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REPORT

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Missing the Mark

Why Golden Dome is Bad for American Taxpayers

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Taxpayers for Common Sense

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Executive Summary

Golden Dome rests on a promise it cannot deliver—reliably defending the United States from the threat of nuclear weapons. Since the 1960s, the United States has spent more than $450 billion trying to develop missile defense systems capable of reliably defending the U.S. from intercontinental ballistic missile threats.[1] No system to date has demonstrated that capability. Despite this history of costly failure, President Donald Trump has proposed building a "Golden Dome" missile defense system with that same goal in mind.[2]

Originally labelled "Iron Dome for America," the program draws its inspiration from Israel's Iron Dome missile defense system. However, the comparison masks critical differences in the challenges facing these systems—Israel's missile defenses are designed to defend against short- and medium-range missiles and rockets armed with conventional bombs, while Golden Dome aims to protect the entire United States, a far larger area, against nuclear-armed, intercontinental-range weapons. The viability challenges associated with Golden Dome are thus vastly greater than those facing Israel's missile defense systems, as are the likely costs.

Estimates of the potential cost of deploying Golden Dome indicate that an expansive approach could cost taxpayers $3.6 trillion over the next 20 years, or $4.4 trillion adjusted for inflation.[3] Even this astronomical estimate does not represent the upper limit of Golden Dome's cost. One analysis suggests that a robust architecture (or system design) for just one component of the system—boost-phase space-based interceptors (SBIs)—could alone exceed $6 trillion over the same period.[4]

Even under generous technical assumptions, the viability challenges facing Golden Dome are severe. When it comes to reliably defending the United States against peer and near-peer intercontinental nuclear threats, those challenges are effectively insurmountable. They include the number of interceptors required to reliably defend the United States, with some estimates suggesting ratios as high as 1,600 interceptors for every incoming missile; the ability of adversaries to deploy countermeasures designed to defeat missile defenses; and the risk that a nuclear detonation in the atmosphere or in space could significantly degrade or disable the system's ability to track and intercept additional threats.[5] As a budget watchdog, one of our guiding principles at Taxpayers for Common Sense is, "if it doesn't work, don't fund it." The evidence presented in this report strongly suggests that Golden Dome will not work.

Pursuing Golden Dome also poses serious strategic risks, including the potential to accelerate nuclear arms and space arms races and to undermine opportunities to secure verifiable arms control agreements that reduce the nuclear threat. The program has also raised troubling conflict-of-interest concerns involving individuals within the Trump Administration and companies vying for Golden Dome contracts.

This report examines the cost estimates, viability challenges, strategic risks, and potential conflicts of interest associated with Golden Dome. Based on findings in these areas, it offers the following recommendations.

Recommendations

- **Congress should implement testing requirements that mandate realistic testing conditions for all missile defense systems.**

  Taxpayers should not pay for missile defense systems that have not been proven to work. At a minimum, testing should use threat-representative targets, incorporate complex countermeasures, and include unannounced target launches. Congress should require independent testing rather than allowing the Missile Defense Agency to test its own systems, fully fund and staff the Office of the Director of Operational Test and Evaluation (DOT&E), and require DOT&E to evaluate all major Golden Dome systems.

- **Congress should require missile defense systems to meet specific performance benchmarks before funding their deployment.**

  New missile defense systems, as well as upgrades to existing ones, should meet defined performance benchmarks before Congress appropriates funds to deploy them. Congress should also establish performance benchmarks for existing systems that may be tasked with defending against intercontinental-range missile threats under Golden Dome and require those benchmarks be met before appropriating additional funding.

- **Congress should withhold additional funding for Golden Dome until it has received and reviewed the program's architecture.**

  As requirements included in the FY2026 National Defense Authorization Act (NDAA) made clear, Congress has not yet received a comprehensive system architecture for Golden Dome. Despite this, Congress approved over $24 billion for the program in the One Big Beautiful Bill Act. Congress should oppose additional funding until it receives the architecture report and briefing required under Section 1652 of the FY2026 NDAA, and should require that an unclassified version be made public.

- **Congress should request an updated cost analysis from the Congressional Budget Office (CBO) based on Golden Dome's architecture.**

  In May 2025, CBO analyzed the potential costs of space-based interceptors designed to counter a limited North Korean threat using outdated assumptions. Congress should request a follow-up analysis that evaluates the potential costs of Golden Dome based on its architecture.

- **Congress should request a Government Accountability Office (GAO) assessment of Golden Dome's feasibility.**

  Although the FY2026 NDAA conditions certain funding on the completion of a long-delayed Institute for Defense Analysis report, the Pentagon has failed to deliver that analysis in a timely manner. Congress should therefore direct GAO to independently assess the feasibility of Golden

Dome systems, including space-based interceptors, as a defense against strategic nuclear weapons.

- **Congress should continue investigating potential conflicts of interest associated with Golden Dome.**

  Lawmakers have already asked the Pentagon's Office of Inspector General to investigate potential conflicts of interest. Congress should continue pressing this inquiry and pursue additional oversight measures to identify and address potential conflicts of interest.

- **Congress and the Trump Administration should pursue verifiable arms control agreements.**

  Strategic missile defense has not demonstrated an ability to neutralize the nuclear threat. Arms control agreements, by contrast, have a proven record of strengthening national security by placing verifiable limits on nuclear arsenals and may help prevent the weaponization of space. Congress should actively support these efforts.

A Brief History of Strategic Missile Defense

Efforts to defend the United States against missile threats date back to World War II, when Germany struck London with V-2 missiles, the world's first ballistic missiles. In response, the United States began researching ways to defend against ballistic missile attacks.[6] In 1957, the Soviet Union tested its first intercontinental ballistic missile (ICBM), and the United States followed suit four months later.[7] Following the Soviet test, the U.S. began developing Nike-Zeus, a ground-based anti-ballistic missile system with nuclear-armed interceptors designed to detonate in space when they came close enough to incoming ICBMs to destroy them.[8]

In the 1960s, the U.S. began developing the Safeguard Anti-Ballistic Missile (ABM) system. However, this effort arguably had more to do with responding to the Soviet deployment of an ABM system around Moscow and with positioning the U.S. for arms control negotiations than with establishing an effective missile defense, given widespread doubts about the system's efficacy.[9]

In 1972, the U.S. and the Soviet Union signed the Strategic Arms Limitation Treaty (SALT I) and the ABM Treaty, agreeing that "effective measures to limit anti-ballistic missile systems would lead to a decrease in the risk of outbreak of war involving nuclear weapons."[10]

In March 1983, President Ronald Reagan delivered a speech imploring the U.S. scientific community to develop capabilities that would make nuclear weapons "impotent and obsolete."[11] The program that followed failed to meet this objective. The Strategic Defense Initiative (SDI), colloquially known as Star Wars, was established in January 1984. SDI went through several iterations, beginning with concepts focused on kinetic interceptors housed in orbital "garages" (essentially storage satellites), and later gave way to a less vulnerable platform called "Brilliant Pebbles," which envisioned a dispersed network of individual interceptors equipped with their own sensors to reduce vulnerability to anti-satellite (ASAT) weapons.[12]

SDI not only failed to produce an effective defense against ICBMs, but it also undermined U.S. efforts to advance arms control agreements with the Soviet Union. Shortly after Reagan's speech, the Soviet Union accused the U.S. of pursuing a first-strike capability and of militarizing space. Those concerns were not entirely unfounded, as many technologies required for ballistic missile defense closely resemble those used for ASAT weapons.[13] At a meeting between President Reagan and Soviet General Secretary Mikhail Gorbachev in Reykjavik, Iceland, in the fall of 1986, arms control talks aimed at limiting U.S. and Soviet intermediate-range nuclear weapons collapsed after Reagan refused to accept limits on SDI. The following year, Gorbachev dropped this condition after advisors "convinced him that asymmetric countermeasures would be a viable, cost-effective solution should the United States move forward with the deployment of a strategic defense system," according to a historical analysis by the Arms Control Association.[14] The Intermediate-Range Nuclear Forces (INF) Treaty followed, ending deployments of intermediate-range nuclear weapons, but even the prospect of a partially effective SDI continued to undermine progress on other arms control agreements, including the Strategic Arms Reduction Treaty (START), which was not finalized until after Reagan left office.[15]

President Ronald Reagan with Mikhail Gorbachev during the Iceland Reykjavik Summit. October 12, 1986. Photo: White House Photographic Collection.

