

Boom's first prototype flight takes step toward easing supersonic skepticism

Richard Craver - Mar 28, 2024

The first flight of the Boom Supersonic Overture prototype aircraft isn't enough on its own to quell skepticism about whether the manufacturer will fulfill its high-risk, high-reward project at Greensboro's Piedmont Triad International Airport.

However, seeing the prototype flying over the Mojave desert on March 22 for 12 minutes, reaching a top speed of 273 mph and an altitude of 7,120 feet, appears enough — for now — to serve as an encouraging symbol of Boom's vision that was unveiled at PTI on Jan. 29, 2022.



The XB-1 in its first test flight Friday above the Mojave Desert.

Boom Supersonic

In the short term, there are between 10 and 20 more test flights with the XB-1 prototype before the manufacturer reaches supersonic flight, a spokeswoman for Boom said.

Despite the long road ahead, observers say that last week's flight provided a boost of confidence.

"It does not hurt with respect to investors since it is the first real tangible evidence of proof of concept," said Keith Debbage, a joint professor of Geography & Sustainable Tourism and Hospitality at UNC Greensboro.

"However, it is the first step of many particularly regarding test flights. Perhaps the biggest step will be the maiden flight of the fully built-out Boom aircraft when all the essential concepts are finally put together in one viable unit."

Overture is expected to be the first large commercial aircraft to be net-zero carbon from Day One, running on 100% sustainable aviation fuel.

"Additional ground-breaking steps will be fully testing the aircraft on sustainable aviation fuels and providing metrics that show a carbon neutral footprint," Debbage said.

Boom officials projected its Overture aircraft could serve at least 600 existing international flights when it announced plans for a \$500 million "superfactory" at PTI. Boom anticipates having at least 1,761 jobs when the factory is at full production capacity in 2030.

The company has created a superfactory blog on its website that is providing written and visual construction updates.

Next steps

Among next steps for Boom is to "systematically expand the flight envelope to confirm its performance and handling qualities through supersonic flight," the company said in a statement released after the flight.

"This includes in-flight checks of all systems, as well as multiple test points demonstrating safe margin to flutter (vibration) boundaries."

When asked about a timeframe, Boom said "we haven't yet determined the top speed we plan to reach with XB-1. We'll make that call later on as we progress the flight test program."

"We have received a supersonic flight authorization permit enabling special rights to fly supersonic in the airspace over the Mojave desert."

According to Boom executive Kathy Savitt, the Overture timeline at PTI is:

- 2024: Begin equipment installation.
- 2025: Assembly.
- 2026: First rollout.
- 2027: First test flight.
- 2029: Federal Aviation Administration certification.
- 2029: First passenger flights.

Kevin Baker, PTI's executive director, has said construction of the 400,000-square-foot facility is expected to be completed in the second quarter.

Both Gov. Roy Cooper and Senate leader Phil Berger, R-Rockingham, touted the inaugural flight for a manufacturer that has been made eligible for at least \$116 million in local and state incentives to the company.

A state Commerce Department report on the Boom project determined the operational hub could bolster the N.C. economy by \$32.3 billion over the 20 years of the \$87.2 million Job Development Investment grant agreement.

"We're excited about this historic flight and know it will lead to great paying North Carolina jobs and cleaner aviation," Cooper said in a statement. "North Carolina is glad to partner with Boom as they continue to make progress on their mission to transform aviation."

Meanwhile, Berger said the first flight of XB-1 "is a tremendous turning point in Boom's quest to bring supersonic flight to the masses."

"I look forward to seeing Boom continue its strong partnership with North Carolina as it solidifies its status as a leader in aviation innovation."

What it means

Analysts cite it remains too early for sighs of relief about Boom and Overture even with the initial success.

According to Boom, it has raised \$750 million in investment support, but chief executive and founder Blake Scholl projects needing about \$8 billion to reach its full potential.

The last major venture into civilian supersonic flight, the Concorde, lasted from 1976-2003.

Concorde, developed jointly by the British and French governments, offered a 3½-hour flight from New York City to London at an average flight cost of \$9,000, which made it a symbol of speed and luxury.



Blake Scholl, Boom Supersonic founder and CEO, talks about the Symphony engine project the press conference at Piedmont Triad International Airport in Greensboro, N.C., on Tuesday, December 13, 2022.

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However, an Air France jet crash on July 25, 2000, after takeoff from Paris, killed all 109 individuals on board and four on the ground.

After flights were grounded for more than a year, the Concorde never recovered from the fatal crash.

An accompanying question: Why does the promise of resurrecting trans-Atlantic and trans-Pacific supersonic flight lie with a private manufacturer just nine years old, rather than global giants Airbus and Boeing?

The best answer for Airbus is that the company is currently not interested in supersonic aircraft. In June 2021, Airbus executives said in a media presentation that they do not plan to prioritize supersonic planes.

Meanwhile, Boeing's plans to invest in supersonic aircraft manufacturer Aerion ended when Aerion was shut down in May 2021 after 17 years of research and development toward a Mach 1.4, 10-passenger supersonic business jet failed to yield a proven product.



Blake Scholl, Boom Supersonic's founder and CEO, talks about the Symphony engine project at a press conference at Piedmont Triad International Airport in Greensboro on Tuesday. Boom has projected having at least 1,761 jobs at its planned PTI "superfactory" by 2030.

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"Boom's XB-1 flight in California achieved what it set out to do — not flying anywhere near supersonic — but taking that next step toward convincing sceptics, the flying public and the all-important investment community that a return to traveling at the speed of sound is clearly on its way," said John H. Boyd, founder and principal with global site-selection firm The Boyd Co. of Boca Raton, Fla.

"By all accounts, Boom's test flight was successful from an engineering and data-gathering standpoint."

