The Heritage Foundation

BACKGROUNDER
No. 3515 | AUGUST 7, 2020
CENTER FOR NATIONAL DEFENSE

Developing a Clear Path for Homeland Missile Defense

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KEY TAKEAWAYS

A capable homeland missile defense is critical to directly safeguarding the American people from nuclear attack and to the U.S.'s nuclear deterrence strategy.

U.S. homeland missile defense is in a state of uncertainty as program delays, cancellations, misguided policy, and uneven program management stymie advancement.

The Administration and Congress should develop a clear path to advancing the homeland missile defense system to be able to defend against the advancing missile threat.

The U.S. homeland missile defense program has a history of changes, cancellations, and downsizing—evolving from a bold plan to defend against *any* nuclear missile to today's modest program able to defend against a limited North Korean attack. Our current, deficient system has resulted not only from technological and programmatic difficulties but also from national missile defense policies that have vacillated from bold to feeble. Today, programmatic challenges continue to leave the future of homeland missile defense uncertain. To fully realize the potential strategic benefits that homeland missile defense provides, the Trump Administration and Congress must develop a clear path to advancing today's missile defense system to be able to defend against the advancing missile threat.

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Why We Need Homeland Missile Defense

The United States maintains a homeland missile defense system capable of defending against limited attacks from rogue states like North Korea and Iran, as well as unauthorized attacks from any nuclear state. A capable homeland missile defense is critical to both directly safeguarding the American people from nuclear attack and to the United States' overall nuclear deterrent strategy. Homeland missile defense provides the United States with a number of tangible benefits.

Raising the Threshold. First, homeland missile defense raises the threshold for adversary attack and complicates adversary decision-making. U.S. adversaries like North Korea are likely to initiate a nuclear attack only if they have a high probability of success. But if an adversary must overcome missile defenses to produce the desired effects, it might think twice before threatening an escalatory attack. By creating uncertainty in the mind of the attacker, homeland missile defense complicates an adversary's decision-making, giving the United States more control over a potential escalatory situation.

For example, North Korea might use its nuclear weapons for a strategy of nuclear brinkmanship, attempting to blackmail the United States by threatening a limited attack.[1] Because the presence of homeland missile defense reduces U.S. vulnerability to a "cheap shot," a North Korean blackmail threat carries less credibility. By minimizing vulnerability to attack, missile defense has also given the Trump Administration the flexibility to choose denuclearization talks with North Korea—as opposed to preemptive strikes.

Credibility of Extended Deterrence. Second, homeland missile defense strengthens the credibility of U.S. extended deterrence. Convincing U.S. allies like South Korea, Taiwan, and NATO allies of the U.S. commitment to their security in a nuclear conflict is a difficult task: The question is inevitably asked, "Would the United States place Los Angeles at risk to save Tokyo or New York for Warsaw?" Adversaries might try to decouple the United States from defense of its allies by threatening to strike the U.S. homeland if the United States intervenes in a regional conflict.

But if the United States enjoys a credible homeland missile defense, it has greater "freedom to employ whatever means it chooses to respond to aggression without risk of enemy escalation to homeland strikes."[2] Similarly, homeland missile defense strengthens U.S. diplomacy. By arming U.S. diplomats with the option of striking down adversary missiles, they can negotiate from a place of greater strength.[3]

Limited Strike Protection. Third, homeland missile defense can protect against a limited strike. Even a North Korean "cheap shot" nuclear attack using a relatively low-yield nuclear weapon can kill hundreds of thousands, if not millions. North Korea's early nuclear weapon tests yielded about 15–20 kilotons, about the size of the U.S. bombs dropped on Japan, which killed a few hundred thousand people. North Korea's most recent 2017 test produced an estimated yield of *250 kilotons*, which would destroy Washington, DC.[4] By deploying missile defense against countries like North Korea who have threatened nuclear destruction, the United States acts in accordance with its moral obligation to safeguard the American people from attack.

