

The logo for the Federation of American Scientists (FAS), consisting of the letters 'FAS' in a bold, white, sans-serif font inside a white square.

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Scientists

The background is a technical drawing of a missile, oriented vertically. It shows various stages and components, including a nose cone, a first stage, a second stage, and a third stage. The drawing is in white lines on a dark blue background. Labels like '1st Stage', '2nd Stage', '3rd Stage', and 'NS10' are visible. There are also various numerical measurements and dimensions scattered throughout the drawing.

ALTERNATIVES TO THE GROUND-BASED STRATEGIC DETERRENT

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At 7:59 am PDT the second of two unarmed Minuteman III Intercontinental Ballistic Missiles is successfully launched. SSGT Mark Borosch.

Cover image: ICBM Prime Team, "Minuteman Weapon System History and Description," 2001.

Page 5: Air Force Global Strike Command, "Map of GBSDEIS project locations," United States Air Force (2020). <<https://www.gbsdeis.com/stations-locations/project-locations>>]

Executive Summary

The Pentagon is currently planning to replace its current fleet of intercontinental ballistic missiles (ICBMs) with a brand-new missile force, known as the **Ground-Based Strategic Deterrent**, or **GBSD**.

The GBSD program consists of a like-for-like replacement of all 400 Minuteman III missiles that are currently deployed across Colorado, Montana, Nebraska, North Dakota, and Wyoming, and will also include a full set of test-launch missiles, as well as upgrades to the launch facilities, launch control centers, and other supporting infrastructure. The GBSD program will keep ICBMs in the United States' nuclear arsenal until 2075, and is estimated to cost approximately \$100 billion (in Then Year dollars) in acquisition fees and \$264 billion (in Then Year dollars) throughout its life-cycle.

However, critics of the GBSD program—which include a chorus of former military commanders and Secretaries of Defense, top civilian officials, current congressional committee chairs, subject matter experts, and grassroots groups—are noting a growing number of concerns over the program's increasing costs, tight schedule, and lack of 21st century national security relevance. Many argue that the GBSD's price tag is too high amid a plethora of other budgetary pressures. Many also say that alternative—and more stabilizing—deterrence options are available at a much lower cost, such as life-extending the current Minuteman III ICBM force.

To that end, **the Biden administration should immediately launch a National Security Council-led strategic review examining the role of ICBMs in US nuclear strategy.**

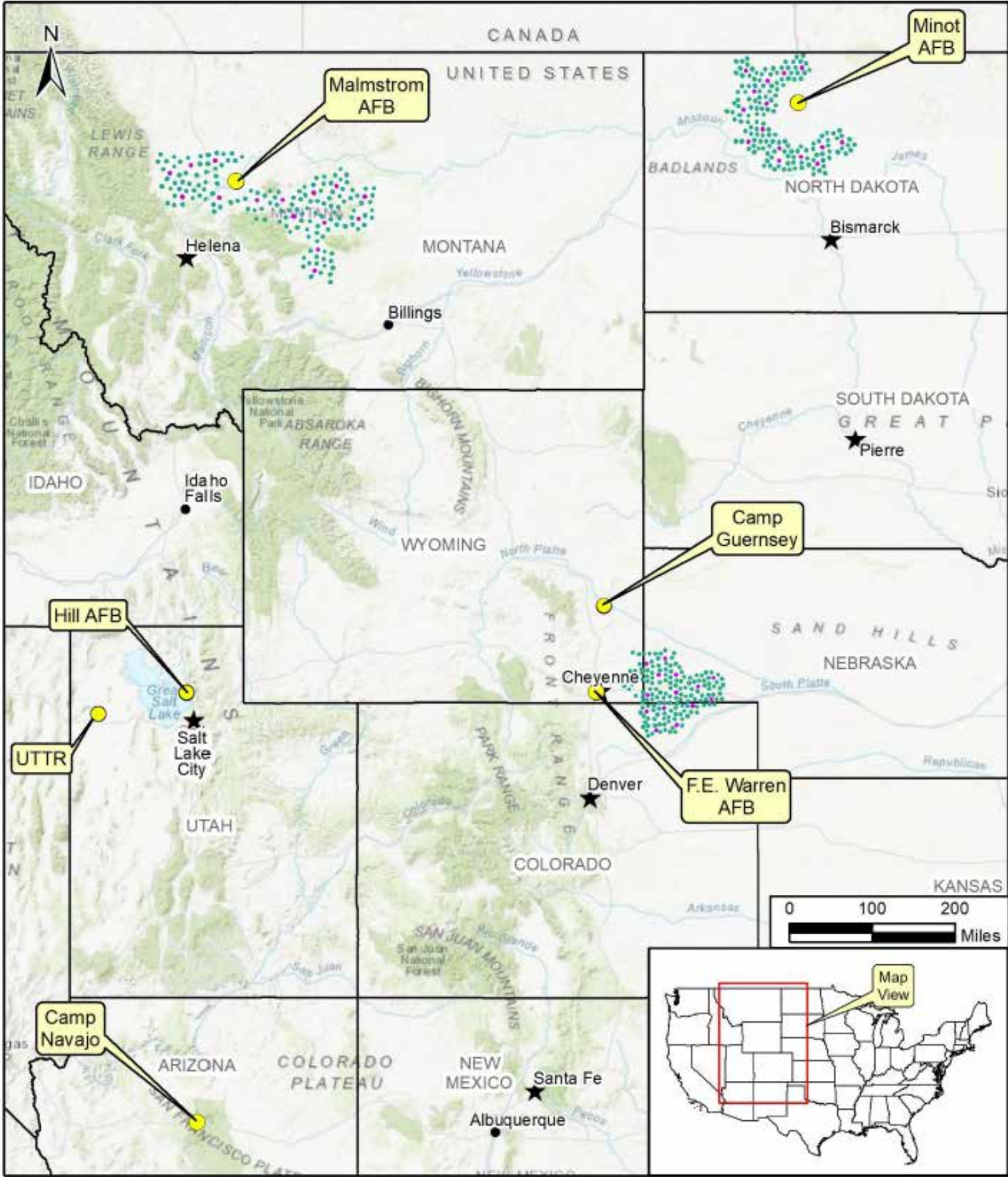
Such a review should address the fact that the ICBM force no longer serves the same strategic role that it did during the Cold War. Despite substantial reductions in the ICBM force over the past two decades, there has not been a serious consideration of what role these 20th century weapons are supposed to play in a 21st century deterrence environment.

Additionally, **a review should consider the status of the GBSD program in particular.**

Despite the growing number of concerns with the program, GBSD has been accelerated under the Trump administration, in an effort to make it more difficult to reverse under a Biden administration.

However, it is still early enough in the program to change course. To that end, this policy memo presents **four alternative policy options** that the Biden administration could pursue in lieu of the current GBSD program of record. Each option includes an associated cost analysis, as well as the results of **brand-new polling** commissioned by the Federation of American Scientists (FAS) in October 2020.

As this memo demonstrates, adopting any of these four options as an alternative to the GBSD program of record would save billions of dollars, would not harm US national security, and—as evidenced by FAS' new polling—would be widely supported by the American public on a bipartisan basis.



LEGEND

- State Boundary
- Launch Facility (LF)
- Missile Alert Facility (MAF)

Locations Associated with the GBSD Deployment Program

The Case Against the Ground-Based Strategic Deterrent

The land-based leg of the US nuclear arsenal has long been recognized as the most politically and militarily vulnerable leg of America's nuclear "triad."

As the Pentagon plans to upgrade from the current Minuteman III ICBMs to the Ground-Based Strategic Deterrent, critics of the program—which include a chorus of former military commanders and Secretaries of Defense, top civilian officials, subject matter experts, and grassroots groups—are noting **a growing number of concerns over the program's increasing costs, tight schedule, and lack of 21st century national security relevance.**

The security rationale for the ICBM force is thinner than it has ever been. During the Cold War—when the United States and the Soviet Union alike feared a "bolt-from-the-blue" nuclear attack—many deterrence theorists argued that ICBMs were a stabilizing force: if both countries had hundreds of missiles on hair-trigger alert, neither could launch without the other responding in kind.

