

# CONNECTING AFRICA

UNLOCKING AFRICA'S INTRA-REGIONAL CONNECTIVITY POTENTIAL

#### Dear African aviator,

I am truly excited to share with you our exclusive Embraer market report on the future potential of the African aviation market. Titled "Connecting Africa", we shed our thoughts around how we can excel on the quest of creating more connectivity on the continent. Because this is what we feel aviation is all about – connecting people & cultures, markets, goods and more.

In discussion with our market experts at Embraer, who carefully crafted this report using the latest market industry data and deliberating with industry experts, we recognized that we do not celebrate and recognize sufficiently the many success stories the African aviation community has achieved, especially in recent history. Don't we all too often debate at conferences around "what's not working in Africa" and "here's what to learn from the rest of the world"?

Shouldn't we join in for a muchdeserved dosage of positivity on the great achievements made, making Africa more connected, safer to fly than ever, and more accessible to the traveling public. African airlines have been on the forefront of bringing the latest technology to the continent, regardless of if Embraer or other manufacturers. If you are into flying vintage aircraft – try Europe or North America, but here in Africa the airlines embrace the latest and safest new technology. Or – look at the great strides made by the big African hub carriers, building robust hub airports. Many reasons that give us great conviction to be excited for what is ahead for "our" region.

And what is ahead is an even more connected continent, more nonstop flights, more connectivity, more convenience to the travellers which will increase trade & tourism. This connectivity report will attempt, and hopefully convince you, of the great potential that is right there in front of us. Split into two chapters the report strives to give you an in-depth perspective on the vast opportunity to increase connectivity, with actual examples on markets worth taking a deeper look into, and secondly puts the magnifier on the great developments made by Africa's leading hub airlines and ways to optimizing connectivity.

We thank all the airline experts that have contributed in making this report a reality and look forward discussing how we can jointly build the best, safest, most accessible and sustainable future African aviation eco-system. Now – please sit back, and enjoy the reading

Yours sincerely,



STEPHAN HANNEMANN Senior Vice President Sales & Marketing Head of Middle-East & Africa

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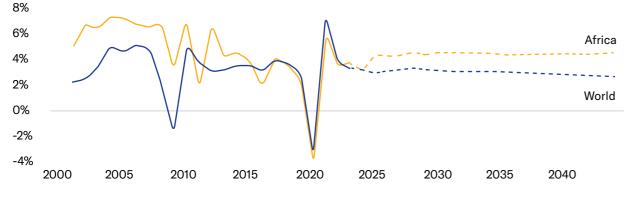
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# **SETTING THE SCENE**

Despite accounting for 18% of the global population, Africa contributes less than 3% to global GDP and 2.1% to global air passenger and cargo traffic, according to the International Air Transport Association (IATA). This disparity reflects, among other factors, the continent's limited intra-regional air connectivity which is a critical bottleneck in Africa's economic and aviation development.

A common metric to measure airline passenger traffic is the number of Revenue Passenger Kilometer (RPK). IATA research from 2019 shows that globally, RPK grows twice as much as GDP. Differences can be observed between regions, depending on economic factors but also the maturity of the air transport industry.

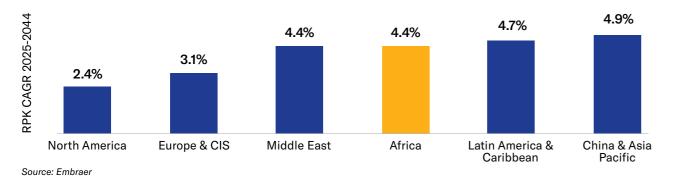




Source: S&P Global Connect, IHS Markit

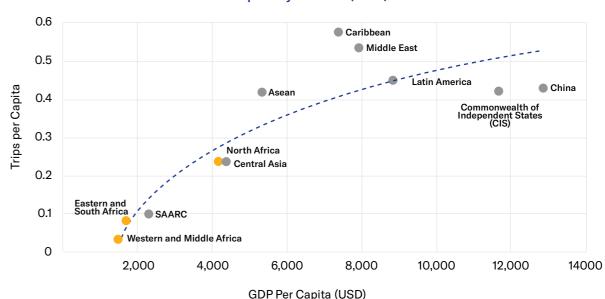
When looking at Africa over the next 20 years, S&P expects the continent's GDP to grow at 3.8% per year and Embraer analysis expects a RPK growth of 4.4% per year. This RPK growth is greater than the growth expected in other regions such as Europe or North America.

