HONEYWELL FORGE

THE CONNECTED CABIN ADVANTAGE

A practical guide to business aviation
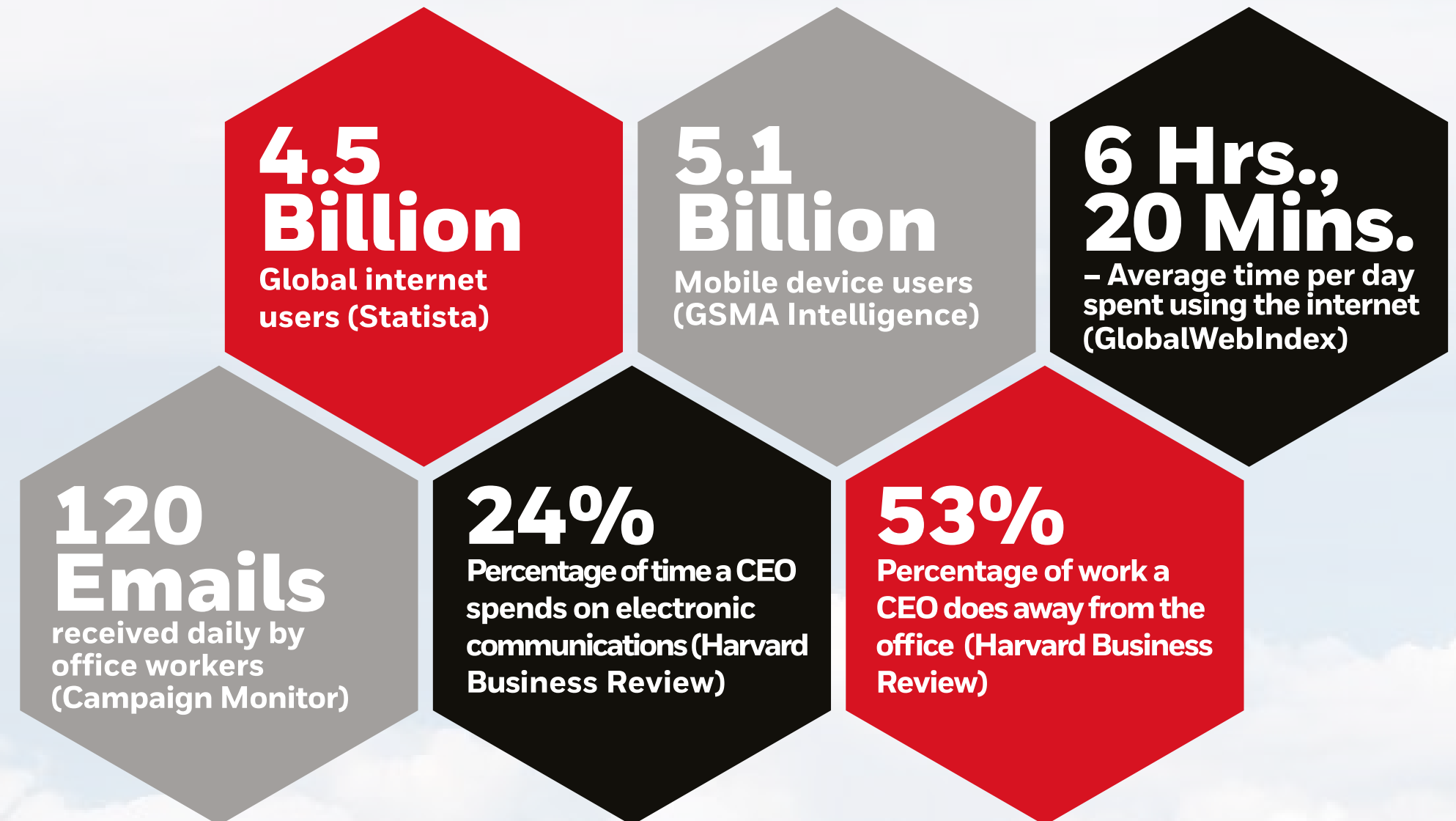
CONTENTS

CONNECTIVITY
BY THE
NUMBERS

THE HIGH COST BEING OFFLINE

The idea of being offline voluntarily for an extended part of the workday is unthinkable for most business leaders, principals and others who routinely fly on business jets. It's especially true when you consider the opportunity cost of a senior manager who can't work because Wi-Fi isn't available.

Here's how to determine the cost of an hour of unproductive downtime:

