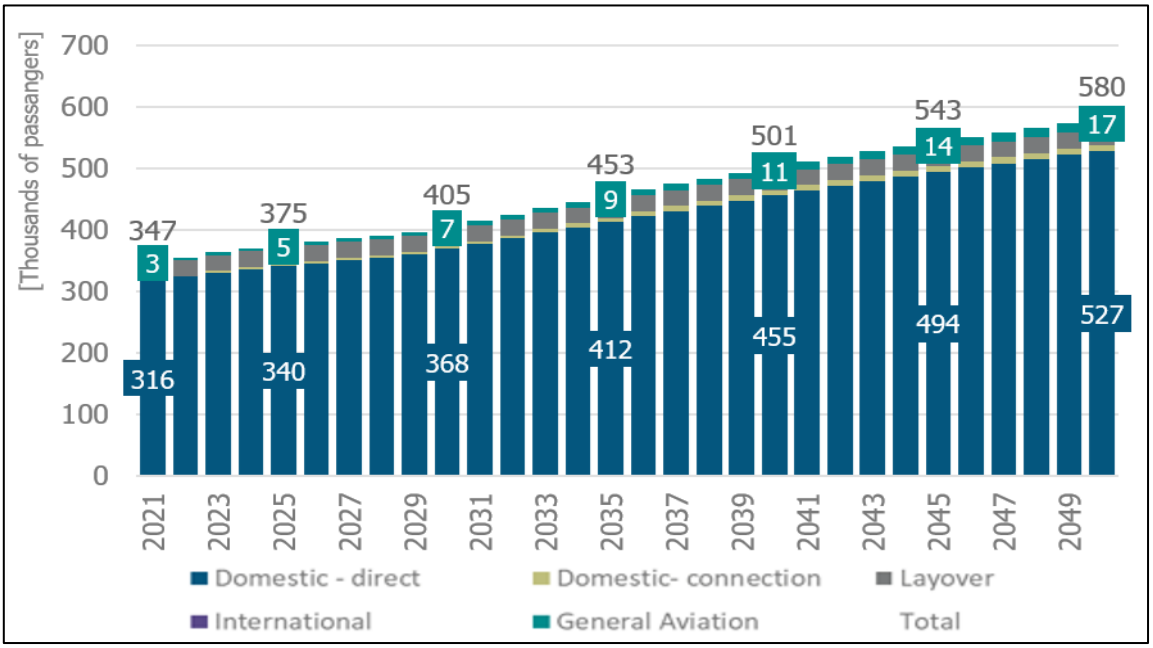
For general aviation passengers, the report first forecasts total aircraft operations based on several independent variables, such as Industrial GDP and foreign exchange rate (taking into account the effects of the pandemic). Total passengers are then estimated based on usual pax/operation parameters.

Total passengers

Figure 1-6 shows the consolidated results of the above forecasts. Total passengers at SBRB will grow 1.8% p.a. from 2021, the first, to 2050, the final full year of the concession, at which time 580 thousand passengers are expected.

[4] Includes the Cruzeiro do Sul airport.
[5] Passengers who do not deplane at the Airport and therefore generate no fee revenues.

Figure 1-6:Total passengers forecast at the Airport by flow type



Source: GCA Consortium

1.2.2 Aircraft operations and airlines network

Domestic and international aircraft operations

Commercial aircraft operations were forecast based on passenger flows by origin-destination (OD) pairs, load factor, and aircraft mix, and are associated with the evolution of the Airport's airlines network. As demand increases, routes that existed before the pandemic are restored and new routes become feasible (the triggers for route creation vary based on distance and allocated aircraft types) – therefore, the mix and number of aircraft evolves in line with the forecast airlines network.

By 2050, the final full year of the concession, the Airport is expected to log 4.2 thousand domestic commercial and 3.8 thousand general aviation operations, with average annual growth rates of 3.6% and 5.6%, respectively.

Figure 1-7:Total annual Airport operations forecast

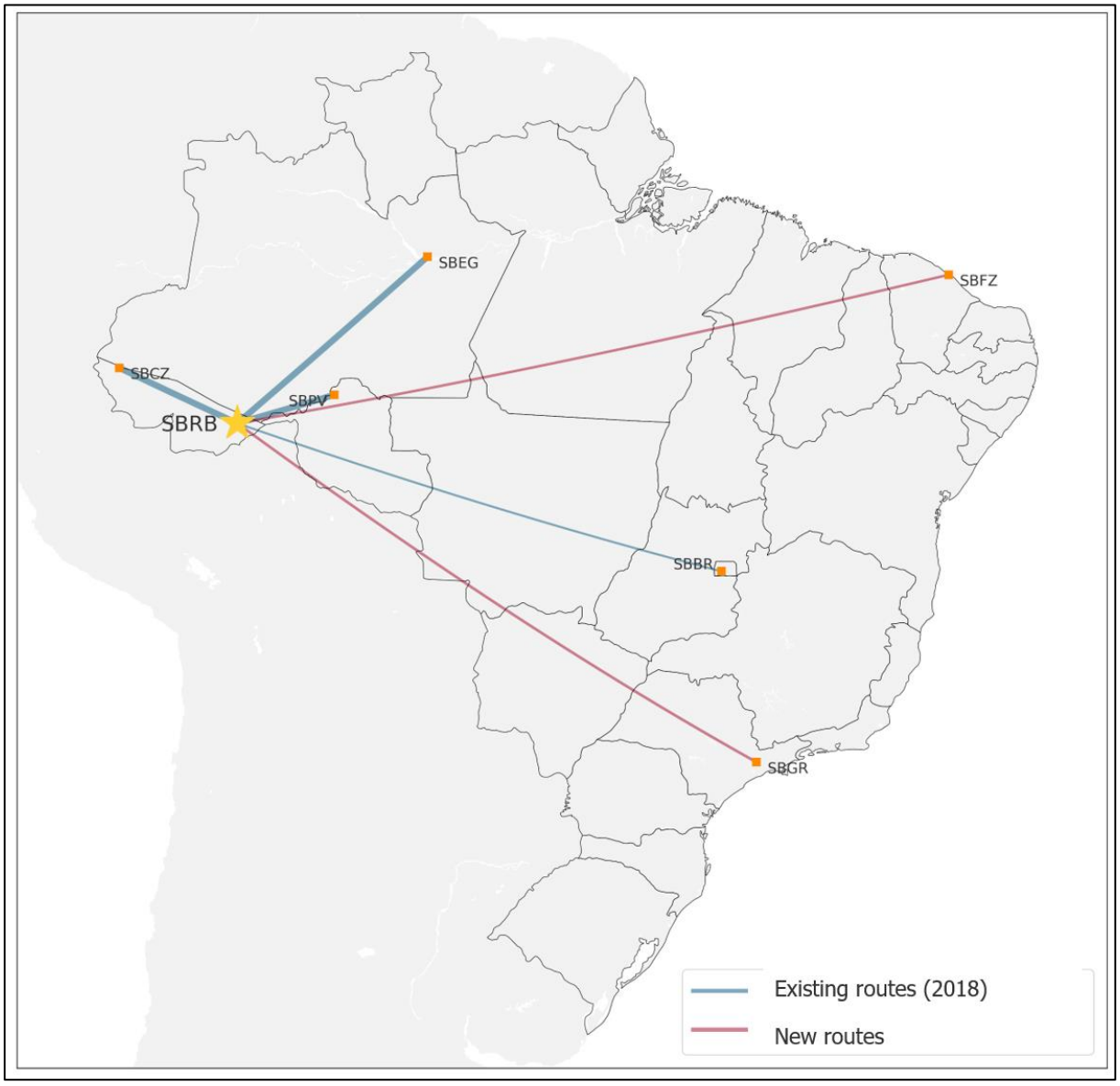
Source: GCA Consortium

No international routes are expected at the Airport during the concession period.

Airport insertion in the airlines network

During the concession period, as Figure 1-8 shows, new connections are expected between SBRB and the Fortaleza (SBFZ) and Guarulhos (SBGR) Airports, for a total 6 connected destinations and commencing service to the Northeast and Southeast regions of Brazil.

Figure 1-8:Domestic commercial routes in 2050



Source: GCA Consortium

1.2.3 Peak demand and restrictions

The Airport's main systems have been sized to meet demands at more intense flow times, so that users will receive appropriate service levels according to previously established criteria and, no severe operational and economic impacts will take place.

For Passenger Terminal (PT) areas and processors at airports flying under one million passengers per year, like SBRB, the applicable service level criterion in the initial investment phase is based on 1.3 times the number of seats in the critical aircraft[6] (or, in the case of simultaneous operations in 45

[6] The aircraft with the largest number of seats available at the airport in the reference period. For this Airport, this is the A320 (174 seats).

minutes, 1.3 times the number of seats available). In later phases of the project, the benchmark becomes the 30th busiest hour of the year.

The results for both criteria have been calculated as of 2018 based on Infraero records and forecast according to domestic peak-factor benchmarks (peak demand/annual demand).

- Using the criterion of 1.3 times the number of seats on simultaneous operations in 45 minutes or on the critical aircraft, the study finds 724 passengers for departures and arrivals, and 1,202 simultaneous passengers at concession start, in 2021;
- Using the 30th busiest hour produces the following numbers:
    - 2021 (concession start): 218 departing passengers, 191 arriving passengers, and 14 connecting passengers, and 293 simultaneous passengers;
    - 2050 (final full year of the concession): 387 departing passengers, 338 arriving passengers, 24 connecting passengers, and 519 simultaneous passengers;

The Engineering Report discusses the use of this data for PT dimensioning.

For the runway system, the report considers maximum commercial aircraft operations per hour over a period of one year. As with passengers, the forecast embraces peak-factor benchmarks. It has been forecast that the Airport will have a peak of 6 commercial aircraft runway operations per hour in 2050.

Dimensioning also considers peak usage of apron positions based on 2018 maximum usage records and peak factor benchmarks. According to the forecasts, a minimum 3 apron positions will be required by the end of the concession period.

Given the various systems' capacities (see Engineering Report), the study assesses potential restrictions on forecast demand. Considering the Airport's expected improvement and expansion works, no restrictions on traffic growth have been forecast for any of the Airport's systems.

1.2.4 Cargo

No import or export cargo flows are expected at SBRB during the concession period. As for domestic cargo, a total 3.4 thousand tons are expected by the end of the concession period.

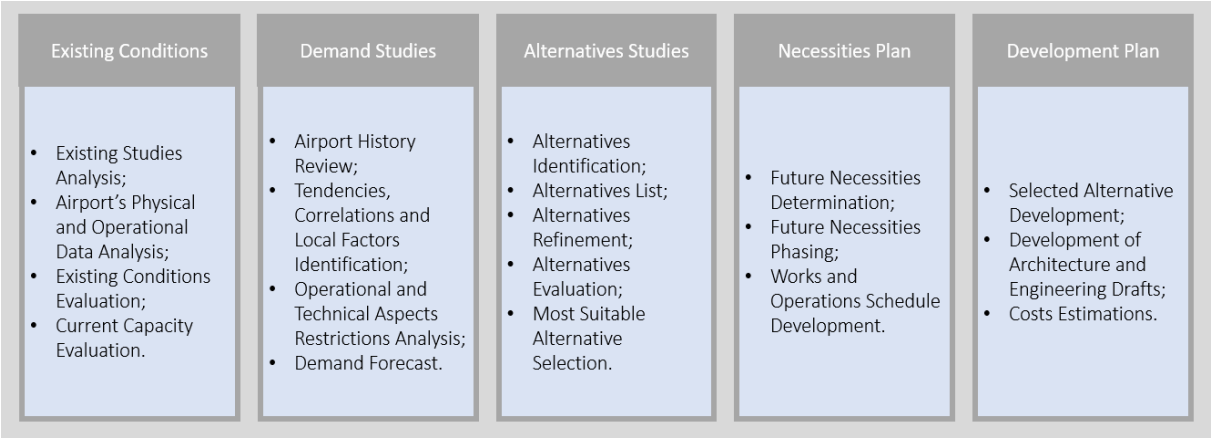
Cargo projections consider the effects of the pandemic related to policies to restrict population circulation, the effect of the economic downturn and the change in consumption behaviors.

2 ENGINEERING STUDIES

This section presents the Executive Summary of the Engineering Studies for the concession of the Rio Branco Airport/Plácido de Castro – SBRB/RBR.

The Engineering Studies Report has been developed according to the methodology presented in Figure 2-1.

Figure 2-1: Study Methodology



Source: GCA Consortium.

Below, in brief explanations, the results and premises of each phase of the studies are presented. For further details, please check the complete studies report.