Supersonic competition

According to a March 18 article in The Washington Post on supersonic flight in which Boom was featured, there is competition in reviving the sector, including from Atlanta-based Hermeus, as well as Exosonic and Spike.

Hermeus, according to the article, is exploring the possibility of a hypersonic commercial passenger jet that would make a commercial aircraft flight between New York and London a 90-minute trip.

By comparison, Overture is being designed to carry 65 to 80 passengers at Mach 1.7 over water — or twice the speed of today's fastest commercial aircraft — with a range of 4,250 nautical miles. At those speeds, flying from Miami to London in just under five hours and Los Angeles to Honolulu in three hours are among the possibilities, Boom has said.

When asked about competition, a Boom spokesman said that the company "is the leader in returning supersonic flight to the skies, as evidenced by our order book for Overture which stands at 130 aircraft (both orders and pre-orders), supplier engagement and overall progress toward production. ... Boom is also the first and only company to build, test and successfully fly the world's first independently developed supersonic jet.

"We continue to have support from the public and interest from investors who recognize that Boom has demonstrated meaningful progress and a clear path forward to making supersonic travel safe, sustainable and economically scalable, and want to be a part of that opportunity."

Boom should not fear having competition for investor funding and aircraft orders, said Roger Beahm, a marketing professor at Wake Forest University.

"Competition in any industry is not a bad thing," Beahm said.

"While on the one hand, an individual business wants to hold as large a market share as it can believing it can maximize its profit, competition is healthy in that it can grow a category to where everyone benefits."

NASA connection

The Washington Post article began with another California supersonic unveiling, this one in January when NASA debuted its X-59 demonstrator jet.

The space agency is investigating the business case for supersonic trans-Atlantic and trans-Pacific passenger air travel aboard aircraft that could theoretically travel between Mach 2 and Mach 4 (1,535 to 3,045 mph at sea level).

By comparison, large commercial airliners cruise at roughly 600 mph — or about 80% the speed of sound.

NASA is projecting spending more than \$800 million on the initiative.

"These new studies will both refresh those looks at technology roadmaps and identify additional research needs for a broader high-speed range," said Lori Ozoroski, a project manager for NASA's Commercial Supersonic Technology project.

A layer of the Boom Supersonic-NASA collaboration was peeled open in August with a study concluding that potential supersonic passenger markets exist in about 50 established routes. NASA did not specify the routes in its blog.

With its X-59 "quiet supersonic aircraft," NASA's Quesst mission "aims to provide data to regulators that would help change the overland supersonic flight rules," according to the NASA website.

Quiet, in this instance, is being described as "soft thump" to those on the ground.

According to a Conte Nast Traveler article in January, finding a solution to the sonic boom rivals the higher cost of operating a supersonic aircraft in making the service commercially and environmentally viable.

"When flying over land, Overture can fly significantly faster than subsonic commercial jets — about Mach 0.94, without breaking the sound barrier," Boom said in a statement issued in August. "This is about 20% faster than subsonic flight."

One key to quieting the boom comes from the plane's design, Peter Coen, mission integration manager for the Quesst mission, told The Washington Post.

"The engine is mounted on top," Coen said. "The plane has a long, narrow nose and sculpted wing to help ensure the shock waves it creates as it speeds through the air are similar in strength and evenly spaced along the aircraft to create a gradual increase in pressure instead of the rapid jump that creates the loud bang."

Overture will be powered by four wing-mounted engines that enable the airliner to cruise at Mach 1.7 over water and just under Mach 1 over land. Boom said the four-engine design reduces noise while decreasing costs for airline operators.

Among the next NASA steps includes issuing two 12-month contracts for companies to develop concept designs and technology roadmaps. The roadmaps will explore air travel possibilities, outline risks and challenges and identify needed technologies to make Mach 2-plus travel a reality.

Boom and Northrop Grumman are collaborating "on a special mission variant" of Overture after ongoing identification and investigation of use cases that will benefit the U.S. Defense Department.

"Time is a strategic advantage in high consequence scenarios, from emergency evacuations to disaster response," Scholl said.

"This collaboration between Boom and Northrop Grumman unlocks the potential for Overture to provide the U.S. and our allies with an unmatched high-speed capability when and where it's most needed."

NASA said the Boeing and the Northrop Grumman teams will develop roadmap elements to include airframe, power, propulsion, thermal management and composite materials that can hold up under high-supersonic speeds.

They also will create non-proprietary designs for concept vehicles.

Once the industry engagement phase is completed, NASA and its partners will decide whether to continue the research with their own investments.

“The design concepts and technology roadmaps are really important to have in our hands when the companies are finished,” said Mary Jo Long-Davis, a manager of NASA’s Hypersonic Technology Project.

“We are also collectively conscious of the need to account for safety, efficiency, economic and societal considerations. It’s important to innovate responsibly so we return benefits to travelers and do no harm to the environment.”

Whetting the appetite

Although the first XB-1 flight was "a modest achievement, this flight keeps Boom's progress top-of-mind among key stakeholders, as well as the public at large," said Beahm, the Wake Forest professor.

"Maintaining awareness among its various target audiences is an important marketing objective for any brand or company, regardless of what business it's in. Keeping people aware that Boom is making progress, even small steps, contributes to the knowledge people have about the company and its Overture brand.

"In this case, helping the public — not to mention investors, employees and government officials — stay up-to-date on the progress toward building the aircraft is particularly important at a time when the benefits to the public can still only be imagined."

Beahm said Overture "suggests what the future of air travel will be like, and it's a major departure — no pun intended— from what it is today. ...

"Giving folks a regular glimpse of that progress helps everyone look beyond the challenges that exist in air travel today. It gives hope for an actual better way to travel in the future. It's not some long-term dream, but it reminds us a better, faster way to travel is really on the edge of reality."