Annual compensation ÷ 2,000 (40 hours x 50 weeks)
=Approximate hourly rate

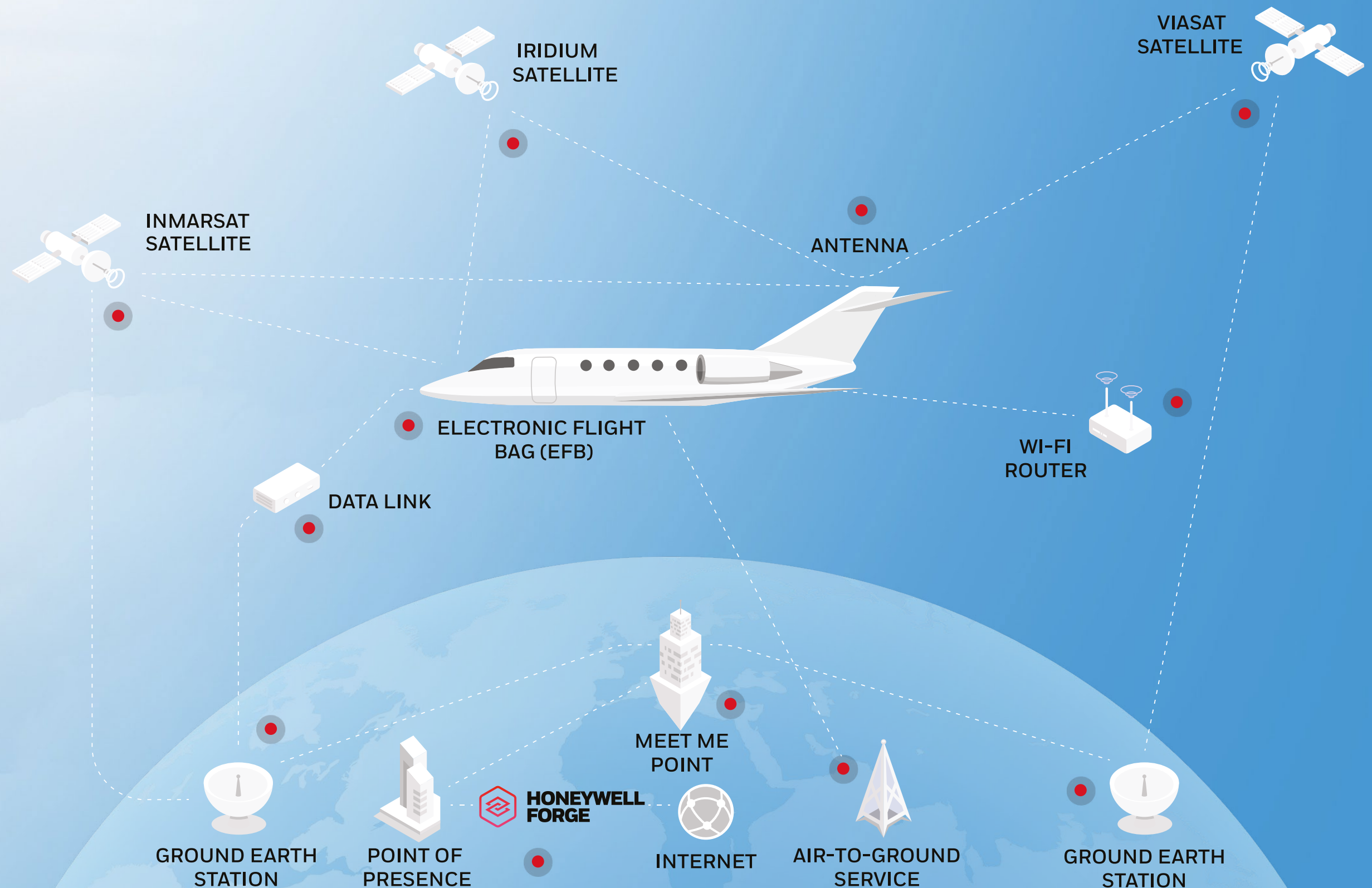Executive salaries vary greatly, of course, with the typical CEO earning about $824,000 (Salary.com) and the average Fortune 500 CEO earning more than $12 million (Fortune). But no matter how you cut it, a few hours of unproductive time on a flight without reliable Wi-Fi can amount to thousands of dollars, particularly if several managers are traveling together.

4.5 Billion
Global internet users (Statista)

5.1 Billion
Mobile device users (GSMA Intelligence)

6 Hrs., 20 Mins.
– Average time per day spent using the internet (GlobalWebIndex)

120 Emails
received daily by office workers (Campaign Monitor)

24%
Percentage of time a CEO spends on electronic communications (Harvard Business Review)

53%
Percentage of work a CEO does away from the office (Harvard Business Review)

HOW THE CONNECTIVITY ECOSYSTEM WORKS

Eighty percent of business aircraft will be equipped with satellite communication (SATCOM) technology within a few years, and users will need more capacity, faster speeds and greater reliability.

