PROJECT Ploughshares

REPORT

Space-Based Interceptor Funding

What We Know, and What We Don't

NOVEMBER 2026

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Space-based interceptor funding: what we know, and what we don't
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First published: November 2026

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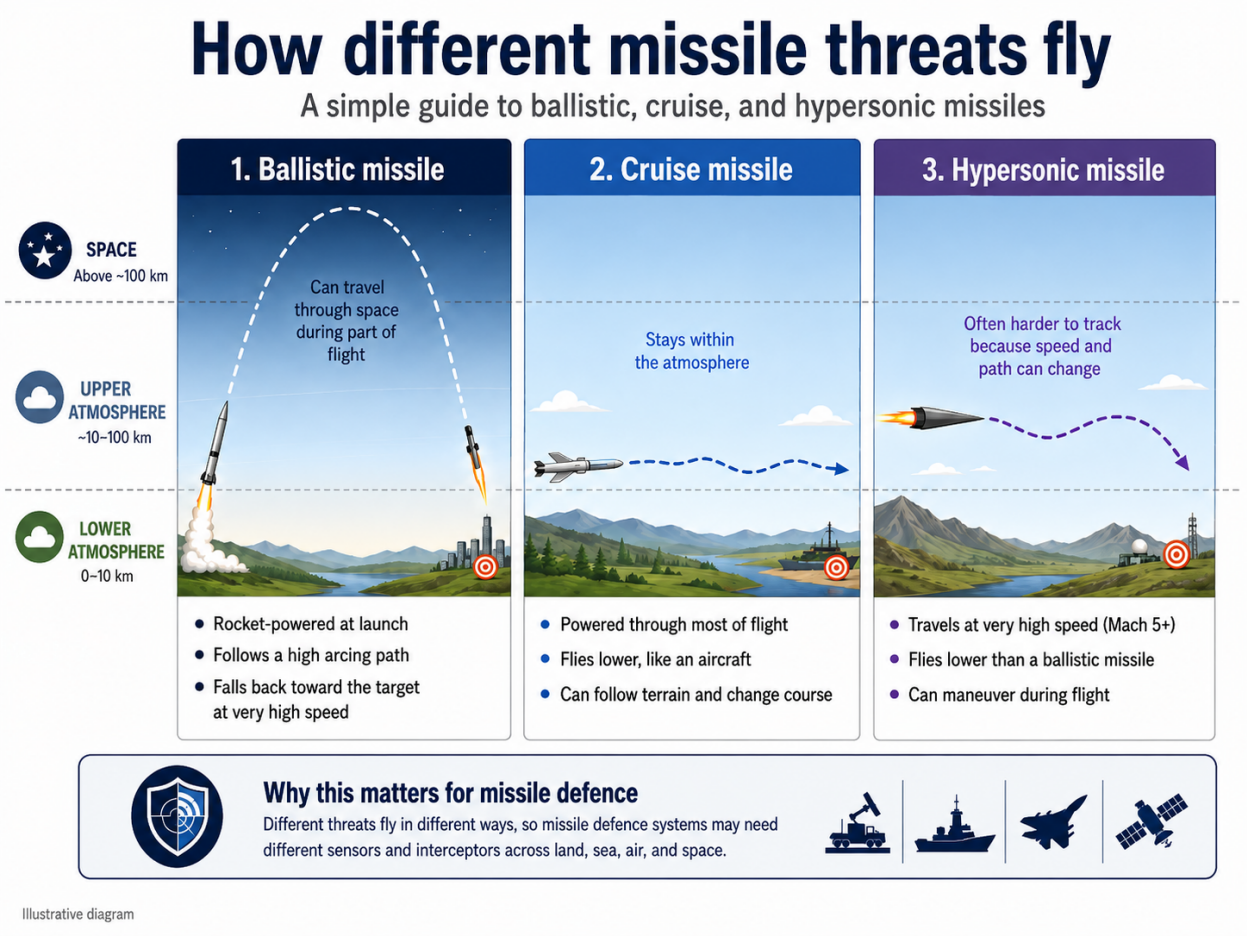
Acknowledgements

Research assistance for this report was supported in part by the Government of Canada through the Canada Summer Jobs program.