However, in today's multipolar nuclear environment, the possibility of a Russian surprise first-strike like this is, in the words of former Defense Secretary William Perry and Ploughshares Fund's Tom Collina, "vanishingly small."¹ This is largely due to the survivability of the US ballistic missile submarine force, which carries approximately 70% of the United States' deployed nuclear warheads.² **Even without the ICBMs, an adversary could never hope to destroy every US bomber and nuclear-armed submarine in an attempted first strike—which is why such a strike remains incredibly unlikely today.** Therefore, a reduced number of ICBMs—or even their complete elimination—would not meaningfully affect an adversary's deterrence calculations.

Additionally, **the United States' ICBM force does not address key 21st century deterrence requirements.** The missiles' flight paths render them unusable against Chinese or North Korean military targets because they would be forced to fly over Russian territory. As a result, **US submarines and bombers are assigned the nuclear mission against China and North Korea—not ICBMs.**³ Intercontinental ballistic missiles are therefore not useful for assuring the United States' Indo-Pacific allies, and there is little evidence to suggest that these allies are particularly invested in the fate of the ICBM force. This stands in stark contrast to allied anxiety over the fates of other nuclear

1 William J. Perry and Tom Z. Collina, *The Button: The New Nuclear Arms Race and Presidential Power from Truman to Trump* (Dallas, TX: BenBella Books, Inc., June 2020).

2 Hans M. Kristensen and Matt Korda, "United States nuclear forces, 2020," *Bulletin of the Atomic Scientists* 76:1, pp. 46-60, DOI: 10.1080/00963402.2019.1701286.

3 Bruce Blair, Jessica Sleight, and Emma Clare Foley, "An Alternative U.S. Nuclear Posture Review: The End of Nuclear Warfighting, Moving to a Deterrence-Only Posture," *Global Zero* (September 2018), p. 62.

systems—such as strategic bombers and submarines—that are immediately relevant to their defense postures.

There is also no evidence that US ICBMs affect either Chinese nuclear doctrine or prospects for US-China arms control. In reality, reducing the number of ICBMs—or eliminating them altogether—could make China more amenable to engage in arms control negotiations, given their longstanding call for the United States to reduce the disparity between the two countries’ nuclear forces, before pursuing US-China arms control talks.⁴

The deterrence mission of the ICBMs can be fulfilled by other nuclear systems.

ICBMs are often characterized as the most “responsive” leg of the triad in the event of a nuclear crisis; however, the Government Accountability Office has found that not only are sea-based nuclear weapons significantly more survivable than ICBMs, they are almost equally as responsive.⁵ This was later confirmed by former Secretary of Defense Chuck Hagel and General (ret.) James Cartwright—who served as Commander of US Strategic Command and subsequently as Vice Chairman of the Joint Chiefs of Staff—who were among the authors of a 2012 Global Zero report stating that “The past clear-cut superiority of ICBM over SSBN communications for wartime dissemination of emergency action messages no longer exists.”⁶ This suggests that ICBMs are no longer necessary in order to maintain a credible second strike capability.

“During the Cold War, the United States relied on ICBMs because they provided accuracy that was not then achievable by submarine-launched missiles or bombers. They also provided an insurance policy in case America’s nuclear submarine force was disabled. That’s not necessary anymore. Today, the United States’ submarine and bomber forces are highly accurate, and we have enough confidence in their security that we do not need an additional insurance policy — especially one that is so expensive and open to error.”

— William J. Perry, *Secretary of Defense 1994-1997*, *New York Times* op-ed “Why It’s Safe To Scrap America’s ICBMs” (30 September 2016)

This situation is not likely to change, even decades into the future. The 2018 Nuclear

Posture Review notes that “there are no known, near-term credible threats to the

4 The Federation of American Scientists assesses the United States to have approximately 3,800 nuclear warheads in its nuclear stockpile, while China has approximately 350.

5 Eleanor Chelimsky, “GAO’s Evaluation of the Strategic Modernization Program,” Testimony before the Senate Committee on Governmental Affairs (10 June 1993), p. 14, <<https://www.gao.gov/assets/110/105080.pdf>>.

6 Gen. (ret.) James Cartwright et al., “Global Zero U.S. Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure and Posture,” *Global Zero* (May 2012), p. 8, <https://www.globalzero.org/wp-content/uploads/2018/09/gz_us_nuclear_policy_commission_report.pdf>.

survivability of the SSBN [ballistic missile submarine] force,” and if a game-changing technological breakthrough were to occur, the United States would—in all likelihood—be the one developing it, given its unrivaled superiority in anti-submarine warfare technology.⁷

The GAO has also found that historically, “unsubstantiated allegations about likely future breakthroughs in Soviet submarine detection technologies, along with underestimation of the performance and capabilities of our own nuclear-powered ballistic missile submarines” have often been “used frequently as a justification for costly modernizations in the other legs to ‘hedge’ against SSBN vulnerability.”⁸ This pattern still holds true today, as evidenced by the fact that many ICBM proponents are increasingly choosing to call the Navy’s nuclear systems into question in order to justify their own.⁹

In contrast to the submarine force—which prioritizes both responsiveness and survivability—the fixed ICBM force clearly places a premium on responsiveness, at the expense of survivability. **This inherent vulnerability, however, creates a destabilizing psychological pressure to launch nuclear weapons quickly in a crisis—even in the midst of a false alarm.** A president would only have approximately two to three minutes to decide whether or not to launch these weapons, without having all the information necessary to make a sound decision.¹⁰ Other weapons in the US nuclear arsenal—such as ballistic missile submarines—can respond to a nuclear attack just as quickly as ICBMs, yet their undetectability and survivability means that they do not come with the same kinds of psychological pressures. As a result, **ICBMs can be considered to be a uniquely destabilizing weapon system.**

On top of these strategic concerns, top military officials agree that the number of deployed US warheads could be significantly reduced. In 2013, the Obama administration signed off on a comprehensive inter-agency review—which included the participation of the State Department, the Defense Department, the National Security Council, the intelligence community, the Joint Chiefs of Staff, US Strategic Command, and then-Vice President Joe Biden’s office—which concluded that **US deterrence requirements could be met by reducing US nuclear forces by up**

7 US Department of Defense, “Nuclear Posture Review,” Office of the Secretary of Defense (February 2018), pp. 44-45; Owen R. Cote Jr., “Invisible nuclear-armed submarines, or transparent oceans? Are ballistic missile submarines still the best deterrent for the United States?” *Bulletin of the Atomic Scientists* 75:1 (2019), pp. 30-35, DOI: 10.1080/00963402.2019.1555998.

8 Chelimsky, “GAO’s Evaluation of the Strategic Modernization Program,” p. 5.

9 Matt Korda, “ICBM Advocates Say US Missile Subs Are Vulnerable. It Isn’t True,” *Defense One* (10 December 2020), <<https://www.defenseone.com/ideas/2020/12/icbm-advocates-say-us-missile-subs-are-vulnerable-it-isnt-true/170677/>>.