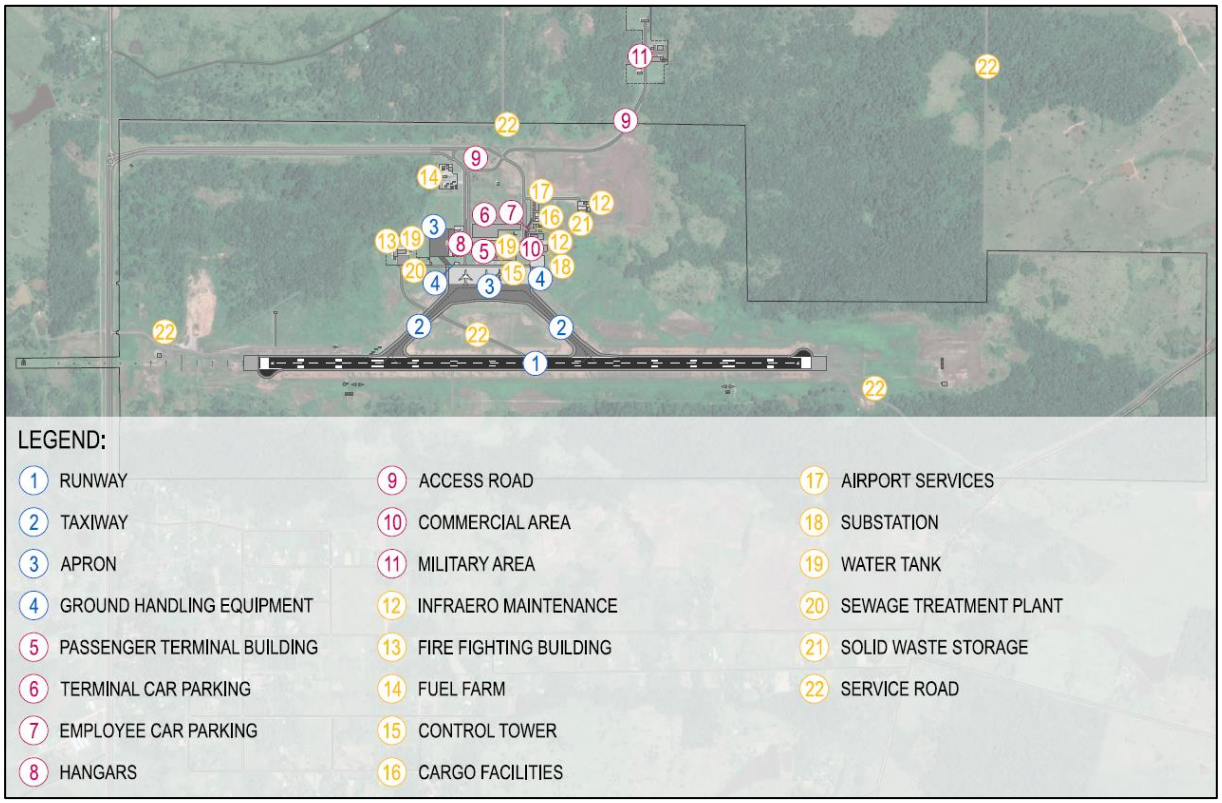
2.1 Existing Conditions

2.1.1 Current Situation

The current situation characterization is extremely important for an appropriate development of the Airport Site. Through it, it's possible to have an accurate understanding of the existing restrictions and opportunities for the expansion of the Airport complex. Among other aspects, the comprehension of the current situation involves operational, security, legal and social-environmental matters.

In order to characterize the present situation, it has also been evaluated the current operation and it has been done the identification of the existing infrastructures, by on-site visits, and of the main development plans and available studies. The Figure 2-2 illustrates the identification of the main existing facilities.

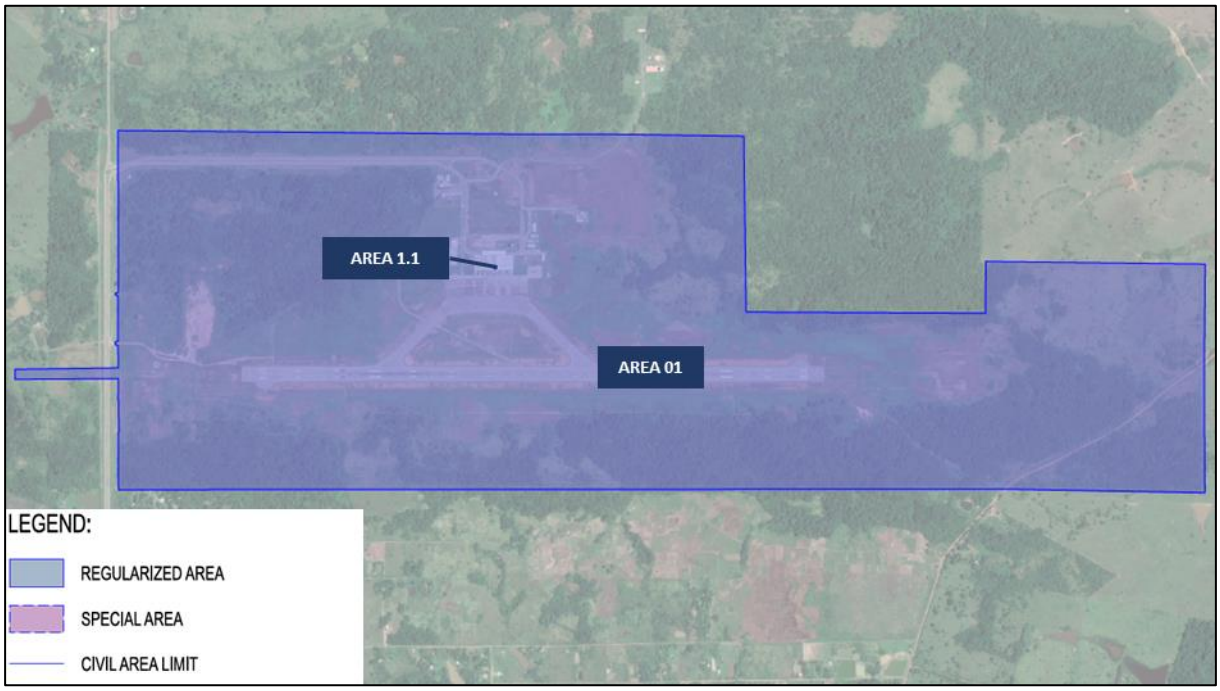
Figure 2-2: Current Facilities Situation



Source: GCA Consortium.

Furthermore, regarding the present patrimonial situation, it should be noted that the airport under study is in a patrimonial area divided in regularized area and area to be regularized. The regularized areas belong to the Federal Union. The areas to be regularized are properties of third parties. The Figure 2-3 presents the patrimonial situation of the Airport.

Figure 2-3: Patrimonial Limits of the Airport Site



Source: Google Earth, GCA Consortium.

Currently, there are works in progress at the Airport, whose projects have been approved by INFRAERO. The most important goal of these works is the adequacy of the PTB hydrants system. According to the SAC/MI guidance, until the start of the concession period, the ongoing works must proceed. From this date on, the remaining services must be completed by the concessionaire and the remaining costs considered in the financial modeling of this study. Since the works in the Airport are expected to be completed until this date, there won't be residual costs related to these works to be considered by CAPEX.

2.1.2 Installed Capacity Evaluation

The analysis of the installed capacity is one of the phases in the existing conditions evaluation process. In this stage are evaluated the capacity conditions according to the appropriate levels of service. Thus, it has been developed the capacity assessment for all airport systems. The installed capacities of the main systems are presented below.

2.1.2.1 Runway, Taxiway and Apron System

Table 2-1 and Table 2-2 summarize the results obtained from the installed capacity analysis and the existing demand for the runaways, taxiways and aprons systems. The taxiways were assessed based on geometric width and code of the aircraft design restrictions.

Table 2-1: Runway Capacity

Component	Current Capacity	Demand	Situation
Runway (mov/h)	20.3	5	Suitable

Source: GCA Consortium.

Table 2-2: Taxiways Capacity

Taxiway	Width (m)	Width Without Shoulders (m)	RBAC154 Code	Critical Aircraft	Situation
Taxiway A	44	23	F	A321	Suitable
Taxiway B	44	23	F	A321	Suitable

Source: AIP, GCA Consortium.

In order to measure the current capacity of the main aircraft aprons, the static and dynamic capacities were analyzed for five different scenarios. Each scenario prioritizes the maximum use of the most restrictive aircrafts, or rather, the occupying positions F, E, D and C in descending order of priority. The Table 2-3 shows the static capacity for the five scenarios evaluated.

Scenario 1: Aircrafts code F, E, D, and C operating simultaneously, in descending order of priority;
Scenario 2: Aircrafts code E, D and C operating simultaneously, in descending order of priority;
Scenario 3: Aircrafts codes E and C operating simultaneously, in descending order of priority;
Scenario 4: Aircrafts Codes D and C operating simultaneously, in descending order of priority;
Scenario 5: Only aircrafts code C operating.

Table 2-3: Aprons Static Capacity

Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Boarding Bridge Positions	F/E/D/C	E/D/C	E/C	D/C	C
A	-	-	-	0	0
B	-	-	-	0	0
C	-	-	-	0	0
D	-	-	-	0	0
E	-	-	-	0	0
F	-	-	-	0	0
Remote Stands	F/E/D/C	E/D/C	E/C	D/C	C
A	-	-	-	0	0
B	-	-	-	0	0
C	-	-	-	2	5
D	-	-	-	2	0
E	-	-	-	0	0
F	-	-	-	0	0

Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Positions (Remotes + Boarding Bridges)	F/E/D/C	E/D/C	E/C	D/C	C
A	-	-	-	0	0
B	-	-	-	0	0
C	-	-	-	2	5
D	-	-	-	2	0
E	-	-	-	0	0
F	-	-	-	0	0
Total Boarding Bridges	-	-	-	0	0
Total Remote Stands	-	-	-	4	5
Total Number of Stands	-	-	-	4	5

Source: PDC Chart, GCA Consortium.

In order to evaluating the hourly dynamic capacity of the main apron, the static capacity obtained by the average occupation time of each aircraft code for the same scenarios was considered, obtaining the total dynamic capacity, as shown in Table 2-4.

Table 2-4: Aprons Dynamic Capacity

Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Average turning time (min)	F/E/D/C	E/D/C	E/C	D/C	C
A	-	-	-	15	15
B	-	-	-	25	25
C	-	-	-	45	45
D	-	-	-	75	75
E	-	-	-	85	85
F	-	-	-	130	130

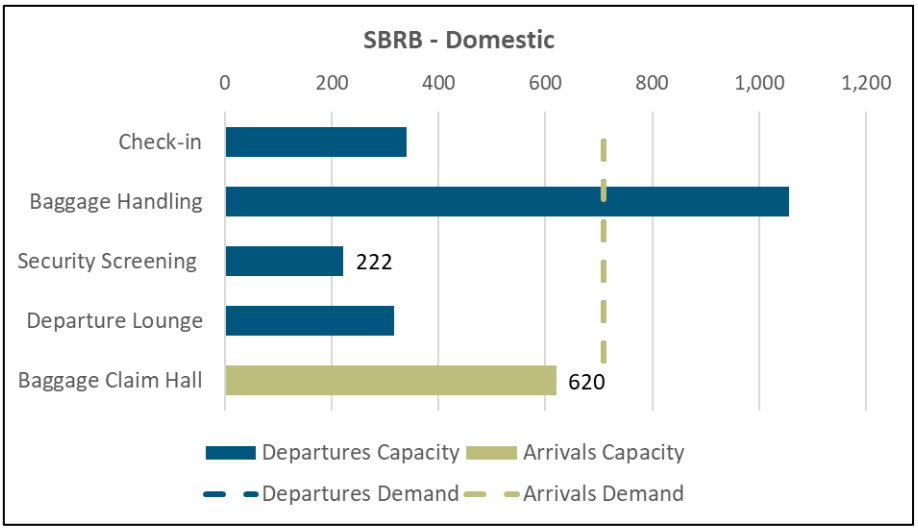
Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Capacity	F/E/D/C	E/D/C	E/C	D/C	C
A	-	-	-	0	0
B	-	-	-	0	0
C	-	-	-	3	7
D	-	-	-	2	0
E	-	-	-	0	0
F	-	-	-	0	0
Total	-	-	-	4	7

Source: GCA Consortium.

2.1.2.2 Passenger Terminal System

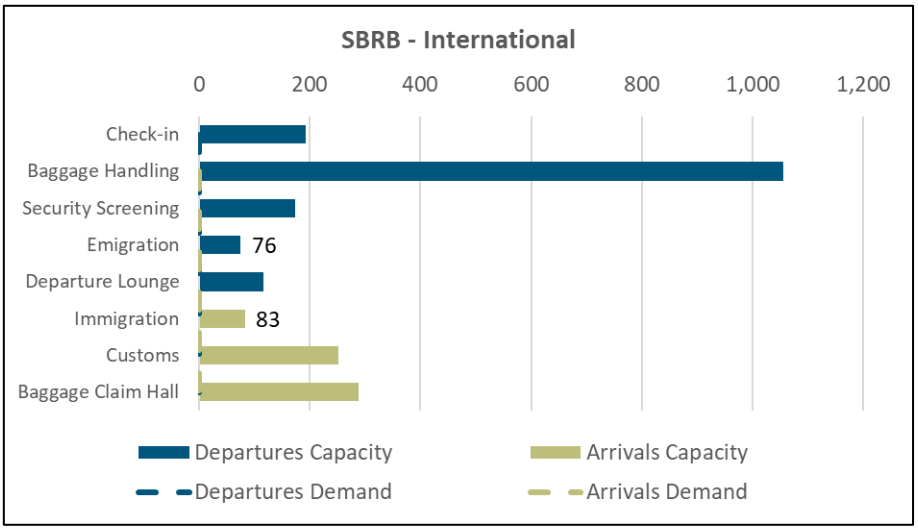
Figure 2-4, Figure 2-5 and Figure 2-6 summarize the results obtained from the installed capacity and the existing demands of the departures and arrivals flows. The components of the terminal were evaluated considering the international and domestic segments.

Figure 2-4: Terminal's Components Capacity – Domestic



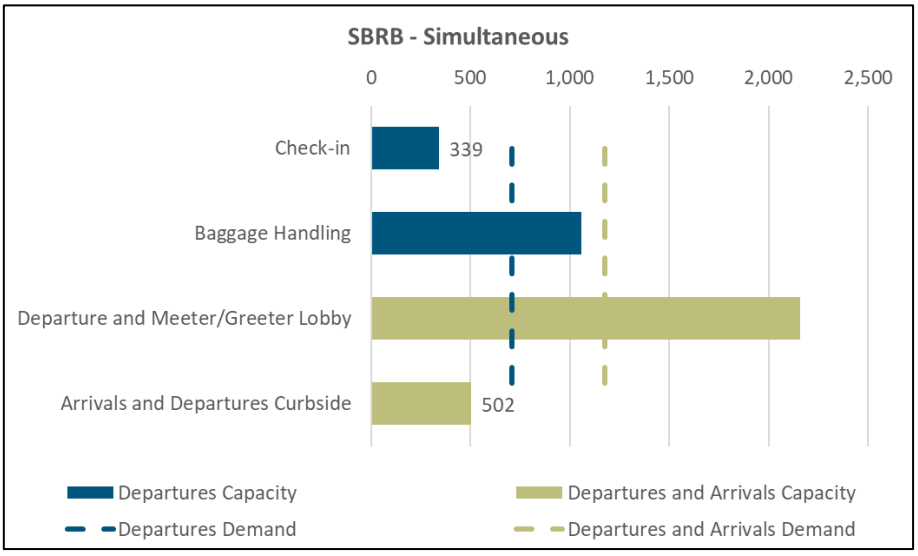
Source: GCA Consortium.

