



Committee on Armed Services
Subcommittee on Strategic Forces

TO RECEIVE AN UPDATE ON

GOLDEN DOME

Tuesday, September 29, 2026

Washington, D.C.

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5 U.S. Senate

6 Committee on Armed Services

7 Subcommittee on Strategic Forces

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10 The subcommittee met, pursuant to notice, at 4:00
11 p.m., in Room SR-222, Russell Senate Office Building, Hon.
12 Deb Fischer, chairman of the subcommittee, presiding.

13 Committee Members Present: Fischer, Rounds, King,
14 Reed, Kaine, and Kelly.

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1 OPENING STATEMENT OF HON. DEB FISCHER, U.S. SENATOR
2 FROM NEBRASKA

3 Senator Fischer: Good afternoon. The hearing will
4 come to order. I would like to welcome our witnesses who
5 are joining us to discuss outside perspectives on Golden
6 Dome for America.

7 Our homeland is not a sanctuary. Our adversaries are
8 developing and fielding long-range capabilities
9 specifically designed to challenge and evade the limited
10 defenses currently deployed. These include cruise
11 missiles, hypersonic weapons, and large drones, threats
12 that fall below the threshold of a full nuclear attack, yet
13 could still provide devastating damage to our ports,
14 critical infrastructure, and military installations.

15 We do not have an effective counter to these threats,
16 and we cannot afford to remain complacent. Our adversaries
17 must never believe that they can coerce us with the threat
18 of a limited conventional missile attack on our country,
19 which is why this Subcommittee has been clear for years on
20 a bipartisan basis that the United States needs a more
21 comprehensive integrated air and missile defense system.

22 This Administration has supercharged these efforts.
23 The Department is finally prioritizing homeland defense and
24 has requested the resources needed to rapidly develop and
25 field new systems, and has granted General Guetlein with

1 all of the authorities necessary to realize this vision as
2 direct reporting program manager for Golden Dome for
3 America. I greatly appreciate General Guetlein's close
4 communication with this Committee, and I am confident that
5 he is building out an architecture that will provide the
6 United States with much better coverage against a greater
7 variety of threats. He is committed to working with
8 industry to lower costs, explore innovative ideas, and
9 deliver capability as quickly as possible.

10 Golden Dome completed its first successful test in
11 June, and I look forward to hearing about future tests when
12 our Committee will be formally briefed in November. Most
13 of the details of the architecture are highly classified,
14 and rightly so. We do not want our adversaries to know the
15 exact contours of Golden Dome.

16 Unfortunately, keeping these details from the public
17 has led to irresponsible speculation, often based on false
18 assumptions about what Golden Dome will look like and what
19 it will cost the taxpayer. Mr. Mosier, I understand that
20 CBO's cost estimate released earlier this year was
21 underpinned by assumptions CBO made based solely on the
22 limited language from President Trump's executive order,
23 and it does not reflect any of General Guetlein's
24 subsequent decisions about the overall program
25 architecture, his engagements with industry to lower cost

1 per shot, or how he plans to sequence the introduction of
2 capability over time and leverage emerging technologies. I
3 look forward to continue engagements with CBO on more
4 informed analysis in the future.

5 However, there is plenty we can talk about in this
6 setting, and I look forward to hearing from the expert
7 witnesses here today about their views on what the
8 Department should prioritize in Golden Dome.

9 Senator King, do you have any remarks you would like
10 to give at this time?

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1 STATEMENT OF HON. ANGUS S. KING, JR., U.S. SENATOR
2 FROM MAINE

3 Senator King: Briefly, Madam Chair, thank you. This
4 is an important hearing and it is a difficult hearing. As
5 the Chairman alluded, a lot of the details by definition
6 are classified and must be so. I am sure our friends in
7 China and Russia are watching us at this very moment.

8 But on the other hand, this will be one of the most
9 expensive and largest projects ever undertaken by the
10 United States government, and therefore the American people
11 have a right to know how much of their money is going to go
12 for this purpose and what will be achieved, how this can
13 and should be effective, particularly given the evolution
14 of technology, of missiles, cruise missiles, space-based
15 weapons, all of the alternatives that are being developed
16 today.

17 So I look forward to the hearing and I hope that the
18 witnesses, we can talk generally about the concept, its
19 feasibility, and its potential cost of a protective shield
20 against missile and airborne attacks on the United States.

21 So I look forward to hearing from you, bearing in mind
22 that we have to be careful in terms of the specifics of
23 what we talk about. And frankly, I have not yet quite
24 figured out exactly where those lines are, but we will try
25 to be mindful of not alerting our potential adversaries of

1 exactly what it is that we are working on, on behalf of the
2 American people.

3 So with that, Madam Chair, we'll hear from our
4 witnesses.

5 Senator Fischer: Thank you, Senator King. Again,
6 welcome to our witnesses. Mr. Trachtenberg, you are a
7 senior scholar with the National Institute for Public
8 Policy. I appreciate you being here today, and you are
9 recognized for 5 minutes for your opening statement.

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1 STATEMENT OF THE HONORABLE DAVID J. TRACHTENBERG,
2 SENIOR SCHOLAR, NATIONAL INSTITUTE FOR PUBLIC POLICY

3 Mr. Trachtenberg: Thank you, Chairperson Fischer,
4 Ranking Member King, members of the Subcommittee. Thank
5 you for the invitation to testify today. I would ask that
6 my full statement, along with an occasional paper I wrote
7 on the topic, be submitted for the record.

8 Let me begin by expressing my condolences on the
9 passing of your former colleague, Senator Jon Kyl, who was
10 a tireless champion of defending the American people
11 against missile attack. His loss will be keenly felt.

12 Let me also note that I have no special insight into
13 the current architectural details of Golden Dome. The
14 Department's reticence to be more forthcoming is apparently
15 due to concern that additional details may provide
16 adversaries with information we prefer they not have,
17 highlighting the tension between the desire for
18 transparency and the need for operational security.

19 Nevertheless, I appreciate this Committee's need to
20 better understand what you are being asked to fund, and the
21 Administration must be willing to communicate the important
22 rationale for this presidential initiative at every
23 opportunity.

24 That said, I would like to focus on three issues.
25 First, does the strategic threat to the homeland justify

1 the Golden Dome effort? Second, what impediments exist
2 that may stifle its progress? And third, what should
3 Congress do to help overcome them?

4 First, I believe the risk of coercive threats from
5 adversaries with a variety of increasingly capable missile
6 systems is growing. This may complicate force planning,
7 discourage U.S. military action where the risk of enemy
8 responses may be considered too great, and have a chilling
9 effect on U.S. decision-making and freedom of action,
10 undermining longstanding U.S. extended deterrence policy.
11 An effective Golden Dome system can help mitigate these
12 concerns.

13 Second, I believe the most significant impediments to
14 Golden Dome's success reflect more political, bureaucratic,
15 and institutional biases rather than technological or
16 fiscal challenges. These include outdated Cold War
17 nostrums, bureaucratic opposition, a poor understanding of
18 deterrence issues, a belief that adversary nuclear threats
19 against the homeland are improbable, a culture of risk
20 avoidance, and the desire to spend resources on what are
21 perceived to be other more urgent priorities.

22 Ideologically based political opposition is rooted in
23 the Cold War notions that a more robust missile defense is
24 both unnecessary because deterrence is reliable and
25 destabilizing because it will spark an offensive arms race

1 as others seek to overwhelm the defense. Both notions are
2 seriously flawed.

3 Moreover, the argument that Golden Dome can never be
4 100 percent effective is also misleading as perfection is
5 not the objective. Heightening an adversary's uncertainty
6 that any attack would be successful strengthens deterrence,
7 and providing some protection against the possible failure
8 of deterrence is, in my view, the only morally acceptable
9 course of action for a government whose primary
10 constitutional duty is to protect the safety and security
11 of Americans. In light of growing missile threats, it is
12 time to abandon the outdated thinking that American
13 vulnerability to missile attack is stabilizing.

14 With respect to cost, speculative estimates are
15 fraught with uncertainty and based on assumptions and
16 variables that may not be valid or even known. Therefore,
17 allowing such estimates to drive policy decisions is
18 shortsighted and unwise.