10 Jeffrey Lewis, “Is Launch Under Attack Feasible?,” *Nuclear Threat Initiative* (24 August 2017), <<https://www.nti.org/analysis/articles/launch-under-attack-feasible/>>.

to one-third.¹¹ Reducing the deployed US nuclear arsenal from the 1,550 strategic warheads allowed under the New START Treaty to 1,100—as elements of the Obama administration were promoting at the time—could be accomplished by cancelling the GBSD program and either reducing or phasing out the land-based leg of the US nuclear deterrent.¹²

Proposed reductions to the ICBM force have historically been opposed by congressional representatives of ICBM host states, on the basis that the land-based missile force provides an economic boost for their constituencies. However, **the ICBM force does not create as many jobs as its advocates often claim.** Analysis by the Costs of War Project shows that defense investment is among the least productive of federal investment opportunities, and that an investment of \$260 billion—the approximately life-cycle cost of the GBSD program—could create millions of additional jobs if it were directed towards other priorities like clean energy (700,000 additional jobs per year), infrastructure (700,000 additional jobs per year), healthcare (two million additional jobs per year), and primary and secondary education (three million additional jobs per year).¹³

Redirecting defense dollars towards these priorities would also help increase local communities' resilience to the potential economic impacts of ICBM elimination. Analysis of previous military base closures indicates that most military communities have actually increased their employment levels—in many cases, by several hundred percent—after their nearby bases closed and those federal investments were reallocated towards other priorities.¹⁴

Despite the GBSD program's rising price tag, ICBM advocates often reference the relative "affordability" of land-based missiles. However, **by its own admission, the Pentagon cannot afford all of the weapons it wants to buy.** In July 2020, the then-Air Force Chief of Staff, Lt. Gen Dave Goldfein, remarked at a Brookings Institution appearance that "this will be the first time that the nation has tried to simultaneously modernize the nuclear enterprise while it's trying to modernize an aging conventional enterprise. The current budget does not allow you to do both."¹⁵ These tensions are already coming into stark

11 Office of the Press Secretary, "Fact Sheet: Nuclear Weapons Employment Strategy of the United States," *The White House* (19 June 2013), <<https://obamawhitehouse.archives.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states>>.

12 R. Jeffrey Smith, "Obama Administration Embraces Major New Nuclear Weapons Cut," *The Center for Public Integrity* (8 February 2013), <<https://publicintegrity.org/national-security/obama-administration-embraces-major-new-nuclear-weapons-cut/>>.

13 Heidi Garrett-Peltier, "War Spending and Lost Opportunities," *Costs of War Project* (March 2019), <<https://watson.brown.edu/costsofwar/files/cow/imce/papers/2019/March%202019%20Job%20Opportunity%20Cost%20of%20War.pdf>>.

14 Data retrieved from the Office of Economic Adjustment, Department of Defense.

15 Marcus Weisgerber, "We Don't Have Enough Cash to Build New Nuclear Weapons, Says Air Force Chief," *Defense One* (1 July 2020), <<https://www.defenseone.com/policy/2020/07/we-dont-have-enough-cash-build-new-nuclear-weapons-says-air-force-chief/166598/>>.

focus: in early 2020, for example, a decision to dramatically increase the budget of the National Nuclear Security Administration directly led to the cutting of a Virginia-class submarine from the Navy's budget plan.¹⁶

The Pentagon is currently facing a “bow wave” of expenditures over the coming decade, with the bills for several big-ticket procurement projects—including the GBSD, the Long-Range Standoff Weapon, the F-35 fighter, the B-21 bomber, the Columbia-class ballistic missile submarine, and the KC-46A tanker—all coming due at roughly the same time. In 2017, the Congressional Budget Office estimated that the entire US nuclear modernization program would cost approximately \$1.2 trillion, and these costs are likely to increase with inflation.¹⁷ With growing recognition that the Pentagon simply cannot afford all of these programs simultaneously, these major acquisition programs have been characterized as “fiscal time bombs.”¹⁸

As a result, **it is important to note the security tradeoffs associated with spending nearly \$100 billion to acquire the Ground-Based Strategic Deterrent, at the expense of more essential programs.** This means that solutions to 21st century security challenges—strengthening pandemic response and relief capabilities, for example, or hardening US command and control systems against cyber threats—could be left unfunded.

“In the world we live in now and given the advance of other technologies, I think that it’s a question as to (a) whether we need an ICBM leg and (b) if we do need some ICBM leg, how big does it really have to be to serve the purpose. I think that is one of the fundamental questions that the NPR should take on, whether we should move to a dyad and, even if you believe we should stay at a triad, can the balance change. [...] In particular, I think the Defense Department should more seriously consider further extending the life of the existing Minuteman III ICBMs as a cheaper near-term alternative to the current plan to build an entirely new ICBM system.”

— Michèle Flournoy, *Under Secretary of Defense for Policy 2009-2012*, Interview with *Arms Control Today* (July/August 2017)

16 Roxana Tiron and Travis J. Tritten, “Pentagon Budget Plan to Pit Ships Against Nuclear Arms, Aircraft,” *Bloomberg Government* (25 February 2020), <<https://about.bgov.com/news/pentagon-budget-plan-to-pit-ships-against-nuclear-arms-aircraft/>>.

17 Congressional Budget Office, “Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046” (October 2017), <<https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53211-nuclearforces.pdf>>.

18 Kingston Reif and Mackenzie Eaglen, “The Ticking Nuclear Budget Time Bomb,” *War on the Rocks* (25 October 2018), <<https://warontherocks.com/2018/10/the-ticking-nuclear-budget-time-bomb/>>; Sydney J. Freedberg Jr., “Bow Wave Time Bomb: B-21, Ohio Replacement Costs Likely to Grow,” *Breaking Defense* (4 August 2016), <<https://breakingdefense.com/2016/08/bow-wave-time-bomb-b-21-ohio-replacement-costs-likely-to-grow/>>.

These security tradeoffs are now worth re-examining, given that the GBSD program's price tag keeps rising. The Pentagon's independent Cost Assessment and Program Evaluation (CAPE) office estimated in August 2020 that the GBSD program's acquisition costs would total \$95.8 billion.¹⁹ This is approximately \$10 billion more than the \$85 billion acquisition estimate set by the Pentagon in August 2016, and over \$30 billion more than the Air Force's \$62.3 billion estimate in 2015.²⁰ These increased acquisition costs will have a knock-on effect on the total life-cycle costs: in October 2020 the Pentagon reported that CAPE's latest GBSD life-cycle estimate of \$264 billion was \$1.9 billion greater than its 2016 estimate, but did not explain why the estimate had grown.²¹ **The GBSD's ever-increasing price tag indicates that the program is not nearly as cost-effective as initially projected.**

These rising costs are especially concerning, given that **the decision to pursue a full replacement of the Minuteman III ICBM in the first place was based on a number of flawed assumptions** about how GBSD would address capability gaps, maintain the health of the large solid rocket motor industrial base, share commonality with the Navy's missiles, and—most importantly—be cheaper than the cost of a Minuteman life-extension.²² In hindsight, and upon further scrutiny, all of these assumptions appear to have either been exaggerated or simply have not come to fruition—meaning that the Air Force's case for GBSD needs to be reevaluated in light of cost escalation and surrounding budget pressures.

Furthermore, it is possible to life-extend the current ICBM force for much cheaper, instead of building an expensive new force from scratch. The Air Force's Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration testified to that effect in April 2019, and a 2014 RAND report commissioned by Air Force Global Strike Command found “no evidence that would necessarily preclude the possibility of long-term sustainment.”²³ In fact, the report noted, “we found many who believed the default approach for the future is incremental modernization, that is, updating the sustainability and capability of the Minuteman III system as needed and in perpetuity.”

19 Under Secretary of Defense for Acquisition and Sustainment, “(U) Ground Based Strategic Deterrent Milestone B Summary: Report to Congress,” *Department of Defense* (September 2020), p. 5, retrieved through FOIA 21-F-0065 on 24 November 2020.

20 Kingston Reif, “Price Tag Rising for Planned ICBMs,” *Arms Control Today* (October 2016), <<https://www.armscontrol.org/act/2016-09/news/price-tag-rising-planned-icbms>>; Brian Bradley, “Air Force: GBSD Currently Estimated to Cost \$62B,” *Nuclear Security & Deterrence Monitor* (5 June 2015), <<https://www.exchangemonitor.com/air-force-gbsd-currently-estimated-to-cost-62b/>>.

21 Anthony Capaccio, “New U.S. ICBMs Could Cost Up To \$264 Billion Over Decades,” *Bloomberg*, 3 October 2020, <<https://www.bloomberg.com/news/articles/2020-10-03/new-u-s-icbms-could-cost-up-to-264-billion-over-decades>>.

22 United States Air Force, “Cost Comparison of Extending the Life of the Minuteman III Intercontinental Ballistic Missile to Replacing it with a Ground-Based Strategic Deterrent: Report to Congress,” Department of Defense (July 2016), p. 4.

