

The Need for an Integrated Strategic Deterrence Strategy

Golden Dome for America
(GDA) Limitations as a
Call for a New Strategic
Deterrence Plan

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Deterrence in the 21st Century

Highlighted are three important factors in determining what a national strategic deterrence program should include.

- The effectiveness of the GDA system (Return on Investment – ROI), the role of defense in integrated deterrence, and what attacks most likely need deterred.
- Alternative approaches to reducing the risk of missile strikes (Trade Space) that may include enhanced verification and disarmament.
- How to develop a deterrence capability that utilizes all aspects of national power across the entire spectrum of engagement (grey to nuclear).

Foundations of a New National Deterrence Approach

The U.S. has stated the need for an integrated strategic deterrence that incorporates all aspects of national power in various strategies but has not created an implementation plan or central authority to ensure deterrence efforts are integrated across the many agencies and departments. A formal, structured, and permanent planning effort that synchronizes actions and assesses progress in the areas of military power, arms control diplomacy, and creating a more informed and resilient society is needed.

The foundations for 21st Century deterrence strategy may evolve through a national dialogue, but a starting point is to understand the difference in modern defense and deterrence, evaluate the most effective way to apply arms reduction efforts, and what are truly the layers of national power that we have at our disposal – and how should we protect them.

Defense vs. Deterrence

At the low-end cost estimate, the U.S. will spend roughly \$70B on GDA per potential missile destroyed, and the costs are certain to grow. The system will likely have a 50-60% kill success rate against ICBMs and will require 12-20 layered interceptor fields to protect most of the U.S at an annual O&M cost of about \$10 B. The cost to physically establish those interceptor fields is not included. GDA may be only part of a comprehensive deterrence strategy.

Evaluate Arms Reduction

Historically, bilateral treaty verification and monitoring costs range from \$50-100+ million annually including; inspections, satellite imagery, field verification, and intelligence analysis. Enhanced satellite collection may also aid early launch detection. Low-end GDA program costs would fund verification for 20,000 years, or multiple agencies for 1-10 years of operations – although arms reduction programs alone are likely insufficient.

Layer National Power

If all aspects of national power are incorporated, the U.S. might create a new diplomatic effort to manage or reduce proliferation, build in national resilience, improve and upgrade current anti-ballistic missile defensive existing systems in the U.S. (which may include some of GDA), and create less traditional and detectable delivery platforms while improving space-base collection. This may also require greater engagement with partners for forward deployment of interceptors.

21st Century Strategic Power Beyond Golden Dome

The current Golden Dome for America program may resonate with the public and appear to provide protection, but it is likely to fall short of having the strategic effect needed for the next half century. Multi-faceted strategic deterrence works.

The question we should be asking then is twofold; given the likely path of adversarial capabilities is GDA sufficient, and if not, what might a more effective deterrence program look like?

Rethink Deterrence

Blueprint for Strategic Deterrence in the United States

Conducting a nuclear war or surviving an attack is not an option, no one wins. Communicate that defense programs can only offer some deterrence, resilience, reduction of loss of life.

Focus major expenditures on to hard-to-find platforms like:

- SSBNs, U3 systems (unconventional, unmanned, unexpected), improve and harden ICBM forces
- Deploy ground-based interceptors inside the Weapon Engagement Zone (WEZ)
- Enhanced C3 and space capability for improved warning and crisis response.
- Make that doctrine clear and try to prevent any further arms races. Technical (possibly AI or quantum) and diplomatic ways to reduce the risk from accidental or miscalculated launches.

Engage Broadly

Engage with allies, adversaries, and the American public about what we can realistically counter in missile attack on the United States. Harden what matters; energy, communications, logistics and supplies, key facilities, and create a realistic continuity of government/society plan. Integrate these with continually monitoring and assessing emerging risks and threats from non-peer nations' missile/nuclear programs.

Invest money and time into improved verification, early warning, and limitations on delivery systems and warheads. Access and negotiated controls are cheap compared to GDA.

Empower Society

Buy into a better America by funding programs that improve society's daily security, up to 450K die each year from deficient societal investment in the U.S. Trade space funds multiple agencies a year that provide health, food security, etc.