Therefore, the argument for bolstering homeland missile defense should be intuitive: Intercepting an incoming nuclear attack can save hundreds of thousands, if not millions, of American lives. Yet since the 1960s, critics have been arguing that homeland missile defense creates instability by spurring a dangerous arms race, provoking U.S. adversaries to build their offensive forces to overcome U.S. defense. For instance, Russian President Vladimir Putin has cited U.S. missile defense as his impetus for developing exotic new delivery systems, such as the nuclear-powered cruise missile and underwater nuclear torpedo, which can reportedly evade any missile defense.[5]

However, history suggests U.S. adversaries will continue to build their offensive forces according to their interests—regardless of U.S. missile defense. Russian leadership has known for years that the U.S. Ground-based Midcourse Defense (GMD) system, limited in both size and capability, does not pose a threat to a Russian first or second strike. As recently as 2017, Russian Deputy Prime Minister Dmitriy Rogozin stated, "We can rip their air defenses apart; at the moment [the U.S. defense shield] poses no serious military threat to us, except for provocations."[6]

A more plausible explanation for Russia's exotic systems, among others, is its desire to demonstrate its military prowess and prove it still has great power status.[7] Ultimately, so long as countries like North Korea threaten to destroy the United States with nuclear attack, the U.S. government has a moral obligation to safeguard its population with missile defense, given that it has the technological means to do so.

The Gradual Decline of a Strong Homeland Missile Defense

Today's technologically and numerically limited GMD system has resulted from years of programmatic and policy changes and underfunding that gradually decreased the aspirations of U.S. homeland missile defense. The United States had its most comprehensive plan to defend the homeland

in 1983 when President Ronald Reagan announced his Strategic Defense Initiative (SDI). The SDI Phase I proposal included deployment of hundreds of space-based interceptors using directed energy and 1,000 ground-based interceptors (GBIs) to ultimately render Soviet nuclear weapons obsolete.[8]

The SDI was initiated as a research and development program, but if implemented, it would have violated the Anti-Ballistic Missile (ABM) Treaty, signed by the United States and Soviet Union in 1972. The ABM Treaty limited both countries to one interceptor site with no more than a 150-meter radius separating the interceptors and radars, which resulted in a maximum of 100 interceptors at each site.[9] It also restricted the ability to test and develop space-based or airborne interceptors.[10] The ABM Treaty's purported purpose was to prevent an action-reaction cycle, in which the deployment of missile defenses by one country would compel the other to advance its offensive forces, which would continue cyclically. Yet empirically, this was not the case.

President Reagan announced the SDI in response to a growing Soviet first-strike capability that the Soviet Union developed without the prospect of any deployed U.S. homeland defenses.[11] When the United States and Soviet Union signed the ABM Treaty in 1972, the Soviets had about 2,000 nuclear weapons, but by the year 2000 had increased their arsenal to 12,000 weapons—a time period in which the United States had *no* deployed missile defenses.[12] Instead of dampening an arms race, the ABM Treaty merely served to restrict development of a robust U.S. missile defense, as U.S. adversaries continued to act in their own interests.

Plans to defend the U.S. homeland peaked with the SDI and became more limited under each successive Administration. After the fall of the Soviet Union, President George H. W. Bush established the Global Protection Against Limited Strikes (GPALS) system to protect against a limited 200-warhead attack, rather than an all-out strike.[13] GPALS was envisioned to consist of GBIs and a modified space intercept layer system called Brilliant Pebbles, which was cleared for demonstration and validation in 1990.[14]

The demise of GPALS began with the passage of the Missile Defense Act of 1991. The Missile Defense Act codified into law the U.S. goal to deploy a ballistic missile defense system including 100 ground-based interceptors, ground-based radars, and space-based sensors by the mid-1990s. But because the act was the result of a compromise with missile defense critics, it also codified into law the modesty of the missile defense system, which was limited to defense against "limited ballistic missile threats, including accidental or unauthorized launches or Third World attacks, but below a threshold that would bring into question strategic stability."[15] Eventually, President Bill Clinton canceled Brilliant Pebbles, the bedrock of the GPALS program.

Congress modified U.S. missile defense policy again with the National Missile Defense Act of 1999, after a congressionally mandated commission highlighted the danger of ballistic missile proliferation to Iran, Iraq, and North Korea.[16] The act made it U.S. policy "to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack."[17] Again, the law expressed the urgency of deploying missile defense—while simultaneously restricting deployment to defend against a "limited" attack.

