

Travel beyond 2020 Supersonic flight

Key themes

- **Supersonic passenger flights could resume as soon as 2023, giving business travelers back their most valuable asset—time.**
- **Developing a supersonic airliner able to halve journey times for a price little different to a current business class fare would trigger mass demand.**
- **While the new aircraft should be quieter and cause less pollution, they'll still have a bigger environmental impact than passenger aircraft like the Boeing 787.**
- **With hypersonic flight already under development, supersonic flight could quickly become yesterday's technology.**

Following Concorde's retirement in 2003, it's been more than 15 years since a supersonic passenger aircraft last operated a commercial service. And yet travelers and travel companies continue to dream of supersonic travel. With the race on to develop the next generation of supersonic aircraft, commercial flights could resume as soon as 2023.

Concorde was arguably ahead of its time, but its technology would fall far short of today's standards for environmental and community concerns. Fuel burn was high; it made a lot of noise during take-off; and it created a sonic boom at supersonic speeds. These issues need solving

before supersonic services can resume, particularly since organizations like the United Nations, International Civil Aviation Organization (ICAO) and Federal Aviation Administration (FAA) have tightened the standards expected of future aircraft.¹ Supersonic flight must prove to be sustainable and responsible.

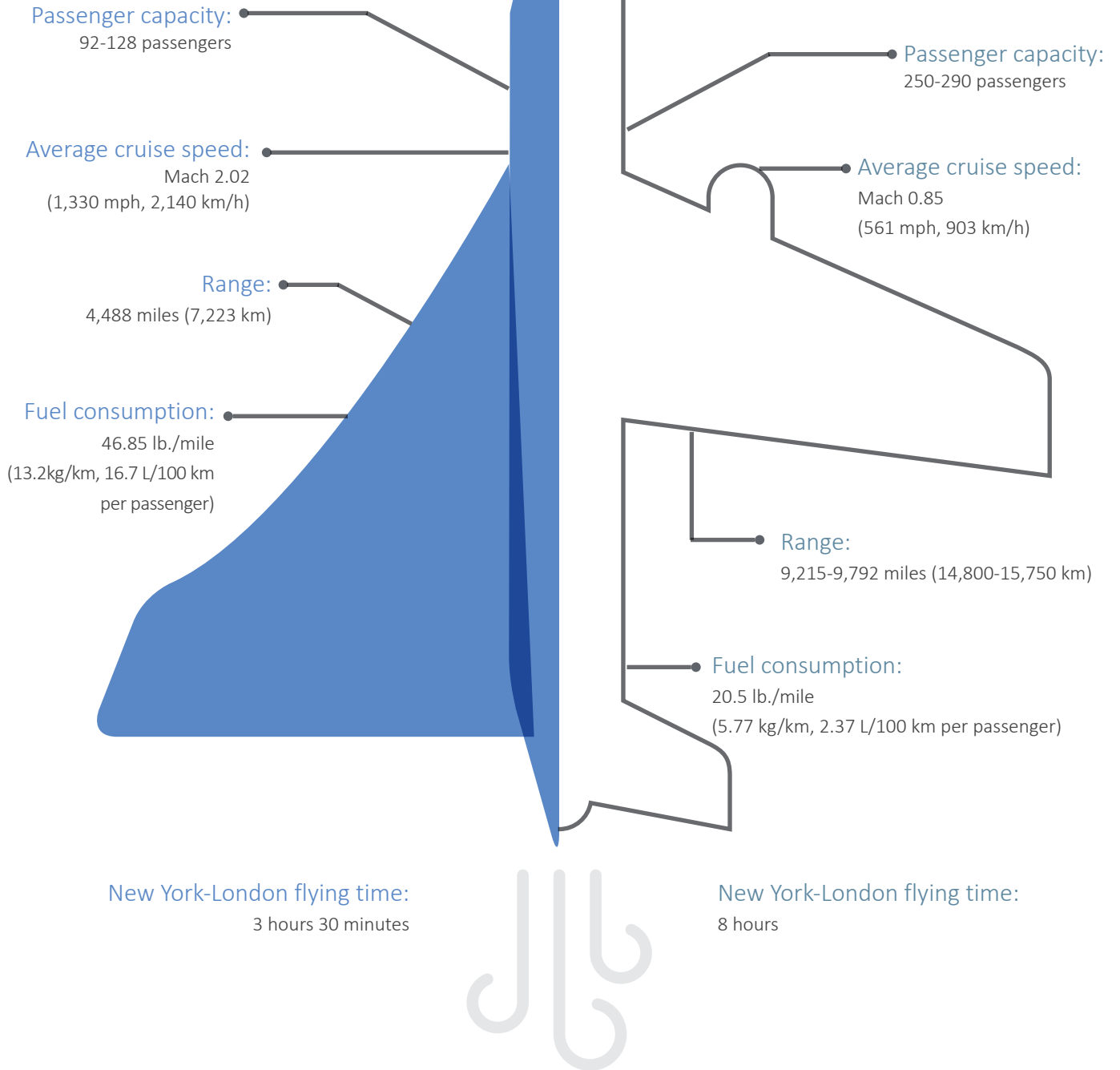
Initially, flying supersonically will be beyond the budgets of most travelers, but developers hope to make supersonic flight available to all, and possibly at costs lower than current flights.