Focus on economic power the U.S. can wield without being so punitive it creates aggressive & retaliatory actions from emerging nuclear powers. Stable money, investment, and trade policies make the U.S. a preferred partner and raise living standards.

Win the information war on strategic deterrence and strike at home (here's what we can realistically do) and globally by setting a course for responsible caps; leveraging the physics, economics, and alliances for deterrence; push for and end to nuclear arms races.

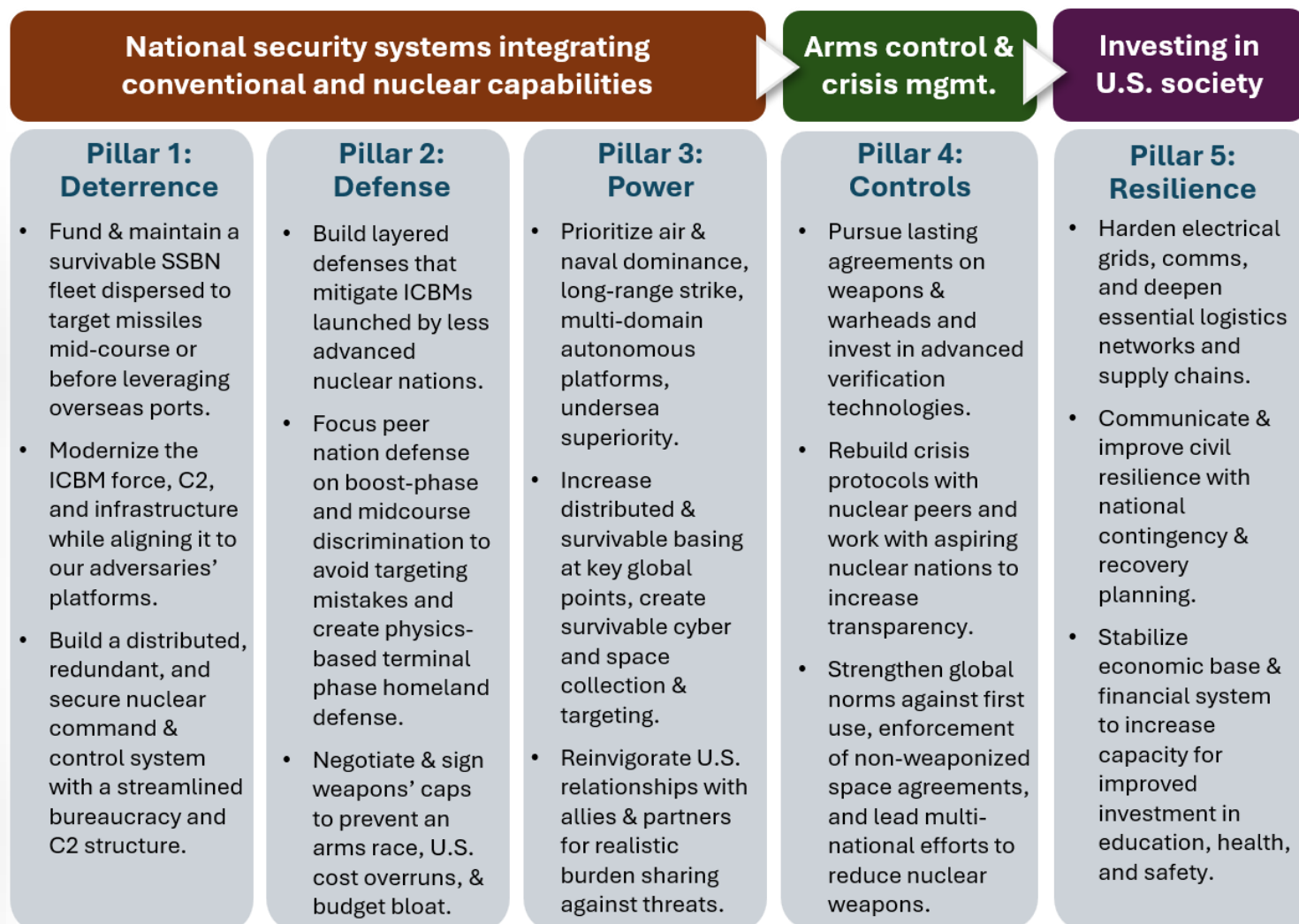
GDA as a Component of an Expanded Deterrence Program

A National Strategic Deterrence Plan that integrates and provides implementation planning could provide more resilience, tailored responses to future threats, and even reduce the likelihood of a nuclear attack on the United States.

