

THE FUTURE OF BUSINESS TRAVEL

FROM SUPERSONIC JETS TO PRIVATE PLANES YOU CAN DRIVE ON THE HIGHWAY—THESE INNOVATIONS ARE POISED TO REVOLUTIONIZE AIR TRAVEL

WHILE TECHNOLOGY that improves our lives takes a giant leap forward daily, commercial, business and personal aviation innovation has advanced at a snail's pace over the last half century. New developments on the near horizon, however, may change all that—and, in the process, transform the way you do business forever. • Case in point: The supersonic Aerion AS2 may make traveling from New York to Paris and back the same day a reality, while the “roadable” aircraft—think flying car—could bring new meaning to the term “road warrior.” The pages to follow offer an overview of some of the potential advances poised to revolutionize air travel, as well as insights from industry insiders and experts on the forces and innovations shaping the industry's future.

**BY
MARK
PATIKY**



▲ The supersonic Aerion AS2 will cut transatlantic travel time in half.

A SUPERSONIC RENAISSANCE

In 1958, a Pan Am Boeing 707 marked the dawn of the commercial jet age as it arched gracefully across the Atlantic from New York to Paris at just under the speed of sound. The seven-hour flight shrank transoceanic travel time by nearly half.

Fast-forward nearly 60 years. The newest airliners and the latest business jets are still cruising at virtually the same speed.

There was a brief glimmer of hope for a faster future when Concorde broke the “Mach barrier” 40 years ago. Cruising at twice the speed of sound, Concorde reduced the Paris-to-New York flight time to a stunning three and a half hours. But, while the supersonic jet flew like a bullet over the ocean, it encountered a massive regulatory speed bump approaching land.

The U.S. prohibits civilian aircraft flying faster than Mach 1 (the speed of sound) over land, and European sonic boom restrictions are equally punitive. That meant that for a considerable portion of Concorde’s journey, the sleek speedster was forced to throttle back to its most uneconomic operating regimen. So, as high as the hope for shrinking time and space, so was the cost. As a result, the plane once destined to transform jet travel was rendered a financial



failure and grounded forever.

Now, however, a new dream of traveling faster than the speed of sound is nearing reality, but this time, it’s designed specifically for business jet travelers.

Aerion Corporation, backed by Texas investor Bob Bass, is creating a supersonic business jet that will take to the skies in 2023. At speeds of 1,000 mph, the Aerion AS2 is poised to shrink the globe in a way that the Internet cannot—by allowing face-to-face business relationships on a schedule that only Superman could

meet. The AS2 will shave three hours off current transatlantic flight times and trim more than six hours from longer trans-Pacific routes. Imagine breakfast in New York, lunch in London and a same-day return for dinner with family in New York—and that’s on your schedule, not an airlines’.

Breaking the Cost Barrier

Aerion is the brainchild of brilliant aerodynamicist Dr. Richard Tracy. After decades of research, development and demanding computational logistics, Tracy developed a breakthrough supersonic natural laminar flow airfoil, which is highly efficient at both supersonic and subsonic speeds. That means the Aerion AS2 will be practical and cost effective over its entire operating range, irrespective of any over land speed restrictions.

While Aerion engineers were conceiving and patenting the airfoil shapes that blend speed and economy in ways never before attained in commercial or military aircraft, Aerion’s co-chairman, Brian Barents, was searching for risk-sharing partners that could develop and manufacture this new-technology supersonic business jet. Last year, Airbus signed on in a partnership that will most assuredly enable the AS2 to come to market within the next seven years.

CEO PERSPECTIVE / AERION: SPEEDING AHEAD

“THE CREDIT FOR THE AERION supersonic business jet goes to Dr. Richard Tracy. His breakthrough aerodynamic design, natural supersonic laminar flow technology and new construction techniques and materials, which create optimal efficiency throughout the speed range, make this new jet feasible.

“We built our business plan assuming that we would fully adhere to current global regulatory requirements. That would limit us to high subsonic speeds over the U.S. Over the

rest of the world, we would fly using existing standards that allow supersonic speeds so long as the sonic boom doesn’t hit the ground [At Mach 1.2–800 mph—the AS2 will be boom-less].