#### Wordwide Air Transpot Demand Growth: 2025-2044



Improving air connectivity is not only essential for the growth of Africa's aviation industry, but also a catalyst for broader economic development. IATA research from 2007 indicates that a 10% increase in air connectivity, relative to GDP, leads to a 0.07% rise in GDP per hour worked, underlining the economic impact of improved air mobility.

Compared to more mature aviation markets, Africa has a big potential to enhance its air transport system and therefore number of travelers in the continent. This can be observed when looking at the propensity to fly, which is defined as the number of air trips per capita. In Africa, the propensity to fly is amongst the lowest when compared to other regions of the World.



Source: Embraer Analysis (data from IHS Markit and Sabre). Note: SAARC includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

Although Africa has the world's lowest propensity to travel, its potential for growth is immense and developing intra-regional connectivity will be a key driver of this growth. Currently, 64% of intra-African markets are served with 7 weekly flights or less. This means that only 36% of intra-African markets have more than 1 daily flight.

While the potential is immense, Africa is also emerging as a leader in various aspects of aviation. Several airlines on the continent have been early

"The potential of intra-African connectivity is vast, and it is within our collective power to unlock new markets, build new regional hubs, and create a more integrated continent. By working together, we can foster economic growth, promote trade, and improve the lives of millions of Africans through better connectivity."

Festus Keyamo, SAN, CON, FCIArb (UK), Honourable Minister of Aviation and Aerospace Development, Nigeria

developing this very much needed connectivity In this report, Embraer first presents potential new routes to be opened that would enhance on the continent. This report was released in intra-African connectivity and then explores how June 2025, during the AviaDev conference in existing African hubs can further contribute to Zanzibar, Tanzania.

#### Propensity to travel (2024)

adopters of next-generation aircraft. For example, Kenya Airways and Ethiopian Airlines with the Boeing 787, or Air Peace with the Embraer E-Jets E2. Moreover, aviation is regarded as a strategic sector in many African countries. A notable example is Nigeria, which has established a dedicated Ministry of Aviation and Aerospace Development. Additionally, Africa is globally recognized as a pioneer in mobile payments and digital financial services, which have significantly boosted online ticket sales in recent years.



# POTENTIAL NEW ROUTES TO ENHANCE INTRA-AFRICAN CONNECTIVITY

#### LIMITED AIR CONNECTIVITY ACROSS THE CONTINENT

While Africa is well connected to the rest of the world, primarily through major global hubs and largely operated by foreign carriers, the same cannot be said for connectivity within the continent. A significant number of intra-African origin-and-destination (O&D) markets remain underserved or entirely unserved by direct flights. As a result, many passengers traveling between African cities are forced to connect through hubs in Europe or the Middle East, adding time and cost to their journeys.

Domestic connectivity also remains limited in several African countries. This creates an opportunity to shift passengers from slower modes of transport, such as buses or ferries, to air travel, mirroring the transformation that has taken place in parts of Latin America such as Brazil. Enhancing domestic routes could help build feeder traffic into regional networks, strengthening the overall air transport network.

New intra-African routes can serve diverse travel purposes, from business to visiting friends and

relatives (VFR), as well as leisure tourism. For instance, tourism-driven demand is notable in countries such as Namibia, Botswana, Zimbabwe, and South Africa, where direct flights to key source markets could unlock further tourism.

In many cases, there are no direct flights between certain African capitals with strong economic, political or cultural ties. In cases like this, the introduction of a direct service often stimulates market demand, making air travel more accessible and increasing overall traffic between the cities.

However, route development is not only a matter of demand. Some O&D markets that could sustain a direct flight remain unserved due to regulatory barriers, such as the absence of bilateral air service agreements or restrictive traffic rights between countries. Addressing these policy issues is crucial to unlocking latent demand and enabling market growth.