In response, the Clinton Administration developed a plan for an increasingly modest missile defense system, one with GBIs but no space elements. With the ABM Treaty still in place, the Administration could choose only one location to deploy interceptors that would provide the best coverage for all 50 states.[18] Eventually, a decision was made to deploy 100 GBIs to Fort Greely, Alaska, in order to extend protection to Alaska and Hawaii, but at the expense of better coverage of the East Coast.

Amid heightened fear of terrorist or rogue nation attacks after the 9/11 tragedy, President George W. Bush withdrew from the ABM Treaty in 2002 and issued National Security Presidential Directive 23, calling for the deployment of a system "at the earliest possible date" that draws from the "best technologies available."[19] Under Bush's directive, the new GMD system would include both boost-phase and midcourse interceptors based on sea-, air-, and ground-based platforms, beginning with GBIs in Alaska and radars across the world.

President Bush's swift deployment of a homeland missile defense system remains the basis for today's missile defense architecture. The first GBI was deployed to Fort Greely in 2004,[20] and by 2008, 24 GBIs were deployed to Fort Greely and Vandenberg Air Force Base, California. The newly formed Missile Defense Agency (MDA) also had forward-thinking plans to develop the next generation of missile defense architecture. These plans included fielding and deploying 20 more GBIs to the United States (bringing the total to 44) and 10 to Europe to defend against potential Iranian intercontinental ballistic missiles (ICBMs); boost-phase interceptors called the Kinetic Energy Interceptor and Airborne Laser;[21] and a Multiple Kill Vehicle that would enable a single interceptor to shoot down multiple targets.[22]

Unfortunately, the Obama Administration canceled all of these advanced programs, shifting focus to regional missile defense in Europe, and slashed the MDA budget by $1.4 billion.[23] After a series of North Korean nuclear provocations, President Obama reversed his decision to deploy a total of 44 GBIs to the United States, which remains the number of interceptors deployed today.[24]

Today's Homeland Missile Defense System

Today's GMD system consists of interceptors at two locations; sensors and radars on land, sea, and space; and fire-control systems. Much of the existing missile defense architecture are artifacts of the progression of program changes, cancellations, and ABM Treaty restrictions that have taken place since the early days of homeland missile defense.

Forty GBIs are deployed in silos at Fort Greely, Alaska, and four more are at Vandenberg Air Force Base in California, which amounts to 44 shots at incoming missiles.[25] Given that multiple GBIs would need to be shot at one target to increase the probability of intercept, GMD can only defend against a limited attack, likely from North Korea or an unauthorized, accidental launch from another nuclear power. Each GBI carries an Exoatmospheric Kill Vehicle (EKV) that releases from the GBI in the atmosphere to seek and destroy the target with hit-to-kill technology.[26]

The EKV was first successfully tested in 1999 and has been upgraded but not replaced since its first deployment on a GBI in 2004.[27] To increase capacity in light of increasing North Korean provocations, Congress approved a White House reprogramming request in 2017 to build 20 more interceptors to deploy at Fort Greely. Construction of 20 silos has been underway since then, but once finished, they will remain empty until the Department of Defense (DOD) can produce additional interceptors.[28]

GMD operates a network of sensors and radars that provide detection, tracking, and discrimination capabilities.[29] The global network consists of the following:

- Space-Based Infrared Sensor satellites in geostationary Earth orbit that have been replacing Defense Support Program satellites, both of which provide early warning detection;[30]
- Two Space Tracking and Surveillance System Demonstration satellites in low Earth orbit (LEO) that demonstrate birth-to-death tracking capability;
- Five forward-deployed TPY-2 radars that provide early tracking;
- The Sea-Based X Band radar deployed in the Pacific Ocean that provides discrimination capability;
- SPY-1 radars on Aegis Ballistic Missile Defense destroyers that track and provide discrimination data on ballistic missiles;

- The early warning and tracking Cobra Dane Radar in Alaska; and
- Five forward-deployed Upgraded Early Warning Radars.[31]