“Because our expertise is in aerodynamic design and natural laminar flow technology, it was always our intention to team with an existing aircraft manufacturer to build the airplane. Last year, we announced collaboration with Airbus Industries, and we are working with them to

put the airplane into production.

“As worldwide commerce expands, the need to travel longer distances more frequently is growing. We believe there is sufficient demand for an airplane like this to satisfy that need, justify the investment and make a very attractive financial return to investors. While you don’t need an airplane in this category 100 percent of the time, when you do, this capability is invaluable.

“We see this as the first in a family of airplanes. Clearly, it

could be a bigger business jet or it could be an airliner in the future. All of these proprietary technologies have application in military or commercial areas. In fact, that was the motivating factor for Airbus to collaborate with us. We have licensed them to utilize our technology in their future commercial products.

“Those are just some of the things on the horizon, and we are very optimistic.”

—Brian Barents
CO-CHAIRMAN, AERION



▲ The volsplane of tomorrow proposed by Terrafugia opens the prospect of flight to a vast new audience.

Geared for global commerce,

The three-engine AS2 has a range of 5,400 miles (virtually anywhere on Earth with a maximum of a single refueling stop), top speed of Mach 1.5 and a stand-up, 6' 2" high cabin with seating for eight to 12 passengers. It is a stunning tool for international business travel. Barents believes the new jet will be highly sought after by business leaders worldwide that value time, want to be there first and depend on face-to-face relationships to jump-start the engines of global commerce.

At a projected \$120 million per copy, the AS2 will be about twice the price of today's top-selling Gulfstream G650,

but it is 60 percent faster. Its forté will be high-speed, over-ocean sprints such as New York to London, Paris or Moscow, San Francisco to Tokyo or Madrid to Sao Paulo.

So who is going to buy this fine-tuned time machine? Major corporations exploring international markets may find the Aerion AS2 an important enhancement to an existing business jet fleet, but Kenn Ricci, chairman of fractional ownership firm Flexjet, has another vision. In November 2015, Ricci took a bold step forward and placed a \$2.4 billion order for 20 Aerions up from 10, which he originally anticipated.

After polling current Flexjet frac-

tional owners, Ricci was convinced that the Aerion AS2, designed for speed and distance, would be a winner. "It is not your everyday airplane," he says, "but, for the times when you need it—for missions that take full advantage of its unique and extraordinary capability—it will be the most powerful business tool that you can imagine."

THE FLYING CAR

The idea of a flying car is nothing new. In 1949, Moulton Taylor designed a roadable aircraft called the Aerocar, which he believed would introduce aviation to the masses. Only six were built. Since then, many other inventors tried and failed, but Terrafugia, founded in 2006 by an MIT Ph.D., Carl Dietrich, together with a crack team of MIT engineers, appears well on the road to revolutionizing personal air transportation.

A Plane In Every Garage?

Imagine backing out of your garage, driving to the local airfield, unfolding wings with the press of a button and, in minutes, taking off on a 300-mile journey. When you land, you merely fold the wings back and blithely drive the few remaining miles to your ultimate destination.

The Terrafugia Transition, which

CEO PERSPECTIVE / FLEXJET: ADDRESSING ACCESSIBILITY

"WHAT COULD BE BETTER than being a leader in the supersonic arena? The Aerion AS2 is going to be a different kind of airplane than we ever had, and it was the ideal product for where we are going with Flexjet.

"If you are a large corporate flight department or a large company and you have a need for a supersonic jet, it will be for specific trips. It is not a plane that you would use every day, so it's ideally suited for our

fractional business.

"Because the Aerion is so unique, we cannot provide unlimited access in the same manner as the fractional model. The number of airports where the AS2 can take off and land is limited. The new jet is 175 feet long. It is going to require 7,000-foot runways and specialized ground handling, so we do know that we are going to operate it on route-specific flights. We won't sell shares,

but for an additional fee, we will allow existing owners to have access on flights between specific city pairs. Since we are evolving into Europe next year, that might be New York-to-London or Paris-to-New York.