19 There is also an unfortunate tendency to confuse cost
20 with value. I believe the value of Golden Dome, both as a
21 deterrent and a defense against the possible failure of
22 deterrence, is worth the cost. It is not that Golden Dome
23 is unaffordable, but rather the critics believe the fiscal
24 resources it requires would be better spent on other
25 priorities. And there is certainly a legitimate debate to

1 be had over spending priorities, but suggesting that
2 extreme cost estimates make Golden Dome unaffordable, I
3 believe is disingenuous.

4 Finally, how might the Congress help overcome these
5 impediments? First, Congress should reaffirm its support
6 for Golden Dome in the NDAA and codify as a matter of
7 policy that the United States shall be defended against all
8 types of missile threats of any range launched from any
9 location.

10 Second, Congress needs to work with the Administration
11 to make the promise of Golden Dome a reality. This
12 includes rejecting a business-as-usual approach to missile
13 defense and supporting efforts to accelerate the
14 acquisition of critical military capabilities, including
15 kinetic and non-kinetic space-based intercept systems to
16 stay ahead of the threat curve. History demonstrates that
17 technology challenges can be overcome if we are committed
18 to overcoming them and not prematurely dismissing them as
19 impossible.

20 Finally, Congress should commit to a regular long-term
21 appropriations funding stream that is not subject to the
22 vagaries of reconciliation bills, continuing resolutions,
23 or partisan politics. The defense of the American people
24 requires nothing less.

25 With these initial comments, I appreciate the

1 opportunity to offer my views to the Subcommittee and look
2 forward to your questions. Thank you.

3 [The prepared statement of Mr. Trachtenberg follows:]
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1 Senator Fischer: Thank you, Mr. Trachtenberg. Next
2 we have Dr. Karako, who is a Director of Missile Defense
3 Project at the Center for Strategic and International
4 Studies. Welcome, Doctor.

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1 STATEMENT OF THOMAS O. KARAKO, Ph.D., DIRECTOR OF THE
2 MISSILE DEFENSE PROJECT CENTER FOR STRATEGIC AND
3 INTERNATIONAL STUDIES

4 Mr. Karako: Well, Chairman Fischer, Ranking Member
5 King and distinguished members of the Subcommittee, thank
6 you for the invitation to be here today.

7 Missiles have become weapons of choice and missile
8 defenses have in turn become foundational to deterrence and
9 defense. We find ourselves at a moment of unprecedented
10 global demand for capabilities that have, for instance,
11 helped keep Ukraine sovereign. It is a little surprise the
12 Ukrainians have put a Patriot launcher on their currency.

13 Over the next few minutes, I would like to highlight a
14 handful of topics: communication, strategic stability,
15 cost, space-based interceptors, and the missile defense
16 enterprise.

17 First, communication. Despite being a flagship
18 priority for the White House, as both of you noted, Golden
19 Dome suffers from a serious lack of strategic messaging, an
20 explanation of what it is and what it is trying to do.
21 References to Golden Dome conjure up fanciful ideas and
22 memes. Critics and cheerleaders project onto it their
23 fears or fantasies, and political polarization does not
24 help.

25 So let me tell you what I think Golden Dome is quite

1 simply. It is about creating a limited but meaningful
2 measure of air and missile defense that enhances stability
3 and deterrence. Now, what do I mean by that? Well, the
4 Cold War idea of strategic attack was synonymous with big
5 nuclear attack on the homeland. Today, it comprehends much
6 more. With cyberattacks, drones, and missiles, there is
7 now the specter of non-nuclear strategic attack. If Guam
8 went away, if Offutt went away without the release of
9 radiation, it would still be a strategic event.

10 Weakness here is provocative. The absence of air and
11 missile defense invites crisis instability. Tempting an
12 adversary to try a disarming non-nuclear first strike is
13 not deterrence. It is an invitation to an adversary to see
14 what they can get away with short of a nuclear reprisal.

15 Now with apologies to Ronald Reagan, Golden Dome will
16 not make nuclear weapons impotent and obsolete, but
17 deterrence by denial does raise the threshold for attack.
18 That was the logic when the Biden administration began work
19 on the defense of Guam and cruise missile defense of the
20 homeland. Golden Dome extends that same logic. Russia and
21 China know this. They have sophisticated homeland air and
22 missile defenses for their homelands, but we refer to them
23 with boring names like anti-access and area denial.

24 Third, cost. And here again, insufficient
25 communication fuels misperception. Some estimates are an

1 order of magnitude greater than General Guetlein's publicly
2 stated budget of \$185 billion over 10 years. One of the
3 layers of Golden Dome referenced in public industry day
4 slides refers to pockets of limited area defense and NORAD
5 term of art. The word "limited" is literally right there
6 in the title.

7 Another reason cost estimates are off is, I think,
8 inattention to the art of the possible and even what public
9 information tells us. This is a home game, and home field
10 advantage translates to eased manning and ruggedization
11 requirements. A containerized FAD launcher plugged into
12 the power grid of your local military base has a lighter
13 footprint than a mobile battery bouncing around the desert.

14 A home game would also permit things like a mesh
15 network of sensors analogous to what Ukraine did with
16 acoustics. We could, for instance, integrate data feeds
17 from things like the FAA's air traffic control radars.

18 Next, space-based interceptors or SBIs. The
19 implications of space as a warfighting domain are still
20 beginning to sink in, but as with all other warfighting
21 domains, it will be home to the various warfighting
22 functions, including fires, space-to-space, space-to-
23 ground, and yes, space-to-boasting missile. The question
24 is not whether SBIs can work, but whether the constellation
25 can be scalable and affordable. Here, it is important to

1 be clear-eyed, open-minded, and imaginative.

2 Cheerleaders should stop ignoring physics and the
3 absentee ratio. This is a hard problem. Likewise, critics
4 should acknowledge improved feasibility and leave
5 intellectual baggage from the Cold War behind. It is not
6 the 1980s anymore. This cannot just be a repeat of
7 Brilliant Pebbles. Congress can push the Pentagon and
8 industry to innovate, solve, and get after those hard
9 problems that will meet those criteria of scalability and
10 affordability and consistent with the fundamentals of
11 warfighting functions to build capability that allows us to
12 mass fires from space and to partake of maneuver warfare.

13 New technologies and capabilities are available, more
14 innovative operational concepts can be devised. This is
15 America. I would urge objectivity and patience. Let these
16 experiments advance. Let's see what industry can deliver
17 and render judgment in a few years.

18 Finally, we should think about how to institutionalize
19 these efforts within the broader missile defense
20 enterprise. The DRPM construct is a temporary one. We
21 probably do not need more than one joint national missile
22 defense acquisition-centric organization for the
23 foreseeable future. It may make sense to merge GDA with
24 MDA into something else more fit for purpose. Ingredients
25 for success would include unity of effort, authorities,

1 high level access and control of resources.

2 And it is no secret that the Golden Dome name has
3 contributed to polarization, but there are probably ways to
4 get after that too. Congress could even rename it in the
5 future NDAA.

6 In closing, let me emphasize that it is the threat
7 that drives the need for Golden Dome and for deterrence by
8 denial. My written statement includes recommendations for
9 how to shape and improve these efforts. The most immediate
10 need, of course, however, is to appropriate funds for both
11 the munition acceleration ramp and this homeland defense
12 effort. All these efforts will stand or fall on 2027
13 funding.

14 Thank you and I look forward to your questions.

15 [The prepared statement of Mr. Karako follows:]

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1 Senator Fischer: Thank you, Doctor. I would remind
2 everyone that while President Trump has named Golden Dome,
3 the focus for this layered missile defense system came from
4 the Senate Armed Services Committee, and it was put into a
5 study put into effect in the fiscal year 2024 NDAA. So it
6 came from us. Thank you, Doctor.

7 Mr. Mosher, Director of National Security Analysis
8 with the CBO, Congressional Budget Office. Welcome, sir.

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1 STATEMENT OF DAVID E. MOSHER, DIRECTOR OF NATIONAL
2 SECURITY ANALYSIS, CONGRESSIONAL BUDGET OFFICE

3 Mr. Mosher: Thank you very much, Chairperson Fischer,
4 Ranking Member King and Senator Reed and the Committee.
5 Thank you for having us, the opportunity to talk about our
6 analysis of national missile defense. I would like to
7 submit my formal statement for the record and then just
8 emphasize a few points.

9 Just to be clear about our tasking, CBO was asked to
10 estimate the costs of implementing President Trump's
11 January 2025 executive order, the Iron Dome for America.
12 CBO has estimated the cost of a notional NMD architecture
13 based on the goals and capabilities outlined in that
14 executive order.