New satellite networks are being launched, including some that measure throughput speed in terabytes, rather than gigabytes, per second. Air-to-ground capabilities are improving as 5G networks expand. All of this will drive down the total cost of inflight connectivity and airtime service plans will become more flexible and affordable.
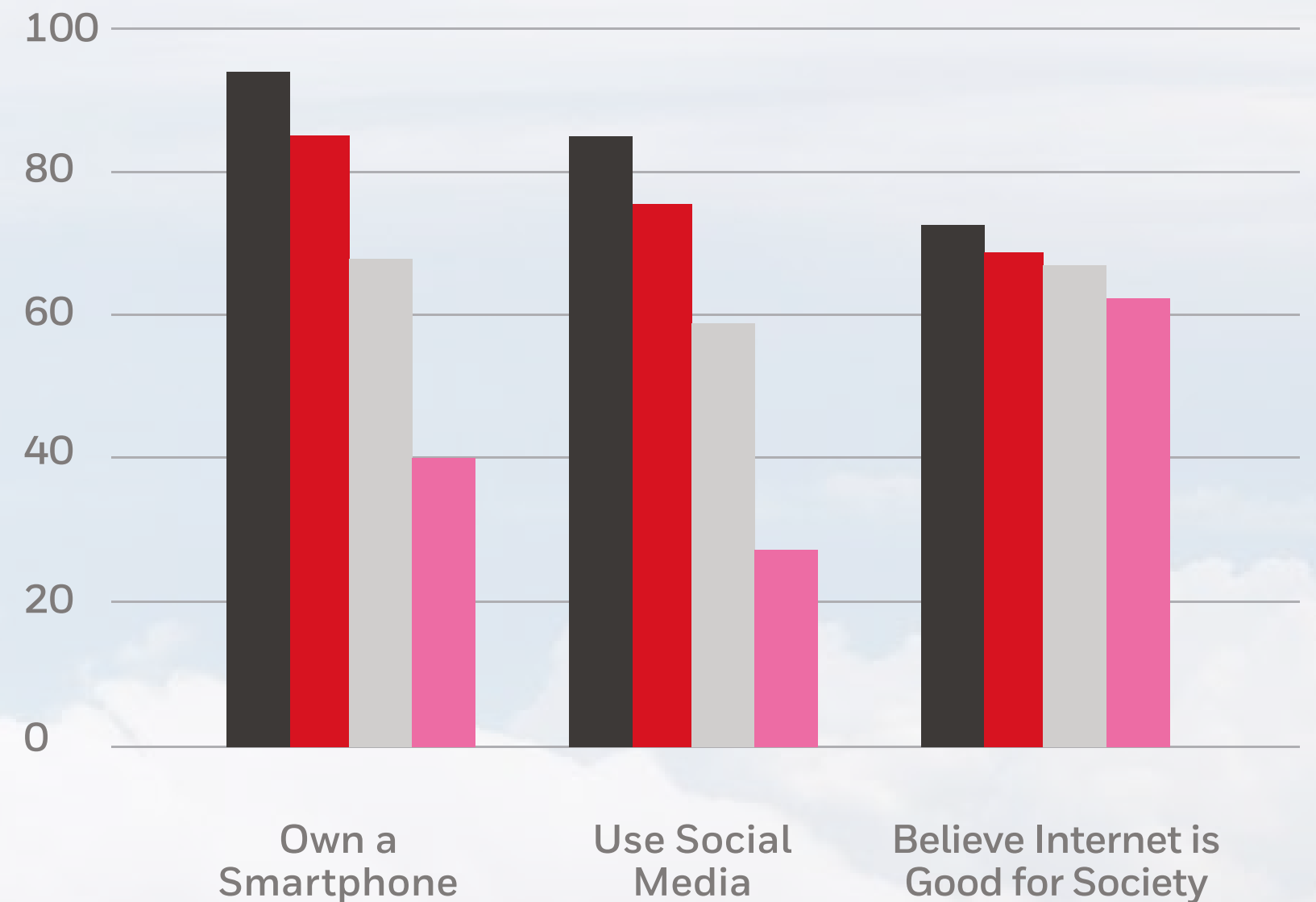
IRIDIUM SATELLITE

VIASAT SATELLITE

INMARSAT SATELLITE

ANTENNA

ELECTRONIC FLIGHT BAG (EFB)

WI-FI ROUTER

DATA LINK

MEET ME POINT

HONEYWELL FORGE

GROUND EARTH STATION

POINT OF PRESENCE

INTERNET

AIR-TO-GROUND SERVICE

GROUND EARTH STATION

CONSTANTLY CONNECTED, MILLENIALS' RAISE THE BAR

Gen X businesspeople in their 40s and 50s are among the most frequent users of business aircraft. They're both tech-savvy and demanding when it comes to onboard Wi-Fi. But just wait until the "digital natives" of the Millennial Generation take over the C-Suite. Now in their 20s and 30s, Millennials grew up with technology and expect to be constantly connected, even when they fly on the company plane.

Millennials
(Born 1981–96)

Gen X
(Born 1965–80)

Boomers
(Born 1946–64)

Silent
(Born before 1945)
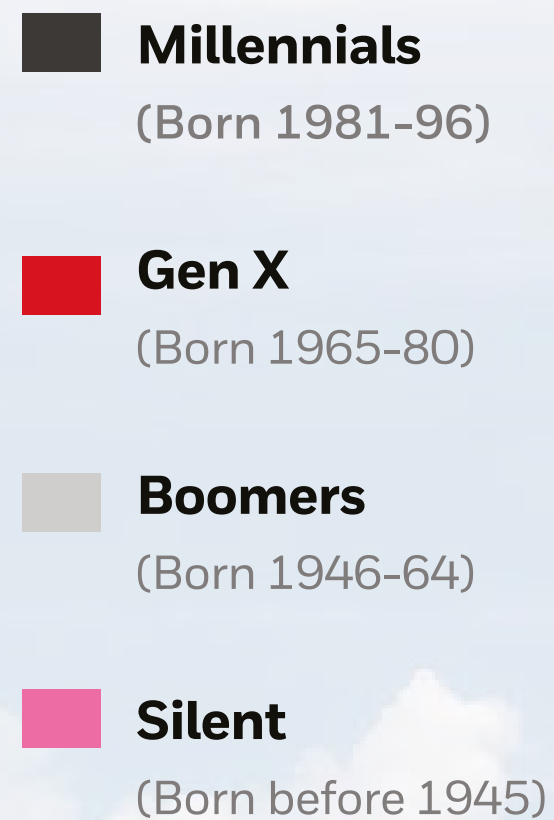
Percentage of U.S. Adults Who...

Own a Smartphone

Use Social Media

Believe Internet is Good for Society

THE CUSTOM CONNECTED EXPERIENCE FOR EVERY BIZJET PASSENGER

When it comes to business aircraft passengers, one size does not fit all. Some passengers are satisfied making a few inflight phone calls, sending some texts and emails, and surfing the net when they fly. Others want to connect to the company server, download big PowerPoint presentations, livestream sporting events, and Facetime with family and friends – all from 40,000 feet.

