

inBrief: The hypersonic imperative

Capabilities that are lethal, survivable, and responsive from long range, will be essential for the United States to achieve battlefield dominance in the highly contested battle space anticipated in any future conflict with major power adversaries. This is why the Department of Defense and Congress must prioritize the accelerated fielding of hypersonic capabilities.

“

The US ability to dominate the current and near future battlefield has been significantly degraded by the current, and projected, asymmetry in hypersonic weapons.

— Mike White,
former principal director for
hypersonics in the Office
of the Undersecretary of
Defense, Research and
Engineering

”

Toplines

- China and Russia have seized an advantage in hypersonic capabilities, challenging the security of the US homeland and its forward bases, ultimately undermining deterrence of great-power war and eroding US assurance of its allies and partners.
- Hypersonic vehicles fly and maneuver at greater than five times the speed of sound (Mach 5) and often much faster. Long-range hypersonic weapons offer the potential to strike fleeting targets deep within an adversary nation and avoid ever-more-sophisticated air and missile defenses.
- The US Department of Defense and Congress must make the acceleration of current-generation hypersonic weapon and counter-hypersonic defense programs a national priority while investing in the next generation of affordable capabilities, including the underlying workforce, T&E, S&T, the supply chain, and the broader industrial base.

What are hypersonic capabilities?

As a general rule, hypersonic vehicles fly a significant portion of their trajectory at speeds in excess of five times the speed of sound (Mach 5, or about 3400 miles per hour (mph) at altitude). Note that many hypersonic vehicles fly at speeds well above Mach 5. The manned X-15 experimental hypersonic aircraft flew at just below Mach 7. Ballistic missiles reenter Earth's atmosphere between Mach 10 and Mach 20, depending on their range. The space shuttles reentered from Earth orbit around Mach 25.

Urgent investment needed to address unacceptable asymmetry

There has been a recent focus on the development of long-range, hypersonic weapons that maneuver high within the atmosphere leveraging speed, a survivable altitude corridor, and lethality to change the dynamic on the battlefield. Unfortunately, potential US adversaries have seized the initiative to develop, field, and use this new class of weapons to help create an asymmetry that challenges US and allied battlefield dominance. The United States must not let that asymmetry persist.

<10 MINUTES

Time-to-target of a hypersonic missile at five-hundred-miles range

MACH 10+

Glide speed of most hypersonic glide vehicles

2021

The year China tested a global range hypersonic glide vehicle, alarming US observers

2018

Russia starts production of Avangard intercontinental range hypersonic nuclear armed glide vehicle

2024

USAF ARRW development successfully completed without transitioning to production

Why are hypersonic capabilities important on the battlefield?

Hypersonic weapons can defeat heavily defended, high-value targets from long range within minutes. To deliver effects on a target at five hundred miles, a traditional subsonic cruise missile, such as the Joint Air-to-Surface Standoff Missile (JASSM) or Tomahawk, would take approximately one hour of flight time. Hypersonic cruise missiles can make that trip in less than ten minutes. A hypersonic glide vehicle can make the trip between Guam and the Taiwan straights in under 30 minutes. Additionally, these missiles cruise or glide above most air-defense systems and below most ballistic-missile-defense systems and are highly maneuverable. Hypersonic weapons, therefore, dramatically compress the timescale of relevance on the battlefield, are highly survivable, and have long range to ensure survivability of their launch platform.

What is the current posture in hypersonics?

Russia and China have aggressively pursued the development of long-range hypersonic weapons and have developed and fielded several types of hypersonic strike weapons that hold US theater land and sea bases at great risk. Furthermore, potential adversaries such as North Korea and Iran have reportedly developed and deployed hypersonic weapons. Russia has developed and deployed a nuclear-armed hypersonic weapon that holds the US mainland at risk from a highly survivable nuclear first strike. While the United States has made great progress developing a first generation of air-, land-, and sea-launched hypersonic strike weapons over the past five years, Washington has not yet fielded its first weapon. Most notably, the US Air Force decided not to field the Air-Launched Rapid Response Weapon (ARRW), a boost-glide hypersonic weapon, when it was ready at the end of 2023. Additionally, while there have now been two very successful flight

tests, there are delays in fielding the Army Long-Range Hypersonic Weapon (LRHW) and Navy Conventional Prompt Strike (CPS) weapons, originally scheduled to field in 2023 and 2025, respectively. As a result, the US ability to dominate the current and near-future battlefield has been significantly degraded by the current, and projected, asymmetry in hypersonic weapons.