After the collapse of the Soviet Union in 1991, concerns about Russian missile threats largely faded, and advocates of strategic missile defense shifted their focus toward longer-term threats from countries such as North Korea, Iran, and Iraq.[16] In 1995, a U.S. intelligence assessment weakened the case for strategic missile defense by concluding that none of these states would be able to develop missiles capable of hitting the continental United States within 15 years.[17] In response, missile defense proponents cited findings from the congressionally established Commission to Assess the Ballistic Missile Threat to the United States, which argued in 1998 that North Korea and Iran could develop such missiles within five years.[18] That assessment helped drive passage of the National Missile Defense Act of 1999, which directed the Department of Defense to pursue a national missile defense system capable of defending the U.S. against "a limited ballistic missile attack."[19]

In 2001, the George W. Bush Administration announced the U.S. withdrawal from the ABM Treaty.[20] The following year, the Administration rebranded the Ballistic Missile Defense Organization—created from the remnants of SDI in 1993—as the Missile Defense Agency (MDA) and exempted it from many of the Pentagon's standard reporting and budgeting requirements.[21]

Since then, the MDA has deployed a range of missile defense systems intended to protect U.S. forces, assets, and allies overseas, generally referred to as theater ballistic missile defense systems. These include sea-based systems such as Aegis Afloat and land-based systems such as Aegis Ashore, Patriot missile defense systems, and the Terminal High Altitude Area Defense (THAAD) system. The MDA also developed the Ground-Based Midcourse Defense (GMD) system to defend the U.S. homeland against limited intercontinental ballistic missile threats.[22]

Since 1962, when the first missile defense interceptors were developed, the U.S. has spent more than $531 billion (in FY2025 dollars) on missile defense. More than $453 billion of that total was devoted to efforts to develop systems capable of reliably defending the U.S. against ICBMs.[23] No system, or combination of systems, has demonstrated that capability to date.

The Golden Dome Concept

On January 27, 2025, President Trump issued a memo titled "The Iron Dome for America," a title borrowed mainly from Israel's Iron Dome missile defense system.[24] Section 1 of the memo established the rationale for the order, arguing that "the threat of attack by ballistic, hypersonic, and cruise missiles, and other advanced aerial attacks, remains the most catastrophic threat facing the United States." Section 2 stated that it is the policy of the United States to defend its citizens and the nation against any foreign aerial attack.

Section 3 directed the Secretary of Defense to submit, within 60 days of the order, "a reference architecture, capabilities-based requirements, and an implementation plan for the next-generation missile defense shield." It specified that the architecture should include, at a minimum, plans for:

> *(i) Defense of the United States against ballistic, hypersonic, advanced cruise missiles, and other next-generation aerial attacks from peer, near-peer, and rogue adversaries;*
> *(ii) Acceleration of the deployment of the Hypersonic and Ballistic Tracking Space Sensor layer;*
> *(iii) Development and deployment of proliferated space-based interceptors capable of boost-phase intercept;*
> *(iv) Deployment of underlayer and terminal-phase intercept capabilities postured to defeat a countervalue attack;*
> *(v) Development and deployment of a custody layer of the Proliferated Warfighter Space Architecture;*
> *(vi) Development and deployment of capabilities to defeat missile attacks prior to launch and in the boost phase;*
> *(vii) Development and deployment of a secure supply chain for all components with next-generation security and resilience features; and*
> *(viii) Development and deployment of non-kinetic capabilities to augment the kinetic defeat of ballistic, hypersonic, advanced cruise missiles, and other next-generation aerial attacks;*

Together, these provisions outlined the intended scope of the program: a complex, multi-layered vision for a U.S. missile defense shield. In February 2025, the Pentagon rebranded the effort as the "Golden Dome for America."[25]

One notable feature of the memo is what it omits. It does not mention short- and medium-range missile threats or outline specific efforts to counter them. While the memo states that the goal is to defend the United States against all foreign aerial attacks, its focus is clearly on intercontinental ballistic missiles, hypersonic weapons, and other next-generation threats, rather than the short- and medium-range missile threats that Israel's missile defense systems were designed to defeat.

The 60-day deadline for submitting the reference architecture, requirements, and implementation plan was not met. In May 2025, the Associated Press reported that "the Pentagon and U.S. Northern Command are still drafting what is known as an initial capabilities document."[26] Around the same time, Air Force Secretary Troy Meink told lawmakers during a hearing that Golden Dome was "still in the conceptual stage."[27]

Congressional Response

Despite the lack of a clear plan, some lawmakers moved quickly to support the effort through stand-alone legislation. In February 2025, nine days after the president issued the memo, Senators Dan Sullivan (R-AK) and Kevin Cramer (R-ND) introduced the Increasing Response Options and Deterrence of Missile Engagements (IRONDOME) Act.[28] The bill would have authorized over $19.5 billion for Golden Dome in Fiscal Year 2026, primarily for existing missile defense efforts. For instance, the bill would have authorized $1.4 billion for THAAD systems.[29] Sen. Jim Banks (R-IN) cosponsored the legislation later that month. No other lawmakers have cosponsored the bill.

Congressional appropriators, meanwhile, expressed concern about the lack of detail surrounding the program. Both the House and Senate reports accompanying their respective versions of the Fiscal Year 2026 Defense Appropriations Act noted the limited information provided on Golden Dome and directed the Secretary of Defense to provide more clarity.[30] In the report accompanying the conferenced version of the Defense Appropriations Act, a section titled "Golden Dome for America" directs the Secretary of Defense and the Director of Golden Dome, "to provide a comprehensive spend plan for Golden Dome resourcing to the congressional defense committees, not later than 60 days after enactment of this Act," which "shall detail planned obligations and expenditures by program, descriptions, justification, and the corresponding system architecture mission areas at the budget line item level for fiscal years 2025, 2026, and 2027 to include a detailed breakout of discretionary and mandatory funds."[31] The report also directs the Director of Golden Dome to provide quarterly updates to the congressional defense committees "detailing budget execution and the status of ongoing Golden Dome activities to achieve initial operational capability by 2028."[32] It also states that these reports "shall be submitted in unclassified form and may include a classified annex."[33]

Notably, the absence of a clear spending plan did not prevent Congress from appropriating over $24.4 billion in mandatory funding for Golden Dome in the One Big Beautiful Bill Act (OBBBA), which was signed into law on

July 4, 2025.[34] Nor did it stop appropriators from adding $1.6 billion above the president's budget request for air and missile defense capabilities in the conferenced version of the Defense Appropriations Act.[35]

Beyond the reporting requirements in the appropriations report, Congress also included reporting requirements in the recently enacted FY2026 National Defense Authorization Act (NDAA).[36]

Sec. 1652 of the FY2026 NDAA requires the Secretary of Defense to submit an annual report to the House and Senate Armed Services Committees on the development and deployment of Golden Dome. The report must be submitted concurrently with the president's budget request each year until Golden Dome achieves full operational capability. Required elements include a description of the system architecture identifying each capability, program, and project; preliminary cost estimates and schedules for achieving initial and full operational capability; a comparison of funding levels across fiscal years within the future-years defense plan; descriptions of relevant concepts of operations; and a schedule of planned test activities, among other requirements.

Sec. 1652 also requires quarterly briefings to the House and Senate Armed Services Committees, beginning no later than 90 days after enactment. These briefings must address changes to the architecture; progress toward initial and full operational capability; execution of appropriated funds; description of upcoming and completed test events; and any notable developments affecting the program.

Sec. 1654 prohibits privatized or subscription-based missile defense interceptor capabilities, a direct response to a funding model for Golden Dome floated by SpaceX CEO Elon Musk.[37]

Sec. 1659 limits the obligation or expenditure of certain Department of Defense travel funds until the Secretary of Defense submits a report required under Sec. 1671 of the FY2024 NDAA.[38] That long-delayed report was intended to include an updated independent analysis by the Institute for Defense Analysis on the feasibility and advisability of developing a space-based missile defense capability.[39]

Program Status

Space Force General Michael Guetlein, the Direct Reporting Program Manager for Golden Dome, was confirmed by the Senate on July 17, 2025.[40] The following week, speaking at the Space Foundation's Innovate Space: Global Economist Summit, Gen. Guetlein told the audience that "the real technical challenge will be building of the space-based interceptor."[41] While he added "That technology exists, I believe," he also described space-based interceptors (SBIs) as "new innovation… which we're testing now." He went on to admit that, "What we have not proven is, first, can I do it economically, and then second, can I do it at scale?... Can I build enough satellites to get after the threat? Can I expand the industrial base fast enough to build those satellites? Do I have enough raw materials, et cetera?"[42]

In September 2025, Gen. Guetlein briefed lawmakers on the program's goals and schedule, and the Pentagon's civilian lead for Golden Dome, Steve Feinberg, received his first formal briefing on the program's architecture, though the level of detail provided remains unclear.[43] Around the same time, reports emerged that the Pentagon was considering a prize competition for boost-phase SBIs, a contracting approach that would require

industry to shoulder more upfront development costs.[44] Industry reaction was skeptical. One official told Breaking Defense that "none of the Big 5 DoD primes would make that size of investment with so little of a return on investment," while another described the proposal as "insane."[45]

Gen. Michael A. Guetlein, Director of Golden Dome. Photo: United States Space Force.

