BUILD YOUR OWN GOLDEN DOME

A FRAMEWORK FOR UNDERSTANDING COSTS, CHOICES, AND TRADEOFFS

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Unanswered Questions

- Set aside for the moment other important questions:
  - Is it technically feasible?
  - Is it strategically destabilizing?
  - Will it lead to an arms race in space?
  - Is it politically sustainable?
- **How much will Golden Dome cost?**
- Cost is important due to the vast dollar amounts involved, and it is highly sensitive to many factors still in flux.
- It will not be a single weapon system but a complex and layered "system of systems" that integrates many existing and future capabilities.

As long as its requirements remain undefined, Golden Dome can cost as much or as little as policymakers are willing to spend.

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Key Design Choices Affecting Cost

Threats

- Small drones
- Aircraft and cruise missiles
- Short- to intermediate-range ballistic missiles
- Hypersonic weapons
- Long-range ballistic missiles and FOBS

Coverage

- Major military installations, ports, and infrastructure
- Major population centers
- All of the United States (50 states + territories)
- Forward deployed forces

Capacity

- Small drones can attack in swarms of hundreds or thousands
- DIA projects that China and Russia will have a combined force of 16,000 missiles by 2035
- Overall capacity matters for overall threats, but local capacity determines local effectiveness

Resilience

- Degrade gracefully under attack
- Protect against electronic warfare, cyber attacks, and salvo attacks
- Defend key BMC3 nodes, such as sensors, communication links, & data processing centers

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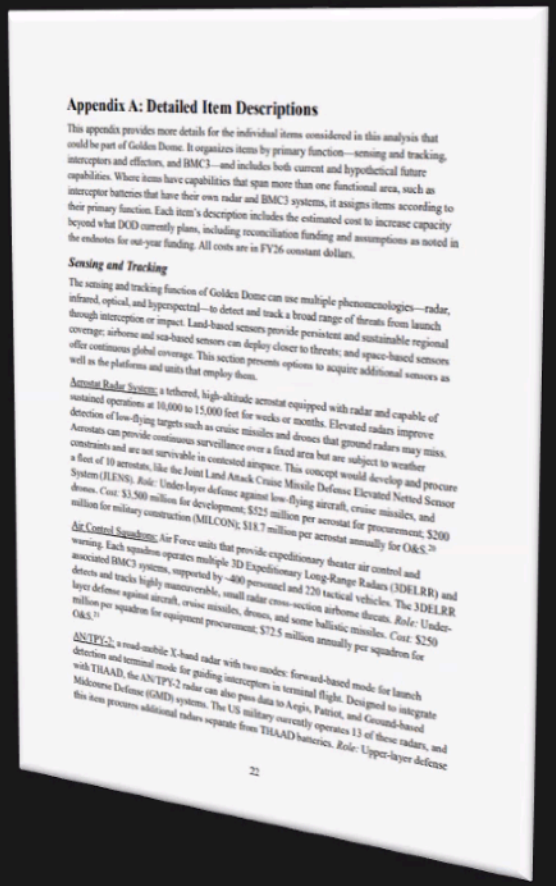
Bottom-up Approach

- Estimate the costs of the individual components that could be part of Golden Dome, including:
  - Sensing and tracking systems, interceptors and effectors, and battle management, command, control, and communications (BMC3)
  - Current, planned, and hypothetical future systems
  - Development, procurement, personnel, and operating costs.
- Assemble these components in various combinations and quantities to estimate the cost and capabilities of different architectures.
- Make the data publicly available so anyone can build their own architecture—and check my work!



Appendix A: Detailed Item Descriptions

This appendix provides more details for the individual items considered in this analysis that could be part of Golden Dome. It organizes items by primary function—sensing and tracking, interceptors and effectors, and BMC3—and includes both current and hypothetical future capabilities. Where items have capabilities that span more than one functional area, such as interceptor batteries that have their own radar and BMC3 systems, it assigns items according to their primary function. Each item's description includes the estimated cost to increase capacity beyond what DOD currently plans, including reconciliation funding and assumptions as noted in the endnotes for out-year funding. All costs are in FY26 constant dollars.

Sensing and Tracking

The sensing and tracking function of Golden Dome can use multiple phenomenologies—radar, infrared, optical, and hyperspectral—to detect and track a broad range of threats from launch through interception or impact. Land-based sensors provide persistent and sustainable regional coverage; airborne and sea-based sensors can deploy closer to threats; and space-based sensors offer continuous global coverage. This section presents options to acquire additional sensors as well as the platforms and units that employ them.