This array of sensors and radars collects information on an incoming missile's launch and flight path and feeds the information to the GMD Fire Control (GFC) components at Schriever Air Force Base in Colorado Springs and Fort Greely, which command the launch of the three-staged GBIs. Supported by Command, Control, Battle Management, and Communications software, the GFC provides this information to GBIs as they fly toward their targets. After the GBI's third stage burns out, it releases its EKV, which uses its sensors to locate and maneuver to the target, to then destroy with kinetic kill.[32] Next, sensors conduct a kill assessment to determine if the target has been destroyed or if another round of GBIs should fire. The DOD is also deploying a network of infrared sensors in space, the Space Kill Assessment program, to improve kill-assessment capability.[33]

The GMD system has successfully intercepted a test target 11 out of 19 times since 1999, the most recent three since 2014 having been successful.[34] This data would yield a 57 percent success rate for an individual GBI, but the actual probability of a successful intercept is substantially higher considering (1) multiple GBIs would launch at a single target, and (2) the improvements of technology and software since 1999. The most recent test in March 2019 (FTG-11) marked the first "salvo" test where one GBI intercepted the target and a second intercepted the biggest piece of debris from the exploded target.[35] The existing GMD system can indeed succeed, but in order for the U.S. to stay abreast of an evolving threat matrix, it must evolve to remain viable.

What Today's System Is Missing: Issues for Fiscal Year 2021 and Beyond

The many years of deferring, delaying, or canceling missile defense advancements have resulted in a GMD system far more modest than it could have been. Now, Congress and the Administration must address a number of pressing issues to improve an already limited homeland missile defense inside a defense budget being pressured by outside constraints. The DOD budget was essentially flatlined as it moved from budget years 2020 to 2021, and the missile defense budget reflects that reality. In fiscal year (FY) 2020, the President's budget request included $9.431[36] billion for MDA, but Congress funded $10.4 billion.[37] This year, the FY 2021 budget request includes $9.187 billion for MDA, a decrease.[38] Issues for FY 2021 and beyond include:

The DOD Lacks an Effective Plan to Replace Aging EKVs and Fill the 20 Empty GBI Silos to Address a Rising North Korean Missile Threat. General Terrence O'Shaughnessy, Commander of U.S. Northern Command (NORTHCOM), has expressed his confidence in the existing fleet of GBIs against the North Korean threat today, but acknowledges that GMD capability will need to improve.[39] Existing EKVs face aging and obsolescence issues, which have prompted the MDA to initiate the Redesigned Kill Vehicle (RKV) program in 2015. The program was canceled last year reportedly due to failure to adequately address technical risks, and in the years since the replacement program was initiated, EKV aging and obsolescence issues are that much worse.[40] The RKV was initially planned to replace the EKVs and fill the 20 new GBIs in Fort Greely beginning as early as 2021. While the RKVs would not have added significant capability, they would have solved aging issues and improved duplicability, reliability, and maintainability.

After the RKV cancellation, MDA initiated the Next Generation Interceptor (NGI) program. Specified to have advanced capabilities tailored to defend against an increasingly complex threat, NGI could provide a long-term solution to homeland missile defense interceptors, but it may not be ready until 2028 or beyond,[41] even though MDA initially intended for RKV to replace the EKV fleet as soon as the early 2020s.[42] While the DOD has committed to pushing NGI as quickly as possible, it would be a leap of faith for the United States to rely on a program that has barely made it onto paper for a 2028 deployment.[43] To make it to fielding, NGI will need to survive the scrutiny of Congress and at least one other administration before 2028, as well as overcome technical and operational hurdles inevitable in a new program.

With no EKV replacement in the near future, two problems are converging at once. First, EKVs continue to age and become increasingly obsolete. Simultaneously, the North Koreans continue to improve their ICBM arsenal both in quantity and in ability to strike the entire United States.[44] Eventually, North Korea could arm its ICBMs with countermeasures like decoys and penetration aids to evade U.S. missile defenses.[45] RKV would have bridged the gap until the DOD developed a next generation interceptor, but now senior defense leaders expect these two issues to converge around 2025.[46] The prospects of having insufficient capability to defend against a rogue nation should prompt serious concern within Congress and the Administration.