During a November 12, 2025 webinar hosted by Space News on the role of space-based interceptors in Golden Dome, a panelist from Lockheed Martin, which sponsored the event, noted that even major defense contractors competing for contracts under the program "haven't seen the official architecture released from the government."[46]

On November 19, 2025, Inside Defense reported that the Pentagon had completed a baseline architecture plan for Golden Dome and was reviewing an implementation plan.[47] Details of the architecture are still not publicly available. The following day, Space Force issued a pre-solicitation notice for prototype proposals for midcourse SBIs.[48] The notice stated that the Space Systems Command Program Executive Office for Space Combat Power "will be looking for kinetic midcourse interceptor solutions only," signaling a focus on hit-to-kill systems rather than directed-energy (laser) systems.[49] Space Force issued a formal request for prototype proposals on December 7, 2025.[50] Contract awards are expected in February 2026.[51]

While that solicitation focused on midcourse interceptors, Space Force has separately awarded multiple prototype contracts for boost-phase SBIs.[52] A Space Force spokesperson refused to disclose the awardees, explaining that contracts under $9 million are not required to be publicly announced.[53]

On December 2, 2025, the MDA announced contract awards to 1,014 companies under the Scalable Homeland Innovative Enterprise Layered Defense (SHIELD) Multiple Award Indefinite Delivery, Indefinite Quantity Contract.[54] Since then, the agency has issued two additional tranches of awards, bringing the total number of eligible companies to 2,440 out of 2,463 applicants.[55] The SHIELD contract, which could issue awards over a decade, could ultimately cost taxpayers up to $151 billion and is considered a central contracting vehicle for Golden Dome.[56]

Astronomical Costs

Public reporting has cited a wide range of estimates for the cost of developing, procuring, and sustaining the systems that could make up Golden Dome. In late May 2025, President Trump said the program would "cost about $175 billion [when] completed" and be fully operational "in two-and-a-half to three years."[57] The $175

billion figure appears to refer to acquisition costs, which include research, development, test, and evaluation (RDT&E) and procurement, but exclude operations and maintenance costs over the program's lifecycle.

CBO's Cost Estimates

President Doland Trump announcing Golden Dome from the oval office. The president claimed that Golden Dome would be fully operational by the end of his term in office, and that it would cost about $175 billion. May 20, 2025. Photo: The White House.

In early May 2025, at the request of Sens. Deb Fischer (R-NE) and Angus King (I-ME), the Chair and Ranking Member of the Senate Armed Services Subcommittee on Strategic Forces, the Congressional Budget Office (CBO), Congress' nonpartisan budget watchdog, published a report detailing new cost estimates for a subset of space-based systems that could be deployed as part of Golden Dome.[58] Specifically, the CBO examined "how recent declines in the costs of launch services would change previous estimates of the costs to deploy a constellation of space-based interceptors (SBIs) designed to defeat one or two intercontinental ballistic missiles (ICBMs) fired at the United States by a regional adversary, such as North Korea."[59] The analysis focused on boost-phase SBIs, which are intended to intercept missiles during their boost phase of flight.

Accounting only for reduced launch costs, CBO estimated that deploying and operating such a system for 20 years would cost between $161 billion and $542 billion (in 2025 dollars). CBO emphasized, however, that these estimates came with two important caveats:

> *Although launch costs are much lower today than when the previous studies were published, two major factors could lead to higher costs for space-based missile defenses than CBO and the NRC estimated earlier. First, North Korea's ICBMs have increased in number and sophistication since those studies were published* [in 2004 and 2012]. *Second, a recent executive order by the president, titled The Iron Dome for America, calls for deploying a missile defense system to protect the United States not only from attacks by regional adversaries (ones with limited capabilities, such as North Korea) but also from attacks by peer or near-peer adversaries (ones with military capabilities similar to those of the United States). Such a defense could require a more expansive SBI capability than the systems examined in the previous studies. Quantifying those recent changes will require further analysis, which CBO is undertaking at your request.*[60]

Despite these caveats, some reports mistakenly described the $542 billion figure as the upper limit for the cost of Golden Dome's space-based interceptors, or even for the program as a whole. In fact, $542 billion represents the upper estimate for deploying and operating, over 20 years, a constellation of boost-phase SBIs capable of

intercepting one or two North Korean missiles, based on technological assumptions that are more than a decade old. [61]

> *"I'm 34 years in this business; I've never seen an early estimate that was too high... My gut tells me there's going to be some additional funding that's necessary."*
>
> — Gen. B. Chance Saltzman, Chief of Space Operations

That distinction has been lost in some public discussion. At a POLITICO event, Chief of Space Operations Gen. B. Chance Saltzman was asked whether CBO's $542 billion estimate for Golden Dome's SBI constellation—another mischaracterization of the analysis—was too high. He responded, "I'm 34 years in this business; I've never seen an early estimate that was too high... My gut tells me there's going to be some additional funding that's necessary."[62]

Even setting aside CBO's caveats, space-based interceptors represent only one component of Golden Dome. The cost of deploying and operating the full suite of systems envisioned for the program over 20 years, let alone over its full lifecycle, would almost certainly reach into the trillions of dollars.

AEI's Cost Estimates

That conclusion is reinforced by a recent report from the American Enterprise Institute (AEI), which examined the costs of a more expansive Golden Dome architecture designed to defend against a broad range of aerial threats from peer-level adversaries. AEI found that such an approach could cost up to $3.6 trillion over 20 years, while still falling short of the Administration's stated goal of 100 percent effectiveness.[63]

The report evaluated six potential architectures, with 20-year costs ranging from $252 billion for a "Limited Tactical Defense" to $3.6 trillion for a "Robust All-Threat Defense." Intermediate options included a "Ground-Centric Strategic Defense" at $406 billion, an "Accelerated Homeland Defense" at $471 billion, a "Balanced All-Threat Defense" at $1 trillion, and a "Space-Centric Strategic Defense" at $2.4 trillion. As the report notes, "the $175 billion price tag President Trump cited only affords a much less capable system that is no match for the quantity of missiles China and Russia possess."[64] Adjusted for projected inflation, the most robust architecture examined could cost $4.4 trillion over 20 years.[65]

These estimates come with two important caveats. First, AEI calculated costs above the existing missile defense baseline, meaning above what the United States is already spending or planning to spend on missile defense. As a result, the estimates exclude projected missile defense spending from FY2027 to FY2029 in recent Pentagon budget requests, as well as projected costs beyond FY2030 where acquisition data are available. They also exclude missile defense funding requested in both the base FY2026 budget and through reconciliation. The One Big Beautiful Bill Act (OBBBA), signed into law on July 4, 2025, included more than $24.4 billion for Golden Dome under a provision titled "Enhancement of Department of Defense Resources for Integrated Air and Missile Defense."[66] These funds, available through FY2029, are not reflected in AEI's projections.

Congress is also poised to add funding for Golden Dome through the regular appropriations process. According to a summary released by House Appropriations Committee Chair Tom Cole (R-OK), the House-passed FY2026 Pentagon spending bill included roughly $13 billion for Golden Dome, including more than $8.8 billion for the Missile Defense Agency and approximately $4.1 billion for relevant Space Force programs.[67] The Senate's draft FY2026 defense spending bill also includes funding for Golden Dome across multiple accounts, though its summary does not spotlight the cumulative cost.[68] Given the continued lack of clarity about Golden Dome's architecture, it remains unclear how much funding in the final FY2026 Defense Appropriations Act could ultimately fall under the program.[69] To the extent that appropriated funds align with the president's FY2026 budget request, they were not included in AEI's estimates.

The second caveat is more consequential: the most robust architecture examined by AEI is not the most robust architecture conceivable. In a table detailing 46 potential program components, the report estimates that a "robust capacity option" for boost-phase interceptors alone could cost more than $6 trillion over 20 years, in FY2026 dollars.[70] This is particularly notable given that congressional funding tables accompanying the reconciliation bill indicate that at least $5.6 billion is intended "for development, procurement, and integration of space-based and boost phase interceptor capabilities."[71] In effect, Congress has already made a $5.6 billion down payment on space-based interceptors that could ultimately cost trillions of dollars, before receiving a system architecture for Golden Dome. As the author of AEI's report Todd Harrison observes, "as long as these requirements remain undefined, it is fair to say that Golden Dome can cost as much or as little as policymakers are willing to spend."[72]

National Security Tradeoffs

The scale of these costs matters because spending on Golden Dome would come at the expense of other domestic and national security priorities. Despite the Trump Administration's and Congress's eagerness to increase Pentagon spending, the Pentagon still faces real fiscal constraints imposed by total federal revenues, competing priorities, a growing national debt, and interest payments exceeding $1 trillion annually.

Partly as a result of excessive Pentagon spending on exquisite, complex military platforms, other national security needs have been chronically underfunded. As of 2024, the Pentagon faced an estimated $271 billion backlog in deferred maintenance and facility repairs, up from $137 billion in 2020.[73] This backlog poses serious readiness and servicemember safety concerns, from poor living conditions at military barracks that undermine recruitment, retention, and servicemember safety and quality of life, to the deterioration of facilities and equipment essential to daily operations.[74]

Taking a more holistic view of national security, funds devoted to Golden Dome could also crowd out investments to address other national security challenges, including pandemic preparedness, disaster mitigation and response, food insecurity, and tackling the threats posed by climate change.

In light of these tradeoffs, understanding the potential value, or lack thereof, of Golden Dome is essential to assessing whether the investment is justified. Having examined the program's potential costs, the next step is to assess the immense viability challenges it faces.