15 The Department of Defense, since the executive order
16 implementing it, has created an initiative now called the
17 Golden Dome for America. It is that sort of term that we
18 all use now. It is still being developed, and the details
19 about what they will develop and when they will deploy it,
20 as people have talked about here, the objective
21 architecture, has not been publicly released. So we did
22 not estimate the cost of that system at all.

23 CBO estimates that a system that is consistent with
24 the executive order would cost about \$1.2 trillion to build
25 and operate over 20 years, and these numbers are all in

1 2026 dollars. That estimate includes \$740 billion for a
2 boost phase space-based interceptor layer, \$270 billion for
3 multiple layers of ground-based defenses as called for in
4 the executive order, and \$180 billion for other activities,
5 including deploying a sensor system and conducting research
6 and development. The Golden Dome's price has been
7 mentioned that they have announced a cost target of \$185
8 billion, which as people have raised is very different than
9 our number.

10 Let me talk briefly about the executive order. It
11 marks a real change in U.S. missile defense policy, as some
12 of my co-panelists have mentioned. It is more in common
13 really with Reagan's strategic defense initiative than
14 recent policy. Recent policy is largely focused on
15 defending against small numbers of missiles coming from
16 small countries like North Korea with limited
17 countermeasures, and the system we have in Alaska sort of
18 reflects that focus.

19 But Golden Dome in the executive order calls to
20 protect the entire United States, its critical
21 infrastructure, and its population from all air missile
22 attacks from any country, including Russia and China. That
23 could amount to hundreds of ICBMs if it is a large attack,
24 thousands or more nuclear warheads that they may carry,
25 hundreds of hypersonic weapons. It could be cruise

1 missiles or other aerial threats and conventional as well
2 as nuclear attacks. So it is a whole range of threats that
3 we have been talking about here.

4 To arrive at our estimate, CBO analyzed this notional
5 system. It is a multi-layered system consistent with the
6 executive order. To counter missile threats, it includes
7 several layers of ground-based systems and a layer of boost
8 phase interceptors based in space, all of which were
9 specified in the executive order. To counter hypersonic
10 threats, it includes space-based sensors and it includes
11 specialized interceptors based on the ground. To provide
12 protection against cruise missiles and long range drones,
13 it includes air defense interceptors and radars. And to
14 protect itself against the sorts of drone threats we have
15 seen recently in other countries, it includes counter-drone
16 defenses.

17 To the largest extent possible, CBO's notional
18 architecture relies on existing systems, the idea being
19 that you can deploy things quickly if they are existing,
20 new technologies just take longer to develop. Some
21 technologies like space-based interceptors, we do not have
22 at hand.

23 I just want to sort of emphasize here that CBO's
24 estimate is subject to considerable uncertainty and it is
25 based on this notional system. Cost could be higher or

1 cost could be lower depending on a number of things. The
2 biggest determinant of whether the costs are higher or
3 lower is the size of the threat and the type of the threat
4 that the defense is designed to handle. And the executive
5 order, in our view, sets a very high bar on that, and so
6 that is reflected in our estimate.

7 To help address that uncertainty and allow readers to
8 kind of make up their own mind, we used a building block
9 approach and reported the cost of each of the elements that
10 we have at each of the layers so that we could see what we
11 have done, and you also could, if you were so inclined,
12 come up with your own architecture and use those pieces.

13 In general though, cost could be lower, as I
14 mentioned, if DoD builds a system that is smaller and some
15 of the things that my co-panelists have mentioned is sort
16 of building smaller and building up, that could certainly
17 cost less than our estimate. If you had space-based
18 interceptors to deal with a smaller attack than the 10
19 missiles we talk about would reduce costs. If you focused,
20 as Dr. Karako has mentioned, on just parts of the country
21 with your ground-based systems, that would reduce costs.

22 On the other hand, costs could be higher if they build
23 a larger system that is really intended to deal with a full
24 Soviet, excuse me, Russian or a Chinese attack, could also
25 be higher if new systems encounter cost growth, and also in

1 sort of an important way could be higher if our potential
2 adversaries take steps to try to undermine those defenses,
3 they increase the size of their forces, they engage in
4 countermeasures and involve in different systems that would
5 reduce the effectiveness of our defenses. And so all those
6 things could lead to higher costs.

7 Thank you again for the opportunity to talk about
8 CBO's work and I look forward to all your questions.

9 [The prepared statement of Mr. Mosher follows:]

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1 Senator Fischer: Thank you, Mr. Mosher. Dr. Karako,
2 in the near term, what are the best opportunities to
3 improve coverage of the homeland against missile attacks?
4 What is your opinion?

5 Mr. Karako: Well, there is a lot there. There are a
6 lot of different types of missiles. I will say, and I want
7 to harken back to the title of the executive order from
8 last January, it was originally called Iron Dome for
9 America. I think they decided that might come into
10 copyright issues, so it is now called Golden Dome, but Iron
11 Dome is the lowest tier of Israel's multi-tiered missile
12 defense.

13 And so where I start from is at the bottom from the
14 lower tier threats. We have a limited GMD ICBM defense from
15 rogue states as was said, but the degree of vulnerability
16 is extraordinary at the, let's just say counter-drone,
17 counter-cruise missile type of things. This is one of the
18 --

19 Senator Fischer: Do you think at that level that we
20 currently have a number of defensive systems that we could
21 leverage?

22 Mr. Karako: Actually, yes. Those are systems that
23 largely are used over there for "regional defense" or base
24 defense. We put out a report a couple of years ago called
25 "North America is a Region Too," because to emphasize that

1 those air and missile threats are coming to a theater near
2 you. And that is kind of what this Golden Dome, I would
3 also say the Joint Integrated Air and Missile Defense Task
4 Force 401, is getting after, the drone threats and the
5 cruise missile threats.

6 And so to get to the additional part of your question,
7 Senator, the first and most needful thing are the sensing
8 capabilities, to have better air surveillance and better
9 tracking and better target identification of the low and
10 slow drones, of the cruise missiles and things like that.
11 So first and foremost, you cannot kill it if you cannot see
12 it. And so first and foremost, I would go after the
13 sensors and start there with the aerial threats and build
14 up.

15 Senator Fischer: What do you see as challenges in
16 trying to develop a management system out there that would
17 integrate systems across different domains, across multiple
18 services, across a number of agencies? And I guess the
19 main point I would like you to hit here is our industrial
20 base up to the task right now.

21 Mr. Karako: So I mentioned along the way the Biden
22 administration's initiative for the defense of Guam. At
23 the time it was described as the perfect air and missile
24 defense problem. Why? First and foremost, because of the
25 neighborhood that it is in and the number of threats that

1 it faces, but also because of the systems integration
2 challenge of fitting together the Aegis and the THAAD and
3 the Patriot or IBCS fire control systems. These are
4 systems that were designed to operate alone and unafraid
5 within their silo.

6 And so the defense of Guam efforts and now the Golden
7 Dome effort must first get these systems that we have today
8 to be able to work together and in concert with another.
9 And what that means especially is to not all shoot at the
10 same thing. You could have multiple systems, and we have
11 seen this in the real world over the past couple years, you
12 need fire's deconfliction and fire control so that you can
13 use these things efficiently and not shoot more
14 interceptors than you need at a given target. That is just
15 an example of the battle management problem.

16 Senator Fischer: Okay. Thank you. Mr. Trachtenberg,
17 what capabilities do Russia and China have that they are
18 developing that you believe threaten our homeland the most,
19 and why are these threats fundamentally different from what
20 we have faced in the past?

21 Mr. Trachtenberg: Thank you, Senator. I think both
22 Russia and China have been engaged now for many years in a
23 very aggressive nuclear strategic and non-strategic
24 modernization program to develop newer, more sophisticated
25 systems. For the Russian Federation, everything from the

1 Sarmat, for example, to the Oreshnik, which was used
2 against Ukraine, an intermediate-range nuclear-capable
3 system to nuclear torpedoes and things like that.

4 The Russians have been very aggressively modernizing
5 their capabilities. In fact, I think it was Vladimir Putin
6 himself who not long ago said that the strategic
7 modernization program of the Russian Federation was well
8 over 95 percent complete, while the same cannot be said
9 obviously for the United States.

10 The Chinese have also been modernizing their nuclear
11 weapon system and building up their conventional
12 capabilities as well. The discovery of some 350 previously
13 unknown Chinese ICBM silos suggests that the Chinese have
14 abandoned the policy of minimum deterrence if they ever
15 actually believed that. They have been developing
16 fractional orbital bombardment systems, hypersonic
17 capabilities.