Aerostat Radar System: a tethered, high-altitude aerostat equipped with radar and capable of sustained operations at 10,000 to 15,000 feet for weeks or months. Elevated radars improve detection of low-flying targets such as cruise missiles and drones that ground radars may miss. Aerostats can provide continuous surveillance over a fixed area but are subject to weather constraints and are not survivable in contested airspace. This concept would develop and procure a fleet of 10 aerostats, like the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS). *Role:* Under-layer defense against low-flying aircraft, cruise missiles, and drones. *Cost:* $3,500 million for development; $525 million per aerostat for procurement; $200 million for military construction (MILCON); $18.7 million per aerostat annually for O&S.[20]

Air Control Squadron: Air Force units that provide expeditionary theater air control and warning. Each squadron operates multiple 3D Expeditionary Long-Range Radars (3DELRR) and associated BMC3 systems, supported by ~400 personnel and 220 tactical vehicles. The 3DELRR detects and tracks highly maneuverable, small radar cross-section airborne threats. *Role:* Under-layer defense against aircraft, cruise missiles, drones, and some ballistic missiles. *Cost:* $250 million per squadron for equipment procurement; $72.5 million annually per squadron for O&S.[21]

AN/TPY-2: a road-mobile X-band radar with two modes: forward-based mode for launch detection and terminal mode for guiding interceptors in terminal flight. Designed to integrate with THAAD, the AN/TPY-2 radar can also pass data to Aegis, Patriot, and Ground-based Midcourse Defense (GMD) systems. The US military currently operates 13 of these radars, and this item procures additional radars separate from THAAD batteries. *Role:* Upper-layer defense

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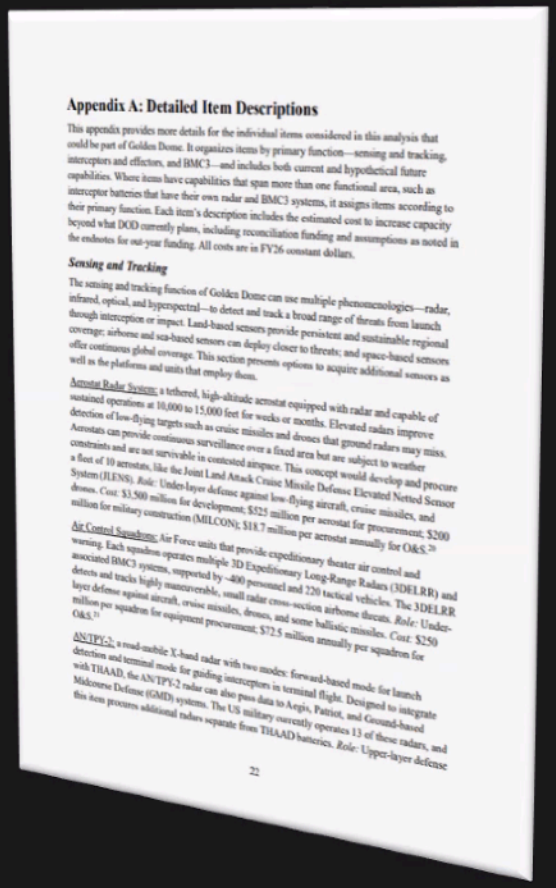

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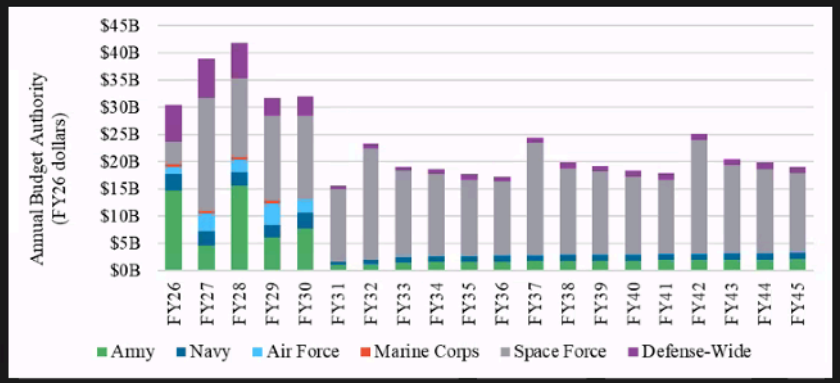
Limited Objectives