## STIMULATION EFFECT WHEN OPENING A NEW ROUTE

direct flight introduction and subsequent change The analysis was conducted by collecting historical in passenger demand was found. This is modeled schedule and traffic data from Sabre Market through the stimulation factor, determined as the ratio Intelligence. The period analyzed is 2014-2024 and between the new PDEW and former PDEW, and can the data extracted consisted in flights schedules and be visualized in the graph below. When introducing demand on all O&Ds, modeled through passengers a direct flight, the PDEW increases as traffic is per day each way (PDEW). In this period, Embraer stimulated to the reduction of barriers for air travel identified more than 70 O&Ds which, within the such as layovers or long ground travel, fare reductions, given period, went from being unserved with a direct new business and touristic opportunities or even the flight to served with a direct flight. To mitigate the simple perception of proximity between two cities.

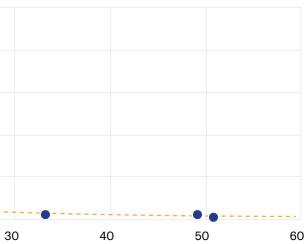
"It's important to prioritize economic development, latent demand and propensity to travel as opposed to just commencing routes based on non-existing industries, low GDP or political interests. At Kenya Airways, the most successful intra-African routes were those driven by sound economic fundamentals like Nairobi to Mauritius, Nairobi to Cape Town and growth into Accra with onward tags to Monrovia, Freetown and Dakar."

Martin Gitonga, General Manager, Digital, Brand & Marketing, Kenya Airways

Stinuation curve for many strategy of the second se

Source: Embraer Analysis (demand data from Sabre)

In general, for O&Ds where the current traffic is very low, the stimulation resulting from the introduction of a direct flight is very high, while for O&Ds where the current traffic is greater, the stimulation factor is lower. This can be explained by the fact that O&Ds with high PDEWs, are usually already served with a one-stop efficient connection while on the contrary O&Ds with lower PDEWs often require a one-stop long layover, with great circuity or sometimes more than one stop itinerary. This analysis supports data-driven decision-making and helps prioritize route launches with the highest potential return on investment.



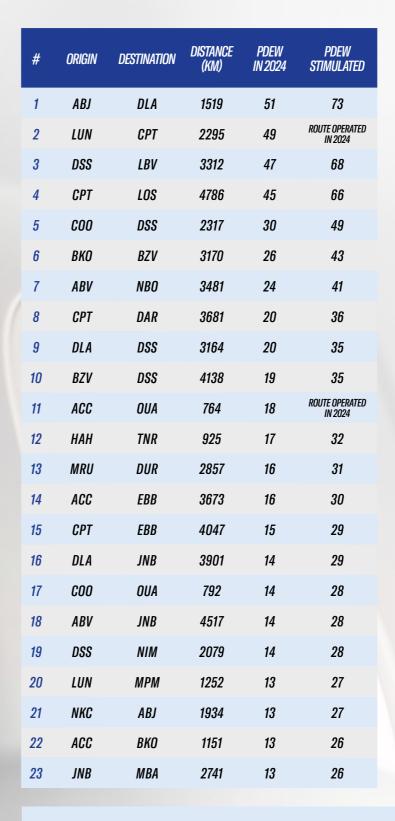
#### Stimulation curve for intra-African markets

# **SIGNIFICANT POTENTIAL FOR NEW ROUTES**

Embraer has then identified the potential new intra-African routes to be opened and the expected PDEW once a direct flight is opened. Insights into the top 10 markets that currently don't have a direct flight are given in the next page.

"The African continent is three times larger than Europe in area, and its population is 2.5 times greater. Yet, air transport activity in Europe is 11 times higher than in Africa. Shockingly, up to 22% of Africans traveling between two African cities must transit through non-African hubs, often in Europe or the Middle East."

Abderahmane Berthé, Secretary General of the African Airlines Association (AFRAA)



#### **KEY TAKEAWAYS**

**Limited intra-African air connectivity:** Many African O&Ds lack direct flights, increasing travel time and in some cases forcing travelers to route through non-African hubs.

**Stimulation effect:** Based on historical data, Embraer has established an intra-Africa stimulation factor curve to estimate expected passengers when opening a direct flight.

**Opportunities for new routes:** Embraer has identified numerous O&Ds which have the potential to sustain multiple weekly direct flights, supporting regional economic growth.

