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# **FOREWORD**

Here we are, having successfully navigated through our industry's most difficult period. One that claimed an OEM (Hawker Beechcraft) along with countless jobs, saw the cancellation of numerous aircraft programs and forced the retraction of established corporate flight departments with business aviation pedigrees that dated back to the early '70s. While we still face significant challenges, none are aimed at the core of our industry that would cause any of these terrible consequences to reoccur.

As we embark on a more steady period of growth, let us not forget some of the important lessons we learned along the way; the kind that only difficult periods afford. For me, it was simply the appreciation of the resilient nature of our industry.

With that, I am pleased to present the 2018 edition of our business aviation market forecast.

Jahid Fazal-Karim Chairman of the Board, Jetcraft

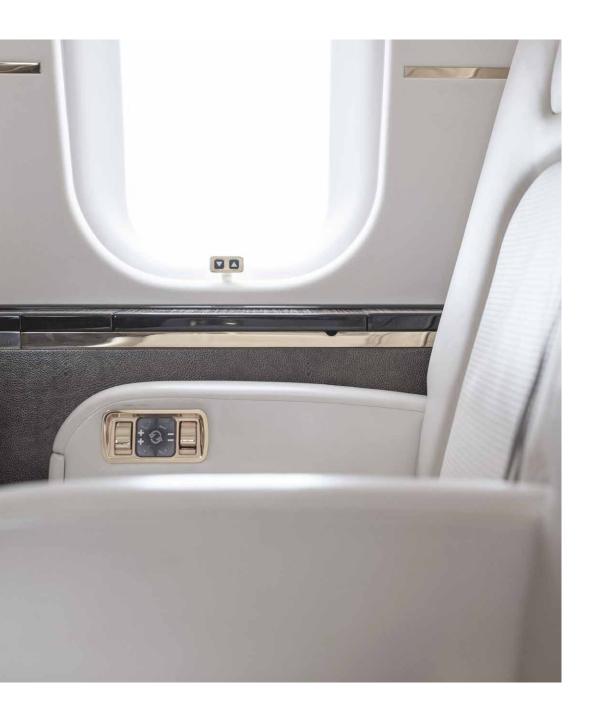
# **EXECUTIVE SUMMARY**

Jetcraft's fourth annual 10-year business aviation market forecast sees the sector set to build upon the 2017 prediction of a new business cycle of steady, healthy growth and expanding revenues.

### **KEY FINDINGS INCLUDE:**

- → The forecast calls for 8,736 unit deliveries representing \$271 billion (based on 2018 U.S. dollars) in revenue over the next 10 years. Unit deliveries will reach their peak in 2025, with 1,027 units worth over \$34 billion.
- → Despite continued economic growth and prosperity for U.S. publicly-traded companies (Fortune 500), this customer segment has yet to return to historical aircraft transaction levels. We believe that other financial priorities share buybacks and paying down debt are crowding out their aircraft purchase intentions.
- → On the other hand, Ultra High Net Worth Individuals (UHNWI) have greatly profited from the current economic situation. It is predicted that by 2022, over 3.6 million individuals worldwide will have a net worth in excess of \$5 million. This wealth creation is spurring growth in family offices and, together with block charter and fractional programs, is facilitating access to business aviation for this customer segment at unprecedented levels.

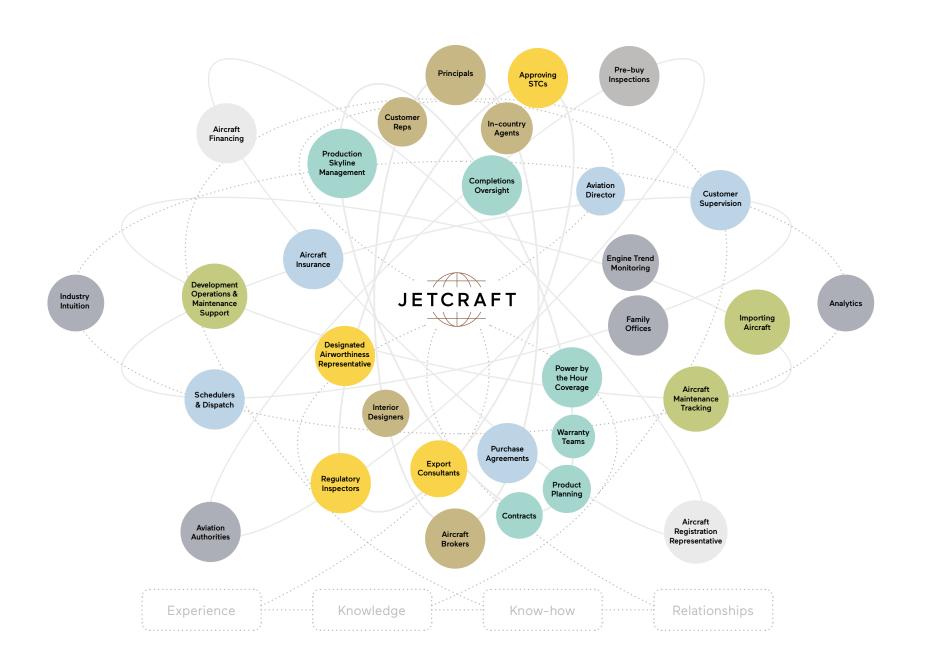
- → Advances in cabin connectivity will significantly affect residual values for pre-owned aircraft over the entire forecast period.
- → The Large Jet category comprising Super Large, Ultra Long Range and Converted Airliner segments will constitute 32% of total units (2,778) and 64% of total revenue. Furthermore, product offerings in the Super Large segment will completely change as Bombardier, Dassault and Gulfstream will each be introducing new models.
- → Taking into account both forecasted unit deliveries and retirements, we predict a total installed fleet of 28,195 aircraft by the end of the forecast period, a 37% increase representing 7,598 aircraft.
- → North America still accounts for the majority of unit deliveries (60%) over the forecast period.



# THE JETCRAFT PERSPECTIVE

The Jetcraft Perspective extends across all aspects of the industry. With a track record stretching over half a century and thousands of transactions, it provides insight on a deep level of understanding of what we believe drives the business aviation market.

Our privileged vantage point, one that we have tirelessly invested in over the years, rests solidly on the four pillars of experience, knowledge, know-how and relationships. This foundation provides the authority for our quantitative data and qualitative observations to produce a market outlook that aims to further our understanding of our industry and the challenges we face.