Viability Problems

The president's January memo outlining the goals of Golden Dome called for defending the United States "against ballistic, hypersonic, advanced cruise missiles, and other next-generation aerial attacks from peer, near-peer, and rogue adversaries."[75] There are serious doubts, however, that any Golden Dome architecture—let alone one consistent with the president's proposed $175 billion acquisition cost—could meet that goal. In particular, the challenge of reliably intercepting peer- and near-peer ICBMs is effectively insurmountable. This goal represents a significant departure from U.S. policy articulated in the 2022 Missile Defense Review, which stated that "to address intercontinental-range, nuclear threats from Russia and the PRC, the United States will continue to rely on strategic deterrence—underwritten by safe, secure, and effective nuclear forces."[76]

The challenges Golden Dome would face are also fundamentally different from those faced by Israel's Iron Dome, which inspired the president's original call for an "Iron Dome for America." Israel's missile defense systems are designed to protect an area of roughly 8,500 square miles.[77] Defending the entire United States, by contrast, means defending an area of roughly 3.8 million square miles.[78] Israel's missile defense systems are also designed to defeat short- and medium-range, conventionally armed rockets and missiles—not ICBMs—and even against those lesser threats, they are not fully effective.[79] When Iran launched a salvo of conventionally armed, medium-range ballistic missiles at Israel in the summer of 2025, Israel's missile defenses reportedly achieved a success rate of 92 to 93 percent.[80] The sheer area Golden Dome would need to cover, the speed and sophistication of ICBM threats, and the catastrophic consequences of failing to intercept even a single nuclear-tipped missile make Iron Dome and other Israeli systems poor analogies for the challenges Golden Dome would face.

A map of Israel superimposed over a map of the Eastern United States. Image: CIA World Factbook, 2015.

Among the Golden Dome architectures examined in the American Enterprise Institute (AEI) report discussed in the previous section, an architecture based on the president's proposed $175 billion acquisition cost was dubbed "Accelerated Homeland Defense." According to AEI, this architecture "prioritizes investments that can begin fielding capabilities within the next three to five years—generally items that are already in production—and includes a limited deployment of boost-phase SBIs, consistent with the Executive Order."[81] Under this approach, the number of boost-phase SBIs would be "sufficient to intercept a five-missile salvo."[82] That

assessment assumes that all relevant missile defense systems perform as planned, a dubious assumption given history.

China currently fields an estimated 600 hypersonic missiles, 400 ICBMs, and 72 submarine-launched ballistic missiles (SLBMs). Russia is estimated to have 200-300 hypersonic missiles, 350 ICBMs, and 192 SLBMs. Both arsenals are expected to grow in the coming decade.[83] Against threats of that scale, the theoretical ability to intercept five missiles is far from sufficient to constitute a meaningful defense.

Even setting aside questions of scale, defending the U.S. against intercontinental-range ballistic missiles presents technical challenges that no missile defense system has demonstrated an ability to overcome. Intercontinental ballistic missiles, including land-based ICBMs and SLBMs, travel to their targets in three distinct phases, each of which poses challenges for missile defense.

Boost Phase

The boost phase of an ICBM attack begins at launch and ends when the missile's booster rockets finish burning their fuel and separate from the warhead(s). Any form of intercontinental ballistic missile defense would need to deploy interceptors in numbers far greater than the number of warheads they are designed to intercept. That imbalance is especially pronounced for boost-phase interceptors. According to a 2012 report by the National Academies, "with one or two minor exceptions, land-, sea-, or air-based boost-phase defense is not feasible when timeline, range, geographical/geopolitical, or cost constraints are taken into account."[84] This conclusion has led some missile defense proponents to advocate for an array of boost-phase SBIs, which has never been attempted. The same report, however, found boost-phase SBIs to be similarly infeasible, a finding reinforced by several more recent reports. [85]

The 2025 CBO report on the "Effects of Lower Launch Costs on Previous Estimates for Space-Based, Boost-Phase Missile Defense," discussed in the previous section, examined three possible configurations of a boost-phase SBI constellation "designed to defeat one or two intercontinental ballistic missiles (ICBMs) fired at the United States by a regional adversary, such as North Korea."[86] The number of SBIs in the constellations CBO analyzed ranged from 1,000 to 2,000, reflecting different assumptions about how quickly interceptors could be launched after detection and initial tracking of an ICBM launch.[87] The model with 1,000 SBIs assumed no decision time between determining the ICBM's initial trajectory and launching interceptors, while the model with 2,000 SBIs assumed 30 seconds of decision time.[88]

A 2025 report on strategic missile defense by the American Physical Society (APS) found that the U.S. would need between 400 and 1,600 boost-phase SBIs to theoretically defend the entire country against a single North Korean ICBM, based on the capabilities of two North Korean ICBM types, the Hwasong-15 and the Hwasong-18.[89] If North Korea were to launch ten such missiles, APS estimated that defending the U.S. would require between 4,000 and 16,000 boost-phase SBIs.[90] Defending against more advanced Russian or Chinese ICBMs, which could be launched in greater numbers, would require even more interceptors. Based on APS's calculations, and without accounting for the greater sophistication of Russian or Chinese ICBMs, defending the United States against a salvo of 100 ICBMs could require more than 160,000 boost-phase SBIs. These

calculations assumed virtually no decision time between the detection of a launch and the firing of interceptors.[91]

AEI's 2025 report reached similarly daunting conclusions. Based on its calculations, the U.S. would need to deploy 4,990 boost-phase SBIs to defend against a salvo of up to five missiles under its basic capacity option, 49,900 boost-phase SBIs to defend against a salvo of 50 missiles under a moderate-capacity option, and 249,500 boost-phase SBIs to defend against a salvo of 250 missiles under a robust-capacity option.[92] These estimates assume the launch of two interceptors per target and a 30-second window between detection and interceptor launch. AEI estimated that the basic-capacity option would cost $271 billion over 20 years, the moderate-capacity option would cost more than $1.65 trillion, and the robust-capacity option would cost more than $6 trillion.[93]

Taken together, these three reports—despite varying assumptions about the nature and decision timelines of ICBM threats—point to extraordinarily high interceptor-to-missile ratios necessary for a constellation of boost-phase SBIs that could theoretically defend the entire United States. CBO estimated that the U.S. would need to deploy between 500 and 1,000 boost-phase SBIs against each incoming ICBM. AEI estimated a ratio of roughly 1,000:1. APS's calculations assume the need for a 400:1 ratio for Hwasong-15 ICBMs and as high as 1,600:1 for Hwasong-18 ICBMs.

> *"If you're trying to do it in boost phase, it's not going to scale the way you want against the threats... so, let's pump the brakes on boost phase intercept."*
>
> — Todd Harrison, Senior Fellow at the American Enterprise Institute

Even with the assumption of virtually no decision time between the detection of an ICBM launch and the launch of interceptors, the numbers are not encouraging. However, some industry officials have cast doubt on whether the military would be willing to automate these decisions to the degree assumed in some of these models. During a November 2025 Space News webinar on the role of SBIs in Golden Dome, Todd Stevens, Vice President of Strike, Deterrence & Missile Defense at Lockheed Martin, argued that a key question is "if we can make the decisions fast enough," and noted that "automated decision making is things [sic] that perhaps exist other places in industry, other places in government, but we haven't maybe had the policy backing to allow us to go do that [for space-based interceptors]."[94]

Another important caveat is that none of these calculations appear to account for the possibility of an atmospheric nuclear explosion, which could result from a successful interception or from a warhead designed to detonate if an interceptor comes too close. Such a nuclear blast could pose serious challenges for detecting, tracking, and homing in on additional ICBMs.

In addition to the technical and cost challenges, boost-phase interception also poses serious strategic challenges. For instance, intercepting North Korean ICBMs during their boost phase would occur over or near Chinese territory, and because interceptors are themselves missile systems, efforts to intercept these ICBMs

could be misinterpreted as an attack. Furthermore, even a "successful" boost-phase intercept could disrupt a missile's trajectory without disabling its warhead(s), potentially causing one or more warheads to fall onto Chinese or Russian territory and detonate on impact, a risk known as the shortfall problem.[95]

Skepticism about boost-phase SBIs extends beyond critics of Golden Dome. During the same Space News webinar, Todd Harrison, the author of AEI's report on the potential costs of Golden Dome, cautioned that, "if you're trying to do it in boost phase, it's not going to scale the way you want against the threats… so, let's pump the brakes on boost phase intercept."[96] Patrick Binning, an instructor in the Space Systems Engineering program at the Johns Hopkins Whiting School of Engineering, while supportive of Golden Dome in general, expressed similar doubts, describing boost-phase SBIs as "a good vision to have, but not likely the best approach when you're looking at space-based interceptors."[97]

Midcourse Phase

The midcourse phase of an ICBM's flight begins once the missile leaves the atmosphere and its warhead(s) separate from the booster, and ends when the warhead(s) reenter the atmosphere. Nuclear warheads carried by ICBMs are typically about three feet long and can travel at speeds exceeding 7 kilometers per second, or over 15,600 miles per hour.[98]