#	ORIGIN	DESTINATION	DISTANCE (KM)	PDEW IN 2024	PDEW Stimulated
24	GBE	NBO	2842	13	26
25	SLI	JNB	1566	13	26
26	DAR	МРМ	2231	12	26
27	NBO	WDH	3156	12	25
28	ABV	DSS	2720	12	25
29	BJM	DAR	1164	12	25
30	TDV	RUN	1223	12	25
31	ACC	CKY	1547	12	25
<b>32</b>	INH	JNB	764	11	24
33	ACC	DAR	4583	11	24
34	LOS	ROB	1513	11	24
35	BLZ	NBO	1611	11	23
<b>36</b>	CPT	FIH	3306	10	23
37	HRE	ZNZ	1572	10	23
<b>38</b>	DAR	LOS	4252	10	22
<u>39</u>	NBO	DUR	3206	10	22
40	DLA	POG	536	10	22
41	DSS	PNR	3858	9	21
42	DSS	NSI	3364	9	21
<b>43</b>	NIM	BOY	753	9	21
44	CPT	ZNZ	3745	9	21
45	LLW	CPT	2715	9	21







#### Abidjan (ABJ) - Douala (DLA) 1519 km

Connecting two of West and Central Africa's largest Francophone cities, this route serves over 10 million combined urban residents. Côte d'Ivoire and Cameroon are both members of CEMAC and ECOWAS. Strong trade in cocoa, palm oil, and industrial goods stimulated business travel. Growing tourism links exist, especially for regional festivals and cultural ties. High potential for VFR (visiting friends & relatives) and SME travel demand. Currently served by Air Côte d'Ivoire with a stop in Abuja which captures about 85% of the market. The remaining passengers transit mostly through Lomé (LFW). Based on the forecasted PDEW, this market could sustain 5 weekly flights on a 120-seater.

#### Lusaka (LUN) – Cape Town (CPT) 2295 km

With Lusaka's population over 3 million and Cape Town's at 4.8 million, this is a vital Southern African link. Zambia and South Africa maintain bilateral air services agreements. Mining and agricultural trade flows support business travel. Cape Town is a key tourist destination for Zambians; outbound leisure travel is rising. Academic and medical travel also contributes to air travel demand. Currently, no direct flights and travelers are mostly routed via Johannesburg. Based on the forecasted PDEW, this market could sustain 4 weekly flights on a 120-seater.

#### Dakar (DSS) – Libreville (LBV) 3312 km

Dakar and Libreville link Francophone West and Central Africa with a combined population of over 5 million. Trade in oil services, construction, and regional banking drives business interest. Demand driven by tourism appeal and diaspora links; growing outbound from Senegal. Increasing presence of multinational and international organizations boosts premium cabin potential. No nonstop service currently, with travelers relying on other regional hubs such as Abidjan, Bamako or Cotonou. Based on the forecasted PDEW, this market could sustain 4 weekly flights on a 120-seater.















#### Cape Town (CPT) - Lagos (LOS) - 4786 km

This corridor links South Africa's leisure capital with Nigeria's business hub, over 20 million people combined. Trade in tech, FMCG, oil services, and fashion makes this a strong business route. Lagos residents travel to Cape Town for tourism and shopping; reverse traffic includes business travel. Student and medical segments are growing. Currently limited direct options; heavy reliance on Johannesburg or Addis Abeba as connection points. Based on the forecasted PDEW, this market could sustain 4 weekly flights on a 120-seater.

#### Cotonou (COO) – Dakar (DSS) - 2317 km

Two strategic Francophone hubs, with a combined population over 6 million and strong diplomatic ties. Benin and Senegal have existing bilateral agreements. Trade in cotton, transport services, and digital entrepreneurship is rising. Dakar's growing fintech and Benin's port economy fuel professional mobility. Moderate VFR and student travel also adds seasonal demand. No current direct service, travelers often use Lomé or Abidjan as transit points. Based on the forecasted PDEW, this market could sustain 4 weekly flights on a 120-seater.

#### Bamako (BKO) - Brazzaville (BZV) - 3170 km

A West-Central Africa link with a combined population of 6 million and shared Francophone heritage, Humanitarian, NGO, and diplomatic travel form a key part of the passenger base. Tourism is limited but may grow with better regional access. VFR heavy traffic due to numerous Malians working in Congo. No current nonstop service, high circuity routing is often required. Based on the forecasted PDEW, this market could sustain 3 weekly flights on a 100-seater.