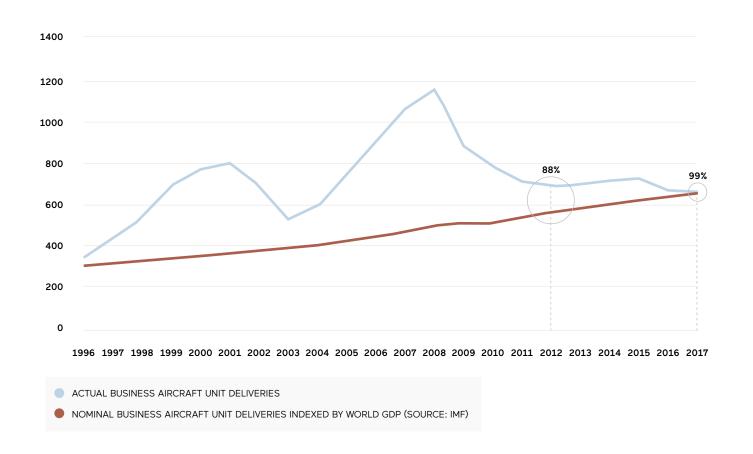


# MAJOR FACTORS AFFECTING THE FORECAST

# BUSINESS AVIATION UNIT DELIVERIES COMPARED AGAINST WORLD GDP

**BUSINESS AIRCRAFT UNIT DELIVERIES (1996 - 2017)** 

### UNIT DELIVERIES INDEXED BY WORLD GDP GROWTH COMPARED AGAINST ACTUAL UNIT DELIVERIES



During slower and more drawn-out economic growth periods, business aviation annual unit deliveries continue to track consolidated World GDP. Over the course of the last six years, indexing unit deliveries by World GDP has averaged coming within 88% of the actual unit deliveries. In 2017, the nominal unit metric came within 99% of actual units i.e. 644 units versus 649 units.

## U.S. PUBLICLY-TRADED COMPANIES AS A SOURCE OF BUSINESS AVIATION DEMAND

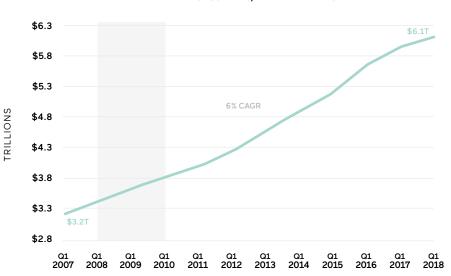
### ASSESSING THEIR CURRENT CASH POSITION AND WHAT IT COULD MEAN FOR ORDER INTAKE

While profits for U.S. publicly-traded companies have continued to grow in the aftermath of the 2008 recession, they still appear to be prioritizing share buybacks and dividend payments at the expense of capital expenditures.

With corporate debt at historical highs, these companies are unlikely to jump back into purchasing aircraft (at historical levels) until after right-sizing their balance sheets which will take us well into the forecast period.

### S&P 500 USE OF CASH \$3.0 \$2,540 \$2.5 \$2,325 \$2,243 \$2,212 \$2,014 \$2.0 \$1.875 \$1,830 TRILLIONS \$1,648 \$1,564 \$1.5 \$1,355 \$1,103 \$1.0 13% 12% 12% 12% 12% 13% 12% 12% 12% 10% 15% \$0.5 27% 36% 28% 28% 37% 28% \$0.0 2007 2008 2013 2009 2010 2011 2012 2014 2015 2016 2017E 2018P ■ CAP EX ■ R&D ■ ACQUISITIONS ■ DIVIDENDS ■ SHARE BUYBACKS

NON-FINANCIAL CORPORATE BUSINESS DEBT SECURITIES, LIABILITY LEVELS



Source: Federal Reserve Bank of St. Louis Note: Shaded area depicts recession.

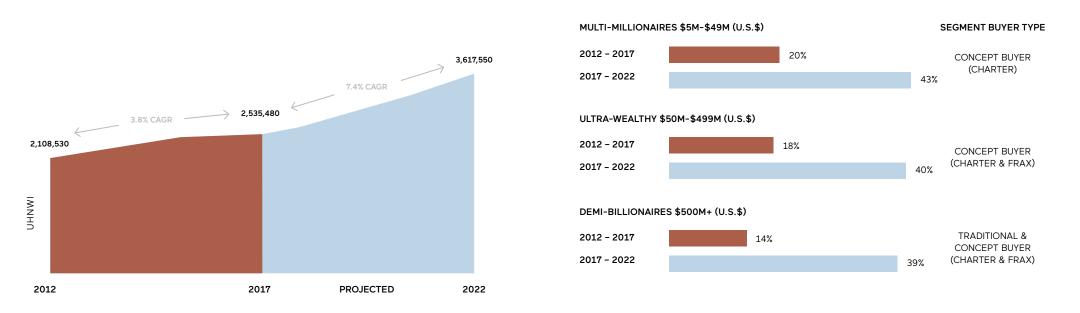
Source: S&P Global Market Intelligence

Although buoyed by the current administration's tax cuts, indications are that corporations will use their cash to pay down their massive debt levels while continuing to return capital to their shareholders and not use it to order aircraft (which falls under the capital investment envelope). With priorities for U.S. publicly-traded companies focused elsewhere, we see a protracted period of lower than historical aircraft purchase intentions from this customer segment. The tax holiday (in the form of a 15% tax as opposed to the revised standard corporate tax rate of 21%) for repatriated cash reserves, estimated to be \$2 trillion dollars, could serve to shorten their time on the "sidelines."

# CONTINUED GROWTH IN WEALTH CREATION FOR UHNWI AND THE RISE OF FAMILY OFFICES WILL CONTRIBUTE TO INCREASED BUSINESS AVIATION OPPORTUNITIES

### WEALTH POPULATIONS \$5M+ (U.S.\$) 2012 - 2022

GROWTH OF GLOBAL POPULATION SEGMENTS

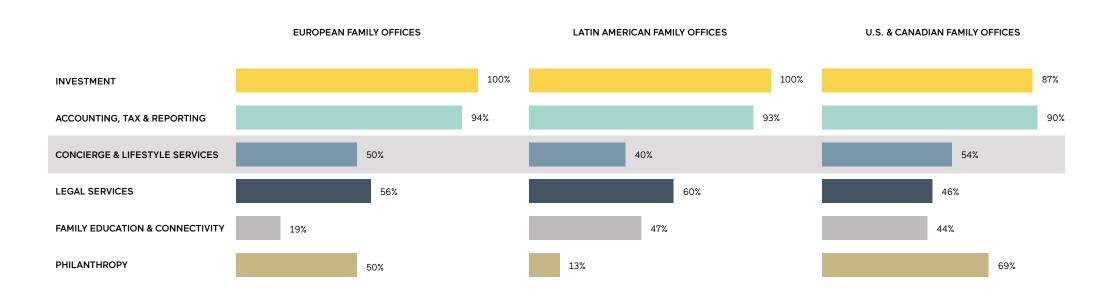


Source: Knight Frank Wealth Report, 2018 (12th Edition)

It is predicted that by 2022, over 3.6 million individuals will have a net worth in excess of \$5 million. The continued growth of block charter and fractional programs is making business aviation even more accessible for these UHNWI.

# CONTINUED GROWTH IN WEALTH CREATION FOR UHNWI AND THE RISE OF FAMILY OFFICES WILL CONTRIBUTE TO INCREASED BUSINESS AVIATION OPPORTUNITIES

### STRUCTURE OF FAMILY OFFICE SERVICES (BY REGION)



Source: Report on Structuring Family Offices by the World Economic Forum in collaboration with JP Morgan (2016)

The growth of wealth creation for UHNWI - both in terms of population and scope is driving the trend in family offices where wealth management is just one of several specialized services they offer. "Concierge and Lifestyle Services" form a critical part of the service portfolio, which includes yachts and aircraft. In 2008, there were an estimated 1,000 single-family offices in the world. As of 2017, Ernst & Young

reported that number exceeded 10,000. This increasing footprint of family offices, with specialists tasked to manage all aspects of aircraft ownership, will serve to facilitate access to business aviation for this customer segment leading to more opportunities for aircraft transactions.