23 Lt. Gen. Richard Clark, testimony before the House Armed Services Subcommittee on Strategic Forces, “Hearing on Fiscal 2020 Budget Request for Defense Nuclear Activities,” 116th Congress, 1st Session (3 April 2019), <<https://www.stratcom.mil/Media/Speeches/Article/1800469/house-armed-services-subcommittee-on-strategic-forces-holds-hearing-on-fiscal-2/>>; Lauren Caston et al. “The Future of the U.S. Intercontinental Ballistic Missile Force,” *RAND Corporation* (2014), p. 84.

This option was not pursued, however, and as a result, the GBSD program is currently under scrutiny for its rising price tag and over-ambitious schedule. One of the major sources of concern stems from the GBSD's surprise sole-source engineering and manufacturing development contract, awarded to Northrop Grumman in September 2020. **There is no precedent for sole-sourcing a contract of this size—one of the largest Pentagon contracts in a generation—as doing so generally results in increased costs and lasting harm to the country's underlying industrial base.** And yet, unlike Congress and several civil society watchdogs, the Air Force appears to be unconcerned with this surprising development. Although the service initially took steps to bolster competition for the GBSD contract, it appears that they ultimately decided against enforcing this competitive ethos when allegations of unfairness arose during the bidding process. By the Air Force's own admission, the GBSD's price tag will likely go up as a result.²⁴

Additionally, the GBSD program will likely face significant delays. The program is being administered by Air Force Global Strike Command—a young, under-resourced command with no prior experience fielding a major weapons system, let alone multiple, ambitious, and simultaneous programs like the GBSD, B-21, and the Long-Range Standoff Weapon.²⁵ Additionally, analyses by the Government Accountability Office and the Institute for Defense Analyses indicate that the W87-1 warheads for the GBSD are likely to be delayed, due to current deficiencies in plutonium pit production capability.²⁶ **The Air Force is already anticipating delays to the GBSD program, and therefore considers the GBSD program schedule to be “high-risk.”**²⁷

An ICBM Review is Long Overdue

Despite these concerns, the GBSD program has been accelerated in recent years, apparently in an effort to lock in the system before the arrival of a new administration. The most recent chance to study the program in depth—a proposed amendment to the FY2020 National Defense Authorization Act—was quashed with the lobbying help of Northrop Grumman, the recipient of the GBSD's

24 “Justification and Approval (J&A) for Other Than Full and Open Competition,” GBSD program document approved by William B. Roper, Jr., Assistant Secretary of the Air Force (Acquisition, Technology & Logistics) on 26 February 2019.

25 Don Snyder et al., “Managing Nuclear Modernization Challenges for the U.S. Air Force: A Mission-Centric Approach,” *RAND Corporation* (2019), pp. 3-4, <https://www.rand.org/pubs/research_reports/RR3178.html>.

26 Allison B. Bawden et al., “NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program,” *Government Accountability Office* (September 2020), GAO-20-703; David E. Hunter et al., “Independent Assessment of the Two-Site Pit Production Decision: Executive Summary,” *Institute for Defense Analyses* (May 2019), NS D-10711, <<https://www.ida.org/-/media/feature/publications/i/in/independent-assessment-of-the-two-site-pit-production-decision-executive-summary/d-10711.ashx>>.

27 United States Air Force, “Report on Development of Ground-Based Strategic Deterrent Weapon,” *Department of Defense* (May 2020), p. 6.

sole-source contract.²⁸ As a result, **key decisions during the most crucial years of GBSD have been made without being able to access the full scope of information and analysis about the program.**

To that end, **the Biden administration should immediately launch a National Security Council-led strategic review examining the status of the GBSD program, as well as the future role of ICBMs in US nuclear strategy.** Despite substantial reductions in the ICBM force over the past two decades, there has not been a serious consideration of what role these 20th century weapons are supposed to play in a 21st century deterrence environment.

This review should ask questions that challenge the most basic assumptions about ICBMs, for example:

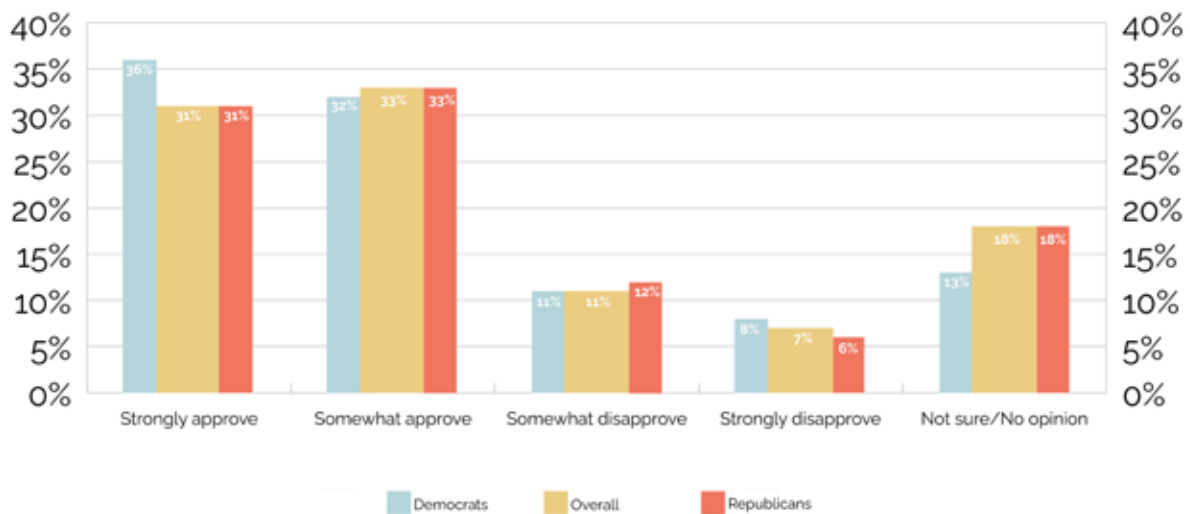
- Is the mission of the ICBM force still essential in a 21st century deterrent environment?
- If so, is that mission truly unique to the ICBM force? Could other elements of the US nuclear deterrent be used to conduct this mission instead?
- Could the ICBM force be substantially reduced without affecting strategic stability?
- Could a reduction in the ICBM force be leveraged to support future arms control negotiations?
- Does the United States really need to maintain an ICBM capability through 2075? If this timeframe was shortened, would other policy options be more appropriate and/or cost-effective?
- Could \$260 billion be better spent on other military or non-military priorities over the next 60 years?
- Should the United States consider shifting away from a nuclear warfighting posture, and towards a minimum deterrence posture?
- Do ICBMs—and the “use ‘em or lose ‘em” alert posture that they necessitate—offer more risk than reward?

While this review is being conducted, the GBSD program should be paused. There is no reason to continue spending billions of dollars on a program that might be significantly affected by the outcome of such a review.

²⁸ H.Amdt. 528 (Blumenauer) to H.R. 2500: “Amendment sought to require an independent study on options to extend the life of the Minuteman III intercontinental ballistic missiles and delay the ground-based strategic deterrent program, and sought to prevent 1” (11 July 2019), <<https://www.govtrack.us/congress/votes/116-2019/h454>>.

Doing so would be overwhelmingly supported by the American public. Recent national polling conducted in October 2020 commissioned by the Federation of American Scientists and conducted by ReThink Media indicates that **64% of respondents approve of delaying the GBSD and continuing to life-extend the Minuteman III ICBM while the GBSD program undergoes a comprehensive review.** This course of action is supported on a bipartisan basis, with 68% of Democrats and 64% of Republicans in approval. By contrast, only 18% of respondents disapprove of delaying the GBSD while the program is under review.

Would you approve or disapprove of delaying the GBSD program while it undergoes a full review, and continuing to refurbish the existing ICBM arsenal in the meantime?