¹[Spike Aerospace, 2019](#)

How concorde compares today

Concorde in numbers

Boeing 787-9 in numbers





Supersonic challenges

Before it can make its commercial return to the skies, supersonic flight has some hurdles to overcome.

Boom!

While Concorde traveled three times faster than the conventional jet aircraft of its day like the Boeing 747, airlines struggled to operate it profitably.

Concorde's supersonic use was limited by the sonic boom—shock waves created when passing the speed of sound—760 mph (1,223 kph).² U.S. federal regulations ban commercial aircraft from supersonic flight over land. Concorde was largely confined to transatlantic services, where it was able to operate supersonically over water, offering passengers a major attraction—time saved. At three hours 30 minutes, Concorde more than halved the flying time taken by conventional aircraft between London and New York. Travelers were able to make day trips from the U.S. to London or Paris.

Viable supersonic flight in sight

Recent advances in technology and adjustments to the regulatory environment could again make supersonic flight viable.

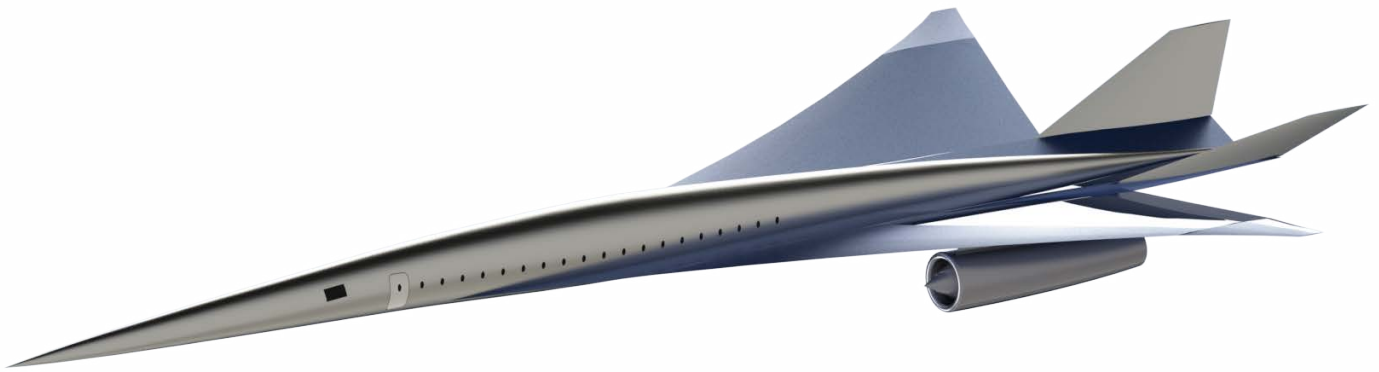
U.S. space agency NASA has been working to significantly reduce the sonic boom in its X-59 (low-boom supersonic flight demonstrator) program. It has political backing: The 2019 budget proposal for NASA included full funding for the X-59 project.

Flight demonstrations are scheduled for 2021, and if successful, could remove one important barrier to the return of supersonic flight. However, the aircraft will also need to reduce noise during takeoff, which was historically much higher than for subsonic aircraft.

The FAA is prepared to look at rewriting the rules to allow for the eventual return of civil supersonic air travel, while ensuring the environmental impacts are understood and properly addressed.³ Initially, it will make it easier to gain approval for testing supersonic aircraft.

²[The Conversation](#), Jul. 11, 2019

³[Reuters](#), June 17, 2019



(Image credit to Exosonic)

Resurrecting supersonic flight

Four companies are leading the race to launch a passenger aircraft capable of supersonic flight: Aerion Supersonic, Boom Supersonic, Spike Aerospace and Exosonic.⁴

Aerion Supersonic

Aerion Supersonic plans to exploit changes in travel patterns that have emerged since the end of Concorde services. Noting a significant increase in the use of commercial business jets, it's developing a supersonic solution aimed at this market segment.