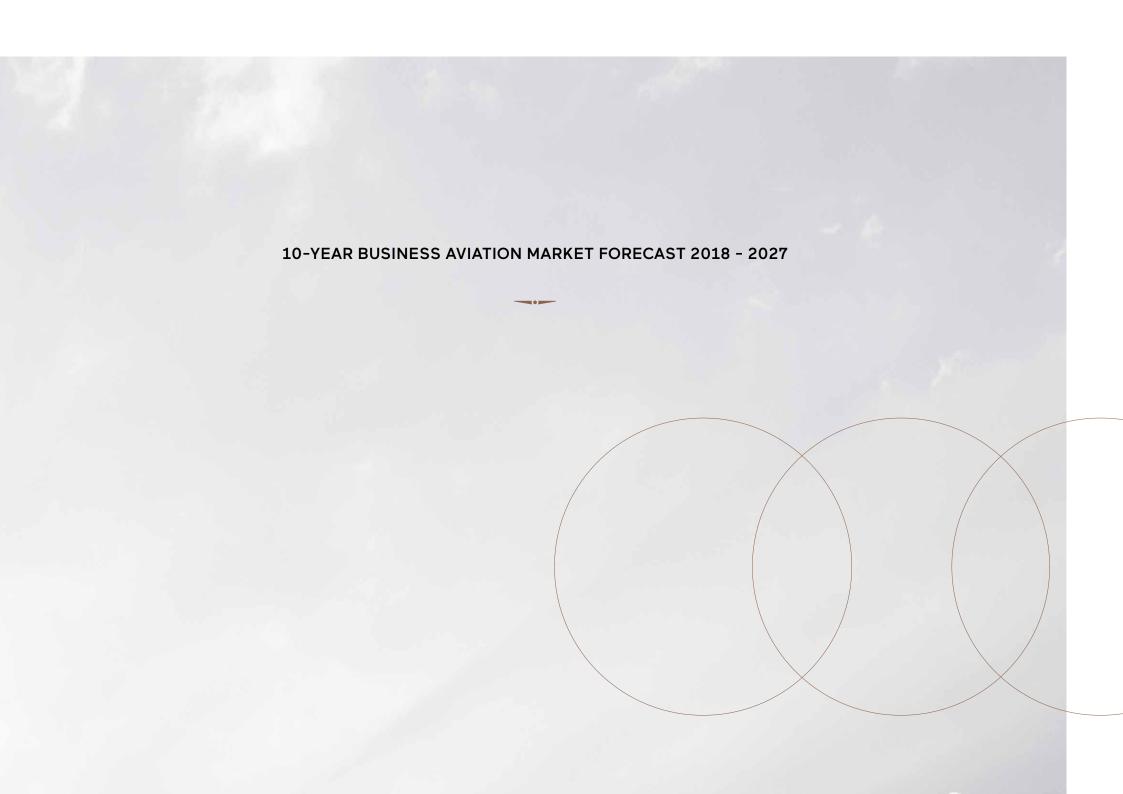
# POSSIBLE IMPACT OF CABIN CONNECTIVITY TECHNOLOGY ON RESIDUAL VALUE OF PRE-OWNED AIRCRAFT

### PRICING FOR SIMILAR PRE-OWNED AIRCRAFT HAVING DIFFERENT CABIN CONNECTIVITY SYSTEMS

MODEL X	MODEL X	MODEL X
YOM <b>2015</b>	YOM <b>2015</b>	YOM <b>2015</b>
AIRFRAME HOURS <b>2,400</b>	AIRFRAME HOURS 2,400	AIRFRAME HOURS 2,400
CONDITION GOOD	CONDITION GOOD	CONDITION GOOD
INTERNET SYSTEM <b>SBB</b>	INTERNET SYSTEM ATG	INTERNET SYSTEM <b>KA-BAND</b>
Unchanged from time of delivery	Aftermarket upgrade for North American connectivity only	Switch to latest high-end connectivity
RESIDUAL VALUE: \$24.0M	RESIDUAL VALUE: \$24.5M	RESIDUAL VALUE: \$24.8M

Aircraft owners expect the same connectivity experience in their aircraft as they do in their home and workplace. In only a short period, the industry has gone from basic connectivity offered by Swift 64 and SwiftBroadband (L-band) systems to more capable Ku and Ka-band systems. Now, with 5G connection speeds currently being rolled out to market, we expect advances in cabin connectivity technology to continue rapidly throughout the forecast period. This trend is not regulatory driven

(unlike ADS-B Out) and, as OEMs deliver new aircraft outfitted with more capable systems, it will drive in-service aftermarket installs for those customers that want the latest system on their aircraft. Those who don't upgrade will have to deal with a significant residual value disparity when selling their aircraft. The larger the aircraft the greater the impact of the residual value disparity.