Correctly identifying the warhead or warheads after separation is among the most significant challenges of midcourse missile defense. In the vacuum of space, discarded boosters or their remnants (boosters can be designed to break apart into multiple pieces) are likely to travel along the same trajectory as the warhead to reach their targets, requiring missile defense radars capable of differentiating between the warhead or warheads and the accompanying debris field.[99]

Beyond booster debris, ICBMs can deploy countermeasures specifically designed to confuse missile defense systems and increase the number of objects a missile defense system must track and intercept. These countermeasures can jam radars, mimic the appearance of warheads, or conceal actual warheads within balloon-like structures. Such technologies are not difficult to develop, and Russia and China have pursued them for decades.[100] Warheads and countermeasures can also be designed to maneuver in space, further complicating tracking and interception.[101]

Midcourse intercept systems must also contend with the possibility that successfully intercepting a nuclear warhead could trigger a nuclear explosion in space. According to APS, such an explosion could "refract radar signals and create directional errors," effectively blinding missile defense radars over an area spanning hundreds of miles.[102] Nuclear warheads could also be designed to detonate when interceptors approach, for this purpose. As the authors of the 2025 APS report note, nuclear detonations in space "could make midcourse tracking and discrimination extremely challenging and could potentially defeat any current or planned midcourse defense."[103]

Any system intended to defend against ICBMs during their midcourse phase must demonstrate that it can reliably overcome these challenges. One novel option proposed as part of Golden Dome is the deployment of midcourse SBIs. According to AEI, a moderately sized midcourse SBI architecture would require roughly 20,000

interceptors in orbit and would be capable—assuming all systems performed perfectly—of intercepting a salvo of 50 ICBMs, provided each missile deployed no more than 10 warheads or decoys and two interceptors were assigned to each target.[104] This implies an interceptor-to-ICBM ratio of 400:1 and would cost an estimated $420 billion over 20 years.[105] A more robust midcourse SBI architecture capable of intercepting a salvo of 250 ICBMs, under the same assumptions, would cost nearly $1.5 trillion over 20 years.[106]

Among existing systems, the Ground-based Midcourse Defense (GMD) system is the only deployed system designed to intercept ICBMs in their midcourse phase—or in any phase.[107] However, the GMD system was not designed to protect the United States from all ICBM threats. As the Pentagon's 2022 Missile Defense Review states, "GMD is neither intended for, nor capable of, defeating the large and sophisticated ICBM, air-, or sea-launched ballistic missile threats from Russia and the PRC [People's Republic of China]."[108]

> *"GMD is neither intended for, nor capable of, defeating the large and sophisticated ICBM, air-, or sea-launched ballistic missile threats from Russia and the PRC."*
>
> — The Pentagon's 2022 Missile Defense Review

Even when judged against the more limited goal of defending the U.S. against potential ICBM threats from nations like North Korea and Iran, GMD's testing record is mixed and ultimately unreliable. The system has been tested 21 times, though in one test the target failed to launch and the interceptor was never fired. Eight of the other tests failed, while 12 were deemed successful.[109] This record suggests a nominal 60 percent success rate; however, unrealistic test conditions undermine the validity of the GMD's test record.

In the mid-2000s, the Missile Defense Agency and the Office of the Director of Operational Test and Evaluation (DOT&E) developed metrics for evaluating ballistic missile defense flight tests, including the use of threat-representative targets, complex countermeasures, and unannounced launches.[110] GMD has rarely met these standards. Only two tests used threat-representative targets. As of 2021, none included complex countermeasures, and when decoys were used, they were "intentionally designed to be much brighter or dimmer than the target," with the kill vehicle "programmed in advance to use this difference to discriminate the target from the decoys," according to APS.[111] In every "successful" test, the timing was chosen to ensure that the sun illuminated the target, making it easier to identify.[112] Perhaps most importantly, none of the tests attempted to intercept a salvo of missiles.[113] As the American Physical Society concluded, "GMD tests have been conducted under scripted conditions and designed for success," and "the Pentagon has consistently rated the GMD tests as low in operational realism."[114] In other words, the apparent success rate of 60 percent is inflated by unrealistic, open-book testing.

In addition to GMD, the Trump Administration has suggested that Aegis Ballistic Missile Defense (BMD) systems and an improved Terminal High Altitude Area Defense (THAAD) system could play a role in midcourse intercepts within a layered missile defense system.[115] Importantly, both the Aegis and THAAD systems would face similar challenges in overcoming countermeasures to those faced by the GMD system. But they would also face unique challenges.

The USS Wayne E. Meyer, an Arleigh Burke-class guided-missile destroyer equipped with Aegis Afloat. Photo: U.S. Navy, Eric Parsons.

Aegis Afloat was designed to protect aircraft carrier strike groups from short- and medium-range ballistic missile threats. Neither its sensors nor its interceptors were designed to detect and defeat ICBMs. However, the speed of its SM-3 IIA interceptor—up to 4.5 km/s—has prompted interest in whether it could play a limited role in midcourse interception.[116] Congress mandated a test of the system, which took place in November 2020 and remains the only test of any Aegis BMD system against an ICBM-range target.[117] While the test was deemed a success, as the interceptor successfully struck and destroyed the target, the Government Accountability Office (GAO) noted that it "was not an operational test, however, and it was executed under highly favorable conditions."[118]

Beyond its limited test record, Aegis Afloat, based on U.S. Navy cruisers and destroyers, would be theoretically capable of intercepting ICBMs targeting the U.S. only if the ships carrying the system were deployed in very specific locations. In 2018, then-Chief of Naval Operations Adm. John Richardson argued that land-based Aegis Ashore systems were better suited to this mission because of the geographic constraints imposed on Aegis ships. As he explained, "Right now… I have six-multi-mission, very sophisticated, dynamic cruisers and destroyers—six of them are on ballistic missile defense duty at sea. And if you know a little bit about this business you know that geometry is a tyrant. You have to be in a tiny little box to have a chance at intercepting that incoming missile. So, we have six ships that could go anywhere in the world, at flank speed, in a tiny little box, defending land."[119]

Aegis Ashore, which offers capabilities similar to those of stationary land-based sites, is currently deployed only in Romania and Poland, as well as at a test site in Hawaii. Like Aegis Afloat, it was not designed to intercept intercontinental-range missiles. The Aegis Ashore system has never been tested against ICBMs, and while it uses the same interceptor and sensor technology as Aegis Afloat, as a stationary system, it cannot maneuver before launch. In the one test of the Aegis Afloat system against an ICBM-range target, the Navy "maneuvered the ship to get the highest probability of kill," something that would not be possible on land.[120]

THAAD, meanwhile, has demonstrated effectiveness against short- and medium-range threats, but has never been tested against ICBM-range missiles and has been tested only once against intermediate-range ballistic missiles. That test was deemed successful.[121] However, THAAD's limited range—roughly 150 to 200 kilometers—severely constrains its utility for defending the entire United States.[122] According to AEI, each new THAAD battery would cost over $2.7 billion.[123] Given their limited range, covering an area the size of the United States would require tens of thousands of THAAD batteries.

Terminal Phase

Defending the United States against ICBM warheads during their terminal phase of flight is uniquely challenging because this phase lasts less than one minute. Perhaps in recognition of this challenge, President Trump's executive order on Golden Dome calls for the "deployment of underlayer and terminal-phase intercept capabilities postured to defeat a countervalue attack," suggesting that terminal-phase defenses may be intended to protect selected military or strategic targets rather than the entire country. While this would constitute a more reasonable goal, it still presents serious challenges.

A Terminal High Altitude Area Defense (THAAD) launcher. Guam, March 13, 2024. Photo: U.S. Army, Maj. Trevor Wild.

One challenge is that warheads in the terminal phase can still deploy decoys designed to confuse missile defense radars and increase the number of targets that must be intercepted. These decoys would only start burning up in the atmosphere during roughly the final ten seconds of flight.[124] Another challenge is that, as in the midcourse phase, a nuclear explosion during the terminal phase—whether caused by a successful intercept or by a warhead designed to detonate when an interceptor approached—could blind terminal-phase sensors and threaten their ability to detect additional targets. Depending on the altitude and yield of the explosion, such a detonation could also pose serious threats to human health and the electric grid. In other words, even a nominally "successful" terminal-phase intercept may not constitute a successful defense.

The MDA has proposed using the Army's THAAD system during the terminal phase of ICBM flight to bolster U.S. defenses against ICBMs.[125] This approach would run into many of the same challenges THAAD faces in a midcourse ICBM defense. Aegis Ashore and the Patriot missile defense system have also been proposed for terminal-phase ICBM defense. As detailed above, Aegis has been tested only once against an ICBM-range target, and under unrealistic conditions. THAAD and Patriot have never been tested against intercontinental-range missiles.

Threats to Oversight

The viability problems associated with strategic missile defense underscore the need for rigorous testing and oversight of any system intended to defend the United States against intercontinental-range nuclear weapons. Yet multiple policy and political dynamics threaten to weaken that oversight.