In January 2025, US President Donald Trump signed Executive Order 14186, *Iron Dome for America*, directing the development of a new homeland missile defence architecture subsequently called Golden Dome. The initiative envisions a multilayered system extending across land, sea, air, and space to defend against a range of missile and aerial threats, including:

- **Ballistic missiles**, which follow high arcing trajectories and can travel through space during part of their flight.
- **Cruise missiles**, which remain within the atmosphere, fly at relatively low altitudes, and can maneuver during flight.
- **Hypersonic missiles** travel at more than five times the speed of sound and can follow lower, maneuvering flight paths that make them harder to track and intercept.
- **Other advanced aerial threats** are a broader category also included in the executive order.



These different types of targets matter for missile defence because different flight paths, speeds, and manoeuvrability require different approaches to detecting, tracking, and intercepting a threat. Golden Dome is therefore being designed as a multilayered system using different technologies to address different threats and stages of flight. One of its most consequential elements is the Space-Based Interceptor (SBI) program, led by the US Space Force. Prototype development is already underway, with ground testing planned by the end of 2026 and the first orbital flight demonstrations expected in 2027.

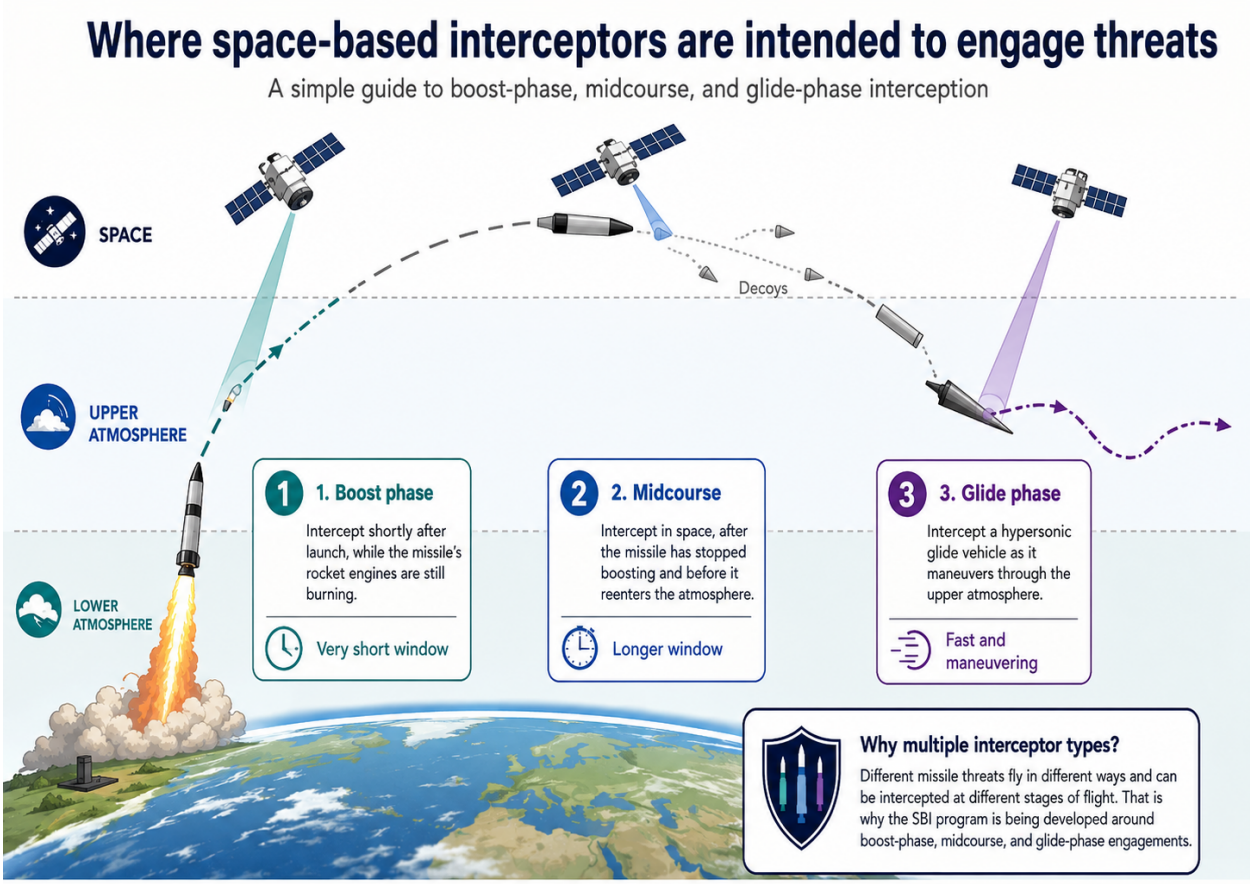
In late 2025 and early 2026, the Space Force awarded 20 prototype agreements to 12 companies, with a potential combined value of up to $3.2 billion. The public record does not reveal how much has been committed to each company or the detailed requirements of each agreement. More recent reporting provides a clearer picture of the program's testing milestones, including ground tests beginning in 2026, orbital flight demonstrations in 2027 and 2028, and a planned intercept demonstration in 2029.