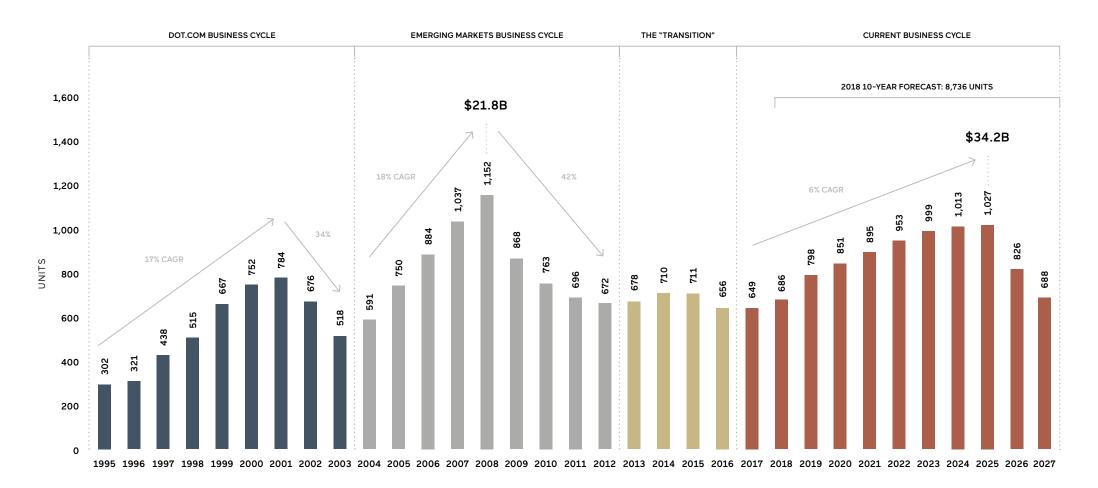


# THE EVOLUTION OF THE CURRENT BUSINESS CYCLE

A MARKED PREFERENCE FOR LARGER, MORE EXPENSIVE AIRCRAFT MODELS HAS MEANT FEWER UNITS BUT CONSIDERABLY HIGHER REVENUES

### **BUSINESS AIRCRAFT UNIT DELIVERIES (1995 - 2027)**

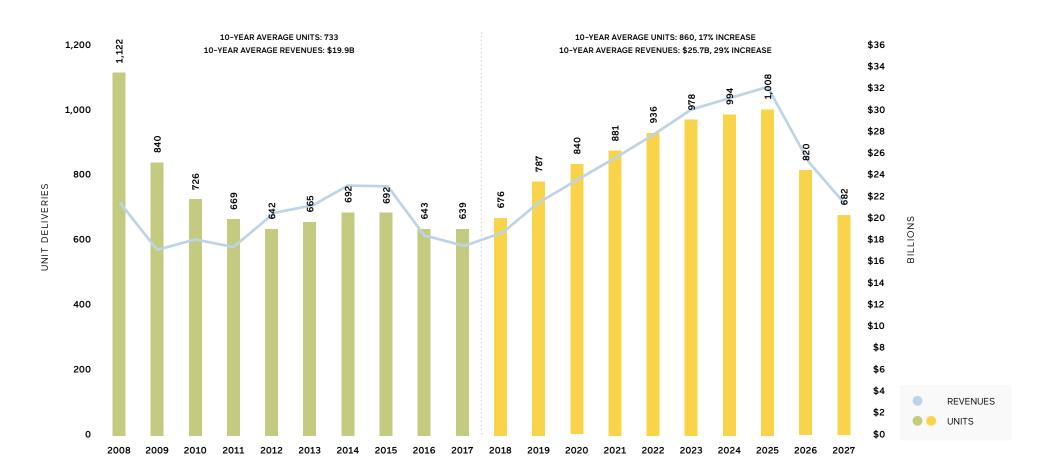
(UNITS, CALENDAR YEAR)



# **BUSINESS AVIATION UNIT DELIVERIES TRACKED AGAINST ANNUAL REVENUES**

BUSINESS AIRCRAFT UNIT DELIVERIES AGAINST REVENUES (2008 - 2027)

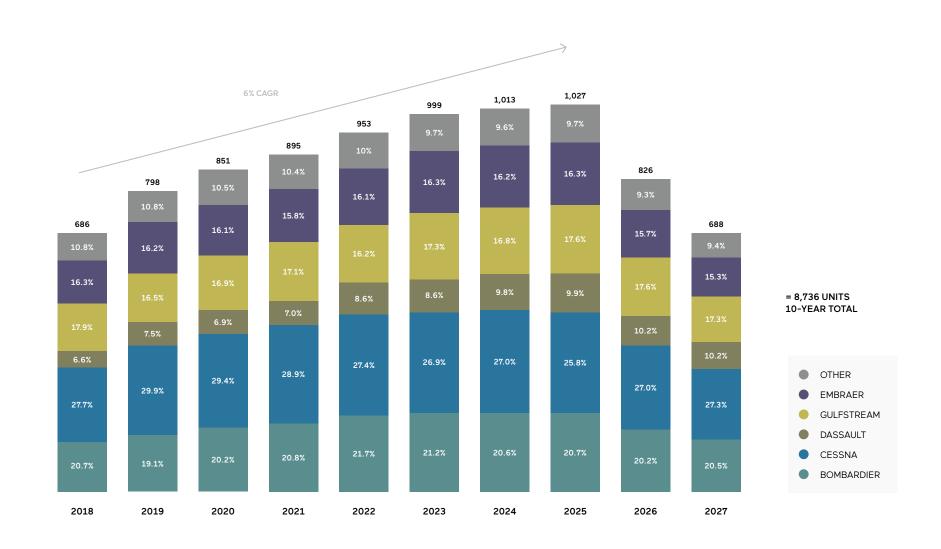
NEXT 10 YEARS PROJECTED TO OUTPACE BOTH UNITS AND REVENUES COMPARED TO PREVIOUS 10-YEAR CYCLE



Note: Numbers reflect units and revenues with Converted Airliners segment removed so as to not overstate average revenues percentage increase.

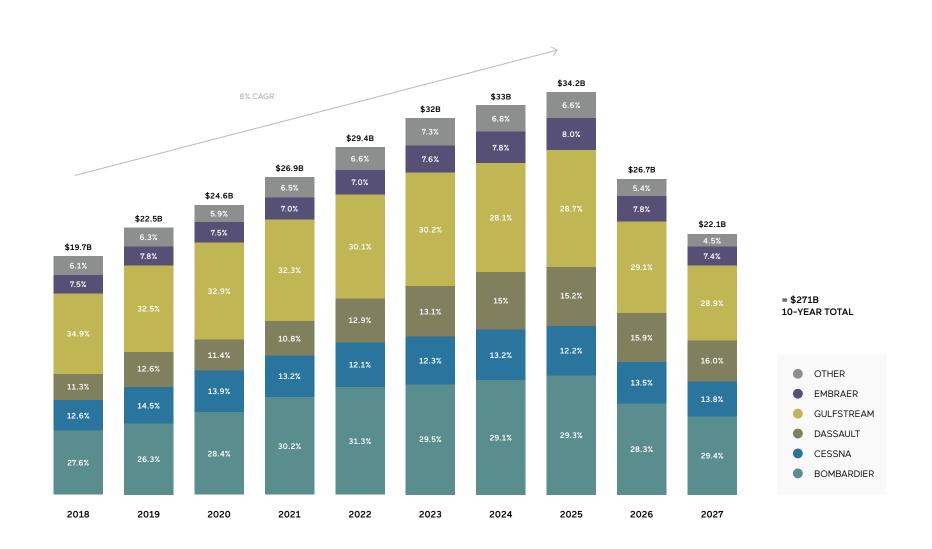
# PROJECTED OEM MARKET SHARE (UNITS)

**EVOLUTION OF DELIVERY MARKET SHARE OVER FORECAST PERIOD (UNITS)** (2018 - 2027)



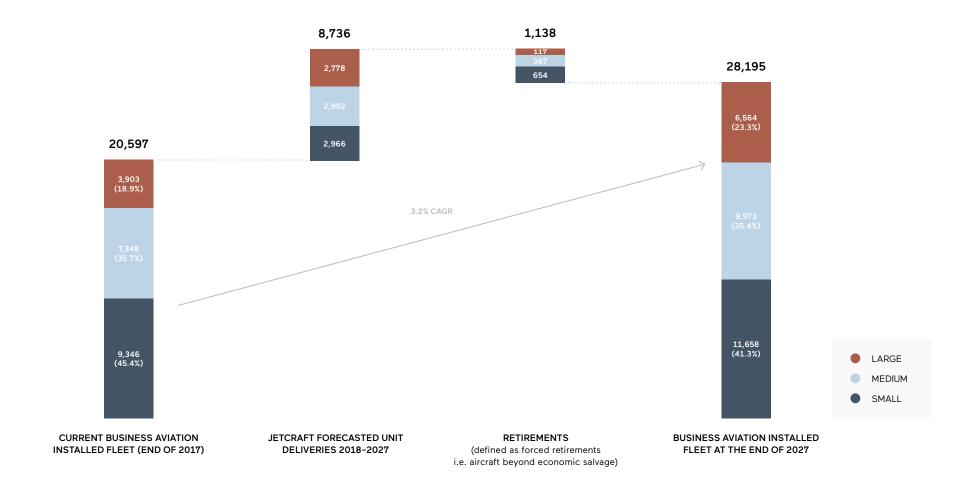
# PROJECTED OEM MARKET SHARE (REVENUES)

**EVOLUTION OF DELIVERY MARKET SHARE OVER FORECAST PERIOD (REVENUES)** (2018 - 2027)



# **EVOLUTION OF THE CURRENT BUSINESS AVIATION INSTALLED BASE OVER FORECAST PERIOD**

CURRENT FLEET AND FORECASTED UNIT DELIVERIES MINUS RETIREMENTS (2018 - 2027)



Taking into account both forecasted unit deliveries and retirements, we predict a total installed fleet of 28,195 aircraft by the end of the forecast period, a 37% increase representing 7,598 aircraft. Given the preference for widebody aircraft, the Large segment will grow from 18.9% to 23.3% of the overall installed fleet at the end of 2027.