Historically, the U.S. has included deterrence within the National Security Strategy and National Defense Strategy. Should a national commission develop a singular deterrence strategy, plan, and oversight body?

Pillars of a National Strategic Deterrence Plan – Draft Proposal

The previous blueprint for deterrence offers a vision of bolstering and leveraging a broader set of U.S. actions and capabilities. However, to peel that back and get to actionable steps will take government-wide discourse on 21st Century deterrence, efficiencies, and trade-offs. As a first step and strawman the Pillars 1-5 offer potential objectives in defense, counterproliferation, and societal resilience.



GDA: Critical Review or Its Integrated Deterrence Value

A first step should be a national review of Golden Dome for America to explore the large expenditure for GDA in relationship to a renewed and reimagined national dialogue on strategic deterrence in the 21st Century.

If the conclusion is that Golden Dome may not offer a return on investment that ensures security from the most likely sources of catastrophic attack, what deterrence program might?

Examining GDA Starts with a Basic Question

What is the realistic assessment of GDA’s ability to preserve counterforce capabilities and minimize the costs and impact of a countervalue strike by peer adversaries?

Testing GDA Value Add

Our nearest military competitors take a more integrated approach to deterrence, encompassing about two thirds for the intersecting spheres. If GDA only covers part of their attack surface, then which nations does it truly defend against?

Current Russia Deterrence Emphasis

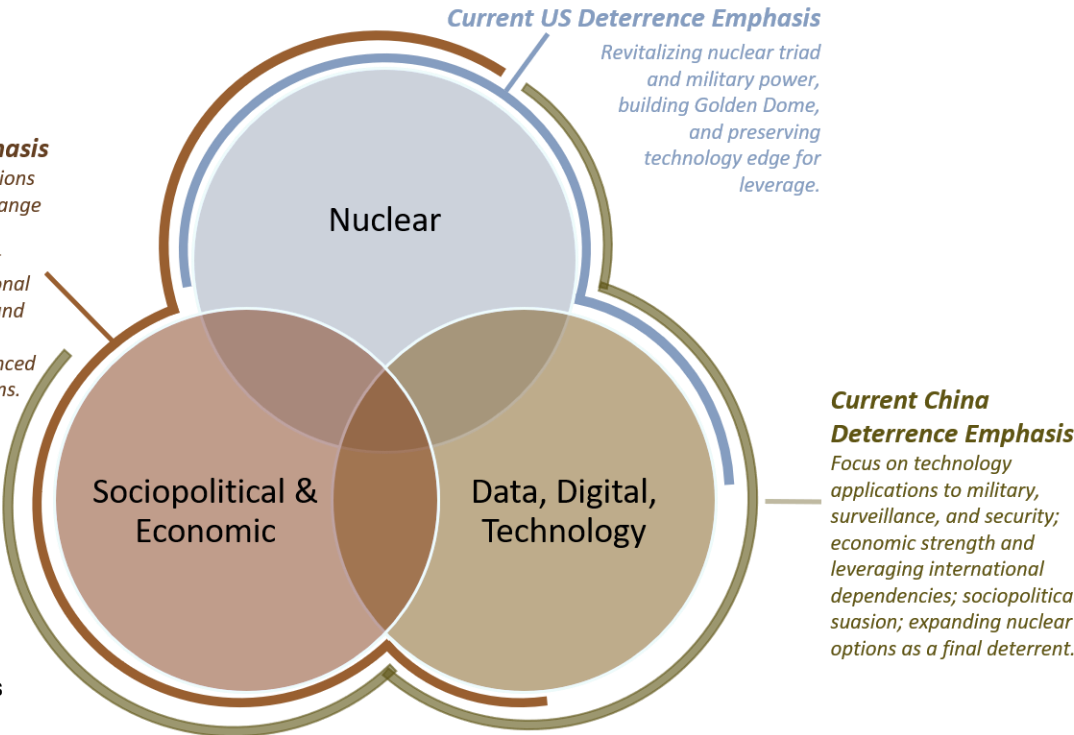
Manipulating populations and perceptions to change decision context; maintaining Cold War nuclear and conventional military capabilities; and improving tactical advantage with advanced and unmanned systems.