"Right now, we have significant demand for travel across the Atlantic, and cutting the flight time from seven hours to four hours is huge."

—Kenn Ricci
CHAIRMAN, FLEXJET

can do all of that and more, is a two-seat, folding-wing, roadable aircraft that drives at highway speeds and will cruise aloft for four hours at 100 mph. It is part of Dietrich's vision for making aviation safer, more convenient and more accessible.

Created for pilots with limited experience, the Transition's advanced features include safety-oriented aerodynamics, latest-technology avionics, airbags, occupant safety cage, full-frontal crash worthiness and a ballistic whole-aircraft parachute that will bring the Transition gently back to Earth in the event of an emergency.

After nearly a decade of development, the Transition is road-tested, flight-tested and nearly ready for production. There is just one annoying hurdle: Dietrich designed the Transi-

BY THE NUMBERS

TERRAFUGIA
TRANSITION

100 MPH
TOP SPEED

300
FLIGHT RANGE, IN MILES

TWO
NUMBER OF SEATS, PLUS ROOM
FOR GOLF BAGS AND LUGGAGE

pilots only), and the certification costs skyrocket. In that case, the decade-long project may be financially unrealistic and Terrafugia production may languish on the runway.

Undeterred, Dietrich is hedging his bets by parlaying years of R&D into a new, even more exciting flying car. Prompted by the Congressional mandate for the FAA to incorporate drones into the National Airspace System, Terrafugia launched the TF-X program, a four-seat, hybrid-electric flying car with semi-autonomous vertical takeoff and landing capabilities—effectively, it is a manned drone that will not require a pilot's certificate.

A New Vision For Personal Mobility

Dietrich's newest idea will incorporate advanced systems logic to autonomously manage the flying requirements; prevent airspace incursions; monitor weather and avoid air traffic, terrain and other hazards. It will take off like a helicopter, using electric powered rotors, and fly like a conventional airplane powered by an aircraft engine and ducted propeller. You, the "operator," will be able to intervene when necessary to make the ultimate decisions about whether it's safe to takeoff or land. The computer will do the rest. In the unlikely event of an emergency, the TF-X has a parachute, so all the operator will need to do is pull the red handle. 

tion to fit the Federal Aviation Administration's (FAA) light sport aircraft category, which only requires a sport pilot license that is less demanding than a conventional pilot certificate and takes half the time and money to obtain.

Regulatory Turbulence

The 1,800-pound Transition, however, is 450 pounds above the FAA's light sport aircraft weight limit. Terrafugia petitioned for an exemption and Dietrich is awaiting a response. He believes that without the waiver, the market diminishes significantly (fully licensed

▼ The TF-X is Terrafugia's newest idea. It is completely computer-controlled and can be operated from a smartphone.



CEO PERSPECTIVE / TERRAFUGIA: GETTING ROAD READY

“WHEN THE FAA PROPOSED the sport pilot and light aircraft rule, we started looking at a roadable airplane, as well as what we could do to make general aviation available to a broader segment of the population. Our analysis showed that if the Transition's unique safety features—impact protection, benign flight characteristics and full-vehicle parachute—were to become widespread, the result

might be a significant improvement in light airplane safety.

“The Transition, which flies and drives exactly as we intended, is designed for the short commutes or getaways where you're planning to fly for a couple of hours, then drive around when you get there. It handles well in the air, and it negotiates the highway surprisingly well for an airplane.

“Later, when the FAA was

tasked with incorporating unmanned aircraft in the national airspace system, we started looking seriously at the idea of a flying car for the masses that anyone can operate with minimal training.

“We also designed an electrical propulsion system with distributed system architecture to thwart any single failure.

A large number of redundant electric motors drive the rotors

for vertical takeoff and landing, and a traditional aircraft engine with ducted fan provides horizontal thrust and cruise power. The result is our vision for tomorrow—the TF-X, a fly-by-wire, computer-guided vehicle programmed not to violate FAA regulations. Just tell it where to go with your smartphone and it will take you there safely.”

— Carl Dietrich
CEO, TERRAFUGIA