The awards move space-based missile interception—and with it the prospect of dedicated weapons systems deployed in orbit—from a longstanding and controversial concept toward funded prototype development, while leaving the scale, design, cost, and implications of that transition unclear.

What is the SBI program?

The Space-Based Interceptor program is the orbital interceptor component of Golden Dome. Led by the US Space Force, the effort aims to develop a constellation of weapons in orbit capable of engaging missiles at different stages of flight. Reporting indicates that the Space Force has identified three interceptor categories:

- **Boost-phase interceptors** would target a missile shortly after launch, while its rocket engines are still burning. This phase offers a bright, detectable target, but the intercept window is extremely short and requires an interceptor to be in the right place at the right time.
- **Midcourse interceptors** would engage a ballistic missile after its engines have stopped firing and while the warhead or other objects are travelling through space. This provides a longer potential engagement window, but distinguishing the actual warhead from decoys or other objects can be difficult.
- **Glide-phase interceptors** would target hypersonic glide vehicles as they manoeuvre through the upper atmosphere after separating from the launch rocket. Their speed, lower altitude, and ability to change course create different tracking and interception challenges.



Illustrative diagram — not to scale

These are not simply three points along the same missile trajectory.

They are intended to address different phases of flight, and in the case of glide-phase interception, a different class of manoeuvring threat altogether.

Unlike space-based sensors, which detect and track missile threats, space-based interceptors are intended to destroy or disable them physically. The interceptors would nevertheless depend on warning, tracking, communications, and data management systems elsewhere in the broader Golden Dome architecture.

No operational constellation of space-based missile interceptors has ever been deployed. The current SBI program therefore revisits a longstanding concept using newer sensors, computing, autonomy, communications, and spacecraft technologies.

Not the First Attempt

The idea of intercepting missiles from space is not new. The United States pursued several related concepts during the Cold War, but none resulted in an operational space-based interceptor system.

1983

Strategic Defense Initiative

President Ronald Reagan launched the program commonly known as "Star Wars," which explored a wide range of ground- and space-based technologies intended to defend against ballistic missiles.

late 1980s—early 1990s

Brilliant Pebbles

One of the most developed space-based concepts envisioned thousands of small interceptors orbiting Earth.

Once activated, individual interceptors were intended to identify targets and collide with incoming ballistic missiles at high speed.

Brilliant Pebbles became a planned element of the U.S. missile-defence architecture, but the system was never deployed.

After the Cold War

U.S. missile-defence priorities shifted toward more limited systems.