Figure 2-5: Terminal's Components Capacity – International



Source: GCA Consortium.

Figure 2-6: Terminal's Components Capacity – Simultaneous



Source: GCA Consortium.

2.1.2.3 Other Facilities

Regarding the current condition of other systems, the following observations can be noticed, about the present situation described on Table 2-5.

Table 2-5: Other Components Capacity Summary

Component	Facilities Description
Aeronautical Infrastructure	• **Operation:** presents technical capability for day/night non-precision VFR/IFR operation for both thresholds (06-24) and IFR day/night accuracy CAT I for threshold 06. With PAPI systems at threshold 06, the runway is capable of landing jet aircraft by this threshold. There is no PAPI systems at threshold 24.
Cargo Terminal System	• **Cargo Terminal Building:** not suitable to current demand. • **Airside Aprons:** suitable to current demand. • **Landside Aprons:** suitable to current demand. • **Cargo Terminal Parking:** not suitable to current demand.
General Aviation System	• **General Aviation Terminal:** there is no General Aviation Terminal currently and as the demand is less than 25,000, the sector is suitable to current needs. • **General Aviation Aprons:** suitable to current demand. • **General Aviation Hangars:** suitable to current demand. • **General Aviation Terminal Parking:** not suitable to current demand.
Administration and Maintenance System	• **Administration:** suitable to current demand. • **Maintenance:** suitable to current demand.
Operation Support System	• **Fuel Farm:** suitable to current demand. • **Fire Fighting Installations:** suitable to current demand.
Airlines Support System	• **Cargo Processing:** suitable to current demand. • **Airlines Support Maintenance:** not suitable to current demand. • **Maintenance and Hangars:** not suitable to current demand.
Industrial Support System	• **Mail:** suitable to current demand. • **Catering:** does not apply, there is no specific area at the airport. • **Airport Services:** suitable to current demand.
Basic Infrastructure System	• **Electric Power:** suitable to current demand. • **Water Consumption:** suitable to current demand. • **Sewage Treatment:** not suitable to current demand. • **Solid Waste:** suitable to current demand.

Source: GCA Consortium.

2.2 Demand Studies

In order to evaluate the current capacity to accommodate the forecast demand and the investments needs over the concession period, market reports and forecasts of passenger demands, aircrafts operations and freight have been developed. The Figure 2-7 shows the results of the studies of demand.

Figure 2-7: Demand Forecast Summary

Source: Market Reports.

2.3 Necessities Plan

Given the demand projections and the installed capacity, the infrastructures required to meet the expected demand were evaluated for all airport systems. The following Figure 2-8, shows a summary of infrastructure needs for the airport throughout the development stages considered for the period of analysis. The requirements of each stage are based on the existing infrastructure in face of the projected demand. Thus, the installed infrastructures have been kept, reallocated or expanded according to the anticipated needs.

Figure 2-8: Necessities Plan

SBRB	Phase 1	Phase 2
Airside System		
Runway	Intervention	Suitable
Taxiways	Suitable	Suitable
Aprons	Suitable	Suitable
Ground Handling Equipments	Suitable	Suitable
Passenger Terminal System		
Passenger Terminal Building	Intervention	Suitable
Car Parking	Intervention	Intervention
Access Roads	Intervention	Suitable
Aeronautical Infrastructure		
Navigation Aids	Intervention	Suitable
Air Cargo Terminal System		
Air Cargo Terminal Building	Intervention	Suitable
Car Parking	Intervention	Suitable
Access Roads	Suitable	Suitable
General Aviation System		
General Aviation Terminal Building	Suitable	Suitable
Aprons and Taxiways	Suitable	Suitable
Car Parking	Suitable	Suitable
Access Roads	Suitable	Suitable
Administration and Maintenance System		
Administration	Suitable	Suitable
Maintenance	Suitable	Suitable
Operations Support System		
Fuel Farm	Suitable	Suitable
Firefighting Building	Intervention	Suitable
Airlines Support System		
Air Cargo and Maintenance Facilities	Intervention	Suitable
Maintenance and Hangars	Suitable	Suitable
Industrial Support System		
Mail	Suitable	Suitable
Catering	Intervention	Suitable
Airport Services	Suitable	Suitable
Basic Infrastructure System		
Eletric Power	Intervention	Suitable
Water Consumption	Suitable	Suitable
Sewage Treatment	Intervention	Intervention
Solid Waste	Intervention	Suitable

Source: GCA Consortium.

Furthermore, an infrastructure needs summary for the airport with its main information and components over the 30 years considered for the analysis period is presented in Table 2-6.

Table 2-6: Main Components Necessity Summary

SBRB	Current	Phase 01	Phase 02
DEMAND	**2018**	**15 Years**	**30 Years**
Annual Passengers Movements			
Regular Aviation	296,428	418,486	537,470
General Aviation	15,217	8,823	16,503
Total	311,645	427,309	553,973
Cargo (tons)			
Total	-	-	-
Aircraft Movements			
Passengers	3,396	3,356	4,176
Air Cargo	-	-	-
General Aviation	3,443	2,017	3,752
Total	6,839	5,373	7,928
RUNWAY SYSTEM			
Design Aircraft Code	C	C	C
Number of Runways	1	1	1
Runway Length (m) (1)	2,158	2,158	2,158
Operation Type	PA1	PA1	PA1
APRON SYSTEM			
Passengers Apron (2)			
Contact Stands	-	-	-
Remote Stands	6C	6C	6C
Total Number of Stands	6C	6C	6C
Cargo Apron (2)			
Total Number of Stands	-	-	-
PASSENGERS TERMINAL SYSTEM			
Departure Peak Hour Capacity	299	741	741
Arrival Peak Hour Capacity	502	741	741
Terminal Building			
Total Area (m²)	9,290	11,390	11,390

SBRB	Current	Phase 01	Phase 02
Baggage Handling System			
Processing Capacity (bhp)	202	218	249
Car Parking			
Total Area (m²)	7,020	9,825	11,964
Number of lots	260	364	443
Curbside			
Departure Curbside Length (m)	48	65	76
Arrival Curbside Length (m)	48	57	66
Total Length (m)	96	122	142
Ground Handling Equipment			
Total Area (m²)	2,790	2,790	2,790
CARGO TERMINAL SYSTEM			
Cargo Terminal Building Area (m²)	-	400	400
GENERAL AVIATION SYSTEM			
General Aviation Terminal (m²)	-	-	-
Total Number of Stands	-	12	12
General Aviation Terminal Car Parking	-	-	-
Hangars and Aprons Area (m²)	6,720	6,720	6,720
ADMINISTRATION AND MAINTENANCE SYSTEM			
Administration [(3)]			
Total Area (m²)	1,630	410	410
Maintenance			
Total Area (m²)	530	530	530
OPERATION SUPPORT SYSTEM			
Fuel Farm			
Total Area (m²)	6,045	6,045	6,045
5-day storage (m³)	280	237	338
Fire fighting Building			
Category	6	7	7
Total Area (m²)	12,960	12,960	12,960

SBRB	Current	Phase 01	Phase 02
AIRLINES SUPPORT SYSTEM			
Maintenance Area (m²)	30	480	480
Cargo Processing Area (m²) (4)	780	780	780
Aircraft Maintenance Area (m²)	-	-	-
INDUSTRIAL SUPPORT SYSTEM			
Mail Area(m²)	-	-	-
Catering Area (m²)	-	225	225
Airport Services Area (m²)	855	855	855
BASIC INFRASTRUCTURE SYSTEM			
Water Tank (m³)	820	820	820
Solid Waste Area (m²)	203(5)	20	20
Electric Power Area (m²)	661	841	841
Sewage Treatment Units (6)	- (7)	1	2

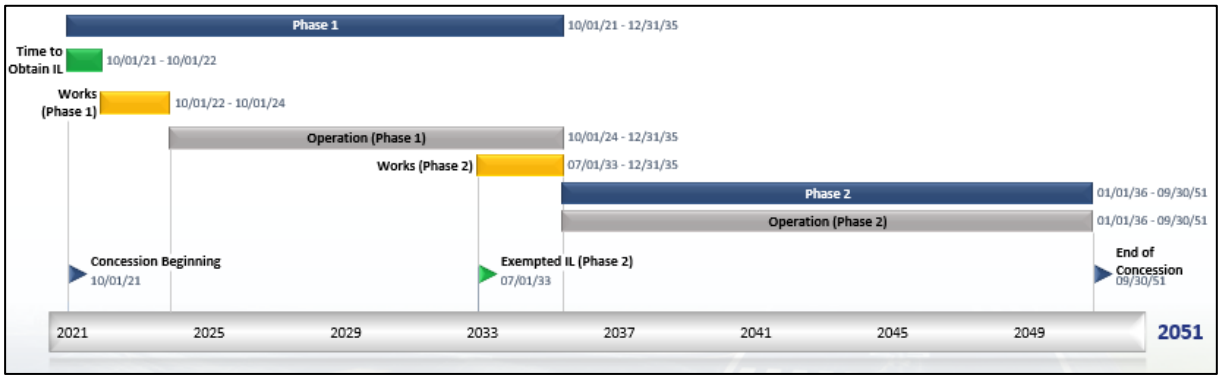
(1) It's been considered the Landing Distance Available (LDA).
(2) The cargo apron can be reversible, that means, shared with the commercial aviation.
(3) The area can be considered inside the PTB.
(4) Area can be considered inside the PTB or Cargo Terminal Building.
(5) Existing Solid Waste Area is inadequate, a new system is proposed.
(6) Compact Sewage Treatment Unit, D70 model.
(7) Currently the airport has an area of 1,643 m² designated to Sewage Treatment Units.

Source: GCA Consortium.

After scheduling needs, based on the capacity of the airport systems, it was possible to define for each component when the interventions should be initiated, so that the service level can be maintained throughout the period.

Considering the concession starts in 2021, it's estimated a 12-month period to get the installation licenses necessary to start the works. After obtaining those licenses, the work can be started. Thus, as a result of the interaction of several planning elements, the work and operation phases were set, as shown in Figure 2-9.

Figure 2-9: Phasing and Works Estimated Schedule



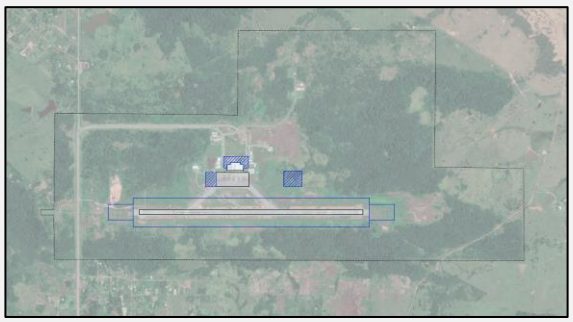
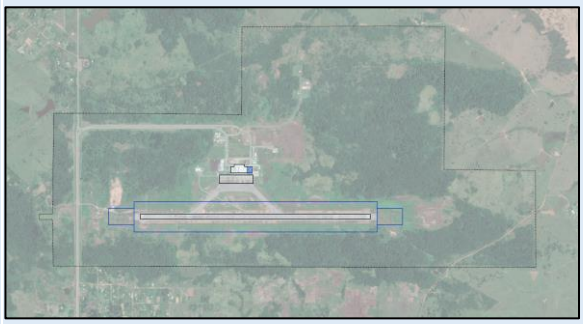
Source: GCA Consortium.

2.4 Alternatives Study

In order to choose the best alternative for the development of the airport site, it was considered the best solution for all infrastructure non-conformities, allowing the future development of the airport site in an optimized way, assuring a high level of service for all installations, minimizing the interference in the existing facilities and presenting compatible costs with the airport revenues during the concession period.

The proposed alternatives and their main characteristics are presented in Figure 2-10.

Figure 2-10: Proposed Alternatives

Alternative 01		• Passenger terminal building extension by approximately 4,000 m² (Costs > R$ 30 MM); • Apron extension of 13,500 m² (Costs > R$ 5 MM); and • New general aviation apron implementation with 20,000 m² (Costs > R$ 7 MM).
Alternative 02		• Passenger terminal building extension by approximately 3,000 m² (Costs > R$ 23 MM).

Source: GCA Consortium.

The presented costs were obtained from reference figures by square meter (m²) and have the purpose to compare in a macro way the different alternatives. The detailed cost analysis was made only for the chosen alternative and it is presented in the CAPEX report.

According to the studies carried out, the demand for air cargo in Rio Branco will be small during the concession period, not justifying the implementation of an Air Cargo Terminal and aircraft apron dedicated to this activity. In addition, the current aircraft apron is enough to meet demand, requiring only a small expansion of the PTB. Thus, alternative 02 proved to be more advantageous than the proposal of the Master Plan (alternative 01).

2.5 Development Plan

After the selection of the most appropriate alternative and the Requirement Plans, it was designed the airport's development plan for the concession period. Furthermore, it was developed an architecture and engineering preliminary design. Thus, the costs of the project and operation along the implementation phases were estimated in order to enable the airport economic-financial modeling.