To hedge against the NGI timeline, the DOD plans to use Aegis SM-3 Block IIA interceptors and the Terminal High Altitude Area Defense (THAAD) system to defend the homeland as an "underlay." The President's

budget request included $39.2 million to test the SM-3 interceptor against an ICBM target and $139.0 million to explore extending the range of THAAD to intercept an ICBM.[47] Ideally, these systems could provide a second and third shot against an incoming attack after GBIs attempt to shoot the missiles down, as part of a truly layered, "shoot-look-shoot" missile defense doctrine.[48] However, even if these systems prove they can intercept an ICBM, developing a concept of operations to deploy these systems might take years and cost billions of dollars.[49] The SM-3 ICBM test has already been further delayed due to the COVID-19 pandemic.[50] Moreover, buying additional THAAD batteries for homeland defense might prove challenging when the Army already does not have enough THAAD batteries to meet existing requirements.[51] Pursuing a homeland defense underlay may prove a worthwhile, long-term investment, but it may not provide backup to the aging EKV fleet soon enough.

The DOD also intends to utilize "left-of-launch" offensive strikes in the event of an impending North Korean or Iranian ICBM launch. While integrating offense with defense is important, the DOD should not hedge its bets on such "bloody nose" strikes that are accompanied by political risk. Without a sure plan for fielding more kill vehicles over the next decade, the United States still faces sufficient risk from the growing North Korean, and potentially Iranian, ICBM threat.

The Locations of Today's GBIs Lack Geographical Diversity. While the 40 interceptors in Alaska and four in California can technically strike down a missile headed anywhere in the United States, the system is optimized for North Korean threats, especially those headed for the West Coast. This imbalance in coverage has sufficed for North Korea's nascent ICBM capability that could barely reach the West Coast, but the East Coast today becomes more vulnerable as North Korea's ICBMs improve and an ICBM threat from Iran becomes likelier. Former Commander of U.S. Strategic Command General Robert Kehler testified in 2013 that GMD "doesn't provide total defense" of the country today and cannot necessarily defend the East Coast from an ICBM launched from Iran.[52] The DOD has been considering building a missile defense site on the East Coast, which would provide the NORTHCOM commander with shot diversity, allowing for an intercept attempt on incoming missiles from the threats traveling over Europe while freeing up interceptors on the West Coast to focus on missile attacks coming over the Pacific.[53]

There Are Holes in Global Sensor Coverage. After withdrawing from the ABM Treaty, which limited the deployment location of radars, the DOD has filled in "gaps" to missile sensing by deploying radars like the Sea-Based

X-Band (SBX) radar and forward-based Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2) radar around the world. But, a midcourse discrimination gap still remains in the Pacific for tracking North Korean missiles. The MDA's Long-Range Discrimination Radar (LRDR) being built in Northern Alaska will improve coverage in the northern Pacific, but will leave a tracking and discrimination gap over Hawaii and elsewhere in the Pacific. In the FY 2021 budget, the MDA omitted plans to build a Homeland Defense Radar (HDR)-Hawaii and another HDR-Pacific. The SBX radar is currently deployed to the Pacific to compensate for this gap in global coverage, but a floating radar cannot remain at sea indefinitely; the MDA will ultimately need a plan to completely close this Pacific midcourse discrimination gap.[54]

The Birth-to-Death Missile Tracking Program Remains in a State of Instability Despite Plans from the Past Five Successive Administrations to Deploy a Missile Sensor Layer in Space. From the ultimate high ground, space-based sensors can track missile launches from boost to terminal phase, compared to ground-based radars that are limited in field of view.[55] Space-based sensors would also be able to track low-flying hypersonic vehicles.