By 1993, Brilliant Pebbles had been downgraded from a planned acquisition program to a technology-development effort, and funding was sharply reduced.

How much funding has been announced?

The announced $3.2 billion figure is the maximum potential value of agreements to develop prototypes across the three SBI interceptor categories: boost, midcourse, and glide. The Space Force has not disclosed individual agreement values, obligations to date, how funding is distributed among recipients, or the full set of milestones tied to additional funding.

In July 2025, Congress made $5.6 billion available for the development of space-based and boost-phase missile intercept capabilities through a special budget reconciliation law, rather than the regular defence budget. While this funding remains available through September 2029, the funding mechanism has raised concerns about whether additional support will be available to sustain development in future years.

The prototype approach reflects the program's early stage of development. No operational space-based missile-interceptor system has previously been deployed. Similarly, the ability to develop a full weapons system that combines interceptors in orbit with the sensors, communications, and command systems needed to detect, track, and engage incoming missiles has not been publicly demonstrated.

Space Systems Command says its use of Other Transaction Authority (OTA) agreements — a flexible mechanism for prototype development that operates outside the standard federal procurement framework — is intended to attract traditional and nontraditional companies, sustain competition, and preserve flexibility among competing providers and designs. It also means that less standardized information is publicly available about individual awards, funding commitments, and technical deliverables.

The SBI agreements best reflect a staged effort to propose, build, and progressively demonstrate possible solutions for an operational architecture that has yet to be proven.

20 prototype agreements

12 selected companies

$3.2 billion potential combined value

2030 earliest reported procurement goal

Individual award values
Not publicly disclosed

Progress of SBI Competition Contracts

Phases/Gate	Phase/Gate Completion Status
Gate 1: Design Completion and Component Ground Testing	COMPLETED
Gate 2: Construction of On-Orbit Device	INCOMPLETE
Gate 3: Proven Functional On-Orbit Capability	
Gate 4: Proven Functionality in Golden Dome Architecture	

Who received the SBI awards—and what are they developing?

Space Systems Command's April 2026 announcement names 11 of the 12 selected companies: Anduril Industries Inc., Booz Allen Hamilton Inc., General Dynamics Mission Systems Inc., GITAI USA Inc., Lockheed Martin Corporation, Northrop Grumman Systems Corporation, Quindar Inc., Raytheon Company, SciTec Inc., True Anomaly Inc., and Turion Space Corp. Bloomberg, Breaking Defense, and SpaceNews identify SpaceX as the twelfth recipient, although SpaceX is omitted from the official list.

However, reporting in October 2026 indicated that the Space Force has since narrowed the field of competitors. The number and identities of the remaining companies have not been publicly disclosed. The companies listed here represent the original award recipients, not necessarily those still competing.

Three types of space-based interceptors are being developed corresponding to the boost, mid-course, and glide phases. However, publicly available contracting information provides only a partial view of how the 20 prototype agreements are divided among these categories.

Two competitive lines of effort can currently be identified from public solicitation records:

- Initial SBI prototype competition: Space Systems Command issued Request for Prototype Proposal FA8819-25-9-1001 in September 2025 for multiple fixed-price SBI prototype agreements. The detailed solicitation materials were restricted to eligible companies through a controlled bidders' library. Reporting on the first awards, this competition was described as focused on interceptors intended to engage missiles during the boost phase shortly after launch.
- Kinetic midcourse competition: In December 2025, Space Systems Command issued a separate Request for Prototype Proposal, FA8819-25-9-1002, for SBI Line of Effort 2M. The public notice explicitly states that this competition sought "kinetic midcourse solutions only."

No corresponding glide-phase solicitation or award structure is evident in the publicly available contracting information reviewed for this fact sheet.

The Space Force has not identified which companies received awards under each category, whether any company received more than one agreement, or how the 20 agreements are distributed among complete interceptor concepts, subsystems, and development stages.