Architecture 1: Accelerated Homeland Defense

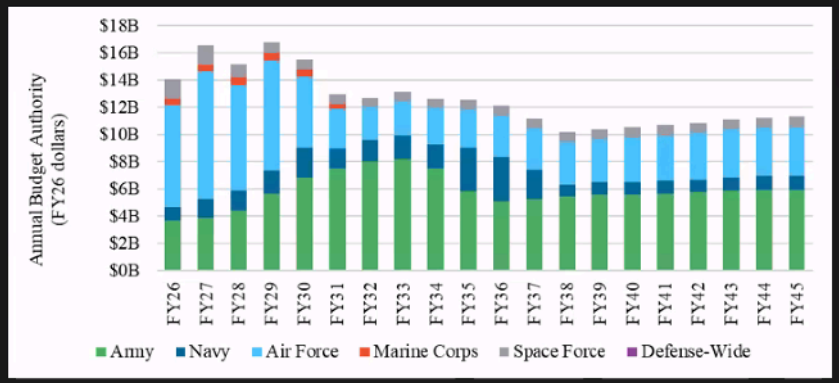
- Focuses on moving fast and staying below a cost cap:
  - "...fully operational before the end of my term."
  - "...we're talking about $175 billion, total cost of this when it's completed."
- Prioritizes capabilities that can show progress within the next three to five years
- Remains within the $175 billion funding limit over the first five years



Cost Over 20 Years: $471B (in FY26$)

Architecture 4: Limited Tactical Defense

- Prioritizes defending against large swarms of drones, aircraft, and cruise missiles
- Protects major population centers, military installations, ports, and other strategic infrastructure
- Provides some coverage of the continental United States

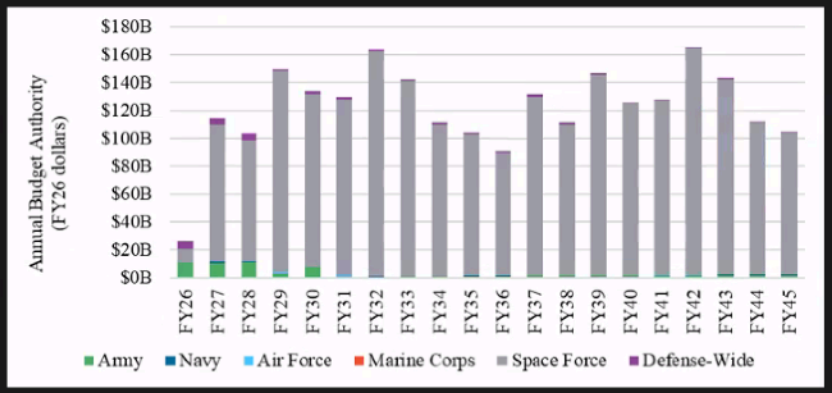


Cost Over 20 Years: $252B (in FY26$)

Strategic Objectives

Architecture 2: Space-centric Strategic Defense

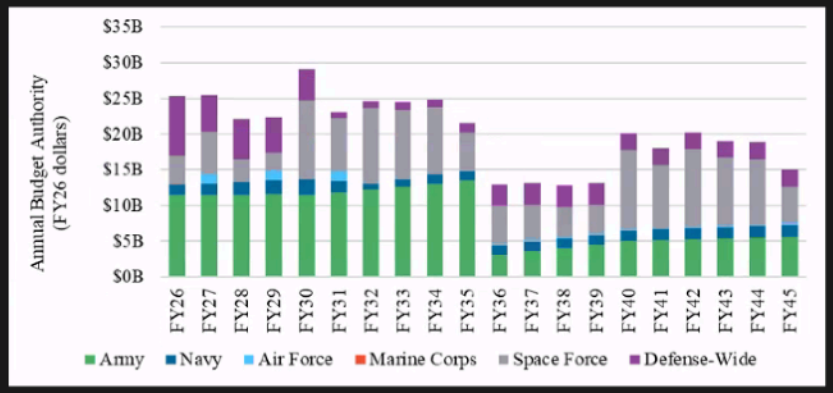
- Relies primarily on space-based systems
- Focuses on defending against strategic threats to the homeland: ICBMS, FOBS, and hypersonic weapons
- Intercepts missiles using a multi-layer defense in the boost, midcourse, glide, and terminal phases of flight



Cost Over 20 Years: $2.4T (in FY26$)

Architecture 3: Ground-centric Strategic Defense

- Relies primarily on ground-based systems
- Focuses on defending against strategic threats to the homeland: ICBMS, FOBS, and hypersonic weapons
- Intercepts missiles using a multi-layer defense in the midcourse and terminal phases of flight