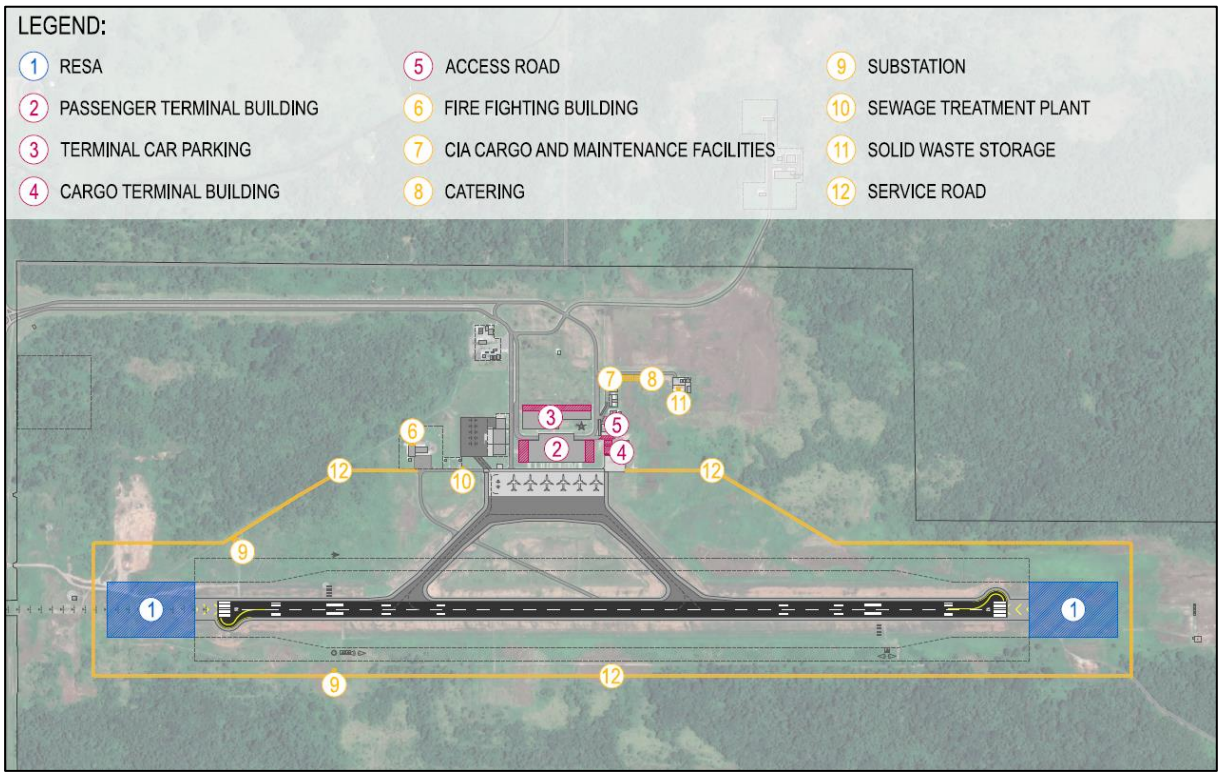
Below, the main investments for each phase of the planning are presented, as well as the implementation plants identifying the interventions at the airport and their subsequent level of details.

2.5.1 Phase 1

The first phase of the concession is expected to occur between the years 2024 and 2035, since the period between 2021 and 2024 will be used to get both the environmental licenses and carry out the constructions, so that all proposed works meet the demand of the year 2035.

In the Figure 2-11, it is presented the implementation proposed to Rio Branco Airport, considering Phase 01.

Figure 2-11: Development Plan – Phase 01 Implementations



Source: GCA Consortium.

The main interventions proposed in this phase are:

- Implementation of RESA on the thresholds 06 and 24;
- Runway 06/24 strip leveling;
- Runway, taxiway and apron drainage system adequation;
- Passenger terminal building and terminal car parking extension.

2.5.2 Phase 2

The second phase of the operation is expected to be between the years 2036 and 2051, since the period for obtaining the environmental licenses and carrying out the constructions happen in the previous phase, in order to all proposed works meet the demands of the year 2050.

In Figure 2-12, it is presented the proposed implementation for the Rio Branco Airport, considering the Phase 02.

Figure 2-12: Development Plan – Phase 02 Implementations

Source: GCA Consortium.

The main intervention proposed for this phase is the terminal car parking extension.

2.6 CAPEX

To elaborate the budget for the planned investments, prices were considered in accordance with the reference tables of SINCRO and SINAPI, in order to get referential unit cost per airport component. It was also considered the BDI rate, according to the TCU guidance and SICRO methodology. So, from the planned investments, unit costs and BDI rate, it was obtained the budget for the investments to the airport development. The Table 2-7 summarize the investments by implementation phase.

Table 2-7: CAPEX – Summary per Phase

DESCRIPTION	VALUES [R$]
Phase 1 Airport Expansion	77,573,664.54
Phase 2 Airport Expansion	32,636,691.11
Airport Expansion Subtotal	**110,210,355.65**
Phase 1 Airport Expropriations	-
Phase 2 Airport Expropriations	-
Airport Expropriations Subtotal	**-**
CAPEX Total	**110,210,355.65**

Source: GCA Consortium.

The Table 2-8 compiles the investment, maintenance and expropriation expenses values for each phase, considering the investments used for the resurfaces in the runaway system (which is included in “Maintenance” in Table 2-8).

Table 2-8: Components Summary

DESCRIPTION	DEVELOPMENT (R$)	MAINTENANCE (R$)	EXPROPRIATION (R$)	VALUES (R$)
Phase 1 Airport Expansion	53,798,588.24	23,775,076.30		77,573,664.54
Phase 2 Airport Expansion	1,002,249.09	31,634,442.02		32,636,691.11
Airport Expansion Subtotal	**54,800,837.33**	**55,409,518.32**		**110,210,355.65**
Phase 1 Airport Expropriations	-	-	-	-
Phase 2 Airport Expropriations	-	-	-	-
Airport Expropriations Subtotal	**-**	**-**	**-**	**-**
CAPEX Total	**54,800,837.33**	**55,409,518.32**		**110,210,355.65**

Source: GCA Consortium.

3 ENVIRONMENTAL STUDIES

The Report 3 – Environmental Studies was elaborated to comply with the *Public Notice (Edital de Chamamento Público) N. 2/2019* regarding projects presentation, surveys, investigations and technical studies required to subsidize the concession modeling for expansion, exploration and maintenance of the Airport of Rio Branco.

The report presents all the environmental studies performed in the field and in the office, by means of primary and secondary data, including a detailed assessment of every document provided by the Secretariat of Civil Aviation (*Secretaria de Aviação Civil – SAC)*, disclosed in Data Room, and of environmental processes verified at the Environmental Institute of Acre (*Instituto de Meio Ambiente do Acre – IMAC*) on October 14, 2019.

These data oriented the technical field visit to the Airport of Rio Branco, which occurred on May 14, 2019.

Environmental studies were conducted in order to meet the guidelines presented by the public notice, considering that all of the requirements were properly addressed in the report, according to certain analytical chronology, by means of careful evaluation of the airport's compliance with the respective licensing procedures, expansion studies, master plans and previous environmental studies.

The airport of Rio Branco is located in Rio Branco city, capital of Acre state, North of Brazil. The aviation history in Rio Branco began in the forties, when the first airport operated, meeting the demands of aviation in general. Years later, the International Airport Presidente Médici was inaugurated, in 1973, meeting the demands of general and regular aviation, connecting the North region to all the great cities of Brazil. In 1999, the International Airport of Rio Branco (current complex) was inaugurated to meet the demands of passengers and cargo in Western Brazil.

Regarding environmental regularity, the Airport of Rio Branco is in a renewal process concerning the operating licensing of its current activities and infrastructure. The Institute of Environment of Acre (*Instituto de Meio Ambiente do Acre – IMAC*), the environmental agency of Acre state, is responsible for the environmental licensing of the enterprise. Information on the Operating Licenses (OL) is detailed below.

Chart 3-1: Operating license data

License	Issuing Agency	Process n.	Issue	Expiration	Status
OL 148/2016	IMAC	OL 245/2015	May 18, 2016	May 18, 2020	Valid

Source: GCA Consortium.

The report detailed the compliance *status* of Operating Licenses (OL) n. 148/2016 constraints, as well as the historical and relevant points of the processes. In the renewal of Operation License nº 106/2020, of February 27, 2020, the conditions were fully maintained.

Since the beginning of its operations, the enterprise received several expansion and improvement constructions. The environmental report presents the main actions, constructions, intended constructions and their respective environmental licenses obtained after 2013.

The following documents were surveyed and reported, regarding the airport manager: authorizations, license agreements and other licenses, including those obtained by its concesssionaire enterprises. A list of ongoing agreements, with the activities susceptible to licensing, was also presented.

Regarding the regularity of the enterprise, notifications and non-compliances of the airport were surveyed and exhibited to several agencies, National Agency of Sanitary Vigilance (*Agência Nacional de Vigilância Sanitária - Anvisa*) and National Agency if Civil Aviation (*Agência Nacional de Aviação Civil - ANAC*).

The information on past notices and fines do not oblige the next manager, which is not responsible for their payments. However, the current airport manager is responsible for eliminating the facts that originated such notices, as well as for managing ongoing mitigating or recovering actions.

The main noncompliances pointed out by ANVISA are related to the non-utilization of chlorine to disinfect the water supply system and failures in solid waste management. Concerning ANAC, there is a note of infraction on noncompliance of RBAC 161, regarding the elaboration of Noise Zoning Specific Plan (answered in 2019).

A socio-environmental assessment of the Airport of Rio Branco was performed and presented by means of the socio-environmental diagnosis in this report, considering the following aspects:

Soil Use and Coverage including approaches to water resources, permanent preservation areas (APP) and vegetation;
Irregular superficiaries and occupations in the airport assets area;
Potential of Cave Occurrence;
Mining rights;
Fauna and Fauna Risk;
Noise;
Atmospheric Emissions;
Energy;
Basic Sanitation including approaches to water supply, effluents, solid waste and drainage system;
Degraded areas, erosions and silting;
Environmental Risks/Emergencies;
Conservation Units, Protected Assets and Communities, including the analysis of heritage, archeological or pre-historical sites and traditional communities;
Stakeholders engagement;
Environmental Management System.

The airport of Rio Branco region is characterized by the Brazilian Amazon Biome, specially by the physiognomies of Dense Ombrophylous Forest and Open Ombrophylous Forest (IBGE, 2004). The vegetation coverage close to the airport corresponds to Ombrophylous Forest, besides of Wetland Area and Anthropic Field with isolated trees.

According to the classification of Brazilian Hydrographic Sub-basins, the enterprise is located in the hydrographic basin of Amazonas River, between Coari lake and Purus river. Regarding Hydrographic Basins of Acre State, it is located in Hydrographic Basil of Acre-Iquiri River.

Inside the airport of Rio Branco site there are water bodies that flow to *Igarapé* Redenção, from where the water is collected for supply. *Igarapé* Redenção is one of the Acre River affluents.

Besides of the INFRAERO areas, in the airport of Rio Branco hosts military buildings of Aeronautics Command dedicated to Amazon Vigilance System (*Sistema de Vigilância da Amazônia – SIVAM*), although the airport use is not shared.

No mining titles were identified issued inside the airport of Manaus site and surroundings. If the future manager finds identify conflicts with mining activities in the future, it is important to request to DNPM, according to article n. 42 of the Mining Code, the mining block at the airport site.

Concerning the fauna risk, considering the operational characteristics of the airport and the criteria established by RBAC 164/2014, elaboration and implementation of IPF and PGRF are required as instruments to adequate management. The IPF and PGRF of airport of Rio Branco are being elaborated by the enterprise Sama Consultoria Ambiental Ltda – Me, Term of Contract n. TC0205-PS/2018/0001 since September 5th, 2018 and with a deadline set to November 11, 2019, more 270 consecutive days that may be added, *i.e.*, August 25, 2020.

Concerning the compliance with RBAC 161, since the airport of Rio Branco is not obliged to apply a Specific Plan of Noise Zoning (*Plano Específico de Zoneamento de Ruído - PEZR*) because it does not fit in the item 161.15(a)(1) of RBAC. However, INFRAERO, based on item 161.15(a)(2) chose to elaborate a PEZR. According to Portaria n. 2673/SIA, of August 27, 2018, PEZR was validated by ANAC.

Concerning basic sanitation, the potable water supply of airport of Rio Branco is made by contract with Rio Branco municipality, that has an agreement with State Department of Pavement and Sanitation (*Departamento Estadual de Pavimentação e Saneamento – DEPASA*). In the airport there is a general hydrometer in the system entrance, were consumption measurement is made. The water is complementarily treated and kept stored in the flowing reservoir: in the Passengers Terminal there is a water castle of 180,000 L and cisterns, totalizing 640,000 L. In the SCI, there is an elevated reservoir of 15,000 L and a buried reservoir of 70,000 L, totalizing 85,000 L.

Concerning solid waste, the airport of Rio Branco has a Manage classifies the waste according to RDC-ANVISA N. 56/08, so segregation is organized in groups A, B, C, D and E. Currently Group A waste are no treated and destined correctly. However, the airport has a constructed Solid Waste Centre and an autoclave, that is not installed. The waste removal is made by municipal public service, that disposes it in Municipal Landfill of Rio Branco.