One longstanding concern dates to the George W. Bush Administration's decision to centralize missile defense oversight within the Missile Defense Agency (MDA), effectively exempting it from standard independent oversight. MDA was allowed to set its own requirements, assess its own performance, and avoid many cost and schedule reporting requirements. It was also allowed to fund most projects using Research, Development, Test

& Evaluation (RDT&E) accounts, which are subject to less oversight than procurement funds.[126] This special treatment persists today. Congress could address this by requiring MDA programs that meet the cost thresholds for Major Defense Acquisition Programs (MDAPs) to be subject to the same oversight standards as other MDAPs.

Another threat to oversight stems from the Trump Administration's decision to reduce staffing at the Office of the Director of Operational Test and Evaluation (DOT&E). In May 2025, Secretary of Defense Pete Hegseth issued a memorandum directing DOT&E to eliminate non-statutory or redundant functions.[127] The memo further instructed DOT&E to reduce staffing to 30 civilian positions and 15 military personnel. Before this change, DOT&E employed 82 civilian personnel and 12 military personnel.[128] By August 2025, DOT&E reportedly removed 99 programs from its prior oversight list of 251.[129] In October 2025, Sen. Elizabeth Warren (D-MA) and Rep. Donald Norcross (D-NJ) wrote to Secretary Hegseth, warning that "DoD's significant cuts to weapons system oversight will increase safety and operational risks to the force."[130] They specifically flagged "top DoD priorities that have been inexplicably removed from DOT&E's oversight list" including "the Enterprise Space-Based Missile Warning and Proliferated Warfighter Space Architecture, which could enable the Golden Dome architecture," and argued that "If homeland missile defense is truly a top priority for the Department, rigorous testing and oversight is vital to ensure the systems are integrated and that funding is not being wasted on systems that do not tie into the broader architecture."[131]

Congress took some steps to address these concerns in the Fiscal Year 2026 National Defense Authorization Act (NDAA). For instance, Sec. 219 of the NDAA requires DOT&E to assess operational and live-fire test and evaluation activities for the "command and control and data integration architecture for layered integrated missile defense of the homeland," among other requirements.[132] However, as plans for Golden Dome continue to come into focus, further steps may be necessary to ensure adequate and independent oversight.

Moving the Goalposts

Golden Dome's stated objective of defending the United States against intercontinental-range nuclear threats from Russia and China marks a departure from relying primarily on nuclear deterrence. That shift, however, does not mean the U.S. is abandoning deterrence. In December 2025, Senators John Hoeven (R-ND) and Mike Rounds (R-SD) signaled that the Sentinel ICBM program—the floundering replacement for the Minuteman III ICBM currently deployed in U.S. nuclear missile silos—could be funded under the Golden Dome umbrella in future authorization and appropriations bills.[133] In comments to *Exchange Monitor*, Sen. Hoeven explained:

> *If you think about it, Sentinel is Golden Dome right now. What protects us from any type of incoming missile or nuclear attack is Sentinel. In other words, people know that they don't dare mess with this because nobody can take us and our nuclear arsenal. So that is what's protecting us today. And so the concept behind Golden Dome is to build on that and actually have counter drone, anti-ballistic missile and all those kinds of things as well.*[134]

Prior to these comments, there had been no public indication that Golden Dome funding might include funding for the U.S. nuclear weapons arsenal. From a budgetary perspective, folding Sentinel into Golden

Dome could allow the Pentagon to use missile defense funds to support the program. Given that Sentinel is currently 81 percent over budget, such a move could relieve fiscal pressure on the Air Force, which oversees the Sentinel program.[135]

That budgetary incentive may help explain the push to include Sentinel under Golden Dome. It may also reflect a tacit admission that missile defense systems may never be able to provide a reliable defense against ICBM threats from peer- or near-peer adversaries. While Golden Dome proponents may continue to pursue anti-ballistic missile technology, folding Sentinel into Golden Dome could be a means of moving the goalposts. If efforts to develop effective defenses against Russian and Chinese ICBMs prove unworkable—as the evidence suggests—proponents of Golden Dome could still claim success by pointing to continued reliance on strategic nuclear deterrence.

Strategic Risks

Whether or not Golden Dome can overcome the immense viability challenges facing strategic missile defense, the pursuit of systems designed to defeat nuclear weapons is inherently destabilizing. As nuclear war planners tend to assume worst-case scenarios, even if other nuclear-armed nations are skeptical that any missile defense system can mount a meaningful defense against strategic nuclear weapons, they will respond to efforts to build them with parallel efforts to overcome them. As a result, the pursuit of strategic missile defense can counterintuitively make the country pursuing it less safe. As Matthew Bunn, a Professor of the Practice of Energy, National Security, and Foreign Policy at the Harvard Kennedy School, explained, "regardless of Golden Dome's feasibility, there is a long history of scholarship about strategic missile defenses, and the weight of evidence points to the defenses making their host country less safe from nuclear attack."[136]

> *"Regardless of Golden Dome's feasibility, there is a long history of scholarship about strategic missile defenses, and the weight of evidence points to the defenses making their host country less safe from nuclear attack."*
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Russia and China's Response

Assessing the significance of political statements made by U.S. adversaries is often challenging, particularly when those statements concern nuclear weapons policy and posture. Such statements must be considered with the understanding that they may be disingenuous or designed to provoke a desired response. For example, statements suggesting that Russia and China will expand their nuclear arsenals in response to Golden Dome may be intended to mask plans to expand their arsenals regardless of U.S. actions. Statements implying that Russia and China will not deploy space-based weapons unless the U.S. does may be intended to conceal plans to deploy space-based weapons before the U.S. does. Such statements must also be considered alongside the behavior of the countries making them. At the same time, ignoring these statements altogether risks

squandering opportunities to pursue arms control agreements that could verifiably limit the proliferation of nuclear weapons and the deployment of space-based weapons.

On May 9, 2025, China and Russia issued a joint statement on global strategic stability, addressing a range of concerns regarding the proliferation of offensive weapons and emphasizing particular concern regarding Golden Dome.[137] It introduces the topic by stating that "Deeply destabilizing in nature is also the recently announced 'Golden (Iron) Dome for America,'" which it describes as "a complete and ultimate rejection to recognize the existence of the inseparable interrelationship between strategic offensive arms and strategic defensive arms, which is one of the central and fundamental principles of maintaining global strategic stability."[138]

The joint statement also asserts that Golden Dome "provides additional impetus to the further development of kinetic and non-kinetic means providing for the left-of-launch defeat of missile weapons and the infrastructure that supports their employment."[139] Left-of-launch refers to the capability to take preemptive action against missile threats prior to their launch, so Russia and China are warning that the pursuit of Golden Dome will compel them to expand such capabilities.[140]

The statement then moves to the implications of weaponizing space:

> *The situation is further aggravated by the fact that the "Golden (Iron) Dome for America" program also directly envisages significant strengthening of the arsenal of means to conduct combat operations in space, including the development and orbital deployment of interception systems, turning outer space into an environment for placing weapons and an arena for armed confrontation.*
>
> *The two Sides oppose the attempts of individual countries to use outer space for armed confrontation and will counter security policies and activities aimed at achieving military superiority, as well as at officially defining and using outer space as a "warfighting domain".*[141]

Perhaps most notably, the joint statement then underscores "the need to start negotiations… that would provide fundamental and reliable guarantees for preventing an arms race in outer space, weaponization of outer space and the threat or use of force against outer space objects or with their help."[142] The statement also says that "the two Sides agree to promote on a global scale the international initiative/political commitment not to be the first to deploy weapons in outer space."[143]

In November, Russia and China reportedly held "in-depth talks" on missile defense and nuclear weapons issues, "including a joint analysis of relevant destabilising factors creating strategic risks to global and regional security, as well as an exchange of views on ways to minimize them," according to the Russian Foreign Ministry, underscoring that their concerns with respect to Golden Dome are ongoing.[144]

Again, these statements must be viewed with skepticism. Russia and China have both been expanding their nuclear arsenals and developing capabilities that could be used to weaponize space for some time.[145]

According to an Arms Control Association analysis published in May 2025, "Moscow is already developing new systems—such as an undersea torpedo, a hypersonic glide vehicle, and a nuclear-powered cruise missile—to

ensure it can overcome any future U.S. missile defenses. It is also developing a capability for a nuclear-armed anti-satellite weapon, which underscores the vulnerabilities of a space-based interceptor network."[146]

China, for its part, has been expanding its nuclear arsenal over the past five years, growing its stockpile of nuclear warheads from about 300 in 2020 to over 600 nuclear warheads as of mid-2024, according to the Pentagon.[147] While most of those warheads are kept in storage rather than deployed on delivery vehicles, that could change as China continues expanding its arsenal. The Federation of American Scientists estimates that by 2035, China will have between 750 and 1,500 nuclear warheads, a wide range of outcomes that will likely be influenced by developments in the United States' nuclear and missile defense postures.[148]

Parsing which activities are a response to actions taken by the United States can be difficult. Even if Russia or China were to assert that their pursuit of specific capabilities was in response to Golden Dome, it would be hard to know with certainty whether those actions were a direct response or whether Golden Dome simply provided an excuse for capabilities they were already intent on pursuing. Systems under development prior to President Trump's first suggestion that the U.S. pursue an "Iron Dome for America" are clearly not a direct response to Golden Dome. However, accelerated efforts to test and deploy new systems may be.