Current US Deterrence Emphasis

Revitalizing nuclear triad and military power, building Golden Dome, and preserving technology edge for leverage.

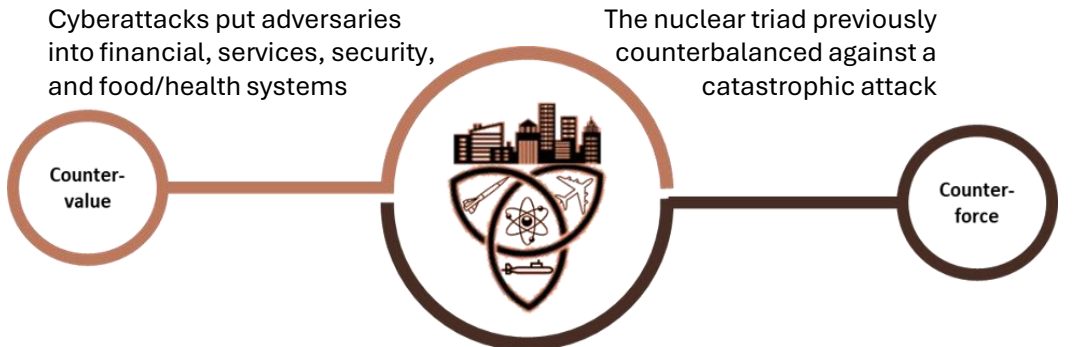
Current China Deterrence Emphasis

Focus on technology applications to military, surveillance, and security; economic strength and leveraging international dependencies; sociopolitical suasion; expanding nuclear options as a final deterrent.



Counterforce vs. Counter-value

Counterforce focuses on retaliatory attacks on an opponent’s military forces to prevent a second-strike. Being able to preserve a sufficient second-strike nuclear weapons program became essential to maintaining a credible strategic stalemate during Cold War. Counter-value focuses on destroying a nation’s critical infrastructure, supply lines, and services. It may concentrate on targeting very-large urban areas, where a dependent population quickly feels the damaging effects. The effect may equal a nuclear strike on a large city, just takes longer to play out.



How Golden Dome is Portrayed

Golden Dome for America is an integrated system of systems that will protect our homeland from a wide range of global missile threats.

It integrates air, land, sea, and space-based defense assets into a unified network to protect American cities, nuclear command centers, missiles, military facilities, and critical infrastructure.

Realistic Outcomes: Golden Dome for America

- **GDA creates a cost asymmetry for our adversaries.** A decoy can cost hundreds of thousands and a real missile millions, while current estimates for a U.S. interceptor is tens of millions and a full interceptor field could cost billions. Some estimates set this security dissymmetry as GDA costing 70 times the cost of each missile it destroys, perhaps more if a space-based defensive system is included.
- **GDA will be marginally effective.** Adversaries can saturate and overwhelm the more limited number of U.S. interceptors, deceive with decoys to simulate real missiles with real warheads, develop faster and more agile missiles or stealthier delivery platforms that collapse the U.S. response time, which is already less than two minutes. There is a limited strike window to intercept a ballistic missile mid-course, mostly outside the lower 48 states, requiring ground-based and space-based interceptor integration within the Weapon Engagement Zone.
- **Investment Trade-space Questionable.** The U.S. will spend billions per potential missile destroyed, and the costs may grow by 100-200% over 20 years. The system will likely have a 50-60% kill success rate to protect most of the U.S. it will cost about \$10-20 billion annually beyond a \$1.9-3.5T initial build cost for GDA. The system will not protect against advanced nations' weapons, like China and Russia, and is possibly less cost-effective than a 21st Century deterrence model of verification, strike platforms, and resilience.