Whatever the expectations, it's your job to outfit the airplane with everything it needs to deliver the best possible cabin experience, every time. Finding the right connectivity solution starts with the answers to three fundamental questions:

1.

WHAT DO YOUR PASSENGERS WANT TO DO?

Understanding passenger requirements is the first step in determining the kind of satellite communications solution that will work best for your operation.

2.

HOW MUCH BANDWIDTH WILL YOU NEED?

Choosing an airtime service plan is a critical step in achieving your cabin connectivity goals, so you'll want to choose a flexible, affordable plan that meets your current and anticipated needs.

3.

WHAT FREQUENCY BAND SHOULD YOU CHOOSE?

You have to assess the available options to find the bandwidth – and network service provider – that delivers the speed and reliability passengers expect for what they want to accomplish on the plane.

WHAT PASSENGERS WANT TO DO AT 40,000 FT

Business aircraft owners and operators have lots of options when it comes to choosing the best combination of airtime services, network service providers, cabin connectivity services and satellite communications hardware.

You probably already have a pretty good idea of what your regular passengers are looking for in a satellite communications solution and, of course, there's no substitute hearing from the passengers themselves. But, here's an easy tool to help you start defining passenger requirements.

WHO YOU ARE	WHAT YOU FLY	WHAT YOUR PASSENGERS WANT
Large corporate flight department Multiple aircraft Multiple passengers	Large, mid-size business jets	• Constant connectivity for business apps • Ability to use multiple connected devices • Access to online entertainment • Easy access to company server • Cybersecurity protection
Small Flight Department 1-2 aircraft Principal/owner as primary passenger	Mid-size, light business jets	• Constant connectivity for business and entertainment apps • Optimized video streaming & live video capabilities • Ability to display content on the bulkhead screen • Cybersecurity protection
Charter/Fractional Company Many aircraft Many passengers	Large, mid-size, light business jets	• Constant connectivity for business and entertainment apps • Optimized video streaming and live video capabilities • Flexibility and ease of use • Cybersecurity protection
Individual owner 1 aircraft Owner as primary passenger	Light business jet	• Constant connectivity for basic business apps • Cybersecurity protection

HOW MUCH BANDWIDTH
DO YOU NEED?

VIDEO DOMINATES THE DATA STREAM

Whether it's used to teleconference with customers and colleagues, Facetime with the family, enjoy the latest Netflix hit or watch a big event on live TV, video streaming has become the internet's most popular application. It's also the biggest consumer of bandwidth, on the ground and in the air.

If your passengers want to stream video when they fly, you'll need to take that into consideration when you choose an airtime service plan, internet service provider and satellite communications system. You'll want to make sure your choices have the horsepower to stream standard video (at around 12 MB/minute) and HD video (at just under 42 MB/minute), per connected device.