18 So the threats themselves have been growing, I
19 believe, substantially. And my concern, Senator, is that
20 the growth in the missile threat is outpacing our ability
21 to deal with it. We still have a very limited national
22 missile defense capability primarily directed against rogue
23 states like North Korea, with a limited number of
24 terrestrial based interceptors. I think we have the
25 capability to do more.

1 Senator Fischer: Thank you. Thank you. Senator King.

2 Senator King: Thank you, Madam Chair. First, I have
3 an issue with how this program is being funded, and that is
4 not really you gentlemen's problem, but it is being funded
5 principally through reconciliation, which is a totally
6 partisan process with very little input from the
7 Appropriations Committee or the members of this Committee,
8 and it has very little restrictions in the way of how it
9 can be spent. So I just want on the record that this is,
10 as I mentioned at the beginning, one of the most expensive
11 and important initiatives of this government, and it should
12 be one that has broad popular support indicated by broad
13 support here in the Congress. The fact that the vast bulk
14 of it was funded first in the reconciliation last year and
15 is proposed for this year, I think is very bothersome from
16 a point of view of process.

17 I have a hard time figuring out how this would
18 actually work in practice, and here is a simple example.
19 Guam, as we know, is a U.S. place in the Pacific, a
20 territory in the Pacific that is highly important to us
21 strategically. So we have a very substantial missile
22 defense capacity there, and sitting right where you are,
23 Mr. Mosher, was the general in charge of that. I asked him
24 how much it cost to develop a comprehensive missile defense
25 strategy for Guam. The answer was \$8 billion.

1 I was not doing my email on my phone. I was asking
2 Claude, how many cities in the United States have 50,000
3 people or more? The answer was 780. So if we are going to
4 protect those 780 cities, the way we protect Guam, the
5 calculation is \$6.2 trillion. So this \$185 billion to me
6 is not a realistic number.

7 And the other piece of this that bothers me, I was
8 looking at the President's executive order, it says, "We'll
9 deter and defend its citizens and critical infrastructure,
10 provide for the common defense of its citizens." The
11 implication of the term Golden Dome is a national coverage.
12 And I think all of you will agree that that is just not in
13 the cards. So one of the questions that has to be
14 discussed is who is being protected and what is the Golden
15 Dome actually going to do?

16 The nomenclature implies an arch over the entire
17 country that is protected from any kind of missile attack.
18 And would you agree that that is not what we are talking
19 about here?

20 Mr. Trachtenberg: Senator, I would suggest that the
21 nature of Golden Dome is to try to produce a system that is
22 capable of a much broader level of defense for the American
23 people, for the country.

24 Senator King: So, this means every American citizen
25 can sleep better tonight because they are going to be

1 protected from a missile attack?

2 Mr. Trachtenberg: Well, with all due respect,
3 Senator, I do not think that is the appropriate metric to
4 use. I believe the appropriate metric, as I stated, is can
5 we build a system that provides a level of protection that
6 dissuades and discourages --

7 Senator King: To whom? To whom?

8 Mr. Trachtenberg: I'm sorry.

9 Senator King: Who is being protected and who makes
10 that decision? Are you telling me that every citizen in
11 America can be protected by this system?

12 Mr. Trachtenberg: No. I am not saying every citizen
13 can be protected. I am saying --

14 Senator King: Okay, so if that is the case, who
15 decides who is protected and who is not?

16 Mr. Trachtenberg: Oh, I think that the actual
17 architecture would be -- again, I do not have insight into
18 the current architectural plans, but I think it would be
19 deployed probably in phases or in stages at certain times
20 when the architecture is ready, but I think it should be
21 expansive.

22 I am a firm believer, Senator, in the old Air Force
23 recruiting motto, "Aim High." I think we should aim high
24 on this. We may not get there. I agree, but I would
25 rather aim high than aim low in terms of what you are

1 telling me to do.

2 Senator King: As you can tell, and these are good
3 faith questions. I mean, I am just trying to understand
4 this thing. If it is not going to protect the entire
5 country, who is it going to protect? How is that going to
6 be decided? And what is the realistic cost estimate? Is
7 my Guam example just completely crazy? I mean, there is a
8 case where there has been a Golden Dome over Guam and it
9 cost \$8 billion to cover, I think it is 200 square miles.
10 Los Angeles is 400 square miles. So protecting Los Angeles
11 would cost twice as much as protecting Guam. What am I
12 missing?

13 Mr. Karako: If I could take a stab at that, I would
14 suggest that the Guam analogy is perhaps not the most apt
15 one. Guam has, as you noted, Senator, an outsized
16 significance for our overall operational plans for the
17 Pacific.

18 Senator King: Right.

19 Mr. Karako: And in that sense, the defense of Guam is
20 about buying time for the forces that are stationed there
21 or based out of there to be able to end the threat by other
22 means, to last long enough.

23 Senator King: Protecting Guam.

24 Mr. Karako: Not just the territory, but especially
25 the power projection capability.

1 Senator King: Of course, I understand.

2 Mr. Karako: And so Los Angeles has some ports, but it
3 does not have that power projection capability. And so to
4 answer your question of what should be protected, I would
5 suggest walking down the hall of the Pentagon to the
6 NORTHCOM office and asking them for their defended asset
7 list, the 12N list, and start there.

8 Senator King: Well, one of the things in the
9 executive order, which I think makes sense, is the United
10 States will guarantee its secure second strike capability.
11 That would imply a special protection for the Sentinel
12 project or the stealthiness of our submarines or the basis
13 of our Air Force. I understand that.

14 But I am just trying to get at what this thing will
15 really do at what cost. The most serious national security
16 threat facing this country today is the \$40 trillion debt.
17 The Chairman of the Joint Chiefs of Staff testified to that
18 several years ago and I cannot disagree. We cannot just
19 say, "Well, this is important and we are going to spend
20 whatever it takes." I think we need to have some realistic
21 cost estimates and \$185 billion to protect what part of the
22 country, 10 percent, 20 percent, I think we have to have
23 answers to those questions. Thank you, Madam Chair.

24 Senator Fischer: Thank you, Senator King. End of the
25 day. Senator Rounds, you are recognized.

1 Senator Rounds: Thank you, Madam Chair. Look, let me
2 look at this a little bit different. I respect what
3 Senator King is suggesting here, but let's start where we
4 are at today and what the difference would be. If, as the
5 Senator had suggested, that this may protect 10 percent and
6 we are spending that kind of money, the answer is today, do
7 we have any protection at all? I will simply begin with
8 Dr. Karako, let's just begin with this. What percent of
9 the United States is protected today from these incoming
10 missiles?

11 Mr. Karako: You are talking about North Korea ICBM
12 [inaudible].

13 Senator Rounds: Put your mic and start over again.

14 Mr. Karako: Pardon me. If you are talking about a
15 rogue ICBM, the GMD system is designed to provide
16 continental coverage or national coverage against a very
17 small number of threats. But again, the kind of threats
18 that we see on a weekly basis in Ukraine or the Middle
19 East, the garden variety cruise missiles and drones, the
20 short answer is, sir, we are astonishingly not protected.
21 The heads of NORTHCOM have come up here and said the same
22 thing. You see drones around Barksdale.

23 Senator Rounds: If you were to ask the American
24 public, they would say, "We have NORAD and the protection
25 is there." The reality is for a lone shot from North

1 Korea, we can handle that. But right now what we are
2 really talking about is taking the next step, which is to
3 avoid a nuclear conflict. Part of that means being able to
4 assure our competitors, the adversaries, that even if they
5 were to get off a successful first strike, that we would be
6 able to defend against it and that we would respond with a
7 devastating response, a responsive strike that they would
8 never want to see. And this is one more step in saying,
9 "Let's not go to nuclear war." Then the question is how do
10 we do that without destroying our economy?

11 The idea behind this to begin with was the layered
12 effect that we have right now as a first step, but let's
13 just think about how this has all got to be put together a
14 little bit so that we have a better understanding of what
15 we are really talking about.

16 I also agree with Senator King when he says, "Should
17 this taken, should it have been necessary to go to a
18 reconciliation to get this started?" And I would say, no,
19 this should have been on a bipartisan basis. I will not
20 lay fault for why that is not happening. I am just simply
21 saying we need to get back to a bipartisan approach to this
22 as soon as possible. But we could not wait another year to
23 have that happen or we would be farther behind than what we
24 are right now. So let's get back to a bipartisan and let's
25 include it in the underlying appropriations bill, which is

1 ongoing.