The Administration's plans to quickly deploy a space sensor layer have been hampered by uneven program management. Even though the 2019 *Missile Defense Review* cited the need for space sensing, in FY 2019 and FY 2020, the Administration failed to request funding for a space sensor layer. Instead, Congress was forced to unilaterally appropriate money for the purpose to the MDA for the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) based off the MDA Unfunded Priorities List. In FY 2020, the Administration tried to move the HBTSS to the nascent Space Development Agency (SDA) to be developed as part of SDA's future proliferated LEO architecture. But Congress assigned primary responsibility of the HBTSS to the MDA, which had already begun work on the HBTSS, and appropriated $108 million for the program.[56]

This year, the President requested $99.6 million to the SDA to integrate the MDA's HBTSS payload into a future LEO architecture, creating two problems.[57] First, $99.6 million is not enough. Funding in FY 2021 for the HBTSS needs to increase—not decrease—to move forward quickly with the development and demonstration of the hypersonic tracking layer in LEO. Second, moving the space sensor layer back to SDA contributes to organizational disorder, which in addition to putting the HBTSS on the unfunded requirement list in FY 2019 and FY 2020, has surely contributed to a delay in the program.

U.S. Missile Defense Policy Is Unclear. Both the Missile Defense Act of 1991 and the National Missile Defense Act of 1999 codified into law the "limited" nature of homeland missile defense.[58] Since then, the National Defense Authorization Act (NDAA) for FY 2017 dropped the word "limited" from the policy and replaced it with a policy enabling a "robust layered missile defense" that can defend against "the developing and increasingly complex ballistic missile threat;"[59] it did not distinguish between near-peer and rogue nation attacks. Similarly, the MDR leaves the door open to expanding missile defense capabilities by stating that the system should "adapt to emerging and unanticipated threats." Yet, in a return to outdated policy, the NDAA for FY 2020 made it a matter of policy to rely on nuclear deterrence, as opposed to missile defense, to "address more sophisticated and larger quantity near-peer intercontinental missile threats to the homeland" and use homeland missile defense against rogue threats.

More than just a matter of semantics, policy is important because it can influence efforts to improve overall defense capabilities. If policy restricts missile defense to only rogue threats, government and industry might be dissuaded from investing in advanced solutions like boost-phase missile defense.[60] As modern technologies become cheaper and China and Russia continue to proliferate their missile technologies, North Korean or Iranian ballistic missiles may rival, in sophistication if not numbers, those of Russia or China. Consequently, the United States must remain aware of how such threats are evolving and alter its missile defense posture accordingly.[61]

Recommendations

Homeland missile defense is a critical component of the United States' deterrent strategy, and its importance will only grow as U.S. adversaries continue to advance their missile capabilities. Today's GMD system lacks the robustness featured in the plans of multiple Administrations that never came to fruition. Now, the DOD faces multiple issues and runs parallel programs for homeland missile defense advancement under a limited budget. To move forward with a clear plan for homeland missile defense, Congress and the Administration should:

- **Stabilize and sufficiently fund the space sensor layer program to move up its deployment as much as possible.** A consensus of Republicans, Democrats, and combatant commanders acknowledge the importance of a space sensor layer,[62] but the program has been plagued by bureaucratic infighting over which organization should manage the

program. Moreover, a decrease in research and development funding in FY 2021 will increase the difficulty of demonstrating this space sensor layer quickly, especially due to the technological challenges associated with developing a sensor that can perform in low Earth orbit.[63] Regardless of the agency chosen to have ultimate responsibility for this program, the government must stick with one plan to enable this program to move forward. Sensors that provide a birth-to-death tracking capability should be a necessary prerequisite to any future intercept capabilities.

- **Invest heavily in keeping the current GBI fleet effective until completion of NGI.** Last year, Congress redirected funding from the canceled RKV program to provide $485 million to sustain and maintain the existing GBI fleet through a service-life extension program for the oldest interceptors, purchase of additional boosters, and further risk reduction.[64] This effort should continue in future years as part of a comprehensive effort that requires MDA to work with industry to develop a cost-effective plan for maintaining the GBI fleet. Such a plan should include a continued effort to extend the service life of the existing 44 EKVs, as well as the use of existing spare parts to produce additional GBIs, if possible. The budget request for FY 2021 included $664.4 million for NGI, but since the NGI request for proposals was delayed, Congress can shift a portion of this funding request to maintaining short-term GBI fleet capability and capacity enhancement if additional funding cannot be found elsewhere. The DOD must develop a plan this year to ensure an effective GBI fleet that can last until enough NGIs are produced to replace all 44 GBIs, for which Congress must allocate the appropriate funds. Given the convergence of aging EKVs and the advancing North Korean threat, the DOD must address this problem with a greater sense of urgency.