20 KB
One email
(no attachments)

300 KB
One email (with standard attachments)

**250 KB
(15 MB/hr.)**
One min. of surfing the web

4 MB
One song downloaded

5 MB
One photo upload to social media

**11.7MB
(700MB/hr.)**
One min. of streaming standard-definition video

**41.7MB
(2500MB/hr.)**
One min. of streaming high-definition video

**97.5MB
(5850MB/hr.)**
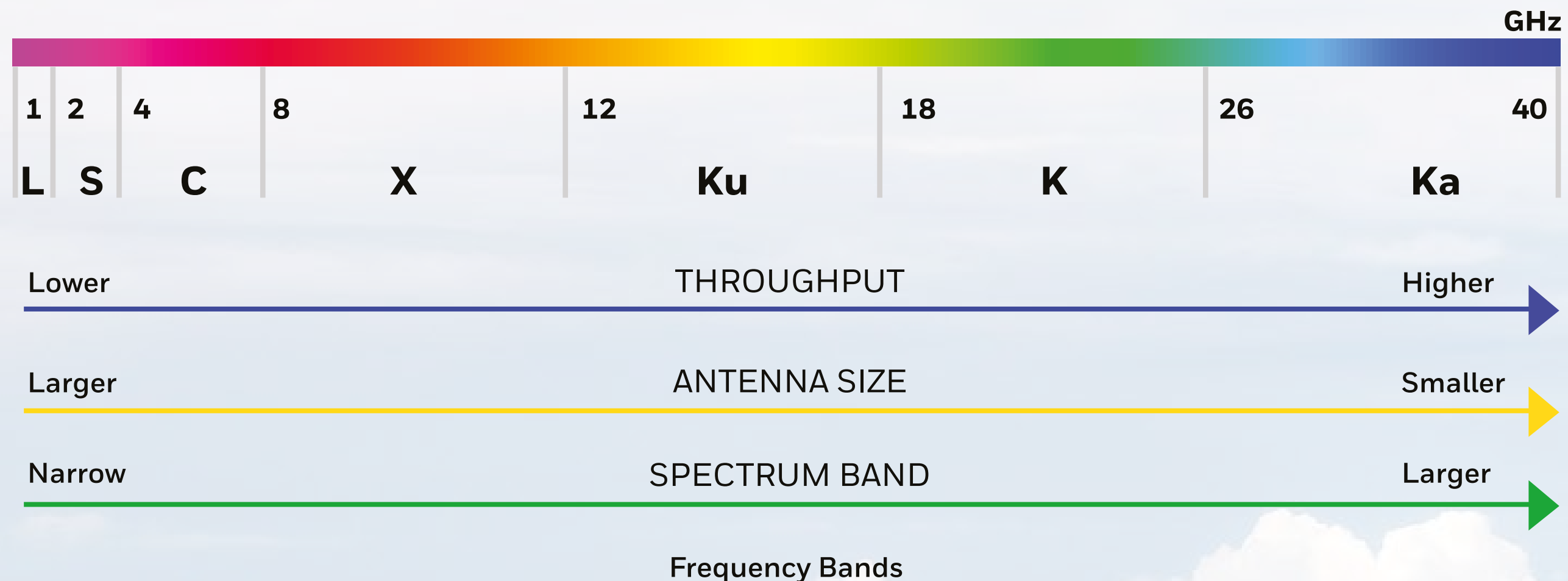One min. of streaming 4K video

**200KB
(12MB/hr.)**
One min. of online games

Choosing an airtime service plan for your aircraft isn't much different than choosing the data plan for your business, home or smartphone. It all boils down to what you want to do, how much data you're using today, how much you think you'll need in the future and how much you're willing to pay.

You never want to pay for bits and bytes you don't need, but you don't want to make choices that will leave your passengers frustrated, either. Allow passengers to spend less time buffering and more time getting to business.

CHOOSE THE RIGHT FREQUENCY BAND

GHz

1	2	4	8	12	18	26	40
L	S	C	X	Ku	K	Ka

Lower	THROUGHPUT	Higher

Larger	ANTENNA SIZE	Smaller

Narrow	SPECTRUM BAND	Larger

Frequency Bands

Operators have several options when it comes to satellite communications networks, which operate in different bands on the radio frequency range. The higher the frequency, the more bandwidth you can send through the system.

On the low end of the spectrum, aircraft can use the L-Band (usually 1.3GHz to 1.7GHz) for basic phone and data communications, like those provided over the Iridium network. SwiftBroadband, which uses the Inmarsat satellite constellations, is available in several configurations with speeds of up to 432 Kbps per channel. That's good enough to handle some common cabin connectivity needs like texting, sending and receiving email, surfing the web, and streaming low-definition video.

You'll need to move up to higher-speed options to deliver the kind of inflight Wi-Fi performance discriminating passengers crave. Ku-Band solutions operate in the 12-18-GHz radio frequency range and can deliver speeds as high as 1.5-6 Mbps, while Ka-Band solutions operate at 26.5-40-GHz and offer considerably faster speeds, typically in the 4.6 to 20 Mbps range but reaching speeds of 40+ Mbps under ideal conditions.

THE TRUE COST
OF CABIN CONNECTIVITY

|	
Satellite Communication System Hardware – Ka-Band or Ku-Band	$400,000–$600,000 (Flyaway cost)
Satellite Communications System Hardware – SwiftBroadband	$350,000–$500,000 (Flyaway cost)
Air-to-Ground Hardware	$150,000–$235,000 (Flyaway cost)
Airtime Service Plans – Ka-Band or Ku-Band	$7,000–$40,000/month
Airtime Service Plans – Air-to-Ground(voice and data)	$1,000–$5,000/month
Cybersecurity Protection	0–$900/month
Data Management	$175–$300/month

HONEYWELL FORGE FOR BUSINESS AVIATION
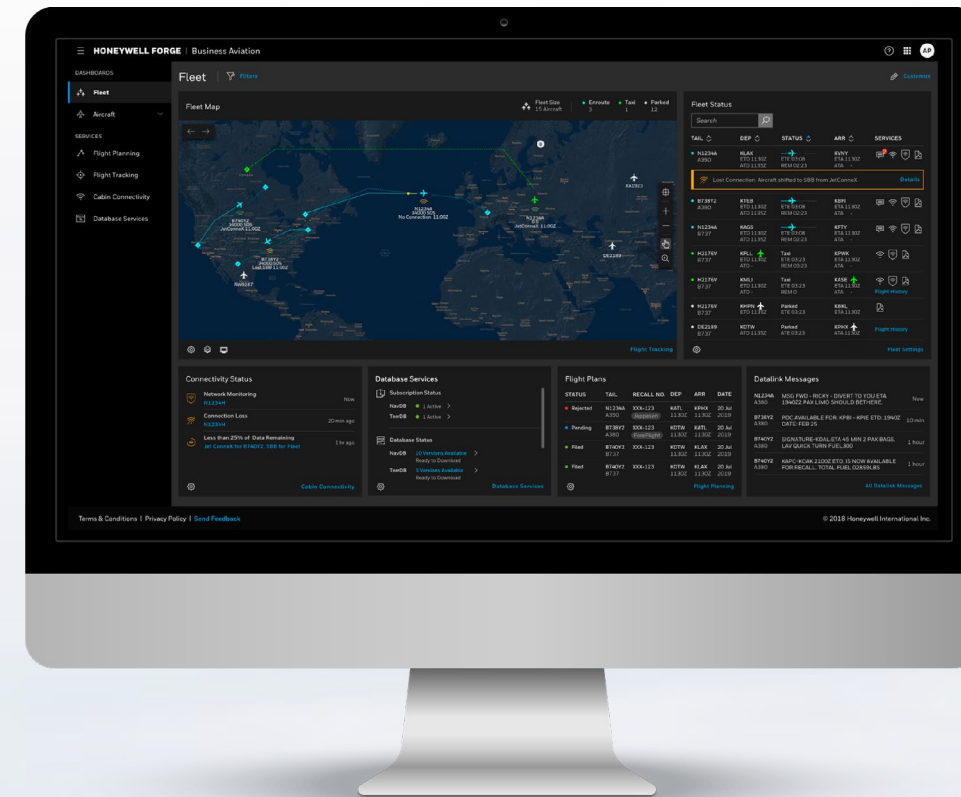
WHAT IS HONEYWELL FORGE FOR BUSINESS AVIATION?