2 Now, if we talk about the plan itself today, there are
3 a couple things we need. Number one, we have got to be
4 able to sense it, in other words, identify if there is an
5 adversary who is actually coming out. We can do some of
6 that by cyber. We check on them, we know what they are up
7 to, we can see their planning. We also know that before
8 the left of a launch, we can have some sort of sense of
9 what is going on.

10 But upon a launch, we need worldwide coverage, in
11 other words, the ability to actually see these launches.
12 Can you talk for just a second about what that would entail
13 in terms of our ability to see worldwide on these types of
14 launches that would create the confirmation that something
15 is going on? I will start with Dr. Karako once again.

16 Mr. Karako: Yes. Well, in terms of the launch
17 detection, if you are talking about ICBM, we have got all
18 kinds of overhead infrared to detect the launch, but there
19 are some very important initiatives, go back to the Biden
20 administration and before in terms of especially hypersonic
21 and ballistic tracking for the more maneuverable phase.

22 Senator Rounds: So we need more than just infrared.
23 We also got to be able to attract a moving object and
24 separate it out from other moving objects, correct?

25

1 Mr. Karako: The discrimination challenge.

2 Senator Rounds: Which means radar for the most part.

3 Mr. Karako: For the most part.

4 Senator Rounds: Okay. The 3.1 to 3.45 portion of the
5 magnetic spectrum is critical for all of our radars, our
6 best radars. Right now, it constantly is under attack by
7 commercial operations that want to take that over. Can you
8 talk about how serious that is just in terms of a very
9 simple issue that we have to protect right now?

10 Mr. Karako: Thank you for your leadership on this.
11 The lower three that you identified, the S-band, that is
12 where so many of our radars operate, our Aegis SPY radars,
13 G/ATOR, the Army's TPQ-53, LRDR. A lot of the radars we
14 have today and that we are going to be deploying are in
15 that band. If you have commercial noise, it will jam them.

16 Senator Rounds: Okay. And so that is just the
17 sensing of it, but then we have got to be able to identify,
18 and this is where the space-based systems come in, we have
19 got to be able to identify early on because we do not want
20 to have that come into the United States. We play away
21 games. We want the ability to have systems available to
22 take out these targets, and some of those are going to be
23 space-based, aren't they?

24 Mr. Karako: Yes, sir. It could be X-band related
25 things that are involved there. It could be kinetic things

1 as well.

2 Senator Rounds: Okay. I am running out of time, but
3 I think this is very important that we have this discussion
4 and the fact that right now, compared to what we have right
5 now, what the Golden Dome will provide is magnitudes more
6 of an opportunity. The question is how do we efficiently
7 deliver this thing in a period of time and how do we do it
8 on a bipartisan basis? Thank you, Madam Chair.

9 Senator Fischer: Thank you, Senator Rounds. Ranking
10 Member Reed, you are recognized.

11 Senator Reed: I will defer to Senator Kelly.

12 Senator Fischer: Okay. Thank you. Senator Kelly.

13 Senator Kelly: Thank you, Madam Chair. Thank you,
14 Senator Reed. Mr. Trachtenberg, I have got some major
15 issues on the physics of this system, especially the space-
16 based interceptor part of this. The physics favors the
17 offense in a big way. Interceptors can be defeated by
18 countermeasures, and often when we test these things, we do
19 not account for those. But the other issue here is
20 deterrence is about perception, and this Administration
21 might see Golden Dome as a defensive system, but what also
22 matters here for strategic stability is how does China and
23 Russia see this?

24 I mean, for decades, U.S. nuclear strategy has
25 recognized the relationship between strategic offensive and

1 defensive forces. They are connected. The basic concern
2 is pretty straightforward. If one side builds defenses
3 that could substantially reduce the effectiveness of the
4 other side's nuclear deterrent, the other side has an
5 incentive to build more or better offensive weapons with
6 more countermeasures, and that dynamic was part of the
7 rationale behind negotiating limits on offensive and
8 defensive systems during the Cold War. We considered this
9 very seriously.

10 So we need to understand what the response and
11 expansion of U.S. strategic missile defense could generate.
12 If Russia and China believe that Golden Dome could reduce
13 the effectiveness of their retaliatory forces, they could
14 respond by expanding their arsenals, developing new ways to
15 penetrate our defenses, or seeing the United States as
16 willing to take a lot more risk if we are in a crisis.

17 So Mr. Trachtenberg, what do you assess Russia and
18 China are thinking about Golden Dome today?

19 Mr. Trachtenberg: Thank you, Senator. I appreciate
20 your comments. I think Russia and China have been moving
21 out irrespective of what the United States plans to do or
22 may do in the future. As I said, both Russia and China
23 have been modernizing their own nuclear systems, and I
24 believe that they are doing that because their goals and
25 objectives do not align with ours. I do think Russia and

1 China will oppose Golden Dome just as they have opposed all
2 U.S. missile defense efforts.

3 Senator Kelly: But it sounds like you think they are
4 on a path regardless of any steps we take. As I think
5 Senator King pointed out --

6 Mr. Trachtenberg: What I am saying --

7 Senator Kelly: -- the Chinese are watching us today.

8 Mr. Trachtenberg: Yeah, sure. But what I am saying,
9 Senator, is that there is no mechanistic action-reaction
10 formula. Historically, the belief that the United States
11 generates reactions on the part of adversaries has not been
12 proven to be so. And I go back, you mentioned the Cold
13 War.

14 Senator Kelly: But isn't it logical that if we were
15 to build, let's just say, when you study math, you look at
16 things at the limit. If we were to build a system that
17 they perceive is able to take out, let's say a large salvo
18 of ICBMs, what would the logical thing for them to do?
19 What would be a logical response?

20 Mr. Trachtenberg: I think the logical thing for them
21 to do would be not to consider attack in the first place.

22 Senator Kelly: You don't think the logical thing
23 would be a larger salvo in nuclear weapons? Because this
24 is going to be sized for something.

25 Mr. Trachtenberg: Sure, sure. But Senator, again, if

1 you look at history --

2 Senator Kelly: So you think that is logical? Let's
3 say just theoretically.

4 Mr. Trachtenberg: No, no. If you look at the
5 historical record, I think you see the Russians and the
6 Chinese moving out based on their own considerations,
7 irrespective of what the United States has or has not done.
8 You may recall --

9 Senator Kelly: On all kinds of things, and we do
10 exactly the same thing.

11 Mr. Trachtenberg: No, you may recall the ABM Treaty
12 of 1972 was intended to prevent the Soviet Union at the
13 time from building up its offensive capability because we
14 eschewed defense of the national territory, so they had no
15 defense to counter. In reality, what happened was the
16 greatest increase in Soviet ICBM weapons and warheads
17 occurred after the signing of the ABM treaty. So their
18 reaction suggests --

19 Senator Kelly: The greatest increase after the
20 signing of the treaty.

21 Mr. Trachtenberg: After the signing of the ABM
22 treaty.

23 Senator Kelly: And how many ICBMs do the Russians
24 have today as a percentage compared to what they had
25 previously?

1 Mr. Trachtenberg: The Russians put most of their
2 nuclear capability on large land-based missiles because
3 they --

4 Senator Kelly: But isn't it true that because of
5 treaties that we have signed we have reduced the size of
6 our nuclear arsenal and the Russians have reduced
7 considerably the number of nuclear weapons that they have
8 today?

9 Mr. Trachtenberg: It is true that we have reduced as
10 a result of arms control treaties the number of nuclear
11 weapons in our arsenal. It is also true that we currently
12 really do not know what the Russians have because the
13 Russians suspended inspections under the New START Treaty
14 years ago and have refused to allow them to continue. And
15 without onsite inspections, it is very difficult to know
16 whether the Russians have continued to MIRV missiles or
17 build up their capabilities. What we do know, Senator, is
18 that they have been aggressively working to modernize their
19 own nuclear capabilities for many, many years while the
20 United States has not.

21 Senator Kelly: Well, we are in the process of doing
22 that as we should.

23 Mr. Trachtenberg: We have been thinking about doing
24 that --

25 Senator Kelly: Well, we have got a program to

1 modernize Minuteman III.