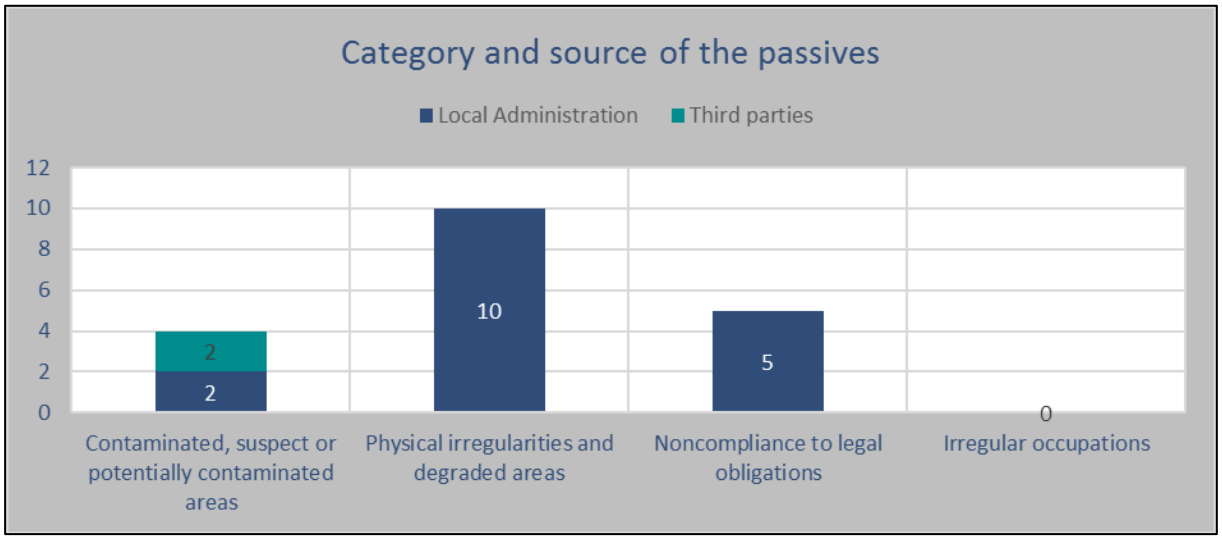
The airport of Rio Branco has a working sewage treatment station constituted by a pumping station and tanks for anaerobic biological treatment.

The runaway draining system was in good conservation conditions, in despite of requiring maintenance regarding vegetation removal in several points. The draining system supports the rainfall flow, although some grass areas were subject to floods presented, requiring leveling interventions. No slopes with erosive processes were observed.

In the airport of Rio Branco site and its surroundings, Conservation Units of sustainable use were identified, and the opinion from the responsible agency shall compose the licensing process of the development plan constructions.

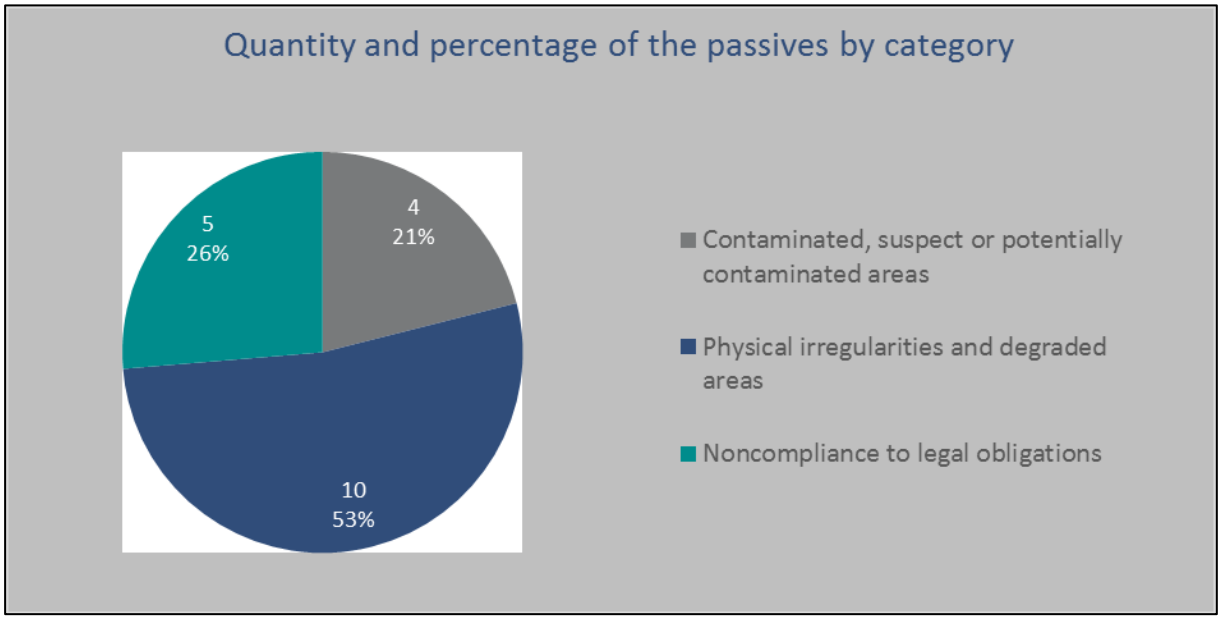
During the preparation of this document, existing socio-environmental passives were surveyed, evaluated and priced. For the Airport of Rio Branco, 19 socio-environmental passives were identified. 17 of them were originated by local administration and only 02 by third parties. From this total, 21% were related to contaminated areas, 53% to physical irregularities and degraded areas, 26% to noncompliance with legal obligations. No passives related to irregular occupations were identified.

Figure 3-1: Category And Source Of The Passives



Source: GCA Consortium.

Figure 3-2: Quantity And Percentage Of The Passives By Category

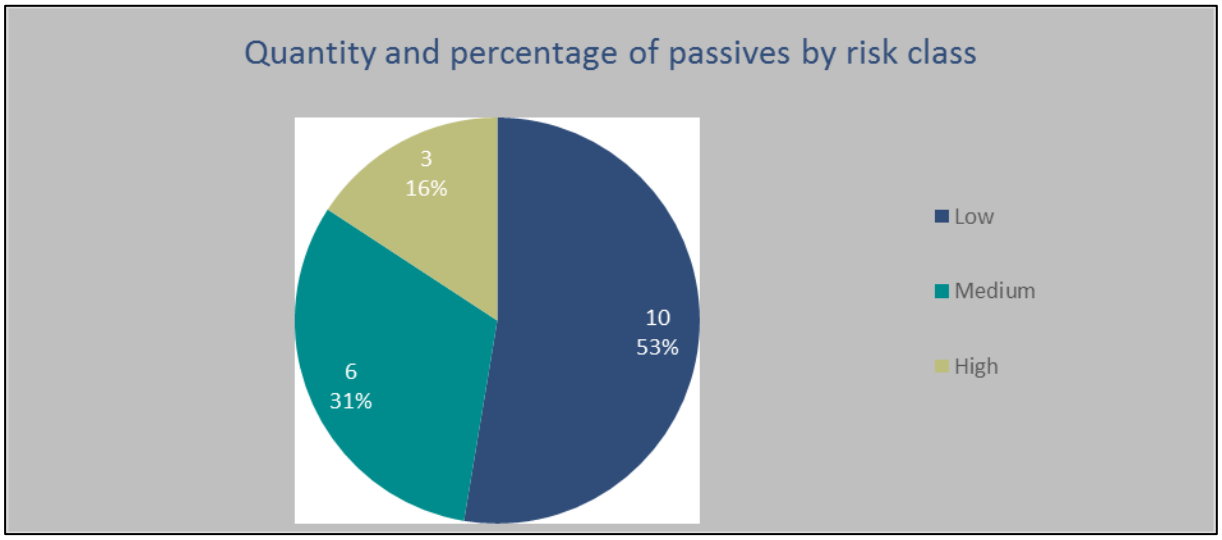


Source: GCA Consortium.

The classification of passives identified according to their Risk Class was assessed based on a methodology adapted from FMEA (*Failure Mode and Effects Analysis).*

Considering the current scenario, the Airport of Rio Branco presents passives classified as of High, Medium and Low risks. The passives classified as of High risk shall be managed in the short run, and the passives classified as of Medium to Low risk may be managed according to their respective criticalities in short or medium term.

Figure 3-3: Quantity And Percentage Of Passives By Risk Class



Source: GCA Consortium.

The study includes a detailed analysis of current and future compatibility of the airport activities and soil use, dedicated to verify if the protection plan against obstacle, the noise zoning plan and airport safety area were properly incorporated in the guidelines and legislation that regulates the occupation of the airport's neighboring areas.

In order to guarantee the good development of the enterprise, the neighboring areas shall continue to be compatible with the airport activities. To achieve this goal, the airport manager shall update and approve the appropriate plans, especially in case of meaningful alterations in operation and infrastructure.

The simulation performed in the study identified in the future scenario, after the constructions' implementation, new areas will not be affected in surfaces that compose the PZPA. For PZPANA, PAPI surface, composed by a limiting surface of obstacles in ramp, becomes part of Porto Acre city.

The study also verified that for the Current Scenario, the noise contours do not extrapolate the airport area, therefore, do not impact residential use in external areas. In the Future Scenario, the noise contours from 65 to 70 dB affect only the green areas close to the airport. However, there are no incompatible uses (residences and sensitive receptors such as public institutions, hospitals and schools) in the affected areas.

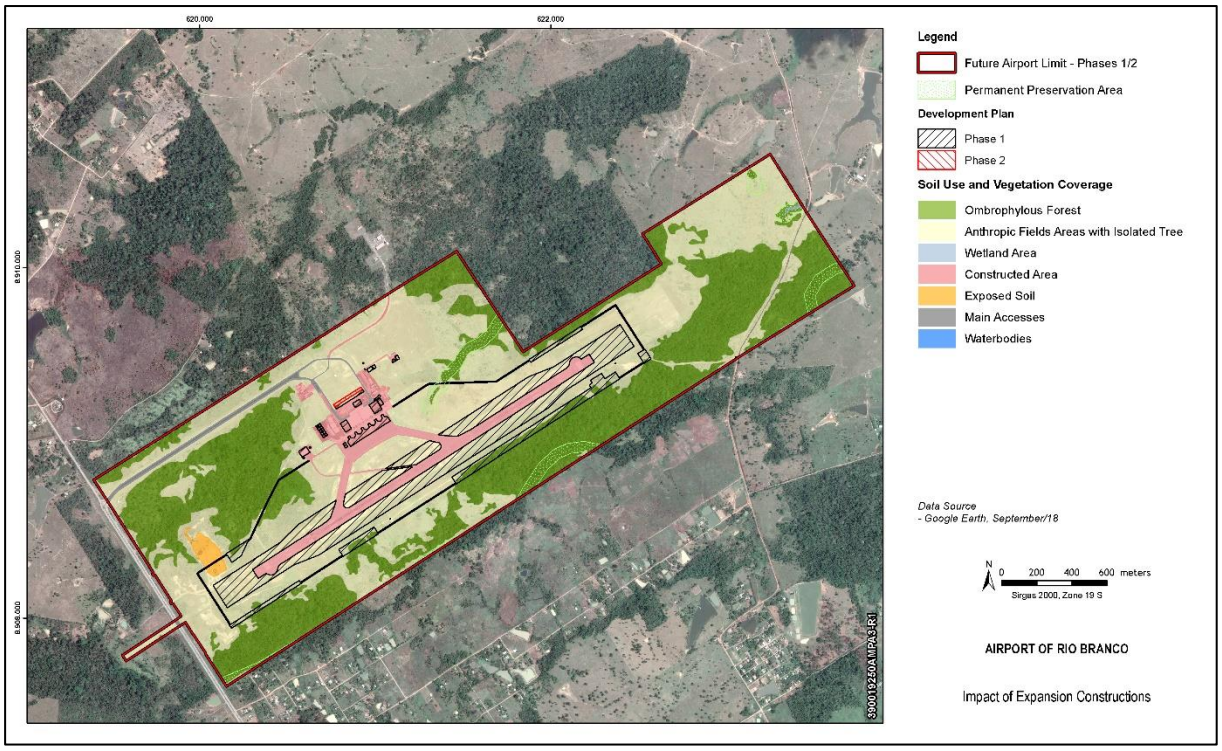
Regarding risks to the Fauna, the study identified the main focuses of attraction inside the Airport Safety Area (ASA), a circular area with 20 km of radius, marked from the geometric center of the longest runway. We highlight the focus related to irregular common garbage disposal and agriculture and livestock occurring in the airport area and surroundings. Thus, the airport manager shall help the municipality to monitor the focuses and to develop educational actions in order to avoid the appearance of new focuses.

Based on all these surveys, the main goal of the study was fulfilled, especially regarding the legal and environmental restrictions of the airport and its neighboring areas. Socio-environmental criteria to be incorporated to the project were identified and oriented the Development Plan in order to minimize environmental impacts.

The airport presents some environmental restrictions that may hinder its expansion, such as APP presence in expansion area. The project has been oriented to avoid permanent preservation areas; however, the airport site presents many water resources, and intervention in some APP areas is required. Associated compensation costs were estimated for all the interventions in forest fragments.

Therefore, the Development Plan for the airport considered every restriction and environmental criteria surveyed in the study. The solution proposed is the one with the lowest environmental impact in the airport region and that allows its compliance with applicable legislation. The following figure shows the impact of expansion works on soil use and coverage.

Figure 3-4: Impact of the Adequation Constructions On Soil Uses And Coverage



Source: GCA Consortium.

Evaluating the construction works impact on soil use and coverage in the Airport of Rio Branco, during the two phases of the Development Plan implementation, the main alterations shall be made in the Anthropic Fields areas, with isolated three individuals, that totalize 85,05% of the intervention area. Interventions in Ombrophylous forest areas will be required for 4,60 ha to adequate the safety operating conditions of the airport. Regarding interventions in Permanent Preservation Areas (APP), there will be impact during phase 1, with 0,09% of the intervention areas located in APP, since vegetation suppression is required to the installation of operational fences and perimetral service route of PPD.

Concerning socio-environmental risks associated to the project, *i.e.*, situations that may impair or delay the execution of foreseen activities and constructions, two risk situations were identified and summarized below.