Honeywell Forge is our next-level software solution that uses advanced data analytics and artificial intelligence to give business jet operators unique enterprise-wide insights they can use to improve operational performance, manage costs and create one-of-a-kind experiences for their passengers. Cabin connectivity is a core element of Honeywell Forge, which also offers operators a wide range of flight planning, flight optimization and database services on a single, seamless platform.

AN EXPERIENCE SO GOOD, PASSENGERS WILL FORGET THEY'RE FLYING

Let Honeywell Forge help you deliver a superior connected-cabin experience for your passengers, every flight. Only Honeywell offers a seamless, integrated, one-stop connectivity solution that includes:
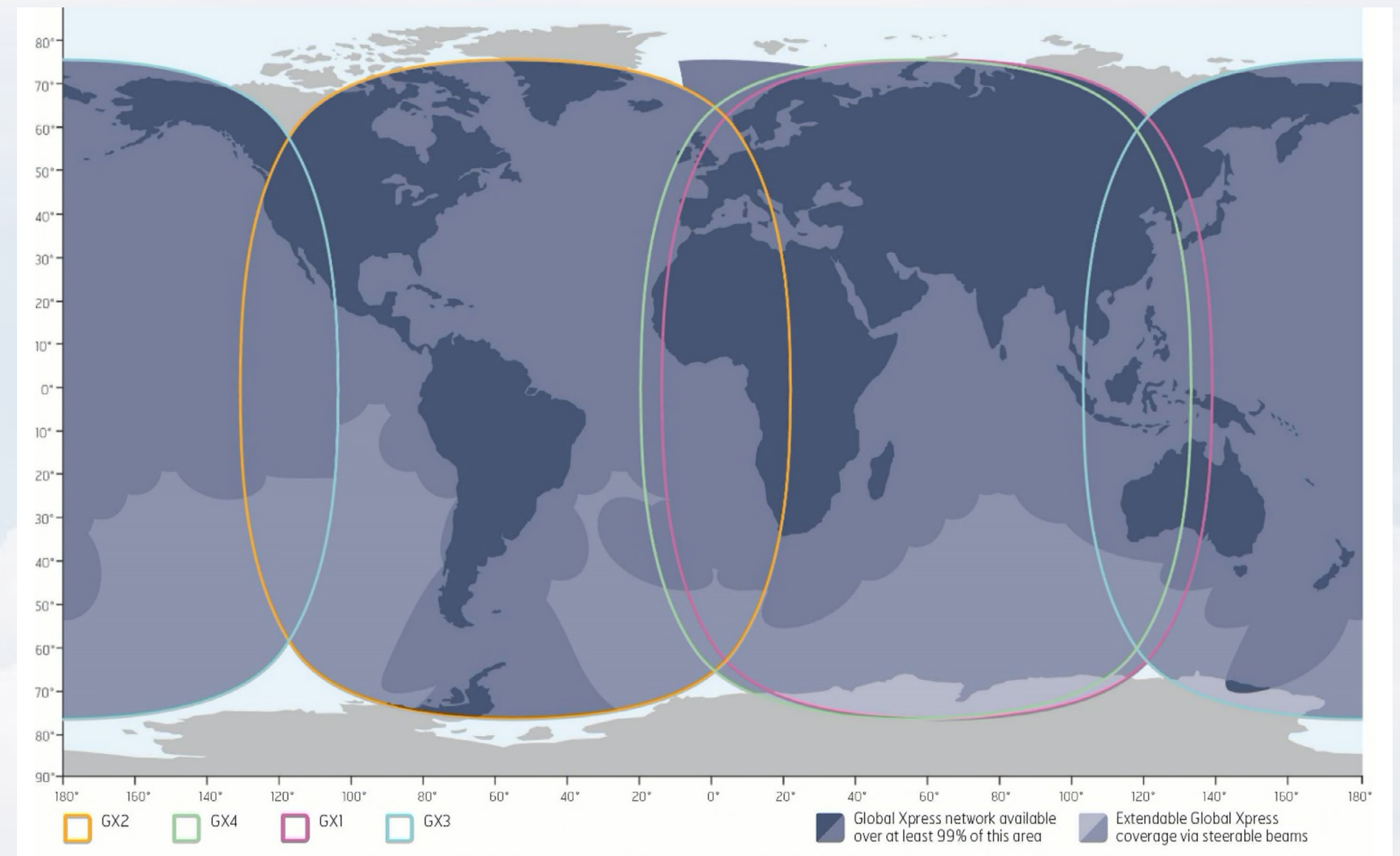
- Knowledgeable advisors who can help you find the perfect connectivity solution
- Your choice of flexible, affordable airtime service plans from top-tier providers
- Business aviation's first experience packages that make it easy to create a custom experience
- The Honeywell Forge platform to help you improve Wi-Fi service and manage data use and cost
- The industry's fastest, most reliable satellite communications hardware
- Standard cybersecurity protection to safeguard the entire network
- Around-the-clock global support by our experienced Honeywell Forge team

CHOOSE THE RIGHT AIRTIME SERVICE

As a leading provider of inflight airtime services, Honeywell Forge offers a wide variety of flexible, affordable plans to meet the needs of every business jet operator. Whether you're connecting to the internet using Ka-Band, Ku-Band, Swiftbroadband or another option, Honeywell Forge airtime packages make sure your passengers can get connected, stay connected and stay engaged.