# NEW AIRCRAFT PROGRAM DEVELOPMENT EXCLUSIVELY CENTERED ON WIDEBODY MODELS

UNIT DELIVERIES OF NEWLY LAUNCHED AND PROJECTED AIRCRAFT PROGRAMS OVER FORECAST PERIOD (2018 - 2027)



Note: Corresponding cumulative revenues for segment in brackets.

OEMs have taken note of the customer preference for larger widebody models. With the HondaJet and PC-24 having begun deliveries, new aircraft model programs (both announced and projected) are exclusively of the widebody variety.

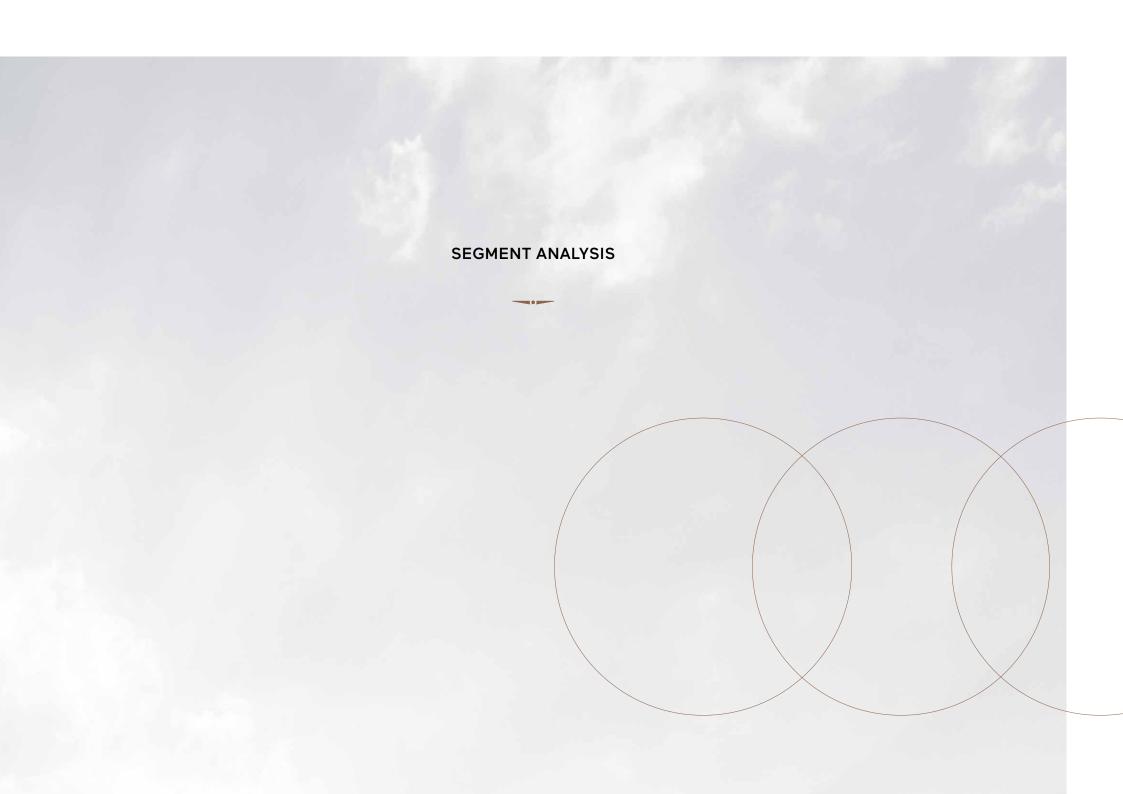
### MAJORITY OF NEW DEVELOPMENT PROGRAMS HAVE BEEN CONFIRMED



# REGIONAL DISTRIBUTION OF 8,736 UNIT DELIVERIES OVER FORECAST PERIOD (2018 - 2027)



North America still accounts for the majority of unit deliveries. Although the region retracted in terms of overall share (compared to the 2017 forecast), we still predict an increase in units. The forecasted share of unit deliveries for both Europe and Asia-Pacific have increased (compared to the 2017 forecast). The differences in regional share of unit deliveries since the 2017 forecast are mainly due to the decrease in contributions from U.S. public companies and overall increase in wealth creation globally.



# **BUSINESS AVIATION OEM PRODUCT LINE-UP**

NARROWBODIES WIDEBODIES

	SMALL			MEDIUM			LARGE		
	VERY LIGHT	LIGHT	SUPER LIGHT	MIDSIZE	SUPER MIDSIZE	LARGE	SUPER LARGE	ULTRA LONG RANGE	CONVERTED AIRLINERS
BOMBARDIER		L70 L70XR 2021 <sup>1</sup>	L75 L75XR 2021 <sup>1</sup>		CL350 CL350XRS 2022 <sup>1</sup>	CL650 CL750 2023 <sup>1</sup>	G5000 G5500 2019¹	G6000 G6500 2019 <sup>1</sup> G7500 G7500XR 2021 <sup>1</sup>	
CESSNA	M2 M2+ 2025¹	CJ3+ CJ4/+ 2019 <sup>1</sup>	XLS+ XLS++ 2019 <sup>1</sup>	SOVEREIGN+ LATITUDE	LONGITUDE	HEMISPHERE <sup>2</sup> 2023 <sup>1</sup>			
DASSAULT					F2000S	F2000LXS	F900LX F6X 2021 <sup>1</sup>	F7X F8X F9X 2023 <sup>1</sup>	
GULFSTREAM					G280	G400NG 2023 <sup>1</sup>	G500	G600 2019 <sup>1</sup> G650 G650ER G750 2020 <sup>1</sup>	
EMBRAER	PHENOM 100EV PHENOM 100EV+ 2023 <sup>1</sup>	PHENOM 300E		LEGACY 450 LEGACY 450E 2021 <sup>1</sup>	LEGACY 500 LEGACY 500E 2022¹	LEGACY 650E LEGACY 700 2023¹			LINEAGE 1000
OTHER	HONDAJET	PILATUS PC-24							BBJ MAX 7/8/9 ACJ VARIANTS

<sup>&</sup>lt;sup>1</sup> Announced or otherwise anticipated entry into service.

The following segment analysis represents our coverage universe. Over the years, we have amassed data on customer buying preferences, loyalty rates and trade-even versus trade-up patterns based on this segmentation. Also, speculation regarding new aircraft development programs that have not yet been announced by an OEM is based entirely on our insight and analysis and is in no way derived from privileged information.