#### Abuja (ABV) - Nairobi (NBO) - 3481 km

Nigeria's political capital to East Africa's major hub. Two influential cities with combined populations near 10 million. Diplomatic, trade, and pan-African organizational ties are strong demand drivers. Nairobi is key for conferences. tech, and development work, Abuja for energy and government affairs. Some tourism and student movement, particularly outbound from Nigeria. No direct flight currently; Addis Abeba or Kigali serve as intermediate hubs. Based on the forecasted PDEW, this market could sustain 3 weekly flights on a 100-seater.

#### Cape Town (CPT) - Dar-Es-Salaam (DAR) - 3681 km

on a 100-seater.

#### Douala (DLA) – Dakar (DSS) - 3164 km

Major ports and commercial hubs, serving over 6 million people combined in West-Central Africa. Growing trade in logistics, infrastructure, and consumer goods. Strong VFR travel, especially among business diaspora and regional professionals. No direct service currently; Abidjan often used for connections. Based on the forecasted PDEW, this market could sustain 3 weekly flights on a 100-seater.

#### Brazzaville (BZV) – Dakar (DSS) - 4138 km

A strategic West-Central Africa link, with a focus on government, diplomatic, and NGO travel. Trade in timber, oil-related services, and infrastructure projects. Tourism limited but diplomatic and education sectors provide year-round demand. Currently no nonstop flights, meaning that travel is multi-stop and expensive. Based on the forecasted PDEW, this market could sustain 3 weekly flights on a 100-seater.

South-East Africa leisure corridor with strong tourism synergy and a growing middle-class market. Trade in wine, textiles, and tourism services. High leisure demand: Tanzanians travel to Cape Town for holidays, and South Africans to Zanzibar and Serengeti. Rising backpacker and medical tourism segments. Currently no direct flights. Routing via Johannesburg or Nairobi adds cost and time. Based on the forecasted PDEW, this market could sustain 3 weekly flights

# HUB CONNECTIVITY AND POWER OF FREQUENCIES

### LIMITED AIR CONNECTIVITY ACROSS THE CONTINENT

A hub is an airport where the dominant carrier has a schedule built with flights arriving and departing in an organized way, minimizing connecting times for passengers. Typically, a hub airline will have at least 30% of its passengers connecting through its hub. The geographical position of a hub will determine the type of flows it can optimally connect. For example, hubs in East Africa are best suited to connect Asia and Africa while hubs in North Africa are best suited to connect North America or Europe and Africa.

Efficient hub operations are the core of an efficient and well-connected air transport network. A functional hub relies on robust two-way connectivity, meaning that arriving and departing flights must be strategically timed to enable seamless transfers. This is typically achieved through a wave structure, where flights are grouped into coordinated arrival and departure banks. Such structure maximizes connection opportunities and minimizes layover times for passengers.

The strategic advantage of hubs lies in their multiplier effect: adding a single new route to a hub can unlock dozens of new connection possibilities via that hub, significantly expanding the network's reach without requiring a direct flight between every city pair. This network effect enhances the value of the hub not only for the airline, but for passengers and regional economies alike.

"A hub and spoke airline is really a manufacturing company and it is about manufacturing connections. The more connections you can drive at a hub, the higher profits you drive at that hub, the more options you have for customers to flow through that hub. And it's exponential. You add one flight into a hub that has 80 connections, you don't just add one market like a point-to-point carrier would be doing, you add 80 new markets that strengthens the whole network."

Scott Kirby, CEO of United Airlines

### THE IMPORTANCE OF ADDING FREQUENCIES

Frequency is another critical driver of connectivity quality. Higher frequencies offer passengers more flexibility, convenience, and shorter wait times. This is especially important for business travelers, who often prioritize schedule over price and contribute disproportionately to airline revenues through higher-yield fares. Increasing frequencies can therefore directly improve a hub's competitiveness and commercial profitability. The competitive advantage of a hub-and-spoke airline is the number of itineraries offered to its customers.

In addition to reducing circuity, from a sustainability standpoint, enhancing connectivity via African hubs and direct intra-continental flights can also help reduce the environmental footprint of air travel. Routing African passengers through African hubs instead of long-haul detours via Europe or the Middle East, can significantly lower emissions per passenger while also improving the overall travel experience.