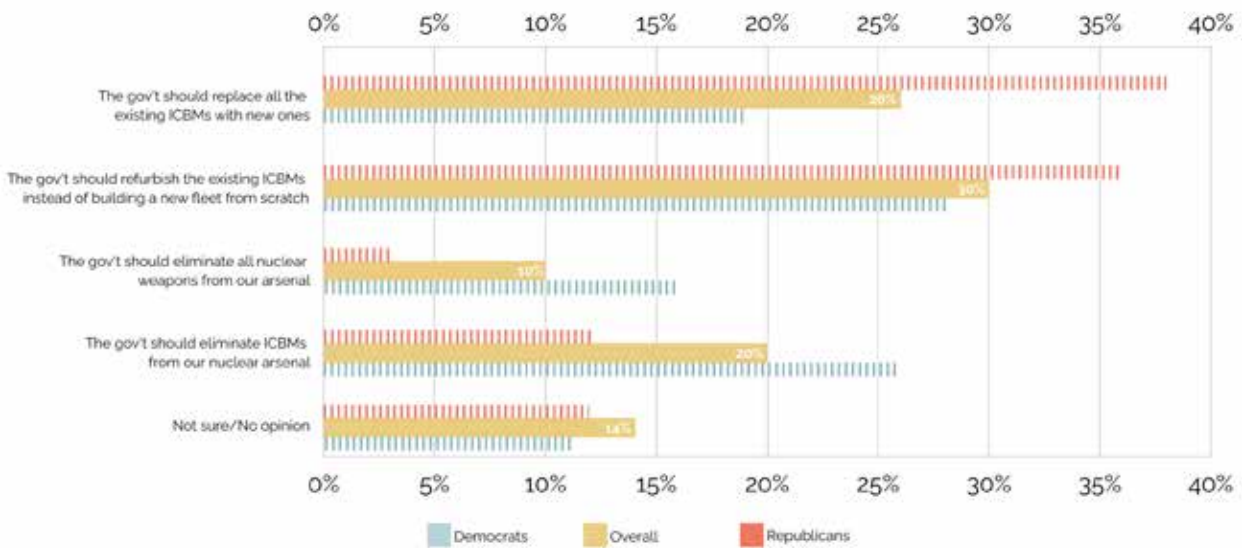
It is clear that the GBSD program is likely to be neither feasible—particularly from budgetary and scheduling perspectives—nor ultimately desirable relative to other options. To that end, this memo offers four possible policy alternatives to the current program of record:

1. Pursue GBSD at reduced force levels;
2. Delay/Cancel GBSD and pursue a Minuteman III life-extension at current force levels;
3. Delay/Cancel GBSD and pursue a Minuteman III life-extension at reduced force levels;
4. Cancel GBSD and phase out ICBMs entirely from the US nuclear arsenal.

The four policy options offered in this memo are all feasible and reasonable alternatives to the current GBSD program of record. Furthermore, they are all supported by the public.

The Federation of American Scientists' 2020 survey data indicates that **60% of respondents support alternative policy options to the current GBSD program of record**, compared to only 26% of respondents supporting GBSD as-planned.

What do you think the government should do about the ICBMs?



This strongly reinforces the previous findings of a May 2019 survey conducted by the University of Maryland’s Center for International & Security Studies, which found that only 32% of respondents supported replacing the ICBM force with brand-new missiles, while 61% of respondents supported phasing out land-based missiles with adjustments to US warhead numbers. In an effort to find “common ground” between all sides of the political spectrum, CISSM’s survey was particularly interested in identifying policy areas where both Democrats and Republicans could agree. **The research team found bipartisan consensus with their ICBM question, in which 68% and 53% of Democrats and Republicans, respectively, supported phasing out the ICBMs**, while 24% and 41% of Democrats and Republicans, respectively, supported the GBSD program.²⁹

This bipartisan opposition to GBSD was also reflected in the October 2020 survey. **Only 19% and 38% of Democrats and Republicans, respectively, supported the GBSD program**, compared to 70% and 50% of Democrats and Republicans, respectively, who supported alternative policy options.

It is clear that the GBSD program of record is not the best way forward for the ICBM force. To that end, **the incoming Biden administration should seriously consider pursuing one of the following four policy options**. Adopting any of them would ultimately save billions of dollars, would not harm US national security, and would be widely supported by the American public on a bipartisan basis.

²⁹ Program for Public Consultation, Center for International & Security Studies, “Americans on Nuclear Weapons,” *School of Public Policy, University of Maryland* (May 2019), pp. 18-20, <https://cissm.umd.edu/sites/default/files/2019-07/Nuclear_Weapons_Report_0519.pdf>.

Option 1: Pursue GBSD at reduced force levels

It is certainly possible to reduce ICBM force levels without meaningfully affecting strategic stability. Many current and former officials have echoed this sentiment, including former Secretaries of Defense, STRATCOM commanders, US ambassadors, as well as current influential congresspeople and prospective Biden administration cabinet members.

In fact, the Pentagon began to explore the possibility of significantly reducing the ICBM force throughout the New START force adjustment process, before ultimately deciding not to pursue them, in part due to pressure from the Senate ICBM Coalition. A renewed commitment to reducing ICBM force levels, however, could yield several positive effects.

Firstly, a commitment to reducing ICBM force levels could open up fertile new ground for arms control with Russia. Both US and Russian ICBMs primarily exist to target the other; therefore, they are natural bargaining chips. Russia, like the United States, is also in the midst of a substantial nuclear and conventional modernization program; however, like the United States, Russia cannot afford to modernize all of the systems that it wants.³⁰ A mutual commitment to substantially reducing each country's ICBM force would allow both countries to reinvest in more important security priorities, and could therefore be an appealing arms control possibility. The United States would have the upper hand in any ICBM-focused arms control negotiations, because Russia has fewer ICBMs than the United States (~310 versus the United States' 400), and significantly fewer overall strategic launchers (510 versus the United States' 675).³¹

Secondly, reducing the number of deployed ICBMs would also alleviate a significant amount of pressure associated with the GBSD's planned warhead production schedules. The National Nuclear Security Administration (NNSA) is currently planning to produce 80 plutonium pits per year by 2030 in order to meet the ambitious schedule of the W87-1 GBSD warhead. However, two separate independent government-sponsored studies have recently concluded that this schedule is all but impossible, due to a lack of current capacity and the likelihood of both budgetary and scheduling overruns.³² To that end, significantly reducing the scope of the GBSD deployment would help mitigate these scheduling concerns.

30 Hans M. Kristensen and Matt Korda, "Russian nuclear forces, 2020," *Bulletin of the Atomic Scientists* 76:2, pp. 102-117, DOI: 10.1080/00963402.2020.1728985.

31 Kristensen and Korda, "United States nuclear forces, 2020," *Bulletin of the Atomic Scientists*; Kristensen and Korda, "Russian nuclear forces, 2020," *Bulletin of the Atomic Scientists*.

32 Bawden et al., "NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program," *Government Accountability Office*; Hunter et al., "Independent Assessment of the Two-Site Pit Production Decision: Executive Summary," *Institute for Defense Analyses*.

Finally—and perhaps most importantly—it would save money. The Pentagon’s independent Cost Assessment and Program Evaluation office estimated in August 2020 that the average procurement cost of each missile is approximately \$75.5 million (in constant year 2020 dollars).³³ If the Air Force only fielded 300 new ICBMs—instead of the current 400—that would amount to approximately \$7.55 billion in savings in procurement costs alone, plus additional savings from not needing to upgrade 100 launch facilities and their associated launch control centers.

Although there would be no significant savings in GBSD research and development costs (which amount to approximately one-quarter of total acquisition costs under the current plan), additional savings would certainly be derived from reduced operational, sustainment, and disposal costs throughout the GBSD’s life-cycle, due to the smaller number of deployed missiles. In 2017, the Congressional Budget Office projected that a GBSD force of only 300 deployed ICBMs would yield \$11 billion (in 2017 dollars) in total savings from procurement, operations, and sustainment operations. Using the same projections, a deployed force of 200 GBSD missiles would save \$19 billion (in 2017 dollars), and a deployed force of 100 GBSD missiles would save \$27 billion (in 2017 dollars).³⁴

Additional Savings or Costs of Alternative Triad Structures Through 2046	
Number of ICBMs Deployed	Billions of 2017 Dollars
400	0
350	4
300	11
250	15
200	19
150	23
100	27
50	32

Source: Congressional Budget Office, "Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046" (October 2017), p. 43.