Chart 3-2: Risks And Their Respective Strategies To Minimization

Socio-environmental risk management at the Airport	
RISK SITUATION 1	Water supply in the dry season
Identified risk	• The Rio Branco region had already been through shortage in the dry season.
Strategies to minimize the risk	• Management with Rio Branco municipality and DEPASA, to adopt measures that guarantee the airport supply. • Installation of deep tubular wells to collect groundwater at the airport site.
RISK SITUATION 2	Difficulty on input obtention
Identified risk	• To perform the constructions, no licensed suppliers of the main input (concrete and asphalt) were identified in the region
Strategies to minimize the risk	• The CAPEX cost to acquire inputs is aware of this difficulty. • To license the plants inside the airport site, if the aerodrome operator understands this possibility as required and environmentally feasible.

Source: GCA Consortium.

Considering that the local availability of input and raw material suppliers, and of waste disposal sites required to implement the Development Plan are essential to the Project feasibility, the Environmental Report listed potential licensed suppliers to help estimating costs in the Report of Engineering and Related Issues.

The study also presents the licensing guidelines required for the entire concession period, accompanied by the respective schedules for the implementation and operation phases of the airport.

For the Operational phase, considering that the airport of Rio Branco is regularized, and the beginning of the concession is foreseen for the second half of 2021, the renewal will be requested by INFRAERO. Normally, the licenses issued for Airport of Rio Branco expire in four years. Therefore, the airport manager will receive the airport with an Operating License valid until May 2024.

Based on these conditions, the chart below presents recommendations to the future airport manager, regarding the conduction of the airport's operating licensing:

Chart 3-3: Recommendations For Conducting The Airport's Operating Licensing

Recommendations for conducting the airport's operating licensing
Once you took over the airport's management, you must request the license titularity transference to your name and CNPJ.
During the airport operation, all the constraints of the future Regularization Operating License (or similar) must be addressed. Periodical reports on the activities' execution must be presented to the environmental agencies.
To request the OL renewal at least 120 days before its expiration date, according to paragraph 4th of article 12 of Complementary Law n. 140, from December 8, 2011.
After the end of each construction phase, if authorized by means of an Installation License, the entrepreneurship shall request these constructions to be included in the current operating license, avoiding the issuing of several OL for the same airport enterprise.

Source: GCA Consortium.

Besides of the operating environmental licensing of the airport, the airport operating activities will be regular by the issuing of authorizations, exemptions and complementary grants and documentation approval by regulatory public agencies. The chart below presents the estimated timeframes used in the present study.

Chart 3-4: Estimated Timeframes For Other Authorizations, Grants And Licenses

Description	Estimated timeframe	TOTAL
Regularization/Renewal/ Transference of Grant for water resources use (AA[1]) and Grant Issuing (OC[2])	2 months (AA[1]) 2 months (OC[2])	4 months
Regularization of Federal and State Technical Registration (AA[1])	2 months (AA[1])	2 months
Elaboration/Regularization/Renewal of IPF and PGRF (AA[1]) and validation in ANAC (OC[2])	15 months (AA[1]) 3 months (OC[2])	18 months
Elaboration /Regularization of noise contours and PZR (AA[1]) and validation and registration in ANAC (OC[2])	6 months (AA[1]) 3 months (OC[2])	9 months
Regularization of PBZPA and PZPANA(AA[1]) and validation in ANAC and DECEA (OC[2])	6 months (AA[1]) 4 months (OC[2])	10 months
Mining block request to DNPM (AA[1]) and mining block issue (OC[2])	2 months (AA[1]) 2 months (OC[2])	4 months

Notes:

[1] AA- Airport manager

[2] OC- Responsible agency

Source: GCA Consortium.

Regarding the expansion and adequation constructions phase, the Development Plan proposed for Airport of Rio Branco will be implemented in two phases. The chart below summarizes the licensing premises for each phase.

Chart 3-5: Licensing Premises For The Expansion And Adequation Constructions Of Airport Of Rio Branco

Evaluated Aspects	Phase 1	Phase 2
Impact degree of the constructions	Medium	Low
Licensing agency	IMAC (State)	IMAC (State)
Applicable licenses	PL and IL	License exemption
Studies to be performed	RAS and PCA	-
Maximum estimated timeframe for studies and licensing	12 months	-

Source: GCA Consortium.

Evaluating the licensing history and the guidelines of Resolution CEMACT n. 02/2017, we adopt the premise that the Environmental Institute of Acre (*Instituto do Meio Ambiente do Acre – IMAC*) will request PL and IL for Phase 1 constructions, subsidized by RAS and PCA, and dismiss licensing of constructions to Phase 2, impacting small areas and do not modifying the airport's category.

The estimated timeframes for the environmental licensing of the constructions considered the impact degrees previously described, results being presented below.

Chart 3-6: Estimated Timeframes For Licensing Constructions Of Medium Environmental Impact

Description	Estimated timeframe
RAS elaboration for PL issue	3 months (AA[1])
PCA elaboration for IL issue (simultaneous to RAS elaboration)	3 months (AA[1])
RAS analysis and new PL issue	4 months (OA[2])
PCA review and compliance with the constraints after the PL issue	1 month (AA[1])
Analysis and new IL issue	4 months (OA[2])
TOTAL	**12 MONTHS**

Notes:

[1] AA- Airport manager

[2] OA- Environmental Agency

Source: GCA Consortium.

The airport manager should also analyze verify other authorizations required to enable the Development Plan, concerning the licensing of all its three phases. The chart below summarizes this evaluation for Airport of Rio Branco.

Chart 3-7: Environmental Authorizations And Procedures Required For Rio Branco

Authorization/Procedure	Applicability for the Development Plan
Municipality Opinion	Applicable
Authorization for Vegetation Suppression (ASV) and/or Intervention in APP	Applicable
National Institute of Historical and Artistical Heritage (Instituto do Patrimônio Histórico e Artístico Nacional - IPHAN) Opinion	Applicable
Grant of water resources use	Applicable
Mining Block	Applicable
Authorization from Conservation Units Managers	Applicable
Authorization for intervention in traditional communities or its surrounding zones	Not applicable
Obtainment of the Evaluation Report Malarigen Potential (Laudo de Avaliação do Potencial Malarígeno - LAPM) and Certificate of Sanitary Condition (Atestado de Condição Sanitária - ATCS)	Applicable

Source: GCA Consortium.

To achieve excellence in socio-environmental management, this study presented mitigation measures, suggestions on Sustainability Guidelines, Environmental Management System, Environmental Plans and Programmes and Environmental Development Indexes to the future airport manager, considering all the environmental subjects assessed herein.

Finally, the study presents the socio-environmental cost budget foreseen for the expansion constructions (CAPEX) and for the airport operation (OPEX), summarized below:

Chart 3-8: Socio-Environmental Costs In R$ Estimated For The Airport Of Rio Branco

Activity	Phase 1	Phase 2	TOTAL
Licensing and Analysis Fees	2,219.67	-	2,219.67
Environmental Studies	430,713.75	-	430,713.75
Environmental Management of the Constructions	1,647,028.86	-	1,647,028.86
Vegetation Suppression and Forest Compensation	325.869,57	-	325.869,57
Confirmatory Investigation of Passives	152,590.30	-	152,590.30
Environmental Passives Recuperation	-	-	-
Environmental Compensation SNUC *	-	-	-
Total	**2.558.449,16**	**-**	**2.558.449,16**

Note: the constructions foreseen for Phase 2 do not require environmental licensing or any activity foreseen by Environmental CAPEX

* Not applicable in this case

Source: GCA Consortium.

Chart 3-9: Environmental OPEX estimated for the Airport of Rio Branco

Item	Activity	Total Cost (R$)
2.1	Environmental Licensing Fees	696,705.59
	OL Renewal	*1,097.99*
	TCFA – IBAMA	*695,607.60*
2.2	Operation Environmental Management	3,842,471.16
	Elaboration of PBZPA and PZPANA	*3,572,471.16*
	Fauna Management Programme	*270,000.00*
2.3	*PF and PGRF Elaboration*	205,678.91
2.4	*Fauna handling actions*	2,854,361.15
	Noise Management Programme	*2,494,361.15*
	Energy and Air Emissions Management Programme	*360,000.00*
2.5	Water Resources and Effluents Management Programme	89,252.79
2.6	*Sampling Plan Elaboration*	23,817.19
2.7	*Water Resources Monitoring*	3,313,271.07
	Solid Waste Management Programme	*23,817.19*
	Social Communication, Environmental Education and Training	*3,289,453.87*
2.8	Environmental Licensing Fees	37,282.87
2.9	*OL Renewal*	481,192.34
	TOTAL	**11,544,033.08**

Source: GCA Consortium.

The Environmental Studies maintained the innovations presented in the study is elaborated by GCA Consortium of the 5th Round of Airport Concessions from Federal Government, which culminated in the concession of 12 airports for private initiative. They are:

Analysis of soil use and occupation inside noise contours, by means of identifying the quantity of residences and their respective areas, people and average quantity of people per residence based on census information (IBGE, 2010);
Survey of focuses of fauna attraction, using criteria defined by specific aeronautical legislation;
Survey and analysis of collision indexes involving aircrafts and fauna, according to data provided by CENIPA;
Identification of areas vulnerable to the airport activities, since there are fauna and flora species of restrict distribution located in regions under the aerodrome influence, according to ICMBIO criteria;
Risk evaluation of environmental passives based on a methodology adapted from FMEA (Failure Mode and Effects Analysis);

Indexes proposition according to GRI Standards (version 2016) and GRI G4- Airport Operator Sector Disclosures (version 2013) references, correlating them to the Sustainable Development Goals (*Objetivos de Desenvolvimento Sustentável -ODS*), to the IFC Performance patterns, and with the guidelines of Global Pact.

In addition, with the participation of several professionals specialized in the environment area and with effective practice on airport operation, the flowing innovations were performed in the Environmental Studies:

Identification of all kinds of irregular superficiaries and occupations in the property and the expansion area;
Survey of potential cave occurrences in the airport area and its surroundings;
Information on the existence of mineral deposits in the airport area and its surroundings;
Evaluation of mining rights in the airport area and its surroundings;
Amplification of identified classes of environmental passives and its respective results presented by an Excel spreadsheet, with friendly and intuitive interface;
Survey on receptors sensitive to aircraft noise – public institutions, hospitals and schools – located inside the airport noise contours;
Indication of licensed potential suppliers of inputs and raw materials, close to the airport, for the Development Plan constructions;
Indication of licensed sites for adequate waste disposal, close to the airport;
Evaluation of the airport position on the ranking of airports used for animal traffic, as well as proposition of actions to prevent traffic;
Use of indicators from the Guide of Good Practices for Elaborating Indicators of Operational Safety elaborated by the Brazilian Group of Operational Safety in Airport Infrastructure (BAIST), published in August 2019;
Quantification of the expansion construction impacts in Permanent Preservation Areas (APP) and proposition of differentiated forest compensation, according to local legislation;
Use of data on water, obtained by SPT drilling performed by GCA, to guide the estimated budget of Confirmatory Investigations and sites with suspected contamination in the airport;
Incorporation of sustainable proposals in the Development Plan;
Definition of Sustainability guidelines for the airport operations, aligned with the policies adopted by the Ministry of Infrastructure;
Proposition of the action "Planting to Support the Amazon Rainforest Conservation", which foresees the anthropic areas located in the airport site or in public areas, by seedlings and seeds in 1 hectare of land by year of operation.

4 ECONOMIC AND FINANCIAL EVALUATION

This section presents the Executive Summary of the Economic and Financial Evaluation for the 30-year concession of **Rio Branco Airport - SBRB** modelled between 01/October/2021 and 30/September/2051. Currently, the airport's total revenue is R$9 MM and its EBITDA margin is -34% (considering 2018 data)[7].

Revenues

The economic and financial evaluation is based on revenue projections which include:

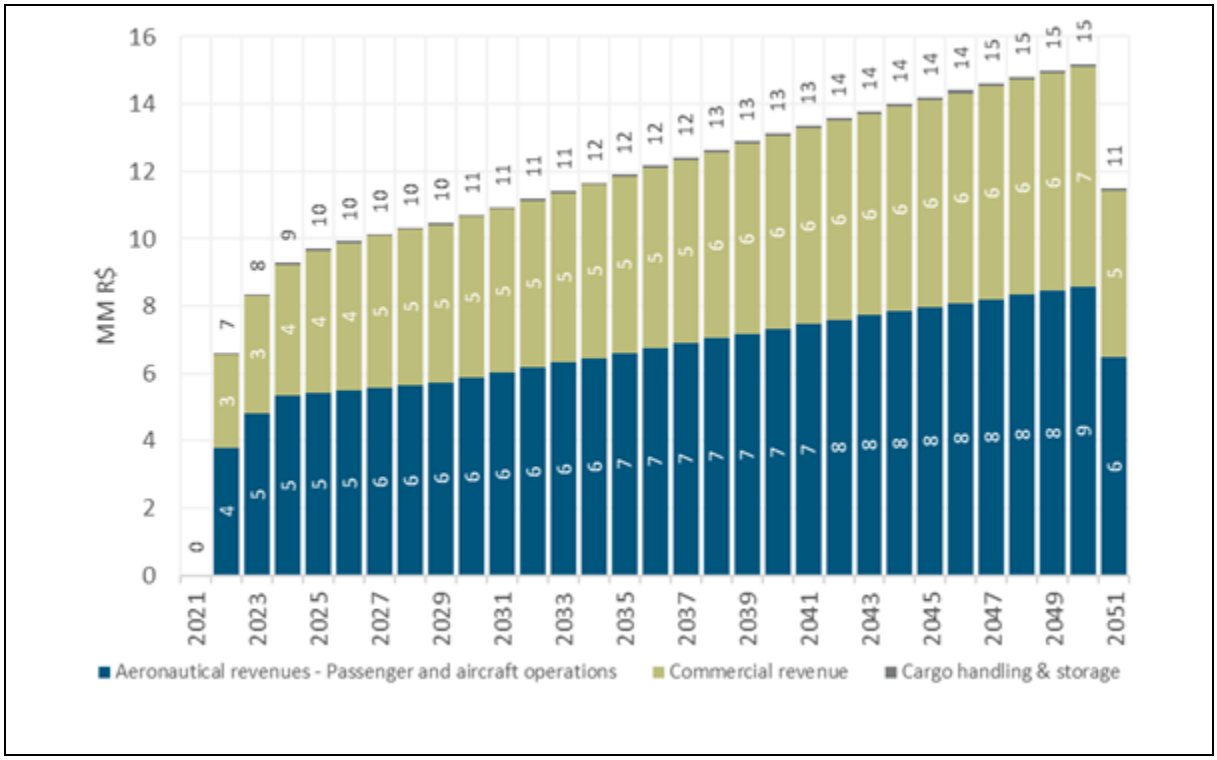
- Aeronautical revenues, resulting from regulated fees on the various operation types. These have been categorized as passenger and aircraft fees and cargo handling and storage fees;
    - Aeronautical revenues – passengers and aircraft operations: applicable to both passenger flows (domestic and international boarding or connection fees) and aircraft operation and parking, by operation type (domestic and international landing and parking fees, and landing and boarding and parking fees for general aviation);
    - Cargo handling and storage: due for cargo handling and storage services where rendered directly by the Airport operator at the air cargo terminal (TECA), and may divide into import, export and domestic cargo;
- Commercial revenues, related to services and goods provided to passengers, airlines and other business users, i.e. retail, food & beverages, car parking, aircraft fuelling, car rental etc.