The hypersonic imperative!

To address the battlefield asymmetry that Washington currently faces in hypersonics, it is imperative that the United States

1. accelerate the fielding of recently matured air-, land-, and sea-launched weapons in numbers;
2. establish block upgrade programs that insert advanced capabilities in a timely manner;
3. prioritize cost-reduction initiatives to ensure the United States can affordably field the necessary capacity;
4. accelerate fielding of capability to defend against adversary hypersonic systems;
5. develop and mature next-generation weapon systems, including reusable hypersonic aircraft;
6. enhance hypersonic ground and flight test capability, modeling and simulation (M&S), science and technology (S&T), and workforce initiatives;
7. energize the broad industrial base to instill affordability and innovation across the portfolio; and
8. work with allies to capture innovation and enable accelerated fielding of affordable capacity.

Should the United States fail to improve its offensive hypersonic capabilities, Washington's ability to penetrate adversary A2/AD nodes and manage escalation could degrade, making it more difficult to de-

ter great-power war and manage intrawar deterrence. Failing to protect the United States from hypersonic weapons could allow adversaries to more effectively coerce the United States by threatening limited warning conventional strike against key civilian and military infrastructure, as well as attacking US forces deployed abroad.

■ Why now?

The United States must field and evolve hypersonic capabilities now as part of a comprehensive warfighting strategy to maintain its ability to dominate the battlefield against an increasingly capable set of adversaries. These adversaries have developed integrated capabilities to create a highly contested environment to defeat US and

allied forces across all domains: air, land, sea, and space. This multi-domain threat must be addressed with a comprehensive and layered defeat strategy that leverages new offensive and defensive capabilities across kinetic and non-kinetic domains to attack and disable adversaries' high-end systems before and after launch. Hypersonic strike weapons, launched from stand-off ranges that protect launch platforms, will be essential to allowing US and allied forces to defeat these systems with lethal, survivable effects in a timescale of relevance on a modern battlefield. This offensive capability must be coupled with effective, layered, kinetic, and non-kinetic defenses against adversary hypersonic and ballistic missile capabilities.

■ The task force

To address these issues, the Atlantic Council has assembled a Hypersonic Capabilities Task Force to

- benchmark US efforts in offensive and defensive hypersonic capabilities;
- identify gaps in technology, policy, and procurement; and
- recommend actionable solutions to ensure the United States remains at the forefront of hypersonic innovation.

The task force is co-chaired by

- **Deborah Lee James**, former secretary of the US Air Force; and
- **Ryan McCarthy**, former secretary of the US Army

This task force is directed by

- **Stephen Rodriguez**, senior advisor, *Forward Defense*, Atlantic Council

The task force lead author is

- **Michael White**, former principal director for hypersonics in the Office of the Undersecretary of Defense, Research and Engineering

Task force members include

- **Jim Cooper**, former congressman; former Chair of the Strategic Forces Subcommittee
- **Madelyn Creedon**, former senior Defense Department and Energy Department leader;
- **Doug Lamborn**, former congressman; former Chair of the Strategic Forces Subcommittee
- GEN **James McConville**, USA (ret), former US Army chief of staff; and
- **Whitney McNamara**, Atlantic Council nonresident senior fellow.

Industry task force members include

- **Felipe Gomez del Campo**, chief executive officer, Specter Aerospace;
- **Hank Holland**, chairman and chief executive officer of Amaero International Ltd.;
- **Katrina Hornstein**, hypersonic portfolio director at Ursa Major;
- **Michael Johns**, senior vice president, Kratos Defense and Security Solutions;
- **Cameron McCord**, co-founder and chief executive officer of Nominal;
- **Chris Power**, founder and chief executive officer of Hadrian;
- **Mark Rettig**, vice president at GE Aerospace;
- **Ralph Sandfry**, director for hypersonics and directed energy at Lockheed Martin;
- **Zach Shore**, chief revenue officer at Hermeus; and
- **Brian Zimmerman**, senior vice president at Booz Allen Hamilton.

Task Force staff members include

- **Mark J. Massa**, deputy director, *Forward Defense*, Atlantic Council
- **Jonathan Rosenstein**, program assistant, *Forward Defense*, Atlantic Council

Use the QR code below to stay updated on our work!