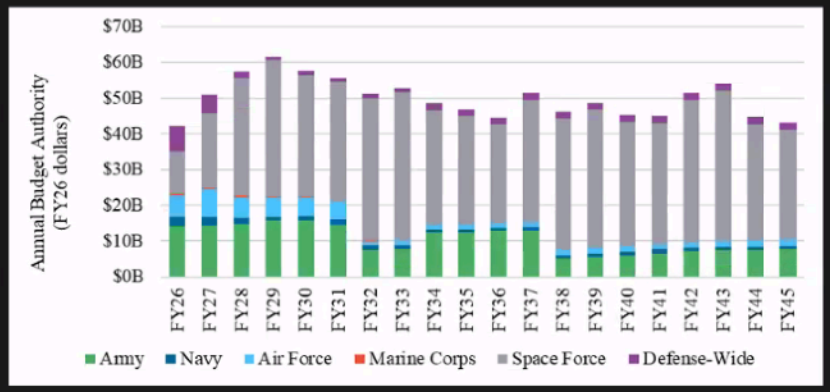


Cost Over 20 Years: $406B (in FY26$)

Broad Objectives

Architecture 5: Balanced All-Threat Defense

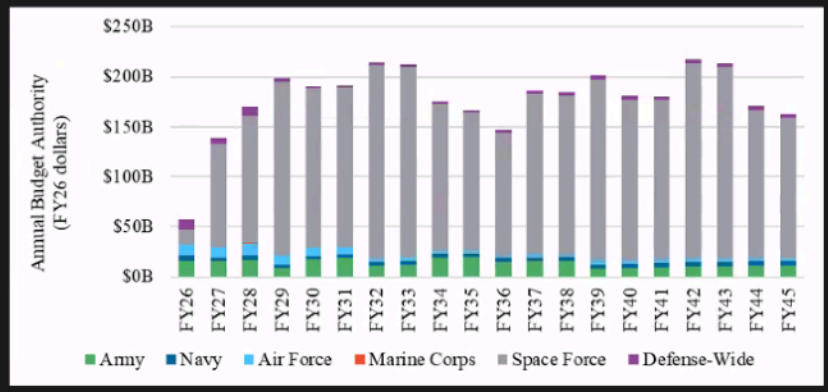
- Provides a moderate level of protection against all aerial threats
- Uses a balanced approach, allocating investments across under-, upper-, and over-layer capabilities
- Stays within a $1 trillion over 20 years (FY26 dollars).



Cost Over 20 Years: $1.0T (in FY26$)

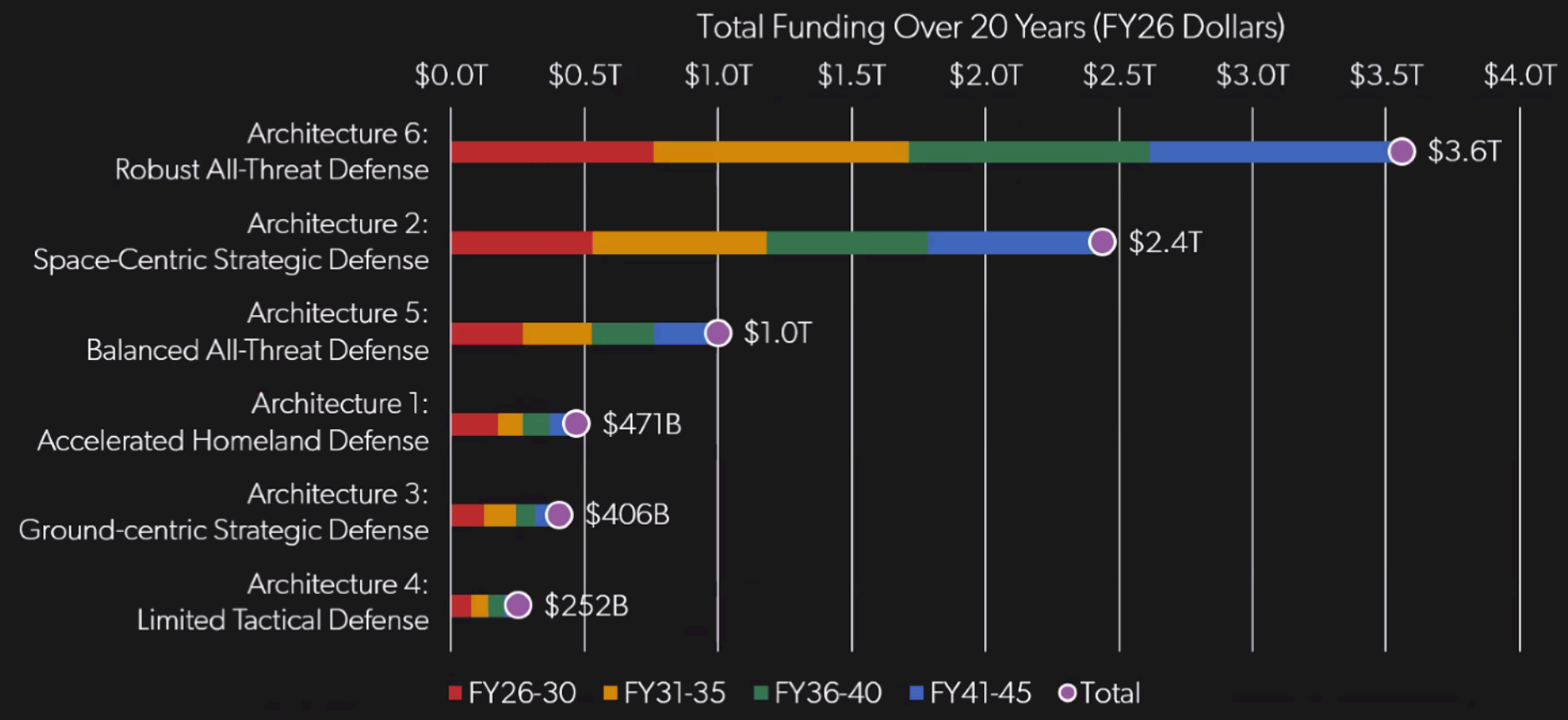
Architecture 6: Robust All-Threat Defense