Forecasts for aeronautical revenues are based on expected Airport throughput, which include passenger flows, cargo, mix of aircraft types and aircraft operations, and their respective fees. Meanwhile, forecasts for commercial revenues consider not only expected demands and their respective impacts over each category of business, but also efficiency gains resulting from contract renegotiations between the concessionaire and the lessees of commercial areas, following market benchmarks.

Total revenues are expected to grow on an average of 2.2%p.a. between 2023 and 2050. Commercial revenues will increase during the concession period, from 42% in 2023 to 43% in 2050.

[7] All monetary value presented in this report is given in constant Real (R$) values based on January/2019 real prices, following SAC/MI guidance.

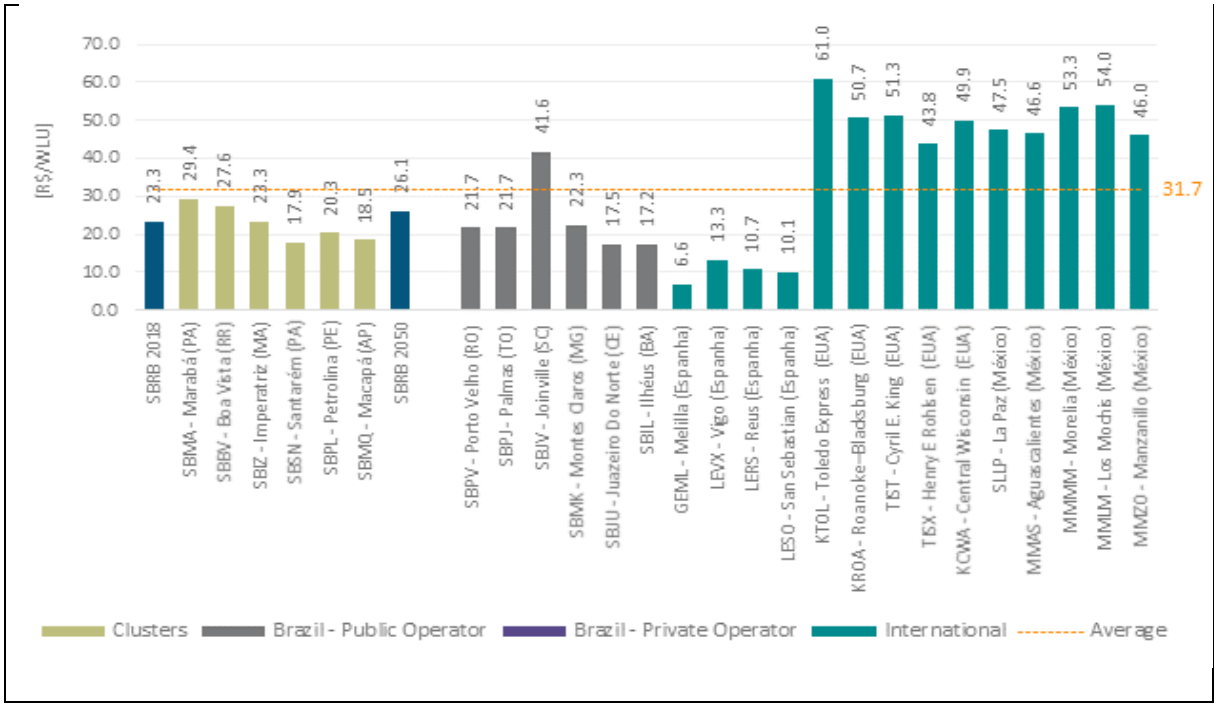
Figure 4-1:Total revenues during concession



Source: GCA Consortium.

In 2050, the Airport's revenue per WLU will be R$26.1. Airport indicators are below the average of comparable airports (Figure 4-2).

Figure 4-2:Revenue per WLU benchmark



Source: GCA Consortium.

Costs and expenses

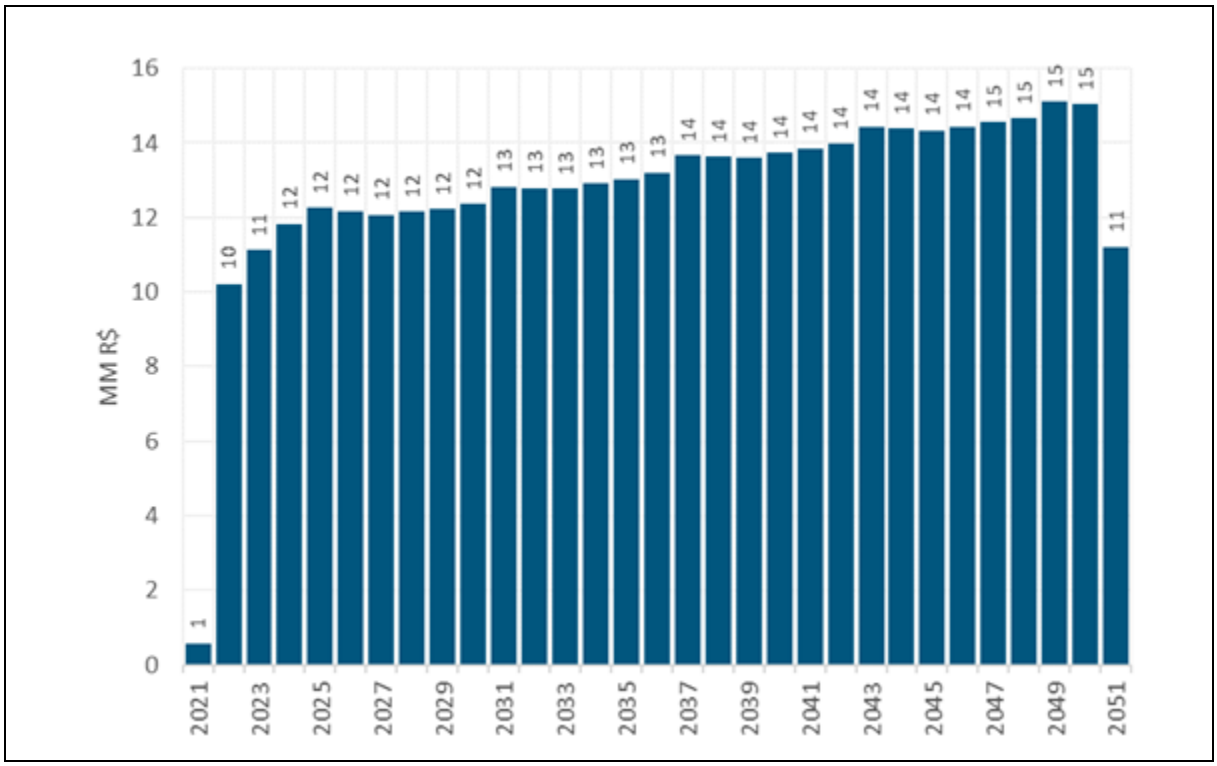
Airport operating costs and expenses are mainly related to personnel and outsourced services, in addition to utilities and public services and consumables.

After the concession, the concessionaire will take up new obligations, which include performance bond, socio-environmental expenses and property tax (IPTU). The concessionaire must also pay grants, applicable according to the feasibility of the concession and therefore not discussed under this item.

Costs and expenses forecast take into account the most appropriate forecast drivers for each item, that is, the variables that best explain the evolution of the observed costs. Additionally, costs and expenses forecasts were based on current values and considered initial efficiency gains derived from private management as well as economies of scale, determined from benchmark analyses.

Total costs and expenses forecasts show an annual average growth rate of 1.1% between 2023 and 2050, increasing from R$11MM to R$15MM (Figure 4-3). Personnel and Outsourced services costs are the most significant, representing 42% and 35% of total costs in 2050, respectively.

Figure 4-3:Costs and expenses during concession (prior to grant values)



Source: GCA Consortium.

It is important to emphasize that, before entering into the concession agreement, the concession holder will be required to settle funds for Infraero's staff readjustment program, reimbursement to authors of the feasibility studies, and compensation to São Paulo stock exchange (B3) for holding the auction. (Figure 4-4).

Figure 4-4:Obligations to be met prior to signing the contract

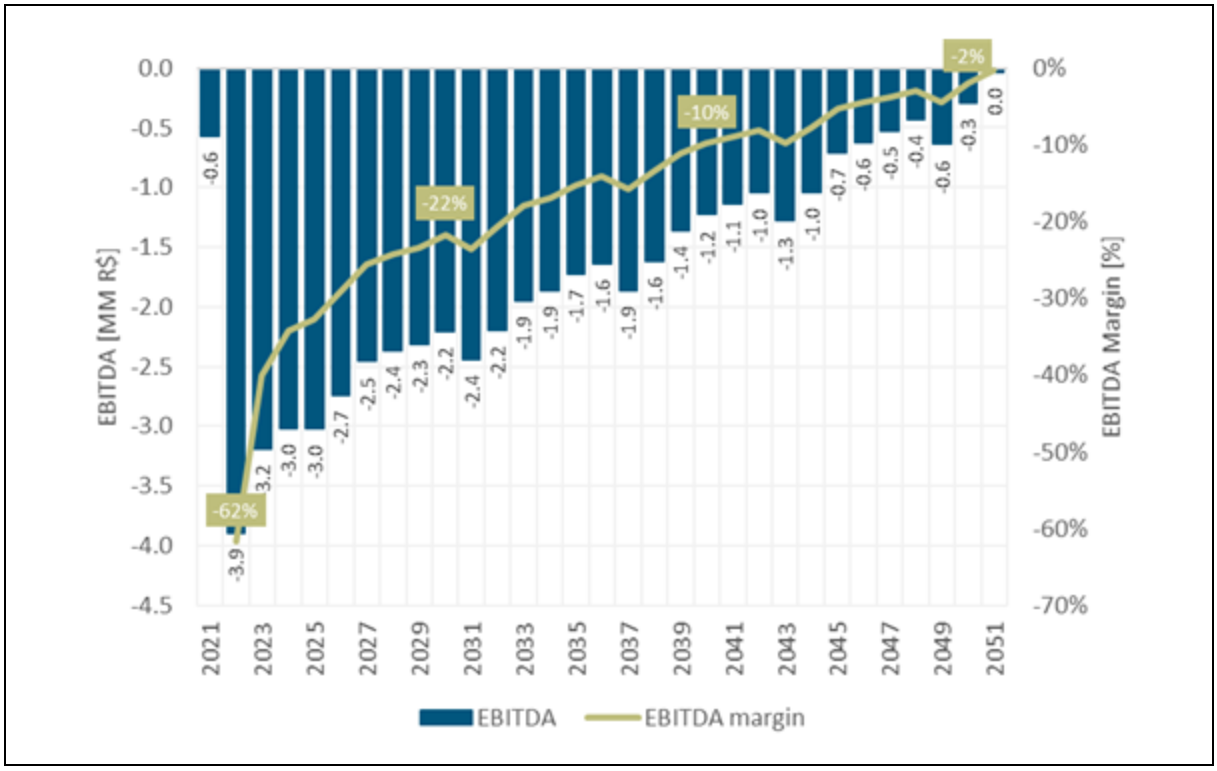
Values in MM R$	TOTAL
OBLIGATIONS TO BE MET PRIOR TO SIGNING THE CONTRACT	**(13.7)**
Funds for Infraero's staff readjustment program	(9.6)
Reimbursement to authors of the feasibility studies	(4.0)
Payment to B3 for holding the auction	(0.1)

Source: GCA Consortium.

EBITDA and margin

Net of grant payments, the concession EBITDA is forecast to be R$3.2MM negatives in 2023 and to reach R$0.3MM negatives in 2050 (Figure 4-5). EBITDA margins increase is forecast throughout the concession due to expected economies of scale.