2 Mr. Trachtenberg: Sure.

3 Senator Kelly: And we are building more ballistic
4 missile submarines, and we should be modernize our forces.

5 My biggest concern here is that this system, because
6 their perception of this matters and that this sets off
7 another arms race and suddenly we are having to build -- I
8 mean, they are building thousands of more ICBMs. The
9 Chinese are building thousands of more ICBMs. This system
10 is in size to handle it. We spent \$1.2 trillion on a
11 system that then becomes irrelevant.

12 I mean, let's just say theoretically, not what the
13 real numbers are. I do not like to talk about those. Let's
14 say we could shoot down 100 ICBMs, while they fire another
15 100 or maybe they fire 500. And then our system was we
16 spent \$1.2 trillion. People do not have healthcare
17 coverage. They cannot afford their lives anymore. We are
18 investing trillions of dollars into the defense industry.
19 And what we get out of it is we get 5, 10 years down the
20 road, even after this thing is built, and we got a system
21 that does not even provide us what the level one
22 requirements for the system was in the beginning on the
23 piece of paper that the President signed.

24 Mr. Trachtenberg: Senator, I appreciate your
25 perspective. I do. I do not think it is an accurate

1 reflection of how history has evolved throughout the Cold
2 War and the post-Cold War period in terms of U.S. actions
3 driving some kind of an arms race.

4 Senator Kelly: Mr. Trachtenberg, you said after the
5 ABM treaty that that is when the Russians accelerated their
6 development of ICBMs. I am way over my time. Thank you,
7 Madam Chair.

8 Senator Fischer: Thank you, Senator Kelly. Mr.
9 Trachtenberg, is it true that China has spent decades
10 building their own integrated air and missile defense
11 system, the A2/AD?

12 Mr. Trachtenberg: Yes, Senator.

13 Senator Fischer: Is it also true that Russians have a
14 massive missile defense system surrounding Moscow?

15 Mr. Trachtenberg: Yes, that is true for decades.

16 Senator Fischer: For decades. Thank you. Senator
17 Reed, are you ready to jump in?

18 Senator Reed: I am ready to jump in with both feet.
19 Thank you, gentlemen, for your testimony. I want to get a
20 perspective on this course issue. I think all of you have
21 essentially conceded that this will be a phased
22 development. It will not be a duplication of the
23 President's initial executive order. Is that fair, Mr.
24 Trachtenberg?

25 Mr. Trachtenberg: Senator, would you rephrase that

1 question, please?

2 Senator Reed: Well, you have indicated in your own
3 testimony that the numbers, the course estimates are far
4 excessive, et cetera. I think what has happened though is
5 that General Guetlein has not taken the President's
6 executive order literally, that he has essentially re-
7 scoped it so it is less expensive. Is that something you
8 would concede?

9 Mr. Trachtenberg: I cannot speak for how General
10 Guetlein has been addressing the particular issue vis-a-vis
11 the executive order. I have not spoken to General Guetlein
12 here in a private capacity. But I think the executive
13 order establishes a goal and an objective. That is a
14 legitimate objective. Whether we can get to that or
15 whether we get to that in pieces over time is --

16 Senator Reed: We have to deal with not goals so much
17 as budgets, technologies available, et cetera. And again,
18 my sense, and I might be wrong, is this is going to be
19 step-by-step. Dr. Karako, you have any comments?

20 Mr. Karako: Yes, sir. I think it is not necessarily
21 the case that it has been de-scoped from the executive
22 order. I have observed that the executive order and the
23 Golden Dome nomenclature is a kind of a Rorschach test that
24 people bring to bear certain assumptions and read into it.
25 The executive order does not say anything about being an

1 impenetrable shield. It does not say anything about
2 numbers of missiles. It talks about types of missiles, but
3 it does not talk about numbers.

4 And so actually I think it is entirely consistent with
5 the thing that I think several of us here are emphasizing,
6 which is a little bit goes a long way. And I hope that the
7 Chinese and Russian friends are watching this and hearing
8 that we are going to try to pull up the drawbridge on some
9 limited attacks so the super onesies and twosies, not just
10 of ICBMs, but drone attacks and Operation Spiderweb attack
11 here at home, I want them to know that we are thinking
12 about that and preparing for that.

13 Senator Reed: Mr. Mosher, you costed out the
14 President's executive order, but I think in your comments,
15 you reflected that it would be much less expensive if it
16 was not fully implemented, that if it was done in phases
17 over the next 10 years. Is that fair?

18 Mr. Mosher: Yes, that is accurate. Our sense is that
19 basically the size of the threat that the defense is
20 designed to go against to counter is a big factor in how
21 expensive that system is. We read the executive order and
22 our takeaway was it was a fairly comprehensive defense. It
23 included multiple layers, space-based interceptors. It was
24 not specific about nuclear versus conventional, and I think
25 Tom has talked about the conventional threat, the Spiderweb

1 type of threat. It is very different than what SDI and
2 missile defense that we have had to date has focused on.

3 But yes, certainly if you built less and phased it in,
4 but we wrote this report and had no information from the
5 Golden Dome office about how they were planning to do it.
6 And we actually got a briefing from them just Friday,
7 finally, thanks to your excellent staff making sure that
8 that happened. We appreciate that. You know, I cannot
9 talk about that here, but it is true that if you built it
10 in a phased way or built less, it would cost less. And we
11 built our estimate that way so that you could play parlor
12 games of how much it would cost to do less.

13 Senator Reed: Dr. Karako, if this is a phase, it
14 strikes me that the SBI, space-based interceptors, are
15 probably far away from doing that. And if that is the
16 case, I think we have to ask ourselves, if we build a
17 system without that space-based interceptors for the kind
18 of money, even the \$185 billion, are we getting what we
19 invested?

20 For example, the most dangerous, one of the most
21 dangerous weapons systems now is hypersonics, and they are
22 most vulnerable in their boost phase, and the SBI is
23 designed to take them out in the boost phase. So if we do
24 not have SBI, but we spent \$185 billion, have we really
25 invested wisely?

1 Mr. Karako: I think the answer to that is that yes,
2 we would still get a lot of value. General Guetlein just
3 described the SBI thing as having demonstrations in 2028,
4 and the next epic after that is 2035. So maybe we get
5 there.

6 And this is why I talked about we got to figure out
7 the viability, especially in terms of whether it makes
8 sense for scalability and affordability. And I think the
9 answer is we do not know yet on that front. But again, you
10 can close the door and leave all the windows open, and that
11 is kind of where we are on all these other threats across
12 the spectrum.

13 So look, I believe that the logic of space as a
14 warfighting domain will necessitate space fires and SBIs
15 will be a subset of that, but it may be very limited. That
16 is entirely plausible. But there is still lots of value to
17 closing all these other windows to threats across the
18 spectrum.

19 Mr. Trachtenberg: May I make a comment on that,
20 Senator Reed?

21 Senator Reed: Yes, sir. Briefly because my time has
22 expired.

23 Mr. Trachtenberg: Yes. Thank you. I do believe that
24 we do need to go to space. And saying that in no way
25 diminishes the technical challenges that we face with

1 respect to space-based interceptors or what have you. But
2 I also believe that we have a very capable scientific and
3 engineering cadre of specialists who are working, who are
4 innovative, who are inventive, who are creative, and who
5 can actually solve some of the technical issues, rather
6 than dismiss the technical issues as something that is just
7 impossible and not worth the effort. That is my personal
8 sense, Senator.

9 Senator Reed: I appreciate that. Thank you, Madam
10 Chairman.

11 Senator Fischer: Thank you. Senator Kaine.

12 Senator Kaine: Thank you, Madam Chair, for
13 recognizing me, especially since I am not a member of this
14 Subcommittee. But when you guys put out invitations for
15 hearings, they are usually important and I like to attend
16 them.

17 Senator Fischer: I appreciate your attendance here.
18 It is nice to have members of the full Committee take an
19 interest in what is the bedrock of our security. So
20 welcome.

21 Senator Kaine: Thank you. This program will be
22 scoped and we will work to find the funding and we will
23 phase it in because nothing happens easily or quickly here.
24 How does it impact the effectiveness of this effort to do
25 it in cooperation with Canada?

1 Mr. Karako: I would be happy to jump on that. The
2 President, in the Oval Office last May, Canada was the only
3 country that he identified as part of the Golden Dome
4 thing. A couple of things. Canada and the United States
5 have this joint command, NORAD, that has been around
6 forever. Canada, to its credit, is pushing forward on
7 over-the-horizon radars, polar over-the-horizon radars,
8 Aegis-equipped frigates, and they were looking at, for
9 instance, the F-35.