Public descriptions of the companies' roles vary considerably. Some firms describe work on complete interceptor systems or major subsystems, while others emphasize relevant capabilities in spacecraft, propulsion, autonomy, software, mission operations, or systems integration.

The table below summarizes each identified recipient's publicly described SBI work and named partners. Detailed statements of work are not available, and some descriptions may reflect broader corporate capabilities rather than confirmed responsibilities under an individual agreement.

Company	Publicly Disclosed SBI Work	Named SBI Partners
Lockheed Martin	Developing, testing, and integrating an SBI system that draws on Lockheed Martin's existing interceptor technologies.	None publicly identified
Raytheon	Working with Rocket Lab to demonstrate advanced capabilities for the SBI program. The companies have not publicly described their respective technical responsibilities.	Rocket Lab Corp.
Anduril Industries	Integrating existing technologies into an SBI system designed for rapid delivery and production at scale; specific technical responsibilities are not publicly described.	Impulse Space, K2 Space, Inversion Space, Sandia National Labs, Voyager Technologies
Northrop Grumman	Developing and testing SBI capabilities with Apex, with ground tests completed and a self-funded on-orbit demonstration planned for 2027. Specific test objectives and interceptor design details have not been publicly disclosed.	Apex
Booz Allen Hamilton	Developing "Brilliant Swarms," which the company describes as a constellation of autonomous small satellites designed to track, target, and intercept ballistic missiles during boost, ascent, and midcourse flight, supported by onboard AI-enabled battle management and command-and-control.	None publicly identified
General Dynamics Mission Systems	No SBI-specific work publicly described	None publicly identified
Turion Space Corp	No SBI-specific work has been publicly described. Turion states more broadly that it is developing orbital infrastructure and logistics capabilities.	None publicly identified
True Anomaly Inc.	Developing autonomous spacecraft, advanced payloads, mission software, and space-based interceptors. The company says its SBI work is intended to operate under extreme engagement conditions at a cost and reliability suitable for deployment at scale.	None publicly identified
Sci-Tec Inc.	Applying missile-warning, tracking, and defence expertise to Golden Dome; its specific SBI role has not been publicly described.	None publicly identified
Quindar Inc	Applying its experience operating satellite constellations and scaling mission capabilities; its specific SBI role has not been publicly described.	None publicly identified
GITAI USA	Selected SBI performer; specific technical responsibilities have not been publicly disclosed. GITAI cites prior on-orbit demonstrations and operation of its own low-Earth-orbit satellite platform as relevant experience.	None publicly identified
SpaceX	Not named in the initial Space Force media release. No SBI-specific work has been publicly described. Separately, SpaceX is developing satellite communications and relay infrastructure intended to support the wider Golden Dome architecture, including future space-based interceptors.	None publicly identified

Related technology development

The Defense Advanced Research Projects Agency (DARPA) has separately funded Space Kinetic to refine its existing "one-to-many" space-based missile defence architecture and upgrade supporting core hardware.

Space Kinetic describes its Whirlwind system as using a larger spacecraft to carry and rapidly release multiple smaller interceptor vehicles. The company argues that this approach could make the individual interceptors simpler, lighter, and cheaper because each one would not need its own full propulsion system.

Space Kinetic has described it as a multi-million-dollar contract. At $2.35 million, however, it is modest in scale and appears to support early-stage exploration of an alternative architecture outside the Space Force's SBI prototype framework.

Private capital and company-developed initiatives

The Space Force agreements are only part of the emerging SBI funding landscape. As noted above, initial awards are relatively modest. Participating companies may therefore be expected to finance substantial portions of prototype development and testing before qualifying for later government payments and possible follow-on production agreements. Several companies are committing private capital to SBI-related technologies and demonstrations.

Apex announced a $15 million company-funded demonstration, Project Shadow, and later joined Northrop Grumman on a separately self-funded on-orbit demonstration planned for 2027. It is not clear how these projects might be related to one another.