For instance, Russia's 9M730 Burevestnik, a nuclear-powered, nuclear-capable cruise missile, was first announced in 2018. In October 2025, Russia conducted a successful test of the missile, which it said flew for roughly 15 hours and traveled 8,700 miles.[149] Weeks before the test, Russian President Vladimir Putin said that Golden Dome "could nullify our efforts to maintain the status quo in the field of strategic offensive arms," and that Russia "will respond appropriately in this case."[150] Following the cruise missile test, Russia asserted that "the missile completed all prescribed vertical and horizontal manoeuvres, showcasing a high capability to evade missile-defence and air-defence systems."[151] The timing of the test and the emphasis on evasion suggest that Golden Dome is an important factor in Russia's current calculations about which strategic capabilities to prioritize.

In addition to Russia and China's stated concern over Golden Dome's potential impacts on the nuclear balance of power, plans to field space-based interceptors raise conventional military concerns for Russia and China as well. While SBIs are nominally defensive, they are functionally missiles themselves and could be used for a variety of purposes, including anti-satellite weapons and conventional strike.[152]

U.S. officials have speculated that certain Russian satellites may already carry anti-satellite (ASAT) weapons and suggested that highly maneuverable satellites deployed by China could be used as ASAT weapons.[153] However, as of this writing, Russia and China have denied deploying weapons in space, and the U.S. has not publicly produced conclusive evidence to the contrary.

Whatever the current status or true motivations behind Russian and Chinese efforts to expand their nuclear arsenals, weaponize space, or prepare for the weaponization of space, both their joint statement and the history of weapons proliferation suggest that the deployment of Golden Dome would lead Russia and China to formalize and expand such efforts.

Given that Golden Dome is still in the early stages of development, and given the time required to develop, test, and field new nuclear weapons and space-based capabilities, it is too early to assess the full extent of Russia and China's current and planned responses to Golden Dome. But arms control experts largely agree that they are already responding and will continue to do so as the program advances.

Joe Cirincione, Board Vice Chair at the Center for International Policy and a nuclear arms control expert, recently argued that "any missile-defense system stimulates an offensive arms race because the easiest response of an adversary to a defense is to build more offensive weapons to overwhelm the defense."[154] With respect to Golden Dome, he underscored that "even if independent scientists conclude that these defenses will not work, an adversary can't count on that. The adversary has to assume that the system will work, and therefore it has to have enough offensive weapons to survive any attrition by defensive interceptors."[155]

Implications for Arms Control

Beyond the inherent dangers associated with the proliferation of nuclear and space-based weapons—likely outcomes of pursuing Golden Dome—the program would also undermine the most effective tool available for reducing the nuclear threat: diplomacy. While some have reasonably argued that plans for Golden Dome could be used as a bargaining tool in arms control negotiations, that does not appear to be the Administration's current intent.[156]

Still, opportunities for bilateral and multilateral arms control negotiations remain, and could be more readily seized if the U.S. is willing to negotiate limits on missile defense. In their joint statement, Russia and China underscored the need for negotiations to prevent the weaponization of space, signaling a willingness to engage in multilateral diplomacy with the United States on that issue.[157] The urgency of such negotiations was underscored last year when reports emerged that Russia was developing a space-based nuclear weapon capable of remaining in orbit for months or years and of indiscriminately destroying low-Earth orbit satellites.[158]

Whether Russia and China would negotiate in good faith remains an open question. But it bears noting that securing verifiable commitments from the United States to refrain from weaponizing space would benefit Russian and Chinese national security, just as securing comparable commitments from Russia and China would benefit U.S. national security. While the history of arms control shows that nations do not always abide by their commitments, it also shows that such agreements can succeed in verifiably limiting the growth of weapons arsenals.[159] Limits of that kind are worth pursuing even if they are not permanent.

In September 2025, President Putin offered to informally extend the New START Treaty—an agreement limiting the number of strategic nuclear weapons the U.S. and Russia may deploy—for an additional year following its expiration in February 2026, provided the United States made the same commitment. "Russia is prepared to continue adhering to the central numerical limits under the New START Treaty for one year after February 5, 2026," said Putin.[160] "Subsequently, based on an analysis of the situation, we will make a decision on whether to maintain these voluntary, self-imposed restrictions." Putin underscored that "this measure will only be viable if the United States acts in a similar manner, and does not take steps that undermine or violate the existing

balance of deterrence capabilities."[161] President Trump responded to press questions by saying that "it sounds like a good idea to me," though he has yet to make any formal public commitment.[162]

Taken together with the joint statement from Russia and China, Putin's New START offer suggests that continued pursuit of Golden Dome—particularly beyond the proposed informal one-year extension—could prompt Russia to deploy strategic nuclear weapons beyond the treaty's limits of 1,550 strategic nuclear warheads and 700 strategic delivery vehicles.[163]

Whether one reads Russia and China's statements as genuine diplomatic openings or as propaganda, the strategic risks of pursuing Golden Dome are difficult to ignore. If the United States presses far enough ahead, Russia and China are likely to respond by deploying space-based weapons and expanding the size and capabilities of their nuclear arsenals beyond what they otherwise would. At the same time, current opportunities to preserve existing limits and establish new ones on nuclear and space-based weapons may disappear. Both outcomes would make the United States less safe. They could also drive the U.S. to respond in kind by further expanding its own nuclear arsenal, at even greater cost to taxpayers than current plans already anticipate.

Conflict of Interest Concerns

Given the astronomical costs, unresolved viability issues, and strategic risks associated with any missile defense system intended to protect the entire United States from nuclear attack, it is important to examine who stands to benefit from pursuing Golden Dome—and whether undue influence may have played a role in advancing it.

Conflicts of interest in military programs are nothing new. Heavy industry spending on political contributions and lobbying, the ability of policymakers to invest in companies affected by their decisions, and a revolving door between the Pentagon, Congress, the executive branch, and Pentagon contractors have long empowered industry to exert outsized influence over national security policy and budgets.[164] Conflict-of-interest concerns surrounding Golden Dome are emblematic of these systemic problems. Still, as systemic solutions have not been implemented, the specific conflict-of-interest concerns raised by Golden Dome warrant particular scrutiny as Congress considers committing hundreds of billions, if not trillions, of taxpayer dollars to this effort.

SpaceX

Not long after President Trump issued his executive order on Golden Dome, Elon Musk's SpaceX emerged as one of several Pentagon contractors well positioned to secure major contracts.[165] At the time, Musk was serving as a Special Government Employee and leading the president's Department of Government Efficiency. In addition to his dual role as a presidential adviser and Pentagon contractor, Musk contributed more than $259 million in support of President Trump's 2024 campaign.[166]

While Musk left his government position in May following a public dispute with the president, SpaceX is still pursuing a role in the program.[167] According to the Wall Street Journal, it may have already secured one. An October 31, 2025 article reported that "SpaceX is set to receive $2 billion to develop satellites that can track missiles and aircraft under President Trump's Golden Dome project, people familiar with the matter said."[168]

President Donald Trump with SpaceX Founder and CEO Elon Musk during a press conference marking Musk's formal departure from his role in the Trump Administration. May 30, 2025. Photo: The White House.

In light of Musk's ties to the president and his former role as a Special Government Employee, a group of 42 Democratic lawmakers wrote to the Pentagon's Inspector General in May 2025 requesting "a review of the Pentagon's process to award the 'Golden Dome' missile defense shield contract, including any involvement by Elon Musk in that process."[169] Among other concerns, the letter cited a Reuters report in which a source familiar with government talks involving SpaceX, Palantir Technologies, and Anduril Industries described them as "a departure from the usual acquisition process."[170] The same source said, "There's an attitude that the national security and defense community has to be sensitive and deferential to Elon Musk because of his role in the government."[171] The lawmakers argued that "Mr. Musk's formal or informal participation in any process to award a government contract raises serious conflict of interest concerns, including the possibility that SpaceX is a top contender for the Golden Dome contract because of Mr. Musk's position in the government."[172]

Palantir Technologies

Palantir Technologies, a firm with substantial Pentagon business, is also seeking a role in Golden Dome. Board Chair Peter Thiel contributed roughly $1.25 million to President Trump's 2016 campaign and has since donated more than $850,000 to Republican incumbents.[173] Thiel is also a longtime mentor of Vice President JD Vance, who previously worked for Thiel's venture capital firm Mithril Capital Management, and whose political rise Thiel has been credited with supporting.[174] Palantir CEO Alex Karp contributed $1 million to a Trump super PAC following the president's reelection.[175]

Administration officials have their own ties to the company. An investigation by the Project on Government Oversight found that Thomas Williams, an OMB official overseeing Pentagon programs, had financial ties to Palantir through his spouse, a former employee, with holdings valued between $2 million and $10 million.[176] After publication, OMB provided evidence that Williams' spouse sold between $1 million and $5 million in Palantir stock options on May 9, 2025.[177] Even if this sale represented a full divestment, Williams and his spouse may have benefited financially from his work promoting Golden Dome funding in the One Big Beautiful Bill Act, given Palantir's perceived status as a leading contender for related contracts. At the same time, the divestment illustrates how scrutiny can reduce potential conflicts.