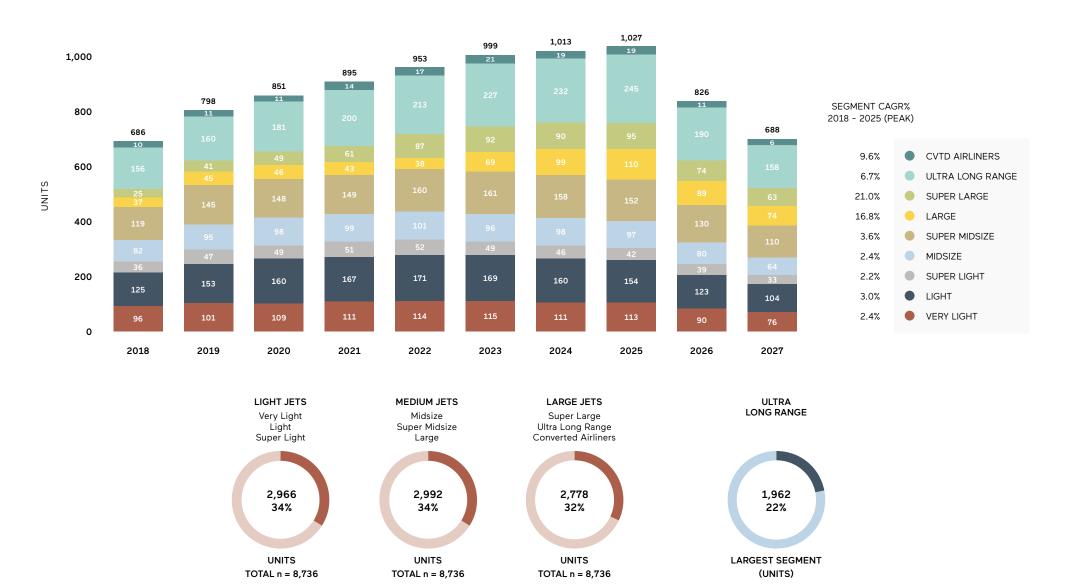
Note: Although Cessna suspended the Hemisphere program this past April, we have elected to keep the model in our forecast. We believe that program exposure emanating from the issues with the Silvercrest engine, much like the Falcon 5X, precipitated the suspension. As Dassault did with the F5X, we strongly believe that Cessna will revive the program with a new engine.

<sup>&</sup>lt;sup>2</sup> We view the cancellation of the Hemisphere program as a legal requirement related to program partnership imperatives and believe that the program will be reinstated once a new powerplant supplier is identified. Note: Forecast does not include Eclipse 550, Cirrus SF50 or SyberJet SJ30.

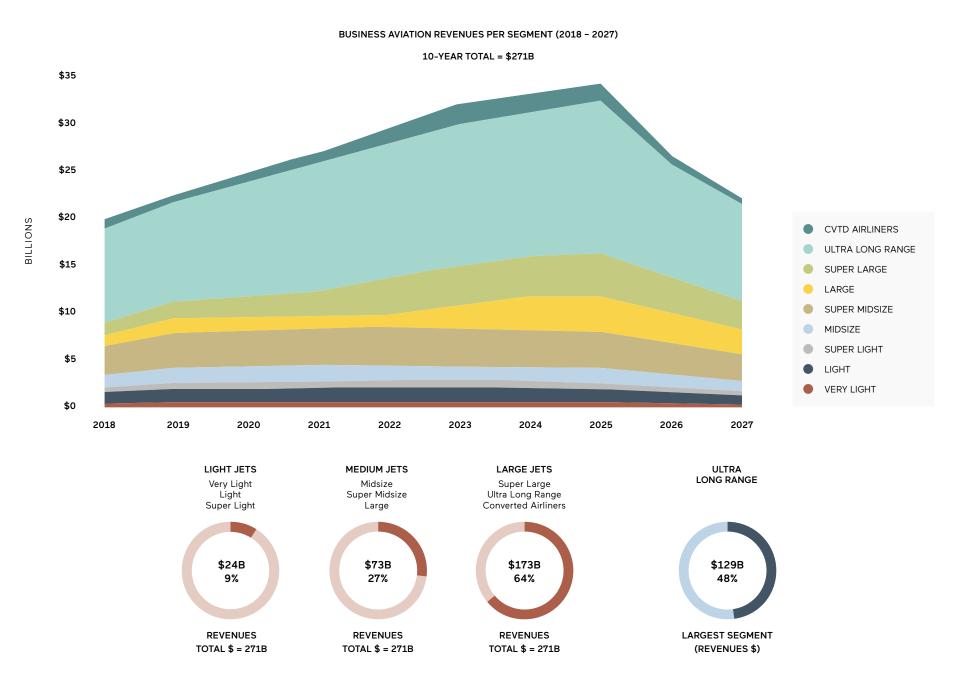
# UNIT DELIVERIES OVER FORECAST PERIOD BY SEGMENT

### BUSINESS AVIATION UNIT DELIVERIES PER SEGMENT (2018 - 2027)

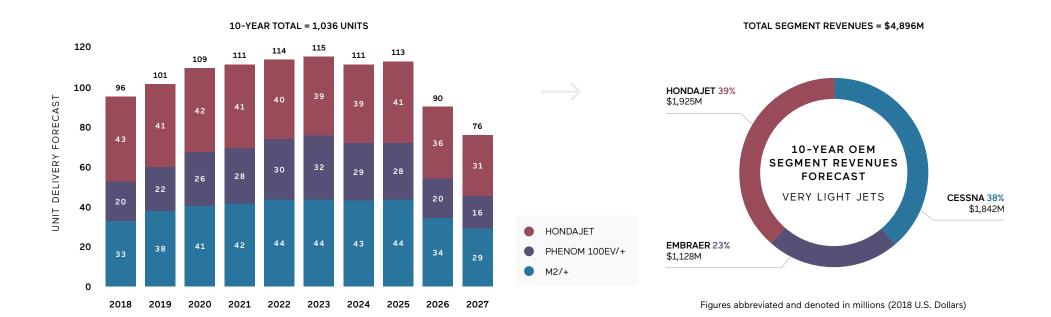
n = 8,736



# REVENUES OVER FORECAST PERIOD BY SEGMENT

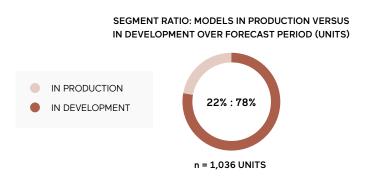


# **CATEGORY FORECAST: VERY LIGHT JETS**

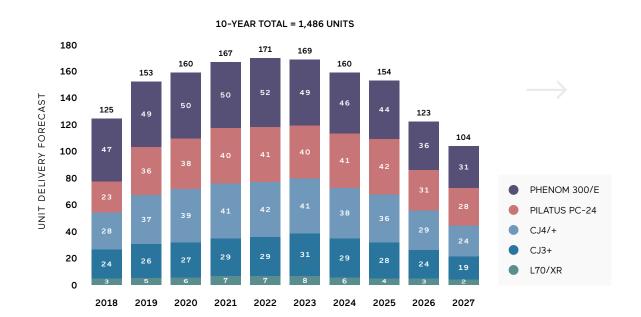


### **CATEGORY CHARACTERISTICS**

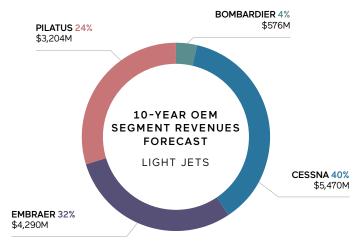
PRICE: \$4.7M - \$4.9M RANGE: 1,178 - 1,550 nautical miles