10 So I think they are going to be critical. I think the
11 President was right in May. I think it is extremely
12 unfortunate that politics is getting in the way of that
13 cooperation, because we need our Canadian friends in the
14 high north.

15 There is also an aspect of Greenland that is involved
16 here. There is Pituffik early warning missile base there.
17 I can think of about six other types of sensors I would
18 like to plop down there for early detection and tracking of
19 various threats and arctic maritime domain awareness, et
20 cetera, et cetera. So the answer is very important and
21 there is an international allied partner aspect here that
22 needs to be gotten after.

23 Senator Kaine: I thought that might be your answer,
24 and I completely agree with that answer. It is really
25 unfortunate, as a member of the Senate Foreign Relations

1 Committee and the lead Democrat on the Western Hemisphere
2 Subcommittee, I have never had to do peacekeeping visits to
3 Ottawa before, and I have had to do like two in the last
4 year and a half and it is unfortunate.

5 And look, I mean, I am going to be blunt. I think
6 this is not completely a two-way street, although it is now
7 kind of devolved into it. The decision of the United
8 States under this Administration to launch a trade war
9 against Canada with full knowledge that there has never
10 been a one-sided trade war, that if you launch, then there
11 is going to be a response, has taken a relationship that
12 has just been so important, so stable, so critical to our
13 economy, much less the defense issues we are talking about
14 today.

15 And the fact that that relationship is now in such a
16 bad place is a real tragedy. And it is unrealistic to
17 expect that you can treat an ally badly in one domain on
18 the economy, but expect, but hey, we really need to work
19 cooperatively in terms of our defense. That is just not
20 human nature.

21 And I see this problem all over the globe. I was in
22 Germany about a year-plus ago to talk to Germany and other
23 European allies about Ukraine and about, "Hey, what more
24 can we do? Do you have any new ideas? How can we work
25 together?" And I got kind of a tough lecture from my

1 German parliamentarians and others that I met with. Like,
2 "Yeah, I know you want to talk about Ukraine, but here is
3 what we want to talk about. We just elected a chancellor
4 who will be probably the most pro-American chancellor, pro-
5 transatlantic chancellor for quite a while. And we have
6 been doing a lot in Ukraine and we want to do more. We
7 want to do more with you, but we elected a chancellor with
8 a mandate to jumpstart a German economy that has been in
9 the doldrums since 2019. And right now the principle
10 obstacle to our chancellor, our pro-American chancellor
11 meeting our economic objective and his own mandate from the
12 public is the United States and the tariff policies."

13 So we need to look at these things not in silos. We
14 need to look at them comprehensively. And I really worry
15 that using Golden Dome as an example -- and for those in
16 the room that do not know, the Canadians call it
17 Continental Shield, but it is the same idea. But to expect
18 them to do what you say they need to do or what the
19 President would want them to do in this current environment
20 is just completely unrealistic. And so I hope we align our
21 defense priorities with our economic actions and rhetoric.

22 Let me ask a second question because I think Senator
23 Fischer asked this before I came in, so I apologize if I am
24 repeating. In an unclassified way, recognizing that we are
25 here, and so there are some things that you cannot say,

1 what are choke points in our supply chain, or areas where
2 we should be focusing on as a Committee to try to
3 accelerate capabilities and production to achieve the
4 objective that the President has set out?

5 Mr. Mosher: Can I try that?

6 Senator Kaine: Yeah, please. Yeah, please, Mr.
7 Mosher.

8 Mr. Mosher: It is basically the interceptors that we
9 are using to a large extent. Overseas is the biggest one.
10 Solid rocket motors, some of the components there.

11 So we are in a situation where depending on what the
12 Golden Dome office decides to deploy, they are likely to
13 rely on systems that exist today, but those interceptors
14 are also being depleted abroad and trying to boost
15 production and solve that problem I would say it is the
16 first and foremost. And I have not done a detailed
17 analysis, but that is a real obvious one.

18 Senator Kaine: And even before Dr. Karako answers,
19 even that kind of depends too, or could be helped by
20 productive relationships with allies because it is not just
21 the U.S. that can produce solid rocket motors. I mean,
22 others can as well. If they produce them to our standard,
23 that could help us have a capacity to enable us to meet
24 whatever the appropriate scope of this is.

25 Mr. Karako: Right. Yes, Senator. The Germans in

1 particular, since you mentioned them, they are doing
2 remarkable things. They are very interested in co-
3 production. We have our foreign ally friends over all the
4 time to CSIS. They are going to go bonkers on producing
5 PAC-2s, for instance. It is not the 1980s anymore. They
6 want ground-based Tomahawk, which is right now built in
7 Arizona, Tucson, Arizona. They want ground-based Tomahawk.
8 And it is going to be hard for them, it is going to be hard
9 for the Japanese to get that based on the expenditures, of
10 course, as you know.

11 So this is where I would just point to the munitions
12 ramp, the munitions acceleration thing that is going on. I
13 mentioned that at the end, right alongside Golden Dome. It
14 has to happen -- forget Golden Dome, but for everything,
15 just to get back to pre-January levels.

16 But you are right, the Germans and a lot of other
17 folks are very interested in doing this and broadening the
18 industrial base and the supply chain for at least some
19 kinds of interceptors.

20 Senator Kaine: Madam Chair, if I could just ask,
21 could Mr. Trachtenberg address either of those?

22 Senator Fischer: [Inaudible.]

23 Senator Kaine: Yeah, Canada or supply chain.

24 Mr. Trachtenberg: Yeah, Senator, I will leave the
25 supply chain issues to those who know more about the supply

1 chain. But I will say this. It is important, I agree, it
2 is important to work with friends and allies on this
3 effort, I believe. That includes the Canadians, that
4 includes NATO countries. That also includes, we should be
5 learning lessons from the Ukrainians. We should be
6 learning lessons and taking away information from the
7 Israelis, those who have suffered from the consequences of
8 missile attack and rocket attack. Those who have invested
9 despite the concerns that investing in defensive
10 capabilities is more expensive than the offensive missiles
11 being fired at them. They still find value in that in
12 saving lives. We should be engaging them and learning from
13 them and taking away lessons that we can apply to Golden
14 Dome.

15 The other thing I would say, Senator, if I might, the
16 more we are able of defending our own country, our own
17 people, the nation, I think the more flexibility we will
18 have in being able to come to the aid and defense of other
19 countries with whom we have treaty commitments or are
20 pledged to defend, if push comes to shove. And I think
21 that is an aspect of Golden Dome that often gets
22 overlooked, but it would provide us additional flexibility
23 to help defend friends and allies abroad.

24 Senator Kaine: Great. Thank you. Thanks, Madam
25 Chair.

1 Senator Fischer: Thank you, Senator Kaine. When we
2 talk about defending our homeland, I think many people
3 believe it is the GBIs that we have in Alaska and the few
4 in California, 44, but those are not geared to defend
5 against China and Russia. They are for defense against
6 North Korea, and I would say, my staff is going to correct
7 me, but a more simplistic nuclear warhead that would be
8 coming to our homeland without the added extras that our
9 peer adversaries would have. So would it be safe to say
10 that we do not have an effective counter to the threats
11 that we are facing? Just yes or no?

12 Mr. Trachtenberg: I would agree, Senator. I would say
13 yes.

14 Senator Fischer: Okay. Doctor?

15 Mr. Karako: Yes, Senator.

16 Senator Fischer: And Tim, Senator Kaine, you talked
17 about the relationship we have with Canada, and I will
18 conclude with this comment. They are a good ally. They
19 are a good neighbor. They are modernizing NORAD right now.
20 It is my understanding for over-the-horizon to be able to
21 handle that.

22 It is my understanding though that an agreement has
23 not been reached with Canada yet on Golden Dome. I think
24 as we progress along there, I mean, my hope would be that
25 we can continue to have a good working relationship there

1 to really protect both of our countries. So I appreciate
2 you bringing that up as well.

3 Senator King, any comments? And we will conclude then
4 with Senator Reed.

5 Senator King: Thank you. Let's return to deterrence.
6 What we are talking about here is defending our country,
7 and the theory of the defense of the country since World
8 War II has been deterrence, mutually assured destruction.
9 Any country that attacks us knows that they are going to be
10 devastated, that they are going to be decimated, and
11 therefore they are deterred from acting. I have always
12 been suspicious of deterrence by denial. If we could
13 really do, if there was some magic solution that you could
14 deny any attack on the United States by cruise missiles,
15 space-based missiles, ICBMs, terrorists, UAVs, maybe.