Wardstone is privately developing "Hailstorm," a proposed space-based missile-defence concept that would deploy a cloud of small particles into the predicted path of a missile. At high closing speeds, collisions with the particle cloud are intended to damage or destroy the target without requiring a conventional interceptor to strike it directly. Wardstone is not identified as a recipient of the 20 Space Force SBI prototype agreements.

Around the time its SBI selection became public, True Anomaly announced a $650 million private financing round. The company said the capital would accelerate the development of several products, including autonomous spacecraft and space-based interceptors. The financing is not dedicated exclusively to SBI. It should not be counted as SBI program spending, but it illustrates the substantial private capital that may be available to selected companies for SBI and related components.

Together, these examples suggest that private financing is supplementing government prototype funding and supporting alternative interceptor concepts. However, how much private investment is being directed specifically toward SBI is not publicly known.

What might an SBI demonstration involve?

The Space Force has repeatedly referred to an "initial capability demonstration" by 2028, but it has not publicly defined what that milestone will require. More recent reporting provides a clearer picture of the sequence of tests leading toward that goal and beyond.

The reported testing sequence is consistent with preliminary acquisition plans described in 2025, which envisioned progressively more demanding tests culminating in a live intercept. It also helps put the Space Force's stated 2028 "initial capability" demonstration in context: 2028 appears to mark an intermediate flight-and-integration milestone, rather than the final demonstration of an interceptor destroying a target. That live test is currently projected for 2029, with potential procurement beginning in 2030.

SBI development and testing timeline:

- 2025—2026 Prototype development: The Space Force awarded 20 prototype agreements to 12 companies, with a potential combined value of up to $3.2 billion.
- 2026, initial ground testing: The first development milestone, involving design and component testing, was reported complete in August 2026. For some midcourse teams, this includes showing that tracking data can be passed from a sensor to an interceptor and demonstrating spacecraft propulsion. Midcourse developers could receive roughly $60 million for completing this milestone.
- 2027 First orbital flight test: Prototype interceptors are expected to demonstrate key capabilities in space. Earlier acquisition plans described this stage as testing the speed and manoeuvring performance needed for an intercept. Midcourse teams could receive about $126 million, with an additional $40 million reportedly available to the first team to complete the milestone.
- 2028 Second flight test and initial capability demonstration: A further orbital flight test is planned. The Space Force has separately said it intends to demonstrate an initial SBI capability integrated with the wider Golden Dome architecture by 2028. However, it has not publicly defined precisely what that demonstration will include.
- 2029 Live intercept demonstration: The final reported test would require a space-based interceptor to detect and physically destroy a government-provided test target. If successful, this would mark a major threshold in the weaponization of outer space: the demonstration of a weapon operating from orbit to destroy a missile target.
- 2030 Potential procurement: The Space Force reportedly plans to begin buying systems from at least some teams that complete the testing program.

The significance of the final live test extends beyond whether the interceptor works. A successful intercept would demonstrate an explicitly destructive military capability operating from orbit: a step that previous U.S. space-based missile-defence programs never reached. Critically, it would represent an important shift from developing and testing enabling technologies toward demonstrating the use of space itself as a platform for weapons.

Industry is also planning its own tests of SBI technologies. Northrop Grumman and Apex have announced a self-funded on-orbit SBI demonstration planned for 2027 but have not publicly stated whether it will involve a target or a live intercept. Apex's separate Project Shadow mission illustrates what an early demonstration can involve: deploying two small interceptor prototypes, sending commands and targeting updates between spacecraft, and tracking them in orbit. Apex says Project Shadow will not strike another object or create debris.

These tests are important steps toward an operational system, but they do not demonstrate the full capability envisioned for SBI. A working missile-defence system would need to detect and track a threat, pass that information to an interceptor, position and guide the interceptor, and successfully destroy the target, all within the time available during an actual missile flight.

The Space Force's 2028 "initial capability" milestone should therefore be understood as a development and integration milestone, not evidence that an operational SBI constellation will exist by that date. A successful live intercept in 2029 would nevertheless be highly consequential: it would demonstrate an explicitly destructive weapon operating from orbit and mark a major step in the weaponization of outer space. It would not, on its own, establish that a large-scale SBI constellation could operate effectively against real-world missile threats.