# **CATEGORY FORECAST: LIGHT JETS**



### TOTAL SEGMENT REVENUES = \$13,541M



Figures abbreviated and denoted in millions (2018 U.S. Dollars)

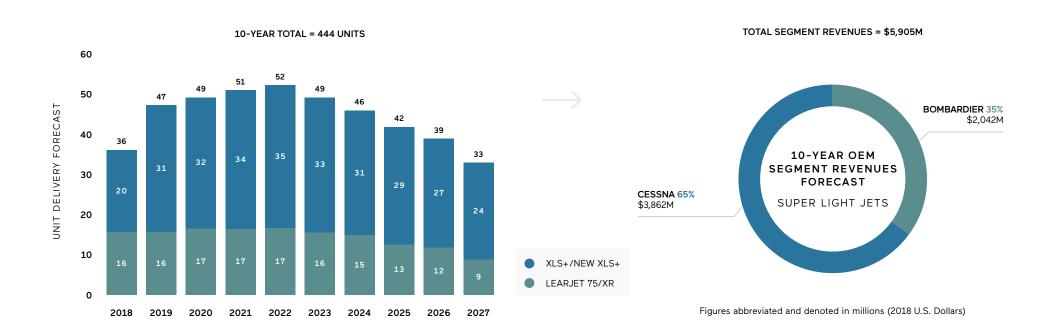
### **CATEGORY CHARACTERISTICS**

**PRICE:** \$8.2M - \$11.3M **RANGE:** 1,702 - 2,165 nautical miles

### SEGMENT RATIO: MODELS IN PRODUCTION VERSUS IN DEVELOPMENT OVER FORECAST PERIOD (UNITS)

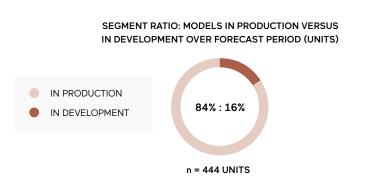


# **CATEGORY FORECAST: SUPER LIGHT JETS**

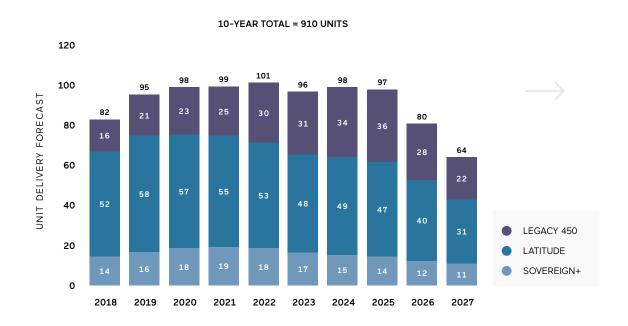


### **CATEGORY CHARACTERISTICS**

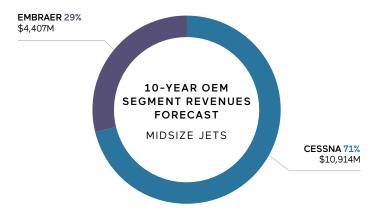
**PRICE**: \$12.7M - \$13.8M **RANGE**: 1,858 - 2,040 nautical miles



# **CATEGORY FORECAST: MIDSIZE JETS**



### TOTAL SEGMENT REVENUES = \$15,322M

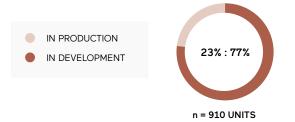


Figures abbreviated and denoted in millions (2018 U.S. Dollars)

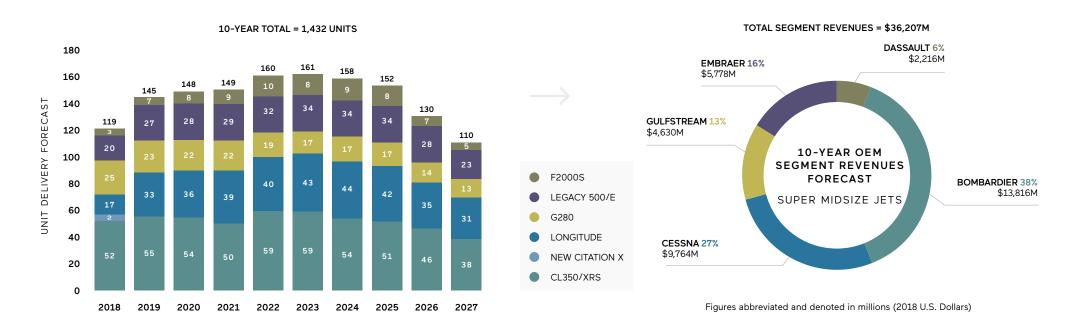
# **CATEGORY CHARACTERISTICS**

PRICE: \$16.5M - \$17.8M RANGE: 2,678 - 3,069 nautical miles

### SEGMENT RATIO: MODELS IN PRODUCTION VERSUS IN DEVELOPMENT OVER FORECAST PERIOD (UNITS)

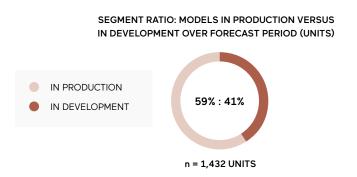


# **CATEGORY FORECAST: SUPER MIDSIZE JETS**

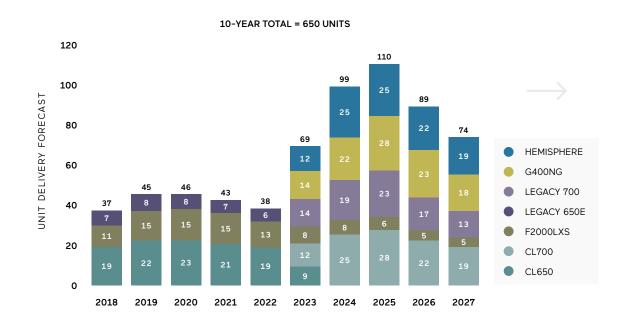


### **CATEGORY CHARACTERISTICS**

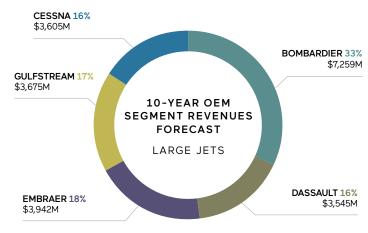
**PRICE:** \$19.9M - \$29.9M **RANGE:** 3,125 - 3,540 nautical miles



# **CATEGORY FORECAST: LARGE JETS**



### TOTAL SEGMENT REVENUES = \$22,027M



Figures abbreviated and denoted in millions (2018 U.S. Dollars)

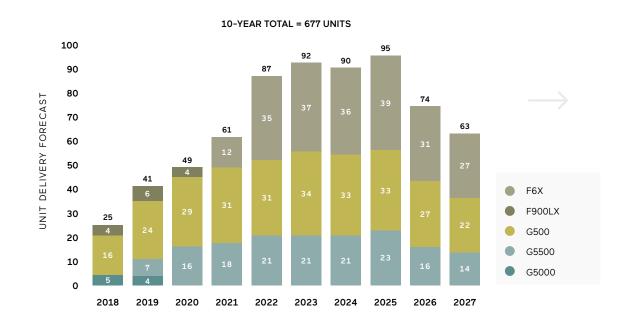
### **CATEGORY CHARACTERISTICS**

**PRICE:** \$25.9M - \$35.1M **RANGE:** 3,919 - 4,065 nautical miles

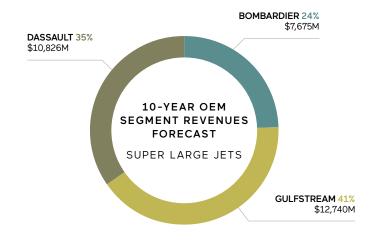
### SEGMENT RATIO: MODELS IN PRODUCTION VERSUS IN DEVELOPMENT OVER FORECAST PERIOD (UNITS)