- Provides a robust level of protection against all aerial threats
- Uses a balanced approach, allocating investments across under-, upper-, and over-layer capabilities
- Stays below 25% of current defense budget each year



Cost Over 20 Years: $3.6T (in FY26$)

Comparison



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Conclusions

- Small changes in objectives can produce outsized changes in cost.
- Space-based interceptors are (by far!) the largest cost driver.
- Trump's cost, schedule, and performance statements do not align:
  - "...forever ending the missile threat to the American homeland and the success rate is very close to 100 percent."
  - "...fully operational before the end of my term..."
  - "...we're talking about $175 billion, total cost of this when it's completed."

Golden Dome's cost ultimately depends on which risks leaders are willing to mitigate, which they are willing to trade, and which they are prepared to accept.

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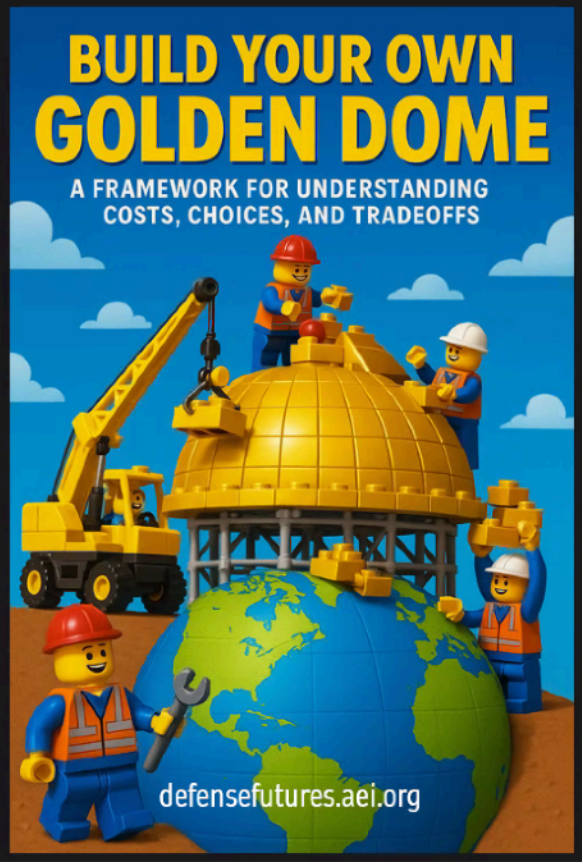
Try It Yourself!



Use AEI's Defense Futures Simulator to build your own Golden Dome architecture:

1. Go to https://defensefutures.aei.org/ and sign up for an account.
2. Log in and click "Scenarios" on the left navigation pane.
3. Click the "Create" button in the upper right, give your scenario a name, and select "Build Your Own Golden Dome" as the baseline.
4. Click the "Item Selection" tab near the top to explore all available options and manually build your architecture.
5. Or you can click on the "Strategic Assistant" tab to have the system automatically create an architecture for you based on your strategic priorities and budget constraints.

Tutorial Video: https://www.youtube.com/watch?v=IDU2-AKtMu4