What could an operational SBI capability cost?

The $3.2 billion potential award ceiling covers prototype development, not the cost of deploying and sustaining an operational interceptor constellation. That cost remains highly uncertain because the government has not disclosed the number, performance, orbital configuration, or intended capacity of the interceptors.

Available analyses nevertheless identify SBIs as the single largest potential cost component of Golden Dome. The Congressional Budget Office (CBO) estimated that a notional boost-phase layer capable of engaging 10 nearly simultaneous intercontinental ballistic missiles would require approximately 7,800 interceptors in orbit and would cost about $720 billion to develop, deploy, and maintain over 20 years, with the SBI layer accounting for approximately 70 percent of acquisition costs and 60 percent of total costs.

Writing for the American Enterprise Institute, Todd Harrison similarly identifies space-based interceptors as Golden Dome's largest cost driver. His analysis illustrates why: because most orbiting interceptors would be out of position when a missile is launched, roughly 1,000 could be required in orbit for each missile the system is designed to engage simultaneously. Small changes in interceptor performance, response time, geographic coverage, and the number of missiles launched in a single attack can therefore produce very large changes in the required system size and cost.

Importantly, these are not estimates of the Space Force's eventual SBI architecture. They demonstrate that the cost of an operational capability could be orders of magnitude greater than the funding currently associated with prototype development.

Why does this matter?

The significance of SBI extends beyond the question of whether individual interceptors can be made to work. Moving toward weapons deployed in orbit could reshape military competition in space, encourage other states to develop countermeasures or comparable capabilities, and increase the likelihood of destructive military activity in orbit.

There are also environmental and operational risks. A kinetic intercept in or near orbit could generate debris, depending on the altitude, target, and circumstances of the engagement. Even limited debris can threaten other spacecraft and complicate an orbital environment already under growing pressure from congestion and military activity.

The program could also affect international efforts to prevent an arms race in outer space, including debates over weapons in orbit, strategic stability, and the relationship between missile defence and counterspace capabilities.

SBI development would move missile defence weapons toward deployment in orbit, crossing a threshold that has long been politically and strategically contested. Even a limited demonstration could create technical, industrial, and political momentum for further development, normalize additional testing, and encourage responses by other major powers.

The financial stakes are also significant. The $3.2 billion potential award ceiling covers prototype development, not the deployment and sustained operation of an interceptor constellation. In the available cost models, space-based interceptors are the single most expensive component of Golden Dome, largely because orbital physics may require thousands of interceptors and continuous replenishment. Early demonstrations could therefore create pressure for much larger long-term commitments before the capability's effectiveness, scale, and affordability are established.

What is already clear?

The SBI program has moved space-based missile interception from conceptual study toward funded, competitive prototype development and testing. The $3.2 billion potential value of the current agreements covers prototype development, not an operational constellation. Even successful tests would not establish that a large-scale system is affordable, sustainable, or effective against realistic missile attacks. They could, however, advance the development of weapons intended to operate from orbit and build momentum toward procurement and deployment.

What remains unknown?

Spending: The announced $3.2 billion is the maximum potential value of the prototype agreements, not an estimate of the cost of an operational SBI constellation. Obligations to date, allocations among recipients, and the eventual costs of deployment, replenishment, and operation remain unknown.

Designs: The government has not identified which companies are developing complete interceptors, components or subsystems, or competing system architectures, or how the 20 agreements are divided among boost-, midcourse-, and glide-phase interception.

Testing: A broad sequence of ground tests, orbital flight tests, and a planned 2029 intercept demonstration has now been reported, but important details remain undisclosed, including the targets, scenarios, technical requirements, and criteria for success at each stage.

Selection and procurement: It remains unclear which designs have advanced to later testing, how many competitors remain, or what an operational procurement and deployment plan would entail.

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