Comparing Projected Force-on-Force with a China-level Foe

China's strategic strike forces in the 2040s will marginalize GDA. The U.S. system as proposed will likely be overwhelmed by any nation with a similar capability, and this does not include program reductions due to cost overruns, loss of political support, or extensive delays.

GDA becomes a hedging bet against a nation with limited ballistic missiles or advanced delivery platforms. In other words, a nuclear-capable, rogue nation within ICBM striking distance of the United States.

Type of Delivery	China 2040 Strategic Strike Force	Global Dome for America (notional)	Net effect
Nuclear delivery	Large, diversified triad (ICBMs, SLBMs, bombers)	Limited homeland interceptors, layered sensors	China can saturate; GDA can only attrit
Conventional missiles	Massive IRBM/MRBM + LACM inventory, high accuracy	Some regional/theater defense, limited homeland coverage	Bases and C2 still heavily at risk
Hypersonic/boost-glide	Mature DF-17 family + follow-ons, designed to stress defenses	Partial tracking, few tailored interceptors	Penetration likely, especially early in conflict
Counterspace/cyber/EW	Explicit focus on blinding U.S. ISR and missile defense	Heavy dependence on space and networks	First blows may fall on Dome's "eyes and nerves"
Cost-exchange	Cheaper additional missiles	Very expensive additional interceptors and sensors	Offense gets more shots per dollar than defense gets kills

Note: At the open-source level, China is estimated to currently have at least 550 ICBMs and more strategic hypersonic vehicles that GDA is relatively ineffective against. China may have 600+ nuclear warheads. The current cost structure for GDA creates a complete multi-layered defense over 10-12 interceptor sites.