Gregory Barbaccia, the federal Chief Information Officer at OMB, also has ties to Palantir that have raised concerns. A former Palantir employee of ten years, Barbaccia reportedly holds company stock valued at up to $15,000.[178] His portfolio includes setting government-wide AI policy, an area in which Palantir already holds major Pentagon contracts and is expected to expand its role under Golden Dome.[179]

Anduril Industries

Anduril Industries, another Silicon Valley firm, is widely viewed as well-positioned to win Golden Dome contracts.[180] Founder and CEO Palmer Luckey was a major donor to President Trump and hosted fundraisers during both the 2020 and 2024 campaigns.[181]

Barbaccia also reportedly held a stake in Anduril valued between $100,000 and $250,000 through a venture capital firm, though he later divested after the conflict became public.[182]

Michael Obadal, sworn in as Under Secretary of the Army in September 2025, previously served as a senior director at Anduril.[183] With Golden Dome expected to integrate missile defense and command-and-control systems across military departments, his position could give him influence over contract decisions affecting his former employer.

President Trump's son, Donald Trump Jr., may also benefit indirectly. In late 2024, he joined the venture capital firm 1789 Capital as a partner.[184] The firm holds significant investments in both SpaceX and Anduril.[185]

Lockheed Martin

Not to be left out, traditional defense contractors like Lockheed Martin are also vying for Golden Dome contracts. In June, John Clark, senior vice president of technology and strategic innovation at Lockheed, told Wired that his company was in talks with SpaceX, Palantir, and Anduril about potential partnerships on Golden Dome, though he remarked that "candidly, I think it's a little premature to lock in on a team when you don't know exactly what the requirements are."[186] Lockheed Martin disclosed in its third quarter earnings call that it is working on a demonstration for 2028 of some portion of the space-based interceptor technology called for by Golden Dome.[187]

Lockheed Martin is one of 37 donors funding construction of a new White House ballroom proposed by President Trump, a project expected to cost more than $300 million.[188] According to sources cited by *CBS News*, Lockheed pledged at least $10 million.[189] While the company has not disclosed the size of its contribution, it said in a statement that it was "grateful for the opportunity to help bring the President's vision to reality and make this addition to the People's House, a powerful symbol of the American ideals we work to defend every day."[190] From 2021 to 2024, 73 percent of Lockheed Martin's revenue came from U.S. government contracts.[191] Palantir is also a ballroom donor.[192]

While the official quid pro quos associated with these contributions—such as listing donor names on a website or etching them into the building—are relatively benign, critics have charged that the arrangement amounts to "apparent bribery," given that many contributors are actively seeking government contracts subject to final approval by the Trump Administration. In November, Sen. Elizabeth Warren (D-MA) and Rep. Robert Garcia (D-CA) introduced the Stop Ballroom Bribery Act, which Sen. Warren described as an effort to "put an end to what looks like bribery in plain sight."[193]

Taking Stock

Potential conflicts of interest surrounding Golden Dome do not necessarily mean the program should not be funded, nor do they mean that companies facing such conflicts are not capable of contributing to it. They do, however, underscore the need for transparency and accountability regarding potential conflicts of interest associated with Golden Dome and other large acquisition projects in order to address such conflicts, develop informed opinions, and make informed judgments about the program's merits. In light of the conflicts already identified, Congress should continue pursuing investigations into and remedies for potential conflicts of interest associated with Golden Dome.

Conclusion

Golden Dome is a bad investment for American taxpayers. The available evidence strongly suggests that developing and deploying the program would cost trillions of dollars while still failing to achieve its stated goal: "defense of the United States against ballistic, hypersonic, advanced cruise missiles, and other next-generation aerial attacks from peer, near-peer, and rogue adversaries."[194] Of particular concern is the high likelihood that none of the potential architectures would be capable of reliably defending the United States from a salvo of nuclear-armed intercontinental ballistic missiles.

Missile defense systems designed to defeat short- and medium-range threats have demonstrated their potential value to U.S. national security. By contrast, no existing or proposed system has demonstrated that it can reliably defend the U.S. against peer and near-peer intercontinental-range nuclear weapons. Nor have proponents outlined a clear, achievable path to overcoming the immense challenges such systems would face.

Viability challenges include the ratio of interceptors to missiles required to defend the entire United States; the vulnerability of space-based interceptors to anti-satellite weapons; the difficulty of tracking ICBMs following atmospheric or exoatmospheric nuclear explosion that could blind or confuse missile defense sensors; and countermeasures designed to confuse, disable, or overwhelm defenses—countermeasures that would almost certainly grow in number and sophistication in response to the deployment of Golden Dome.

Strategic challenges range from the risk of accelerating a nuclear arms race, to initiating a space-based arms race, to undermining existing and future prospects for arms control agreements to verifiably limit nuclear and space-based threats.

Cost remains a fundamental constraint. The United States is more than $38.5 trillion in debt, and annual interest payments now exceed $1 trillion.[195] Responsible national security budgeting requires making choices about which investments are best suited to defend the United States. Investing potentially trillions of dollars in a system that would likely fail to achieve its central goal, while increasing the threats it is meant to counter, would be deeply unwise. It would accelerate the nation's debt burden and divert resources from other pressing domestic and national security priorities.

Given the long and costly history of failed efforts to develop strategic ballistic missile defenses, the conflicts of interest surrounding Golden Dome's proponents and prospective contractors warrant heightened scrutiny to ensure taxpayer dollars are not squandered for private gain.

Not pursuing Golden Dome as a defense against peer or near-peer nuclear threats does not mean abandoning missile defense altogether, nor does it mean abandoning other efforts to address the unacceptable dangers posed by nuclear weapons. Unlike missile defense systems, arms control agreements have a proven record of reducing nuclear risk—and they do so at far lower cost.

Golden Dome promises something all of us want: freedom from the fear of nuclear weapons. It appeals to our hopes for security and our faith in technological ingenuity. But a sober assessment of its costs, feasibility, and incentives reveals how hollow that promise is. Worse, pursuing Golden Dome risks making the United States less safe by expanding the nuclear and space-based threats it faces.

If policymakers pursue the folly of Golden Dome, robust testing requirements containing clear performance benchmarks with triggers and off-ramps are necessary to mitigate the waste of taxpayer dollars on unworkable missile defense systems.

Recommendations

- **Congress should implement testing requirements that mandate realistic testing conditions for all missile defense systems.**

  Taxpayers should not pay for missile defense systems that have not been proven to work. At a minimum, testing should use threat-representative targets, incorporate complex countermeasures, and include unannounced target launches. Congress should require independent testing rather than allowing the Missile Defense Agency to test its own systems, fully fund and staff the Office of the Director of Operational Test and Evaluation (DOT&E), and require DOT&E to evaluate all major Golden Dome systems.

- **Congress should require missile defense systems to meet specific performance benchmarks before funding their deployment.**

  New missile defense systems, as well as upgrades to existing ones, should meet defined performance benchmarks before Congress appropriates funds to deploy them. Congress should also establish performance benchmarks for existing systems that may be tasked with defending against intercontinental-range missile threats under Golden Dome and require those benchmarks be met prior to appropriating additional funding.

- **Congress should withhold additional funding for Golden Dome until it has received and reviewed the program's architecture.**

  As requirements included in the FY2026 National Defense Authorization Act (NDAA) made clear, Congress has not yet received a comprehensive system architecture for Golden Dome. Despite this, Congress approved over $24 billion for the program in the One Big Beautiful Bill Act.

Congress should oppose additional funding until it receives the architecture report and briefing required under Section 1652 of the FY2026 NDAA, and should require that an unclassified version be made public.

- **Congress should request an updated cost analysis from the Congressional Budget Office (CBO) based on Golden Dome's architecture.**

  In May 2025, CBO analyzed the potential costs of space-based interceptors designed to counter a limited North Korean threat using outdated assumptions. Congress should request a follow-up analysis that evaluates the potential costs of Golden Dome based on its architecture.

- **Congress should request a Government Accountability Office (GAO) assessment of Golden Dome's feasibility.**

  Although the FY2026 NDAA conditions certain funding on the completion of a long-delayed Institute for Defense Analysis report, the Pentagon has failed to deliver that analysis in a timely manner. Congress should therefore direct GAO to independently assess the feasibility of Golden Dome systems, including space-based interceptors, as a defense against strategic nuclear weapons.

- **Congress should continue investigating potential conflicts of interest associated with Golden Dome.**

  Lawmakers have already asked the Pentagon's Office of Inspector General to investigate potential conflicts of interest. Congress should continue pressing this inquiry and pursue additional oversight measures to identify and address potential conflicts of interest.

- **Congress and the Trump Administration should pursue verifiable arms control agreements.**

  Strategic missile defense has not demonstrated an ability to neutralize the nuclear threat. Arms control agreements, by contrast, have a proven record of strengthening national security by placing verifiable limits on nuclear arsenals and may help prevent the weaponization of space. Congress should actively support these efforts.

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