- **Proceed with an underlay using SM-3 Block IIA interceptors, but not as a replacement for short-term improvements to the existing GBI fleet.** A homeland missile defense underlay is a worthwhile pursuit; it can provide a "back-up" option to shoot down an incoming attack should the GMD system fail, and if deployed throughout the continental United States, it can improve defense of the East Coast. Yet, in the short-term, relying on the deployment of such an underlay to hedge against increasing EKV obsolescence in the mid-2020s would be unwise. Achieving an effective underlay could require building multiple Aegis Ashore sites, a costly and time-consuming

endeavor. If the DOD assumes an Aegis underlay can solve the problem of EKV obsolescence, it risks entering the mid-2020s with a weakened GBI capability and an underlay still years away. The DOD touts the underlay solution, but has yet to put math to the concept—many questions require answers, such as the costs of an underlay, radars required, and a feasible concept of operations. While the DOD begins to answer these questions, it should maintain current GBI improvement as its first priority and Aegis underlay as an additional project to bolster, but not replace, existing GMD capability.

- **Forgo funding construction of an East Coast missile defense site in FY 2021, and instead consider defense of the East Coast using a future underlay.** Ideally, the United States should get ahead of a future Iranian ICBM threat and deploy missile defenses as quickly as possible to better defend the East Coast. But so long as the DOD lacks a solution for defending against the growing North Korean threat, it must prioritize allocating funds to the existing GMD system. Moreover, moving forward with an East Coast GMD site is illogical when the MDA does not have interceptors to fill empty silos in Alaska, much less for an East Coast site that does not yet exist. Instead, Congress should require the DOD to explore alternative options to a new GMD site for defending the East Coast, including deploying future Aegis Ashore sites at locations already vetted for an East Coast site.[65] The DOD requested funding for technical feasibility of an Aegis underlay in FY 2021, but in addition to filling this request, Congress should also mandate that the DOD simultaneously begin exploring site selection to increase the chances of executing an underlay quickly.

- **Resume funding the Homeland Defense Radar-H in FY 2021 if funding is available for additional priorities.** To fill the Pacific mid-course discrimination gap as HDR-H remains delayed indefinitely, the DOD plans to use deployed AN/TYP-2 radars, the SBX radar, and radars on Aegis ships;[66] the eventual deployment of the space sensor layer will also improve this capability. However, these radars and sensors combined would not equal the discrimination capability that a ground-based radar in Hawaii would provide to increase the chances of intercept. Accounting for economic downturn from the COVID-19 pandemic, the MDA's top spending priorities must remain the space sensor layer and GBI improvement, but additional available resources should go toward filling the Pacific mid-course gap.[67]

- **Direct the MDA to continue studying boost-phase intercept as a long-term homeland defense capability but focus its limited resources on improving the GMD system in the near future.** Boost-phase missile defense would provide a reliable defense by intercepting a missile before it gains high velocity and begins to deploy countermeasures.[68] But, boost-phase intercept, deployed on Earth or from space, faces large technical, operational, and political challenges that make boost-phase intercept unlikely to provide a silver-bullet solution in the near future.[69] Exploration of this technology is important, but in FY 2021 and the near-term, the DOD should assume it will rely on the GMD system this decade and allocate resources accordingly.

- **Refuse to accept limits to homeland missile defense in arms control negotiations.** The Russians have expressed concern with U.S. missile defense systems that do not threaten their missile force. The United States should not make a concession to Russia or China that threatens its ability to defend against North Korea and Iran. Instead, the United States should continue to modernize its nuclear weapons and delivery systems and develop and deploy both conventional and hypersonic missiles overseas to use as negotiating leverage against Russia and China.

Conclusion

U.S. homeland missile defense is in a state of uncertainty as program delays, cancellations, misguided policy, and uneven program management continue to stymie advancement. To move forward with developing a missile defense system that can respond to the growing missile threat and contribute to U.S. deterrence, the DOD needs to answer many questions, stabilize programs like the space sensor layer and be held accountable for the weakening GBI fleet. To support the DOD, Congress needs to provide the funding necessary to reflect homeland defense as both the National Defense Strategy's and MDR's highest priority.

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