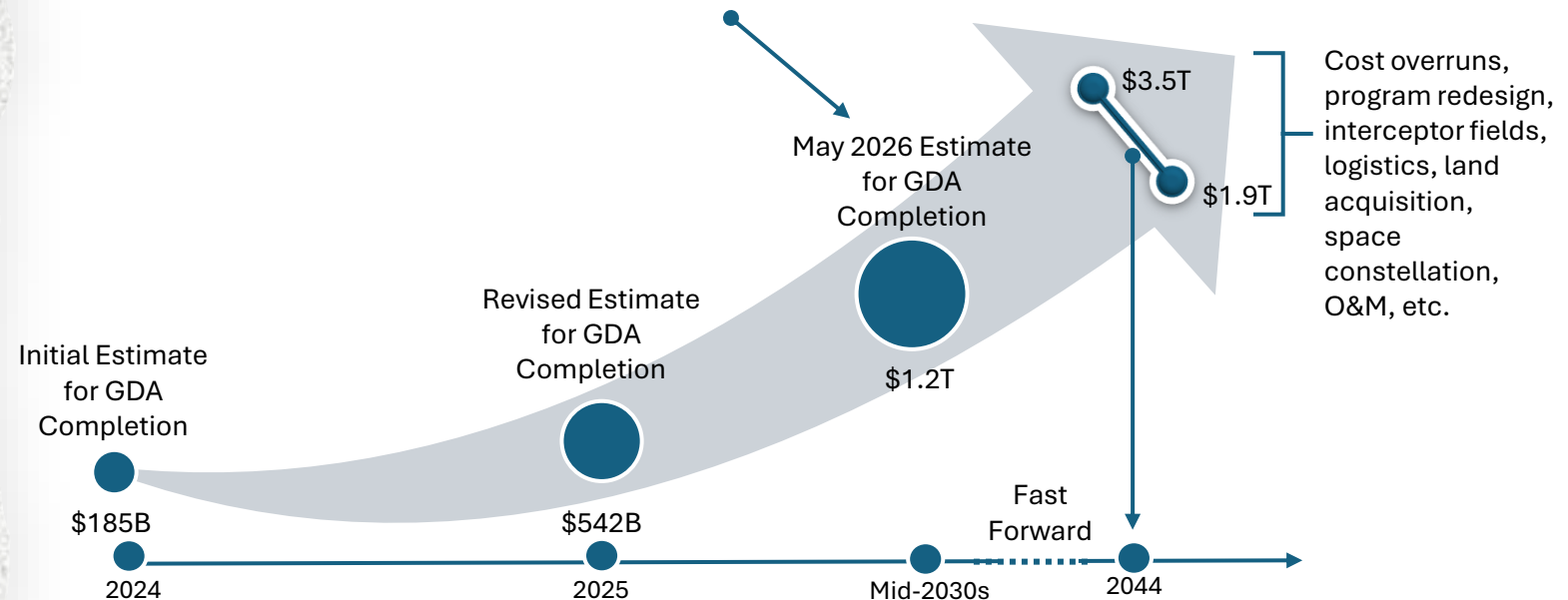
The Potential Economic Costs

Currently, total GDA costs are estimated to be \$1.2 trillion over the next 20 years. The actual cost may be more if the required basic research and development in the individual military services and refocusing the defense industrial base are factored in.

Escalating Costs Will Impact the Trade Space

An important factor in determining what deterrence should look like in the 21st Century is the cost for GDA and what it may potential crowd out because the U.S. cannot afford to invest in other aspects of a multi-faceted, national strategic deterrence strategy. This figure illustrates the potential for rising costs to design, develop, test, and field the core system through roughly the early to mid 2030s, including:

- RDT&E for space-based sensing and tracking, battle management, and networking
- Initial procurement and integration of space and ground sensors, command and control, and interceptor systems
- Supporting infrastructure and data transport layers needed to make the shield operational



Potential Interceptor Gaps in Golden Dome

Developing a homeland defense interceptor system may face significant challenges at the system level that could also add years and costs to initial and fully capable operations.

Many of these challenges, or operational gaps, will not surface until advanced testing or initial fielding stages. This could effectively reset the program due to new contracts, redesigns, and tests.

Seeker and guidance limitations may challenge target discrimination

- Hit-to-kill seekers must distinguish real warheads from decoys, debris, and chaff in cluttered scenes; small algorithmic errors show up only in late, realistic tests.
- Tiny timing or inertial errors at long range translate into big miss distances, especially against maneuvering targets.

Interceptor integration and reliability across multiple designs

- Booster, kill vehicle, seeker, divert system, and data-link all must work perfectly together; integration bugs often appear only in full-up flight tests.
- You need many successful shots across varied conditions to claim credible reliability; that takes years of expensive testing.

Interceptor survivability and adversaries' counter-interceptor options

- Interceptors for high-speed or exo-atmospheric engagements face brutal thermal loads; material or design margins that look fine in analysis can fail in real trajectories.
- Adversaries watching Golden Dome development may counter U.S. interceptors, e.g., overwhelm, out-maneuver, confuse with decoys/electronic warfare/cyber, blind satellites, and boost speed.

Sensor–interceptor timing and data-link

- Interceptors depend on external sensors (space, radar, OTH). Latency, dropped messages, or mis-correlated tracks can cause clean misses even when the interceptor “works.”
- If midcourse updates are late or inconsistent, the interceptor may chase a stale track.

Test campaign realism vs. schedule pressure

- Early “successes” are often against cooperative targets; when more realistic tests are finally run, failure rates spike and trigger redesigns that cause IOC delays and cost overruns.
- Producing interceptors before testing is mature (to “save time”) leads to retrofit waves, cost spikes, and schedule slips.

Industrial base and supply chain fragility

- Advanced seekers, divert thrusters, and radiation-hardened electronics rely on narrow suppliers; any disruption can stall the entire line.

Major Hurdles to Overcome

Determining a realistic timeline for a credible, multi-layer (boost, midcourse, and terminal incoming missile phases) homeland defense system requires estimating and forecasting the most important hurdles.

The current Initial Operating Capability (IOC) of 2028 is unlikely to be achieved, and every delay adds costs and provides time for adversarial adaptations that might degrade the system's operational effectiveness.