Note: Red areas denote the current GBSD acquisition plan. Totals reflect changes in procurement, operations, and sustainment and reflect reductions or increases in force size taken at the end of the planned production run. Each force would retain 50 more silos than deployed. Whether smaller forces would result in base closures is unknown, so those potential savings are not included.

However, the amount of money saved would still be significantly less than if the GBSD was cancelled in favor of pursuing a significant Minuteman III life-extension, as described in the following policy options.

³³ Under Secretary of Defense for Acquisition and Sustainment, "(U) Ground Based Strategic Deterrent Milestone B Summary: Report to Congress," p. 5.

³⁴ Congressional Budget Office, "Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046," p. 43.

Option 2: Delay/Cancel GBSB and pursue a Minuteman III life-extension at current force level

By its own admission, the Pentagon is facing a budget crisis. In July 2020, the then-Air Force Chief of Staff, Lt. Gen Dave Goldfein, remarked at a Brookings Institution appearance that “this will be the first time that the nation has tried to simultaneously modernize the nuclear enterprise while it’s trying to modernize an aging conventional enterprise. The current budget does not allow you to do both.”³⁵

Given these aforementioned “fiscal time bombs,” it is worth considering whether the GBSB program could be delayed for several years—perhaps even decades—in order to alleviate these significant budgetary pressures over the coming years, especially in light of the rising costs and complexities of pursuing other nuclear modernization programs like the Columbia-class SSBN, the B-21 bomber, and the massively-increased NNSA warhead budget. Pursuing this option—absent a decision to phase out the ICBMs entirely—would require a significant life-extension program for the currently-deployed Minuteman III, in order to keep them operational past their currently-projected service lives.

As military, governmental, and non-governmental experts have pointed out, it is technologically feasible to continue extending the life of the Minuteman III ICBM at current force levels until approximately 2050. In order to do this, the Air Force would need to replace the Minuteman III’s solid rocket motors and guidance systems, and reduce its annual testing rate.

Air Force estimates indicate that the Minuteman III’s solid rocket motors will age out between 2029 and 2035.³⁶ However, it is reasonable to take the Air Force’s estimates with a grain of salt, because the motors of the Minuteman II—which shares its first and second stages with the Minuteman III—continue to perform reliably in their new roles as space launch vehicles and sounding rocket systems. To date, first-stage Minuteman II motors between 27 and 54 years of age have performed successfully in all 27 test launches, as well as 23 static tests. Second-stage Minuteman II motors older than 17 years have achieved success in 60 out of 61 test launches, as well as 26 static tests.³⁷

By the Air Force’s own projections, a 30-year old missile core has an estimated

35 Marcus Weisgerber, “We Don’t Have Enough Cash to Build New Nuclear Weapons, Says Air Force Chief,” *Defense One* (1 July 2020), <<https://www.defenseone.com/policy/2020/07/we-dont-have-enough-cash-build-new-nuclear-weapons-says-air-force-chief/166598/>>.

36 United States Air Force, “Cost Comparison,” p. 5.

37 Steve Fetter and Kingston Reif, “A Cheaper Nuclear Sponge,” *War on the Rocks* (18 October 2019), <<https://warontherocks.com/2019/10/a-cheaper-nuclear-sponge/>>; Steve Fetter, personal communication, 11 December 2020.

probability of failure of 1.3 percent.³⁸ Although this failure rate increases exponentially for each additional year, it is still relatively low (under ten percent) until the cores reach 36 years old.³⁹ This projected failure rate, plus the encouraging test results from the Minuteman II motors, imply that there is still time to pursue a Minuteman III life-extension option at current deployed force levels.

Unless the United States elects to phase out its ICBM force entirely, however, the Minuteman IIIs would eventually need to be re-cored. Compared with the cost of producing entirely new missiles, this is not a particularly expensive task; under the Propulsion Replacement Program in the mid-2000s, the Pentagon re-manufactured 601 Minuteman III solid rocket motors for an approximate price tag of \$2 billion.⁴⁰

Around the same time, the Air Force completed a 652-unit Guidance Replacement Program for only \$1.6 billion.⁴¹ This work was approved by Congress despite the Government Accountability office noting that the Minuteman III guidance systems had actually improved with age, as well as an Air Force study suggesting that “There is no conclusive evidence of degradation within the Minuteman III missile guidance set that cannot be corrected on a case-by-case basis.”⁴²

Collectively, the Air Force spent only \$7 billion on various life-extension programs for the Minuteman III. Upon completion of these programs in 2012, Air Force analysts declared that the refurbished Minuteman IIIs are “basically new missiles except for the shell.”⁴³ Clearly, life-extension operations are possible—not to mention significantly cheaper than building a new ICBM force from scratch—and the Air Force has a good track record of completing them.

38 Air Force Nuclear Weapons Center Intercontinental Ballistic Missile (ICBM) Systems Directorate, “Minuteman III Propulsion Replacement Program,” p. 11; Todd Harrison, “Options for Ground-Based Leg of the Nuclear Triad,” *Center for Strategic & International Studies* (September 2017), p. 18. <https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/170921_Harrison_OptionsGroundBasedLegNuclearTriad.pdf?q2TQEeJsoYEGK0hBv.6Nm6kHAIwq2nx>.

39 Although some might balk at the idea of a hypothetical ten percent failure rate, an adversary would realistically still have to target every silo in a nuclear first strike, because there would be no way of knowing which missiles were functional and which were duds. Additionally, it is extremely unlikely that the United States would ever elect to launch only a small number of ICBMs in a crisis. As a result, a ten percent failure rate inflicted on 400 launched ICBMs would still enable approximately 360 fully-functional missiles to reach their targets. Therefore, when it comes to the ICBM force, it is fair to say that reliability should not be a significant factor in how either the United States or its adversaries think about ICBMs.

40 U.S. Congress, House of Representatives, *Howard P. “Buck” McKeon National Defense Authorization Act for Fiscal Year 2015: Report of the Committee on Armed Services on H.R. 4435*, 113th Congress, 2nd Session (2014), Report 113-446, pp. 304-305; 341st Missile Wing Public Affairs Office, “Propulsion replacement program complete,” *Air Force Space Command* (19 August 2009), <<https://www.afspc.af.mil/News/Article-Display/Article/250723/propulsion-replacement-program-complete/>>.

41 Paul G. Kaminski (Under Secretary of Defense for Acquisition and Technology), “Sustaining the U.S. Nuclear Deterrent in the 21st Century,” prepared remarks at the U.S. Strategic Command Strategic Systems Industrial Symposium, Offutt Air Force Base, Nebraska (30 August 1995), <<https://fas.org/nuke/guide/usa/doctrine/dod/di1099.htm>>.

42 Steven F. Kuhta et al., “Minuteman III Guidance Replacement Program Has Not Been Adequately Justified,” *Government Accountability Office* (June 1993), GAO/NSIAD-93-181, pp. 16-17, <<https://www.gao.gov/assets/160/153500.pdf>>.

43 Air Force Global Strike Command Public Affairs, “Life Extension Programs Send Missiles into the Future,” *United States Air Force* (26 October 2012), <<https://www.20af.af.mil/News/Article-Display/Article/457746/life-extension-programs-send-missiles-into-the-future/>>.

“If I’m putting together the Nuclear Posture Review, I think we should seriously re-examine, first of all, whether or not we even need the ICBM leg of the stool. Certainly we don’t need to replace it, because I think the current ICBMs can last longer.”