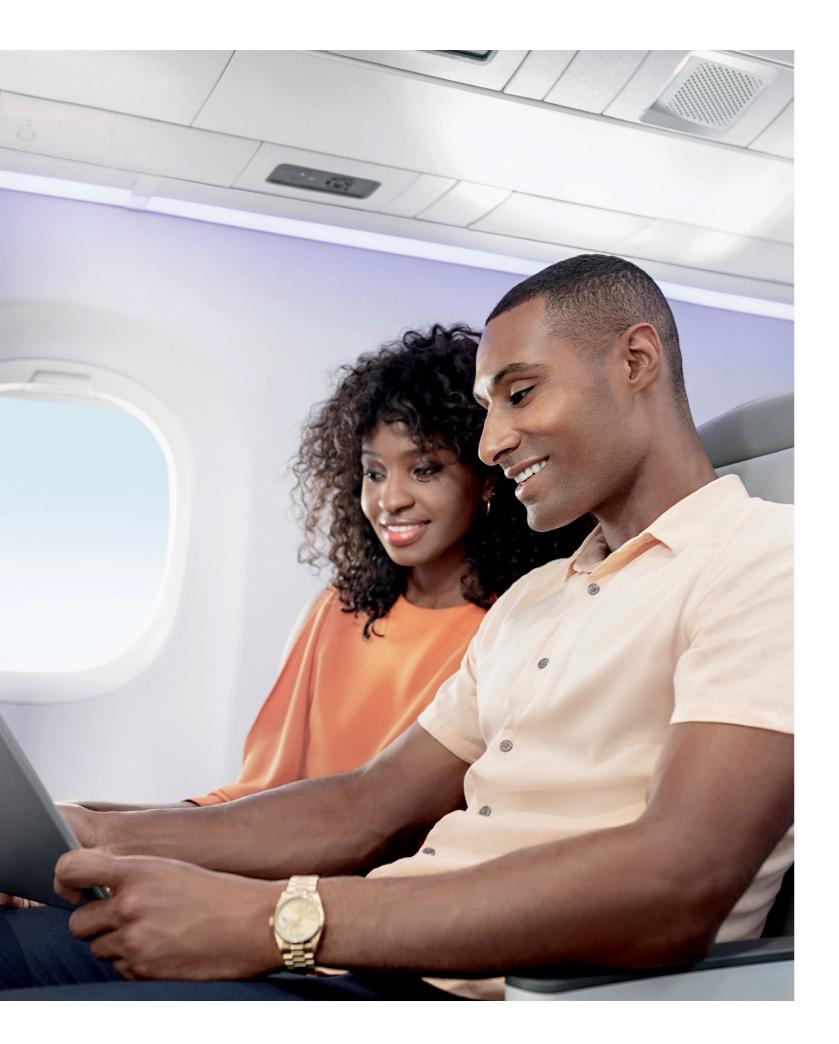
Beyond the traditional hub-and-spoke model, there is untapped potential to increase frequencies on domestic routes, especially in mid-sized countries such as Ghana, Angola, and Tanzania. Strengthening domestic services not only improves internal mobility but also helps feed traffic into regional and international networks.

A common metric to measure hub efficiency is the number of daily frequencies per destination. The chart below shows a selected list of hubs around the World in different regions and the main African hubs of airlines with more than 1 million passengers in 2024.



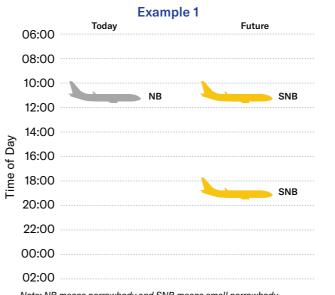
Source: Embraer own analysis, based in OAG schedules (APR 2025); Feeding routes up to 4,000km considered

REQ. PER DESTINATION	# DEST.	AVG. GAUGE
	43	68
	77	148
	66	180
	28	126
	69	144
	13	102
	14	148
	20	112
	87	143
	88	139
	104	159
	70	117
	77	152
	58	133
	57	159
	187	191
	38	376
	78	237
	81	234
	41	142



A hub should have at least one bank, comprising of one arrival wave and one departure wave. Ideally, a hub should have at least two banks as this maximizes the number of connections and increases aircraft utilization. A typical two bank set-up is to have a morning bank with long-hauls arriving and regionals departing, and then an evening hub with regionals arriving and longhauls departing. As an airline develops, it can add a third bank in the afternoon, between the morning and evening hub.