- **Sensor Array Fragility:** Key to Golden Dome success is maintaining a viable targeting window and any delay or problem could add minutes to initial detection and response that shrink interceptor windows to a point where they are ineffective. Fragility in the system might come from reduced access to radar sites or data, suboptimal satellite warning, and latency in data movement or misinterpretation.
- **Interceptor Maturity & Success Rates:** Previous defense missile systems often required IOC periods of 15-20 years and were less complex, systems of systems. This could push Golden Dome IOC as far out as the **2040s** instead of the next couple years. Success rates for scripted and controlled tests for interceptors can be as low as 50-60%, while mixed testing results could take 3-5 years to resolve.
- **Command and Control Fusion:** In a complex, joint system there are often latency problems for data between systems, conflicting tracking of targets, design and authority problems with Rules of Engagement for automated systems, and generally data bottlenecks between air, land, sea, and space data sharing. Resolving these could add 4 to 8 years to full operation capability.
- **Cost Overruns:** Historically, major military systems have experience cost growth over initial estimates of anywhere from 100-300% to IOC. Each time there is a major cost overrun there is the potential for delay, and those delays have further costs in new requirements, changes in production lines, and further testing that must be balanced against funding and political fatigue for the program.
- **Adversarial Adaptation:** Increasingly maneuverable warhead reentry vehicles, future advances in hypersonic glide vehicles, complex decoys, and adversarial programs to complicate collection of targeting data can make a Golden Dome system obsolete before being fielded. If the threat-to-capability is realized in time, it could force significant program redesigns across multiple contracts, components, and systems.

External Factors Worsen Timelines, Costs, and Efficacy

The external factors highlighted here are not certain, but their likelihood should be considered when weighing the cost/benefit of the program.

These factors may significantly affect the \$1.9 to 3.5 trillion price tag on the previous slide. The costs climb if:

- the U.S. is forced to replace Arctic coverage;
- must continuously adapt to adversaries;
- expand GDA to a system that attempts to cover the entire U.S.

Arctic Coverage Deterioration: Golden Dome is deeply dependent on Northern approach detection (sensing, basing, and data-sharing). Loss or further degradation of those relationships could push the program years to the right and increase the cost by \$40-100 billion. This might require or result in:

- New basing
- New sensors
- New C2 logic
- New doctrine
- New money
- New political fights

Unanticipated Adversary Adaptation: China, North Korea, and Russia have all taken the position that GDA will push them to develop enhanced defensive and offensive capabilities. We do not know what those might be, but we can assume they will have some impact on the efficacy of the system and drive redesign or restructuring of the currently planned GDA. It is likely they will adapt with faster and more agile missiles, complex decoys, and new ways to target ground and satellite collection and C2.

Politicization of Protected Areas: Decisions regarding what are high-priority areas for robust interceptor systems will spur debates on what cities, installations, or areas are essential to protect in an attack. Some components of GDA help everyone, some only protected sites.

- Space-based architectures (tracking, targeting, battle-space mgmt.) help everyone in the United States.
- Ground-based infrastructures will likely be more regionally focused (interceptor fields, mobile launchers, command and control nodes, supporting infrastructure).
 - May require land acquisition, impact studies, additional infrastructure build-out.
 - Will require operations and maintenance like personnel, interceptor reload storage, security.

Any significant loss of collection in the Arctic region could **add 6–12 years** of delay and **50–100% cost growth** to compensate.

Adversaries will likely focus on deception, missile speed, and saturation to shorten reaction time and overwhelm GDA. GDA will need to be more robust and continually upgraded.

Based on previously built U.S. sites, each:

- a. Interceptor field: \$5-10B
- b. Regional C2 & radar: \$1-3B
- c. Land acquisition and compliance: \$.5-2B
- d. Initial interceptor load and preparation, depending on number and type: \$2-6B

Cost per City: \$8.5-20B for initial build.

Cascading Delays May Compromise GDA Effectiveness

In a worst-case scenario, the system, as envisioned, costs too much and is constantly retooled due to improved adversary capabilities, loss of collection or strike access, and our own systemic problems.

The most likely scenario is that we have less than full coverage and continuous cost increases due to upgrades. This presents a very different challenge as hard decisions must be made over what is a priority to protect.