16 But it seems to me if we are talking about finite
17 dollars, the most important expenditure we could make would
18 be to ensure our second strike capability, which underlies
19 the whole concept of deterrence. If they know that they
20 cannot knock out the missile field in Montana or Wyoming,
21 that they cannot knock out our ballistic missile
22 submarines, and that we have great capacity with the B-21,
23 they are not going to attack us in the first place.

24 The best attack is the one that does not occur. And
25 it strikes me that if we are talking about, again, finite

1 dollars, which we are, that it would be better put, and the
2 President even mentioned this in his executive order, it
3 would be better put toward ensuring the protection of our
4 second strike capability, which feeds into the whole
5 concept of deterrence that has protected this country for
6 80 years. What are your thoughts? This is sort of --

7 Mr. Trachtenberg: Senator, if I may, at the risk of
8 sounding like a maximalist here, I do not believe this
9 should be an either/or proposition. Either we protect our
10 offensive nuclear retaliatory capability or we build
11 defenses. I see Golden Dome as an adjunct to help
12 deterrence, not to undermine it or not to take resources
13 away from the necessary offensive nuclear modernization
14 programs that we need, but I see those two things as
15 complementary.

16 Senator King: Well, it is a question of cost and it
17 is a question of allocation of resources and it is a
18 question of -- I go back to my original set of questions.
19 What is it? Is it going to protect Cleveland but not Sioux
20 Falls? Is it going to protect New York but not Richmond?
21 I think that is an unanswered question, and as near as I
22 can tell, protecting the entire country is impossible.

23 And so there are going to be choices made, and I think
24 the President and the Administration and the Congress, if
25 we endorse this, have to be honest with the American people

1 about what it is that we are doing. We are not building
2 something that is going to protect every person in this
3 country from the possibility of either conventional or
4 nuclear attack, and that is where we get into making
5 choices. And again, I think the question is cost and a
6 much more effective use of our dollars would be to ensure
7 our second strike capability, which underlies the whole
8 premise of deterrence.

9 Mr. Trachtenberg: Senator, yes. We do not know yet
10 because it has not been built yet. So we do not know what
11 ultimately it is going to look like. I agree with you.
12 There are choices that have to be made with respect to
13 cost.

14 Senator King: But you have to start out with a plan.
15 You have to start out, okay, we are going to protect these
16 assets, these cities, or these military assets. Or the
17 talks about critical infrastructure, that is the entire
18 grid in the United States. I mean, is that what we are
19 doing? I just think we need to be a little more real about
20 this and honest with the American people.

21 Mr. Mosher: I think, Senator, if I could on this, one
22 of the things that we have -- well, first of all, I used to
23 work for Bob Hale when I first started at CBO who was a
24 comptroller. And one time when I was doing work, I went in
25 and said, "Maybe we should have a map that shows

1 probability of survival by congressional district." He did
2 not think that was very funny, but I did at the time.

3 The issue is, and you raised this, about how much are
4 we defending and what are we defending? I actually
5 happened to teach a class on missile defense at Georgetown.
6 I have for a number of years now. And one of the things
7 that I try to instill in my students --

8 Senator King: I wrote my thesis on this 60 years ago.

9 Mr. Mosher: It is probably still relevant, actually.
10 All the sort of main forces are there, right? Deterrence,
11 et cetera. But what I tell them is when you are thinking
12 about a missile defense, what is the goal of that defense
13 and what is the threat you are trying to deal with?

14 And so if you sort of parse the different pieces, the
15 different threats we have talked about here, whether it is
16 ICBMs, long range systems, which we might have one set of
17 defenses for, whether it is the --

18 Senator King: Yeah, they talked about space-based
19 weapons that are directly overhead and dwelling.

20 Mr. Mosher: It could be space. I think all those
21 things are possible. It could be the short-range stuff
22 that we are talking about with drones. That is another
23 type of defense. And so if you think about what is it I am
24 trying to defend against what kind of threat, that sort of
25 helps lead you to the sorts of solutions that might be

1 required. Now whether you decide that is worth the funding
2 or not, that is up to you.

3 Senator King: That is essentially what I am asking is
4 what is the plan?

5 Mr. Karako: Senator King, can I take a stab at it?
6 So the question you asked is why not put, dollar for
7 dollar, why not have a secure second strike and
8 specifically secure nuclear second strike? But I think the
9 problem with that logic is that it presupposes that the
10 first thing we reach for is that nuclear retaliation.

11 Senator King: I think it should be conventional
12 second strike as well. I agree with you. It is not a
13 credible deterrent if nuclear is our only option. That is
14 why the Chair and I have supported SLCM-N.

15 Mr. Karako: And that is frankly how I think about the
16 defense of Guam. It has an outsized importance because it
17 is protecting our conventional power projection
18 capabilities. And here in the homeland where we have 70
19 percent of the joint force at any given time, for instance,
20 think about it as the prospect of deterrence by denial of a
21 decapitating non-nuclear strategic attack. Could be our
22 leadership, General Guetlein's talked about that, the
23 decapitation problem, or it could be some other way to pin
24 up the joint force within the United States so that we
25 cannot flow forces abroad.

1 People talk about a space Pearl Harbor and a cyber
2 Pearl Harbor. I worry about a Pearl Harbor Pearl Harbor,
3 that, no kidding, takes out our ability to project power.
4 The Japanese came pretty close to taking out a lot more
5 than they did, and that is the logic of trying to have
6 deterrence by denial for that non-nuclear strategic attack.

7 Senator King: I agree with the danger of a
8 decapitation strike. That is why I think the Vice
9 President's office should be in Kansas City.

10 Mr. Karako: Not Maine?

11 Senator Fischer: No, you don't want anything in
12 Maine, do you?

13 Senator King: Not if it is going to be a nuclear
14 target.

15 Senator Fischer: Ranking Member Reed, close it for
16 us, please.

17 Senator Reed: Thank you, Madam Chairman. The whole
18 premise of the Golden Dome is that we are going to be able
19 to defeat a limited number of missiles encroaching upon the
20 United States. Which raises the question, what is cheaper
21 to build Golden Dome if you are in the United States, or to
22 build a heck of a lot more missiles if you are somebody
23 else and you can defeat this system? Mr. Mosher?

24 Mr. Mosher: Generally, the view is that offense is
25 cheaper to do than defense, and you do not have to

1 necessarily build missiles. You can have countermeasures,
2 you can do other things. So that is the general calculus
3 that people use. I think the counter to that is what is it
4 that, if we can outspend them, and this was the logic
5 really with defending against North Korea, that they cannot
6 outspend us, we can outspend them. And that is an
7 exchange, even if we have to spend 10 for every dollar they
8 spend, that is worth it. Where that trade happens is sort
9 of up to the executive branch in the Congress to figure out
10 where that is.

11 Senator Reed: Dr. Karako?

12 Mr. Karako: Sir, if you have put yourself in the
13 shoes of the Chinese, I would not try to just take out the
14 missiles, the more offensive missiles that the U.S. has,
15 but rather attack our entire kill chain. As Senator King
16 just said, attacking our leadership, attacking our command
17 and control. There are so many nodes, there are so many
18 ways in which to take us apart into little, small pieces
19 besides offense versus defense. And that is where I see
20 the real value of limited air and missile defense for the
21 homeland is protecting those critical things so that they
22 cannot accomplish a fait accompli with a couple cheap
23 shots.

24 Senator Reed: I do not want to delay this, but the
25 question really is what is the threat? And the threat

1 definition all through this discussion is 10 missiles or 10
2 or 20 drones, something small, when in fact it is quite
3 easy and a lot cheaper to build lots of these things.

4 The other issue too is in this asymmetric world we not
5 only have to worry about the Chinese launching a missile
6 from China, we have got to worry about somebody out in
7 Bethesda launching a drone and hitting our executive
8 offices. But thank you, gentlemen.

9 Senator Fischer: Thank you, Senator Reed.

10 Thank you to our panel. If any Committee members have
11 questions for the record, I would ask that they submit
12 those soon and we will get those to you. Then if you could
13 respond within 2 weeks, that would be good. With that, the
14 hearing is adjourned.

15 [Whereupon, at 5:18 p.m., the hearing was adjourned.]

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