With partners like Inmarsat, Viasat or Iridium, Honeywell Forge lets you choose from a wide range of airtime service plans that can be tailored to meet your specific requirements. Our new experience packages make it easier than ever to choose an airtime service option that will help you deliver the ideal experience for your passengers.

Jet ConneX from Inmarsat offers coverage over most of the world on the fast, reliable Ka-Band frequency band.

GX2   GX4   GX1   GX3

Global Xpress network available over at least 99% of this area

Extendable Global Xpress coverage via steerable beams

CHOOSE THE RIGHT CABIN EXPERIENCE

Choosing the right airtime service plan is easy with Honeywell Forge Experience Packages. You don't have to pull out a calculator to estimate megabytes, hours, uploads or downloads. All you have to do is choose from three Experience Packages.
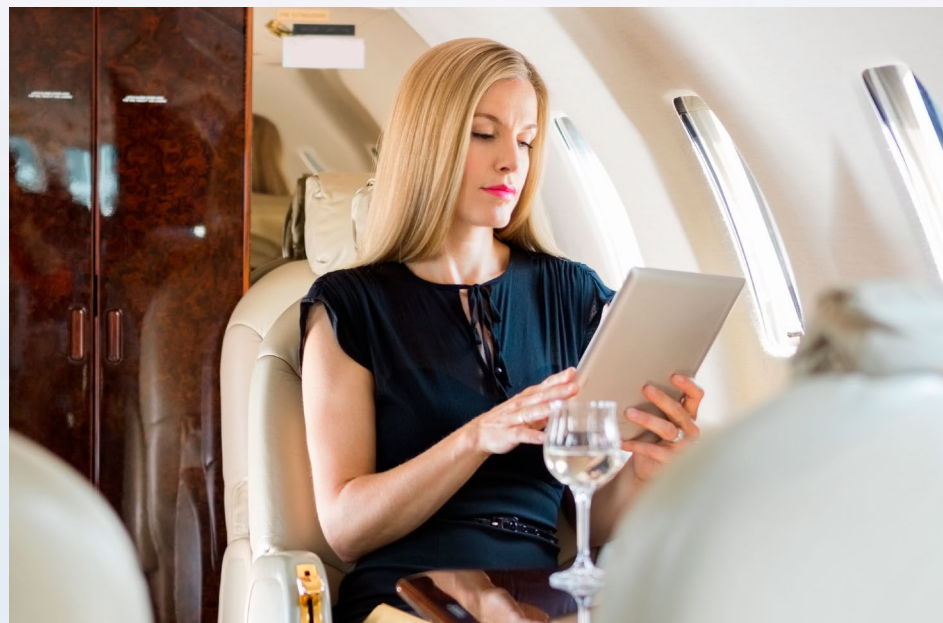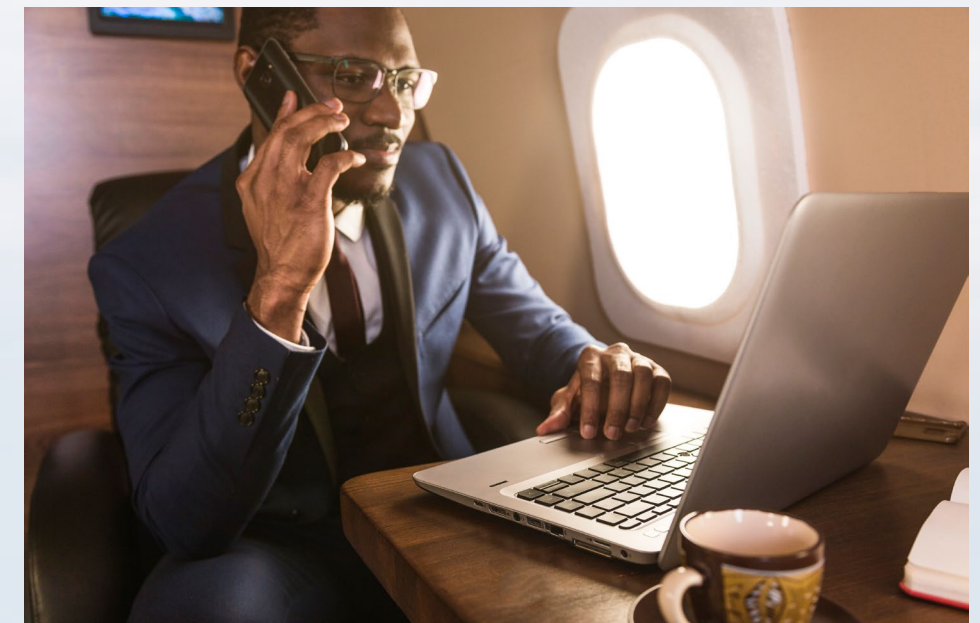

HONEYWELL FORGE ELITE EXPERIENCE PACKAGE

The Honeywell Forge Elite Experience Package is built with the most discriminating passengers in mind. Using our highest throughput capabilities, it provides the kind of high-speed access you need for premium video and other applications that demand the ultimate in speed, reliability and availability. The elite package is optimized for multiple users and includes dedicated concierge-level support.

HONEYWELL FORGE COMFORT EXPERIENCE PACKAGE

Business jet passengers have high expectations these days and the Comfort Experience Package meets them. It's designed to emulate a "living room" experience, with emphasis on the ability to stream live or prerecorded video simultaneously to all devices onboard. Country-specific content is available and users have access to a dedicated support engineer.