# **CATEGORY FORECAST: SUPER LARGE JETS**



### **TOTAL SEGMENT REVENUES = \$31,242M**



Figures abbreviated and denoted in millions (2018 U.S. Dollars)

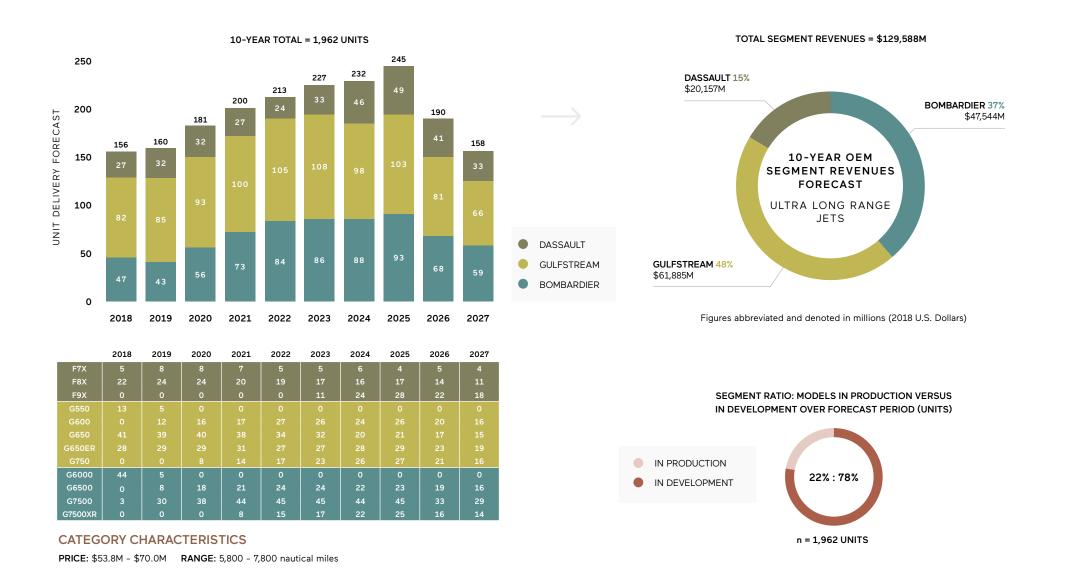
# **CATEGORY CHARACTERISTICS**

**PRICE:** \$44.8M - \$47.0M **RANGE:** 4,650 - 5,700 nautical miles

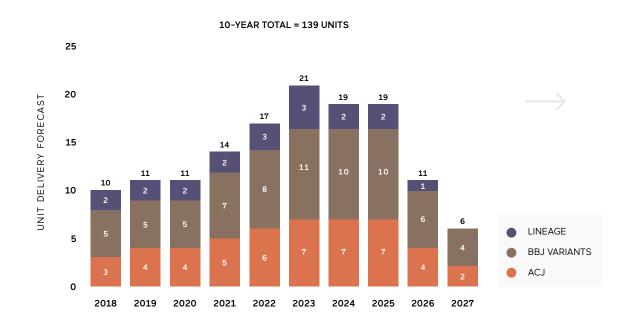
# SEGMENT RATIO: MODELS IN PRODUCTION VERSUS IN DEVELOPMENT OVER FORECAST PERIOD (UNITS)



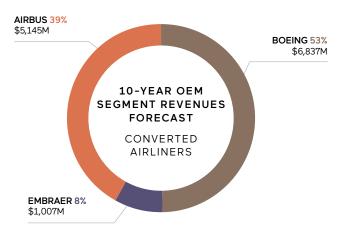
# CATEGORY FORECAST: ULTRA LONG RANGE JETS



# **CATEGORY FORECAST: CONVERTED AIRLINERS**



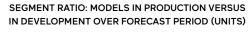
### **TOTAL SEGMENT REVENUES = \$12,989M**



Figures abbreviated and denoted in millions (2018 U.S. Dollars)

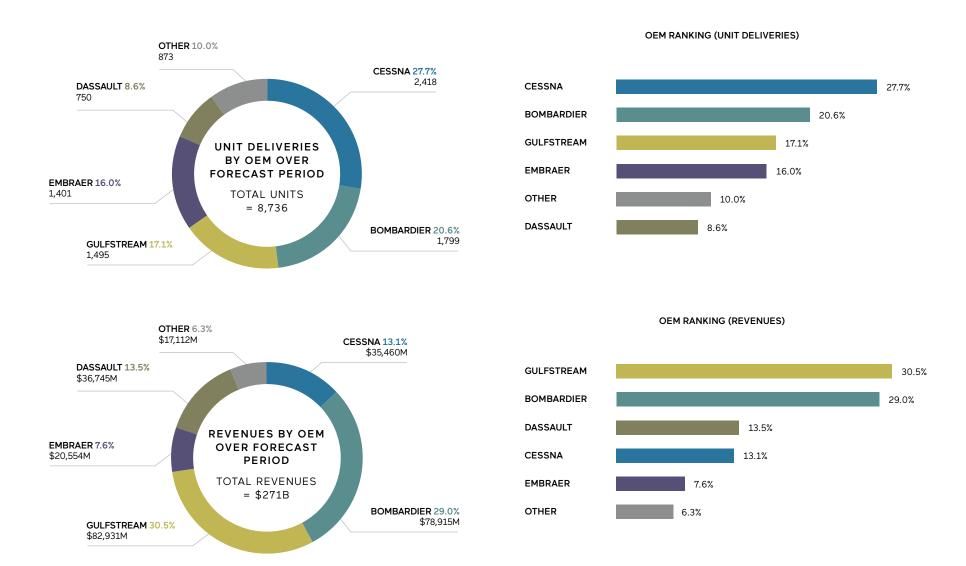
### **CATEGORY CHARACTERISTICS**

**PRICE**: \$50.0M - \$87.0M **RANGE**: 4,380 - 7,000 nautical miles





# **OEM UNIT DELIVERIES & REVENUES RECAP (2018 - 2027)**



Figures abbreviated and denoted in millions (2018 U.S. Dollars)

# **SOURCES**

- → Bloomberg Business
- → Business & Commercial Aviation (B&CA)
- → Compustat
- → Ernst & Young Family Office Guide, 2016
- → Goldman Sachs Global Investment Research
- → International Monetary Fund (IMF)
- → JetNet
- → JP Morgan
- → Knight Frank Wealth Report, 2018 (12th Edition)

- → National Bureau of Economic Research (U.S.)
- → S&P Global Market Intelligence
- → The Federal Reserve Bank St. Louis (Economic Research)
- → The Wall Street Journal
- → The World Bank
- → World Economic Forum Reports
- → Wealth-X, Billionaire Census 2018
- → U.S. Department of Commerce