Backed by Boeing, which has provided investment and engineering, manufacturing and flight-testing resources, Aerion is developing the AS2, a 12-seater supersonic business jet, designed to fly at speeds up to Mach 1.4 or approximately 1,000 miles per hour (1,610 kph).⁵ That's still around 330 mph (530 kph) slower than Concorde. The AS2 would be capable of flying from New York to São Paulo or from London to Beijing nonstop.

Aerion expects to complete the preliminary design phase in 2020, with the first scheduled flight slated for 2023. Priced at US\$120 million, the AS2 will cost almost 50% more than a Boeing 737-800.

Boom Supersonic

Denver, Colorado-based Boom Supersonic is developing Overture, an airplane capable of carrying 55-75 passengers at Mach 2.2. Matching Concorde's top speed—and looking remarkably like it—the Overture would be unable to offer an improvement on Concorde's three hour 30 minute flying time between New York and London.

Boom Supersonic expects its XB-1 supersonic demonstrator to break the sound barrier in 2020. The company hopes the Overture will be 30% more efficient and 30 times quieter than Concorde—and expects it to be operational in 2023. It already has preorders for 20 aircraft from Japan Airlines and 10 from Virgin Group.⁶

⁴CNBC, Jan. 18, 2019

⁵Boeing, Feb. 5, 2019

⁶Robb Report, Oct. 23, 2019

Spike Aerospace

Like Aerion Supersonic, Boston, Massachusetts-based Spike Aerospace is starting small, developing a supersonic jet capable of carrying up to only 18 passengers.

It claims the S-512 Quiet Supersonic Jet will be the fastest civilian aircraft in the skies. Capable of flying at Mach 1.6 with a range of 6,200 nautical miles, the S-512 could fly nonstop between New York and Dubai in nearly half the time it currently takes a subsonic aircraft. Like Aerion's AS2, the S-512 would still be slower than Concorde. Spike claims prices would be "very competitive with business class tickets."

Spike Aerospace's development partners include Greenpoint Technologies and Siemens. Like its rivals, it's aiming to have the S-512 in service for 2023.

Exosonic

Startup Exosonic is also trying to revive supersonic aviation, but it is some years behind Aerion, Boom and Spike.

Exosonic intends to reduce the boom using sonic boom-shaping technologies, enabling supersonic flight over both water and land.⁷ By flying constantly at Mach 1.8, it believes it can halve flying times, carrying 60 passengers in a dual-class configuration over distances of 5,700 miles (9,260 km).

Supersonic flight gives passengers back their most valuable asset—time. Developing a supersonic airliner able to halve journey times for a price little different to a current business class fare would create mass demand. Exosonic CEO Norris Tie estimates there will be a market for 325 supersonic aircraft between 2030 and 2050.

⁷[Phocuswire](#), Aug. 14, 2019

The future is hypersonic

Other companies are already looking to a future beyond supersonic flight.

Engineers at U.K.-based Reaction Engines are developing technology for Synergetic Air-Breathing Rocket Engines (SABRE), which could one day enable aircraft to fly at Mach 5—3,836 miles per hour (6,173 kph).⁸ Hypersonic flights would cut journey times between London and Australia to just four hours 30 minutes.



(Photo credit @reactionengines)

While many of its rivals are focusing on the next generation of supersonic jet, Boeing is betting on hypersonic aircraft. But this won't be possible without the SABRE engines, which are capable of processing air flows with extremely high temperatures. So far, Reaction Engines has handled the temperatures expected at Mach 3.3. This would still be three times the speed of sound and 50% faster than Concorde.

In space rocket mode, the engines are designed to speed a craft up to Mach 25 –hyper-hypersonic travel. Reaction Engines is backed by BAE Systems, Rolls Royce and Boeing.

Some way behind Boeing and Reaction Engines is the Antipode, a hypersonic business aircraft from Imaginative capable of reaching 16,000 mph (25,750 kph).⁹ At this speed, it could theoretically fly from London to New York in just 11 minutes and from New York to Sydney in 32 minutes.¹⁰

A small aircraft, the Antipode would be able to carry up to 10 passengers, making it most suitable for business travelers with vast budgets.

Do you have questions or comments regarding this report? Please email [Mike Eggleton](mailto:mike.eggleton@bcdtravel.com) to share your thoughts.

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⁸CNBC, Apr. 8, 2019

⁹Imaginative, Jan. 27, 2016

¹⁰Inooz, Feb. 3, 2016