— Rep. Adam Smith (D-WA), *House Armed Services Committee Chair 2019-present*, Ploughshares Fund policy forum (November 2020)

Life-extension, however, would not address the

ongoing challenge of asset attrition. The Air Force currently tests its Minuteman III missiles at a rate of 4.5 test firings per year, meaning that the total inventory of ICBMs in the US stockpile will dip below 400 by approximately 2040.⁴⁴ However, this test rate used to be three per year, and was apparently only increased in FY2017 in order to improve the Air Force’s ability to collect age-related data on the ICBM force.⁴⁵ Testing is critical to the technical surveillance process to ensure that the missiles are working as designed; however, if the Air Force was prepared to accept additional risk of failure as described above—given the fact that doing so would have no discernible effect on deterrence—then the number of tests per year could realistically be decreased. To that end, the Center for Strategic and International Studies’ Todd Harrison points out that “the Air Force could slow the rate of missile tests to stretch the inventory of missile bodies. Reducing the test rate to 3 per year, for example, would mean the inventory of missile bodies would not drop below 400 until 2050.”⁴⁶

As a result, this option would save billions of dollars, allow the United States to continue deploying 400 ICBMs until 2050, and have no discernible effect on strategic stability. It would potentially require accepting slightly higher risk that some missiles may not launch as intended; however, as described above, this would not meaningfully affect deterrence.

This option could buy the United States as much as twenty years of leeway with regards to a decision over whether to pursue or cancel a follow-on GBSD program. If the United States chooses to pursue GBSD at that point, then the Congressional Budget Office estimates that approximately \$42 billion (in 2017 dollars) of the costs of replacing the Minuteman IIIs would be pushed beyond 2046—which would allow for the total costs of nuclear modernization to be spread out over several decades and would reduce the likelihood that the aforementioned “fiscal time bombs” would explode over the coming years.⁴⁷

44 United States Air Force, “Cost Comparison,” p. 5.

45 Caston et al., “The Future of the U.S. Intercontinental Ballistic Missile Force,” pp. 84-85.

46 Harrison, “Options for Ground-Based Leg of the Nuclear Triad,” p. 9.

47 Congressional Budget Office, “Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046,” p. 30.

However, there is also a possibility that twenty years from now—when a decision about a follow-on ICBM would have to be taken—the national security environment will have changed dramatically, and ICBMs may no longer be deemed strategically important by American political or military leaders. In that case, GBSD could simply be cancelled; the Congressional Budget Office estimates that doing so would save an additional \$120 billion (in 2017 dollars).⁴⁸

Option 3: Delay/Cancel GBSD and pursue a Minuteman III life-extension at reduced force levels

This option is similar to Option 2; however, it could save even more money and also addresses potential concerns over ICBM failure rates. For some policymakers, the increased risk in booster failure incurred by Option 2 might be a politically difficult pill to swallow. If that is the case, then an effective way to mitigate risk while pursuing a Minuteman III life-extension—and delaying or cancelling GBSD—would be to reduce the size of the ICBM force while maintaining the current testing rate.

As explored in Option 1, reducing the number of deployed ICBMs would not meaningfully affect deterrence, and would suddenly make a significant quantity of additional missiles available for testing purposes. For example, if the Pentagon reduced its deployed ICBM force from 400 to 300 missiles, it could maintain the current testing rate of 4.5 tests per year, and the missile inventory would not drop below 300 until approximately FY 2060.⁴⁹

The amount of money saved by pursuing this option largely depends on what happens to the ICBMs that are taken offline. If they were all converted into test assets, then they would still require the same life-extension programs as the deployed missiles, in order for the Air Force to conduct aging surveillance operations throughout the refurbished Minuteman III's extended life-cycle. However, if a portion of the missiles were simply retired, then they would not require improved boosters or guidance systems—thus yielding additional savings.

Regardless, reducing the size of the ICBM force would yield additional savings over time by decommissioning the superfluous silos, thereby significantly reducing personnel and material costs throughout the system's overall lifespan.

Additionally, as explored in Option 1, a commitment to reducing ICBM force levels could offer opportunities for new arms control initiatives with Russia.

⁴⁸ Ibid, p. 41.

⁴⁹ Harrison, "Options for Ground-Based Leg of the Nuclear Triad," p. 9.

Similarly to Option 2, pursuing this option could allow the United States to defer a decision on GBSD for up to two decades, while still maintaining an active ICBM capability. If—after a twenty-year delay—the United States ultimately decided to pursue an ICBM replacement program for deployment in the 2050 timeframe, the Congressional Budget Office estimates that it would save \$11 billion (in 2017 dollars) in total life-cycle costs by doing so at a reduced force level of 300 deployed ICBMs. If the United States simply decided to cancel GBSD instead, the Congressional Budget Office estimates that approximately \$120 billion (in 2017 dollars) would be saved.⁵⁰

Recent national polling commissioned by the Federation of American Scientists suggests that the American public would be broadly supportive of legislative efforts designed to reallocate funds away from GBSD, towards alternative military or non-military priorities.⁵¹ When asked to allocate a hypothetical budget of \$1,000 between a wide range of policy options, poll respondents ranked “investing in ICBMs” consistently and significantly lower than alternative options, such as “giving money back to taxpayers,” “ensuring that Social Security is fully funded for decades to come,” “lowering health care costs,” or “investing in cyber and other emerging technologies.” It is also notable that ICBM investment ranked lower than “Modernizing our other nuclear delivery systems (bombers and submarines),” indicating that Americans see more value in other elements of the US nuclear arsenal than in land-based missiles.

Imagine that the federal budget was \$1,000. How would you spend that money?



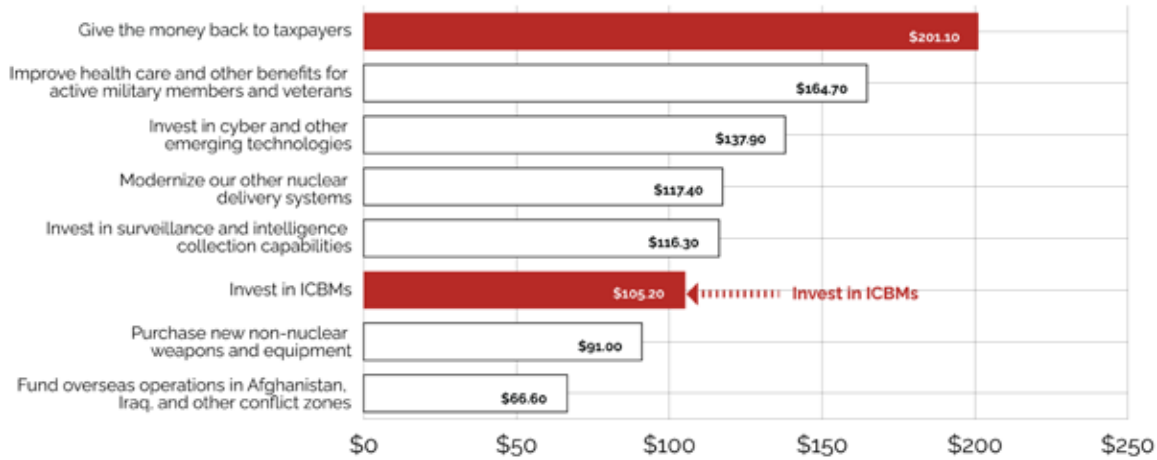
It is clear that younger voters are significantly less supportive of the GBSD program than older voters. Respondents between the ages of 18-29 allocated an average of only

50 Ibid, pp. 41-43.

51 On behalf of the Federation of American Scientists, ReThink Media conducted a national survey of 800 registered voters between 12-28 October 2020, with the purpose of exploring Americans’ opinions about US nuclear posture in general, and ICBMs in particular. The survey included a 200 oversample of registered voters in “nuclear sponge” states (Colorado, Montana, North Dakota, Nebraska, and Wyoming), in order to gain deeper insight into how residents of the “nuclear sponge” think about the weapons that their states are hosting. The survey was conducted online using a panel provided by Qualtrics, and has a confidence interval (similar to a margin of error) of +/- 3.4%. The data were weighted slightly by gender, age, race, educational attainment, party ID, vote history, and region to be representative of the registered voter population.