HONEYWELL FORGE OFFICE EXPERIENCE PACKAGE

The Honeywell Forge Office Experience Package is designed for users looking for a "business office in the sky" experience that helps them stay on top of their work responsibilities and use business collaboration tools whenever and wherever they fly. It includes always-on communications, site-to-site virtual private networks and enough bandwidth to videoconference and stream video.

PROVIDE A GREAT EXPERIENCE
WHILE MANAGING DATA USE

Honeywell Forge features help you deliver a great passenger experience while still managing data use and cost. For example, Honeywell Forge makes it easy for flight crews and cabin staff to keep an eye on the Wi-Fi signal and make sure passengers have the access they need. It also helps the flight department troubleshoot and address issues remotely, even while the aircraft is flying.

Other Honeywell Forge options let you give priority access to certain passengers, control the flow of bandwidth consumed by automatic smartphone updates, manage the bandwidth allocated to certain uses, restrict access to certain kinds of content, and much more.

You can access these and other Honeywell Forge tools, applications and subscription services with the easy-to-use and intuitive Honeywell Forge dashboard. The dashboard gives the flight department and other operations an unprecedented view of the operating status for a single aircraft or an entire fleet.

PROTECTING YOUR PASSENGERS' DATA

We understand that cybersecurity is just as big a priority on the airplane as it is at a company headquarters. Honeywell includes essential network monitoring capabilities as part of the basic Honeywell Forge offering and gives you the opportunity to upgrade your cybersecurity protection for a nominal fee.

Honeywell Forge Network Monitoring uses software installed on the aircraft's onboard router to examine data traffic and look for malicious activity, unauthorized access attempts and problems with the connected devices signed onto the network. Questionable activity is reported to the network administrator through a special tile on the Honeywell Forge dashboard.

Basic network monitoring service is included with your Honeywell Forge subscription. Basic coverage includes firewall monitoring of the core network, ground-based monitoring and intrusion protection, automated monthly reports covering threats that were detected, and monitoring and tracking capabilities using the Honeywell Forge dashboard.

Operators can upgrade to an advanced service offering for a monthly fee of $175 per aircraft. The fee expands Honeywell Forge Network Monitoring to cover "on-wing" cybersecurity services, including intrusion detection and prevention services that detect and respond to network intrusion attempts.

HONEYWELL
SATCOM HARDWARE

Honeywell satellite communications hardware complements the Honeywell Forge offering and helps operators create a true integrated connectivity solution for their passengers. Regardless of the airtime service plan and satellite network provider you choose, Honeywell has hardware – including satellite communications systems, onboard routers and antennas – that will make the most of your connectivity investment.

JETWAVE

Honeywell's JetWave satellite communications system gives you an inflight Wi-Fi experience comparable to what you get on the ground, anywhere you fly. It's fast, reliable, secure and always available, even on transoceanic flights where other systems may go dark.

JetWave is the hardware that allows you to connect to Inmarsat or ViaSat Ka-Band satellite networks for the fastest broadband available for business aviation. JetWave enables speeds of up to 33 Mbps under ideal conditions and was the first SATCOM system in business aviation to offer committed data rates of up to 6 Mbps when used on the Inmarsat Jet ConneX satellite network.

ASPIRE

The Aspire family of satellite communications systems for business aircraft and helicopters provides seamless in-flight connectivity on Inmarsat's L-Band SwiftBroadband network. Included is the Aspire 400 SATCOM, which delivers high-speed voice and data communications in a compact package. The Aspire 200 enables all classes of aircraft to connect to SwiftBroadband service and is the first SATCOM to mitigate the issue of rotor blades interrupting and slowing communications from helicopters.

GoDIRECT ROUTER

Honeywell's GoDirect Router gives you all the speed, performance and reliability of today's best routers in a package that costs less and is 65 percent smaller, 45 percent lighter and uses 35 percent less power. Multiple routers can be installed anywhere on your aircraft in a distributed architecture, which will provide optimum coverage throughout the cabin and flight deck and enable true redundancy at a fraction of the previous cost.

DEDICATED CONNECTIVITY SUPPORT
FROM HONEYWELL FORGE

Honeywell Forge has your back when it comes to delivering the best-possible cabin experience for your passengers. We helped pioneer satellite communications more than three decades ago and introduced one of the first satellite telephones for business aviation.

No one understands the total connectivity ecosystem quite like Honeywell, the only company that offers a totally integrated approach. It includes everything you need to get your passengers connected, keep them connected and help them stay productive, engaged and entertained from the moment they buckle in to the moment they step off the airplane at their final destination.

Our domain expertise in connected aircraft solutions is unequaled. Our dedicated team can help you assess your unique situation and tailor an approach to help you meet or exceed the expectations of even the most demanding passengers.

When you need our help, you're never more than a phone call or email away from connecting with an experienced and knowledgeable Honeywell Forge specialist who can help you address any issue – usually at first contact.

HONEYWELL FORGE
ON YOUR SIDE

EVERYONE WANTS TO STAY CONNECTED. EVEN WHEN THEY FLY.

We can be thankful that today's satellite communications capabilities let you create a connected experience for business aircraft passengers matching what they've come to expect at their home or office. With Honeywell Forge on your side, you can meet the expectations of even the most discriminating travelers for inflight Wi-Fi that is fast, reliable and always available.

Let's talk about it.

THE FUTURE IS WHAT WE MAKE IT.

To learn more
Please contact your Honeywell
sales representative or
call 1-888-634-3330 ext. 7
or email **sales.honeywellforge@honeywell.com**

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Honeywell