### **RIGHT SIZING TO ENHANCE HUB CONNECTIVITY**



Note: NB means narrowbody and SNB means small narrowbody

Small narrowbodies can be used to replace larger narrowbodies in a hub to increase the number of frequencies per destinations and strengthening the banks. They allow to increase frequencies without creating over capacity. New generation small narrowbodies enable this at a lower trip cost and with a similar seat cost as narrowbodies.

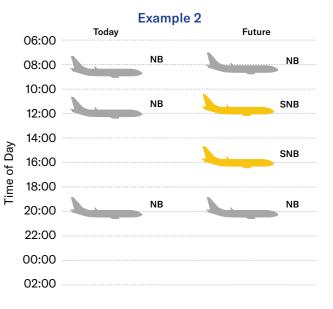
### **KEY TAKEAWAYS**

Efficient hub operations drive network connectivity: Well-timed banks at hub airports enable seamless passenger transfers and create a multiplier itineraries effect.

The importance of frequencies: Higher frequencies improve convenience, especially for business travelers who drive yields up, and strengthen a hub's competitiveness.

**Optimizing hub structure boosts efficiency:** By operating small narrowbodies, airlines can increase daily banks, boosting hub attractivity and increasing aircraft utilization.

The more banks an airline's hub has, the greater number of itineraries will be possible and will reduce the connection time. The latter is very important as it allows the airline to be better positioned in the Global Distribution Systems who presents the flight options sorted by total trip time. As the connection time reduces, airlines must work closely with the airport to ensure that there are no operational constraints and that quick connections can be made.



# **DEPLOYING THE RIGHT AIRCRAFT TO SEIZE THE UNTAPPED POTENTIAL**

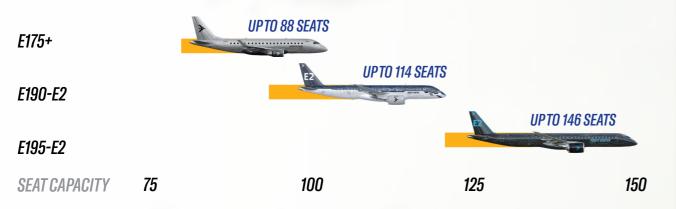
This study shows that there is a big potential to enhance intra-African connectivity, both point to point routes but also by developing African hubs. The aircraft deployed on each route will play a big role in determining the profitability that will be achieved. Indeed, while demand, and by extension revenues, may be uncertain, costs are certain. By operating the right-sized aircraft airlines can de-risk the operation by minimizing operating costs.

"You can fly a smaller plane twice, but you can't only fly just half of a larger one. Right-sized aircraft with regional jet capacity are key to unlocking sustainable growth in Africa's fragmented markets."

Sean Mendis, Former Airline Executive

Small narrowbodies, up to 150 seats, such as the E-Jets family with the E175+ (76 seats), the E190-E2 (96 seats) and the E195-E2 (120 seats) are the right aircraft to develop connectivity in most of the markets. The seating capacities mentioned previously correspond to typical dual class configurations.

#### THE E-JETS FAMILY COVERS THE WHOLE 70-150 SEAT SEGMENT



Compared to larger narrowbodies, the E2 has a smaller capacity but a much lower trip cost, meaning that the operation is less risky as the airline will need to sell less seats to reach profitability. With up to 6 hours flying range, the E2 family provides airlines with full flexibility to deploy the aircraft on both shorter routes and longer routes.

#### E2, ENGINEERED TO DELIVER BEST IN **CLASS ECONOMICS**



**Optimized Wings For Each Family Member** 



Fourth Generation Fly-By-Wire





#### **E2, A GAME CHANGER FOR AIRLINES** Compared to larger narrowbodies, the E2 offers:

**Lower Cost Per Trip** 

Similar Cost Per Seat

The E2 family offers unmatched cost efficiency as well as the opportunity to improve load factors and yield through usage of right-sized aircraft.

"The E-Jets family offer the perfect mix of low risk and right-sized capacity airplane enabling commercially viable expansion into short and medium haul markets across the African continent. With its increased range and excellent fuel burn, the E195-E2 is a big asset for both hub and point-to-point focused airlines."

Behramjee Ghadially, Senior Manager Fleet & Network Planning





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