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# Potential Military Roles for Supersonic Transports

A new generation of supersonic (faster than the speed of sound in level flight, also called Mach 1) passenger aircraft is now under development. Using "low-boom" technology developed through NASA research to minimize sound signatures on the ground, advanced engines, and alternative fuel concepts, these new supersonic transports (SSTs) advertise the ability to fly over populated areas with minimal disruption, cruise more economically, and avoid some of the potential negative environmental effects of carbon-based fuels in high-altitude flight.

These new aircraft have attracted interest and some investment from the U.S. military, and have on occasion been proposed for military missions by their developers. The potential roles differ with the size and capabilities of each aircraft.

## History

Aircraft first went supersonic in 1947. Since then, two supersonic transport aircraft (SSTs) served in commercial airlines. The Soviet Tupolev Tu-144 flew from 1968 to 1999, although it was only in commercial service (with Aeroflot) for three years. The Anglo-French Concorde flew from 1969 to 2003, most of that time in service with British Airways and Air France.

Due to the technology of their time, those SSTs were hampered by high operational costs (particularly for fuel) and operational restrictions resulting from many countries' prohibitions against sonic booms over land. (A sonic boom results when the shock wave created by a supersonic aircraft touches the ground, and is heard as a sharp, loud report resembling an explosion.) These restrictions relegated earlier SSTs to trans-oceanic service, excluding them from a number of potentially profitable routes.

## Current Principal Developers

Two companies are leading the development of new SSTs, with a few others newer to the field, and one previous leader having now shut down. The three main firms are at different stages in the process, and targeting somewhat different markets.

### Boom Supersonic

Denver-based Boom is developing the Overture, a 65- to 88-passenger airliner designed for Mach 2.2 with a range of 5,100 miles. The company expects to fly a one-third-scale demonstrator this year. Projected to enter service in 2029, the Overture is targeted to cost $200 million for the basic aircraft.

In January 2022, Boom announced receipt of an Air Force contract worth up to $60 million over three years to investigate using the Overture for surveillance, reconnaissance, special forces deployment, and other roles.

**Figure 1. Boom Overture**

Artist's Rendering

**Source:** Boom Supersonic.

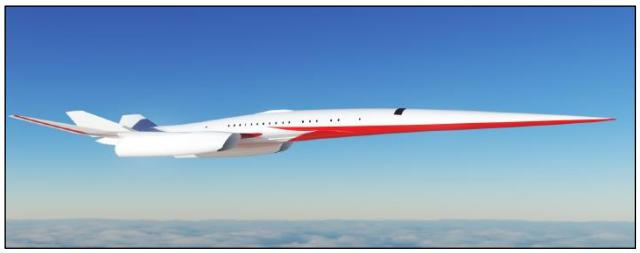
Boom was founded and is run by Blake Scholl, a former software engineer. It has raised backing primarily from Silicon Valley venture funds and is partnering with Rolls-Royce to develop engine concepts.

### Exosonic

Exosonic, of Los Angeles, is designing a 70-passenger, Mach 1.8 low-boom airliner with a 5,700-mile range. CEO Norris Tie comes from the aerospace engineering world. The company has yet to announce a timeline for its aircraft, although a subscale demonstrator is reportedly slated for 2025.

**Figure 2. Exosonic Airliner**

Artist's Rendering



**Source:** Exosonic.

### Aerion

Although having led in development of a new-generation low-boom SST, Aerion, of Melbourne, FL, ceased operations in May 2021, having completed wind tunnel tests of its AS2, intended as an 8- to 10-passenger business jet with a 5,400-mile range at a top speed of Mach 1.4. The three-engine jet was anticipated to enter service in 2027 at a target price of $120 million. The company was founded by entrepreneur Robert Bass and was run by Tom Vice, formerly head of Northrop Grumman Aeronautics. Boeing held a stake in the company, and General Electric had been designing the AS2's engines.

**Figure 3. Aerion AS2**
Artist's Rendering

**Source:** Aerion.

Organizations at earlier stages of development include

- Virgin Galactic, a private space company, which has teamed with Rolls-Royce to study a 9- to 19-passenger, Mach 3 jet;
- Boston-based Spike Aerospace, which is proposing a 12- to 18-passenger low-boom aircraft aimed at Mach 1.6;
- Hermeus, of Atlanta, which proposes a Mach 5, or hypersonic, aircraft. Its capacity and schedule are not yet announced. However, on August 5, 2021, the U.S. Air Force, in cooperation with some private venture capital firms, announced a three-year, $60 million contract with Hermeus to further advance its development.

## Possible Military Uses

The U.S. military already has supersonic fighters and bombers. Some other military missions could potentially benefit from higher-speed travel for people and/or small loads of cargo, including but not limited to the following:

### Executive Transport

In September, 2020, the Air Force Research Lab awarded contracts to Boom (reportedly $2 million) and Exosonic ($1 million) to explore the use of their aircraft for executive transport. This followed an earlier $1.5 million contract with Hermeus for the same purpose.

The Air Force executive transport fleet currently includes a wide range of aircraft used for moving senior commanders, congressional delegations, and government officials, including the President. Those aircraft are derivatives of existing commercial airliners and business jets.

Adding speed to personnel transport offers several potential benefits. Getting senior diplomats to meetings in times of crisis could help defuse tensions. Moving senior officials to remote meetings or site visits in ways that minimize time away from their principal duty station could allow them to work more efficiently.

### Continuity of Operations/Continuity of Government

Rapid relocation of national leaders in time of crisis could enable their presence at command posts and reduce the impact of interrupted or degraded communications networks.

### Special Operations

Deploying small teams to trouble spots quickly for missions like hostage rescue or embassy defense has been cited as a role where increased speed can be decisive. (It is less clear how such a deployment could be kept covert if the teams are using an aircraft not in common service around the world.)

### Nuclear Security

Using high-speed aircraft to transport warheads for nuclear weapons to forward units could allow those warheads to be stored in the United States with high security, then sent forward only when they might be needed—or when national commanders wanted to send a signal of possible consequences to an aggressor and/or reassure allies.

### Intelligence, Surveillance, and Reconnaissance

Adaptation of a supersonic platform that flies at very high altitude could give U.S. forces highly responsive, easily redirected intelligence platforms of a sort absent from the inventory since the retirement of the SR-71.

### Humanitarian Relief

In a number of scenarios, rapid dispatch of relief supplies, medical teams, and/or other specialists to areas suffering from natural disasters, virus outbreaks, or other events could make a positive difference in outcomes.

### Rapid Reinforcement

Moving additional troops to areas under siege or suffering from surprise attack could enhance commanders' options and allow the United States to multiply force on short notice at times and places of its choosing.

### Medical Evacuation

Moving wounded personnel to high-level care facilities in roughly half the time of current airlifters could significantly increase the chances of survival.

### Crew Replacement

Dispatching relief crews for ships or submarines stricken by illness could minimize downtime and restore U.S. sea presence in vital areas.

A basic configuration could allow a number of these missions to be carried out by the same aircraft. Having to reconfigure the aircraft for specialized missions could reduce the time advantage a supersonic aircraft would have over those currently in the fleet.

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## Disclaimer