Figure 4-5:EBITDA and EBITDA margins during concession



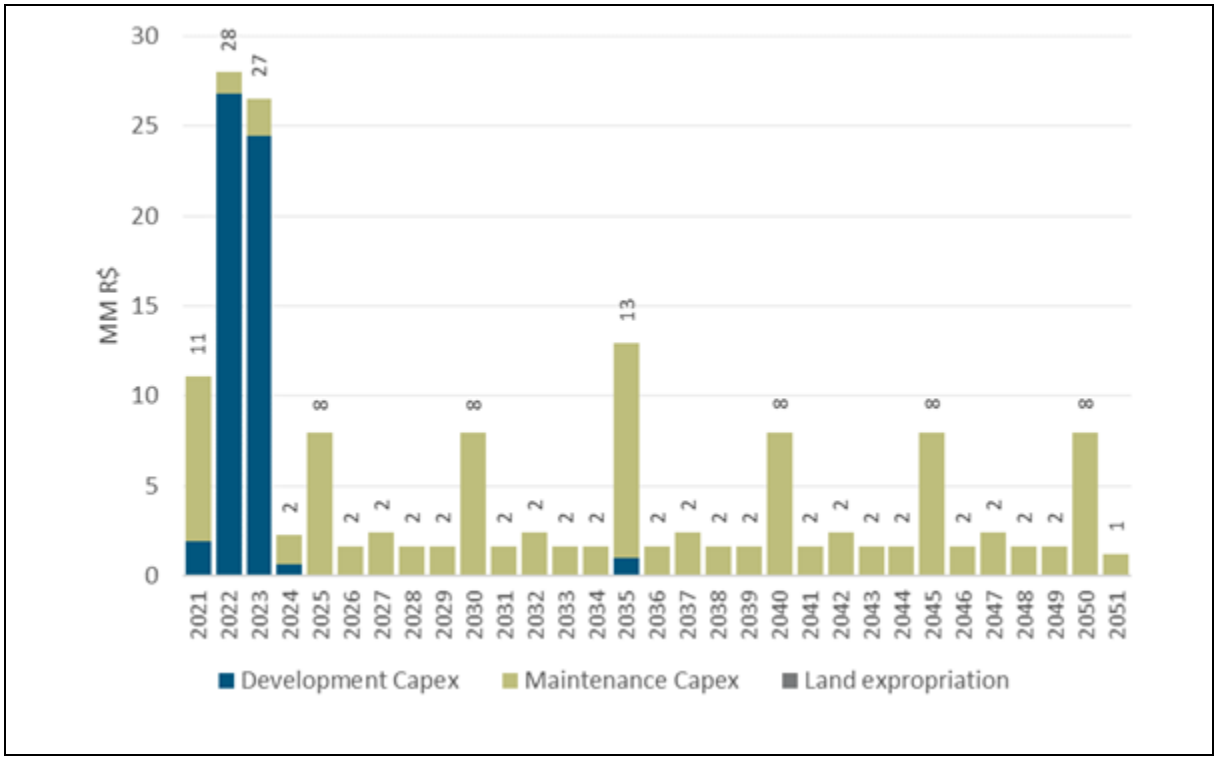
Source: GCA Consortium.

CAPEX

The development plan, expansion of airport assets to meet growing demands and ensure appropriate level of service, requires a total investment of R$158MM.

Development investments (topical and intended to expand airport assets, including expropriations) will be divided into different phases and amount to a total R$55MM. Maintenance investments (periodical and intended to maintain and replace assets, including re-paving cycles) add up to R$104MM throughout the concession period. (Figure 4-6).

Figure 4-6:: CAPEX during concession

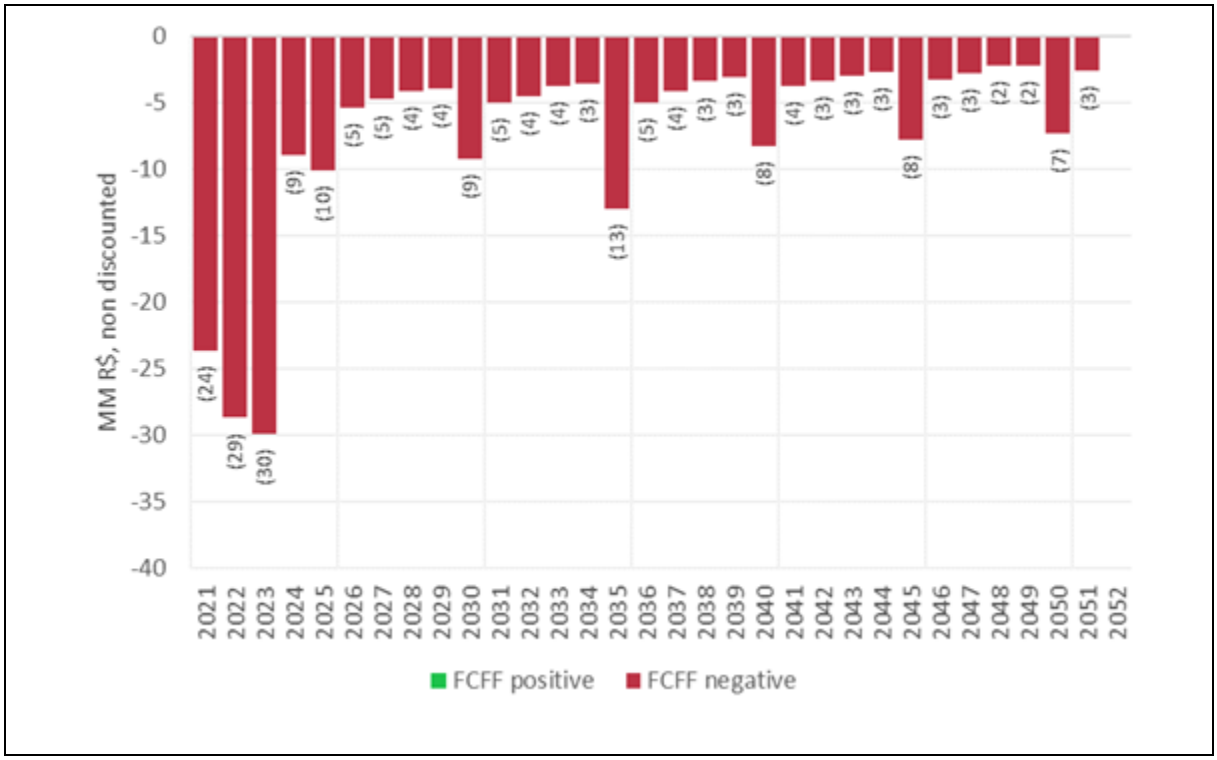


Source: GCA Consortium.

Evaluation of concession's financial feasibility

The project's forecasted free cash flow (FCFF) is presented inFigure 4-7, which shows the FCFF is negative throughout the concession. This being the case, it is not possible to compute either IRR or MIRR for the project, and the concession is not financially feasible.

Figure 4-7: Free cash flow to firm (non-discounted – prior to grant values)

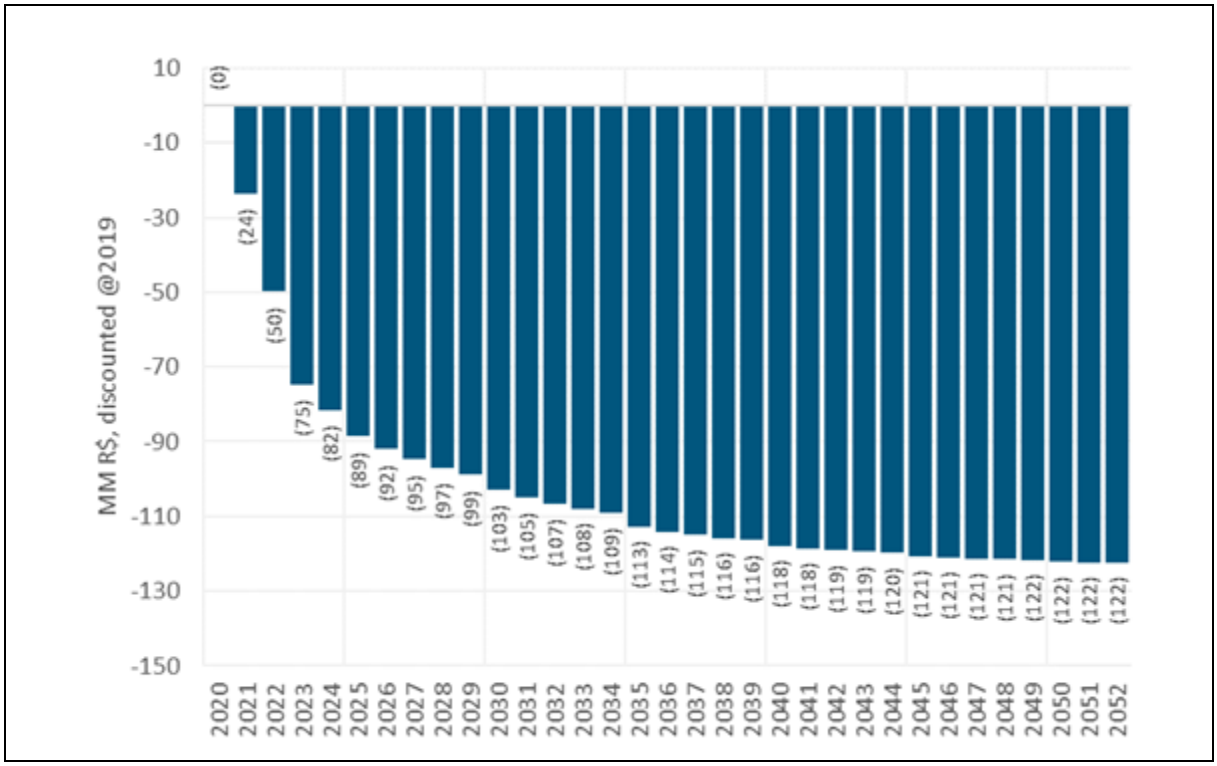


Source: GCA Consortium.

The cumulative discounted FCFF (given the referential weighted average cost of capital – WACC set at 9.36%p.a., real), from which the NPV net of grant payments is determined, is shown in Figure 4-8. Project does not offer a rate of return to its capital providers, consequently, the NPV is negative (**R$-122.4MM**). As such, the isolated concession of the Airport is not financially feasible and cannot support grant payments made out to the Government.

This result is mainly due to the high relevance of the initial investments to meet required airport's appropriate level of service, in addition to its inability to generate positive cash flow.

Figure 4-8: Cumulative discounted free cash flow to firm (net of grant payments)



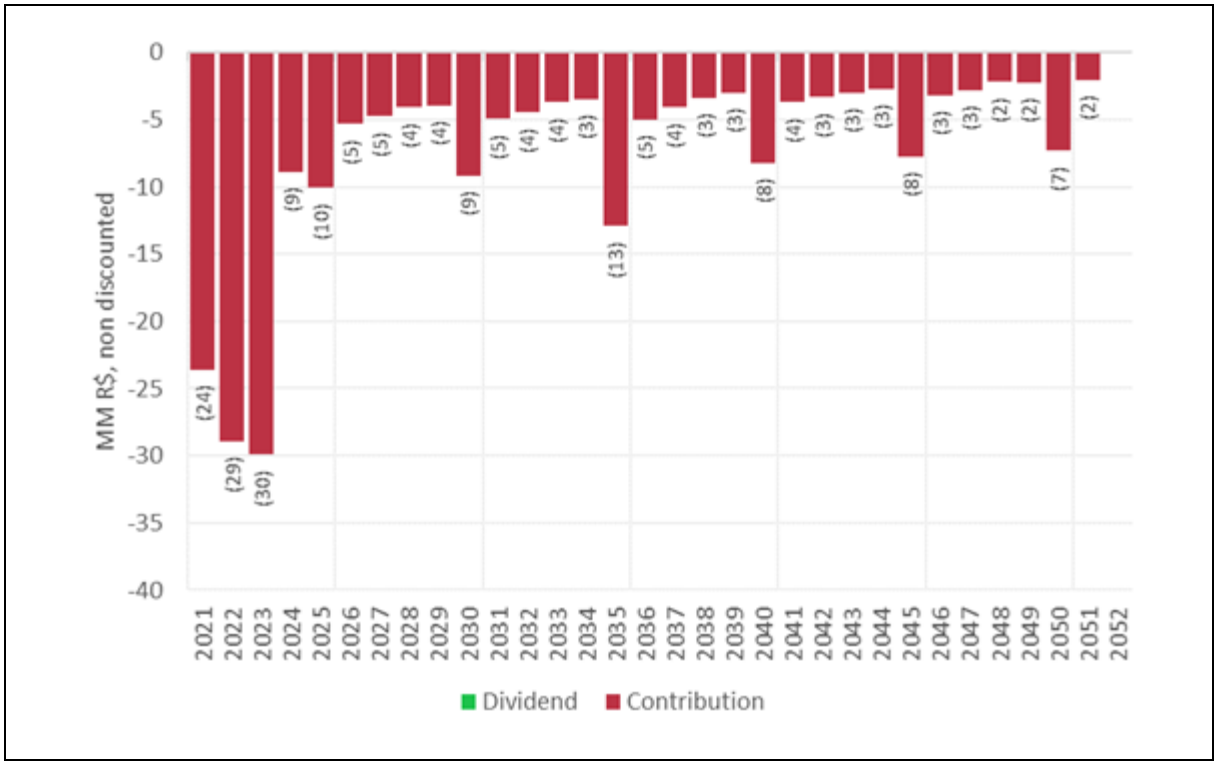
Source: GCA Consortium.

Attractiveness to shareholders

Analyses of the project's attractiveness to shareholders consider: (i) third-party funding (long term BNDES loan and issuing of debentures, given market conditions and minimum covenants); (ii) equity needs; and (iii) the possibility of dividend payments throughout the concession.

Figure 4-1presents the forecast flows of capital injections and dividend distributions. The concessionaire needs to inject equity resources during the whole concession. The main contributions occur during the first two development phases, with equity needs decreasing as airport demand and efficiency gains increase. Given this scenario, there is no equity IRR.

Figure 4-9:Contribution and dividend flows, non-discounted (post-payment of grants)



Source: GCA Consortium.