\$65.60—by far the least amount of money—towards ICBM investment, compared to respondents over 65, who allocated an average \$143.20 towards the program. Younger respondents, on average, allocated significantly more money towards investing in clean energy alternatives, lowering health care costs, improving health care for active military members and veterans, or simply giving the money back to taxpayers.

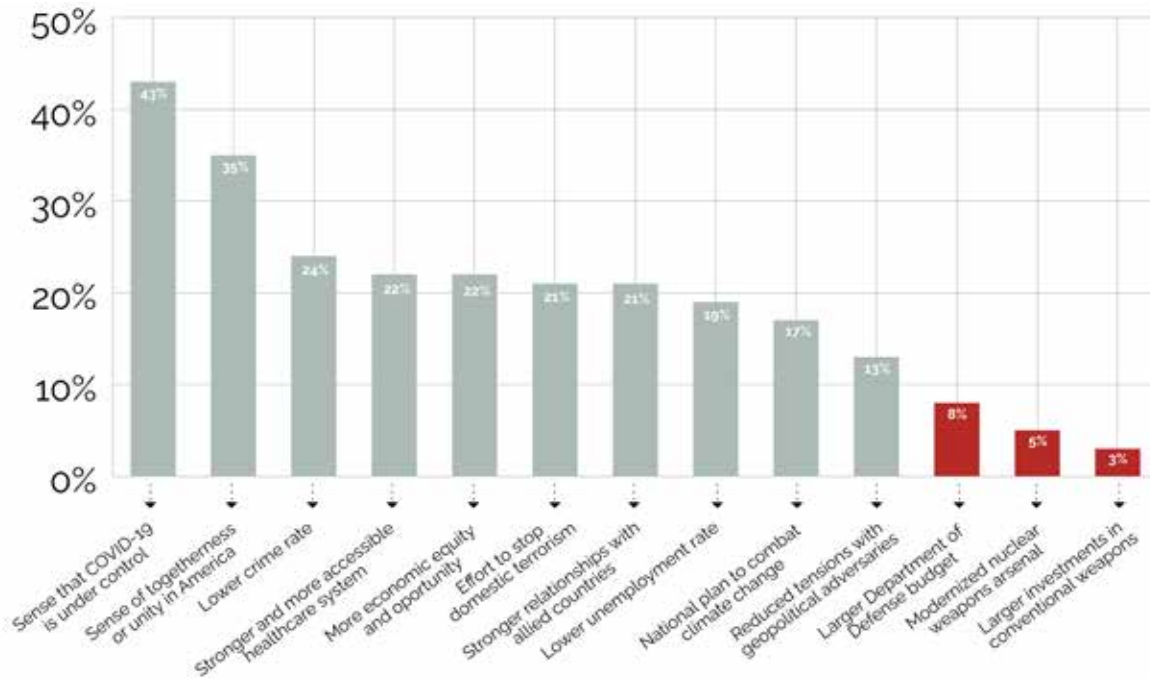
Imagine that the Pentagon's budget was \$1,000. How would you spend that money?



A related survey question indicates that Americans overwhelmingly do not derive their sense of safety from investments in nuclear or conventional weapons. When asked to select policy options that “would make you feel more safe,” by far the most selected option was “A sense that COVID-19 is under control” (43%), followed by “A greater sense of togetherness or unity in America” (35%). At the very bottom of the safety priorities list—ranked lower than additional policies focused on crime, health care, domestic terrorism, alliances, unemployment, climate change, and reducing tensions with adversaries—were the three military-focused priorities: “A larger Department of Defense budget” (8%), “A modernized nuclear weapons arsenal” (5%), and “Larger investments in conventional weapons” (3%).

Notably, the three traditional military priorities rank near the bottom of the list for both Democrats and Republicans. The rest of their safety ranking still differ significantly—Democrats are more inclined to rank “A sense that Covid-19 is under control” higher than Republicans, for example, and Republicans are more inclined to rank “A lower crime rate” higher than Democrats—however, it is surprising that respondents from both political parties consistently suggest that both a “modernized nuclear weapons arsenal” and “larger investments in conventional weapons” contribute the least to their personal safety.

Regardless of how secure you feel the United States is currently, what would make you feel more safe?



Based on these results, it is clear that Americans overwhelmingly do not derive personal safety from investments in traditional national security priorities like new weapons or military investment. Instead, they would feel much safer with investments in non-military security priorities—such as pandemic response, combatting domestic terrorism, and strengthening the health care system—that actually contribute directly to their personal sense of security. Combined, these results indicate that legislative efforts to redirect funding away from GBSD and towards more proximate security priorities would be very popular on a bipartisan basis.

Option 4: Cancel GBSD and phase out ICBMs entirely from the US nuclear arsenal

The option that saves the most money would be to pursue neither GBSD nor a Minuteman III life-extension, and instead simply eliminate ICBMs from the US nuclear arsenal as the Minuteman IIIs age out in the mid-2030s.

According to the Air Force, the current Minuteman III boosters will begin to age out in FY 2029, and the entire ICBM arsenal will be past its accepted service life in FY 2035.⁵² However, if political and military leaders were willing to accept an increased failure rate, as previously discussed, then this timeline could potentially be delayed by a few years—depending on how much risk was deemed acceptable. Eventually, however, pursuing this option would necessarily result in the complete elimination of the ground-based leg of the US nuclear arsenal.

⁵² United States Air Force, "Cost Comparison," p. 5.

Eliminating the ICBMs would not necessarily have a significant impact on strategic stability. Over 70 percent of the United States' deployed nuclear weapons are attributed to bombers and submarines. Even without the ICBMs, an adversary could never hope to destroy every US bomber and nuclear-armed submarine in an attempted first strike. Therefore, a reduced number of ICBMs—or even their complete elimination—would not erode deterrence. This is because, as political scientist Robert Jervis suggests, “Deterrence comes from having enough weapons to destroy the other’s cities; this capability is an absolute, not a relative, one.”⁵³

Furthermore, eliminating the ground-based leg of the US nuclear arsenal would not affect the United States' extended deterrence relationship with its allies. The primary weapons used for NATO extended deterrence are not ICBMs, but rather the forward-deployed B61 gravity bombs and NATO dual-capable aircraft deployed on European soil. In the Indo-Pacific theater, ICBMs would not prove useful in any realistic nuclear crisis scenario, and it appears that allies like Japan and South Korea only care about them in as much as they represent a commitment to a status quo US nuclear force posture. These concerns could be offset, however, by continued investments in air- and sea-based nuclear forces, which are much more useful instruments of assurance for US allies. Overall, it appears that American allies largely do not factor the ICBMs into their deterrence or assurance calculations, and are much more concerned with the status of the United States' other nuclear systems.⁵⁴

“Could a dyad, perhaps eliminating the land-based intercontinental ballistic missiles, yield cost savings without sacrificing deterrence?”

— Adm. (ret.) James Stavridis, *NATO SACEUR 2009-2013*,
Bloomberg op-ed “Biden's Defense Team Will Survive
Trump's Pentagon Massacre” (November 2020)

Eliminating the ICBMs altogether
would yield significant savings;

according to the Congressional Budget Office, it would save approximately \$120 billion (in 2017 dollars) through 2046. These savings would be even greater—approximately \$149 billion (in 2017 dollars)—if the elimination of the ICBMs was implemented immediately, instead of waiting for the Minuteman IIIs to age out of the arsenal in the mid-2030s. These additional savings would be derived from operation and sustainment costs that are expected to take place over that period, as well as from the cancellation of the ICBM fuze modernization program, which would no longer be necessary.⁵⁵

53 Robert Jervis, “Why Nuclear Superiority Doesn't Matter,” *Political Science Quarterly* 94:4 (1979), pp. 617-633. DOI: 10.2307/2149629.

54 Michael H. Keifer, “Assuring South Korea and Japan as the Role and Number of U.S. Nuclear Weapons are Reduced,” *Defense Threat Reduction Agency, Advanced Systems and Concepts Office*, ASCO 2011 003 (January 2011), p. 30, <<https://fas.org/irp/agency/dod/dtra/assuring.pdf>>.

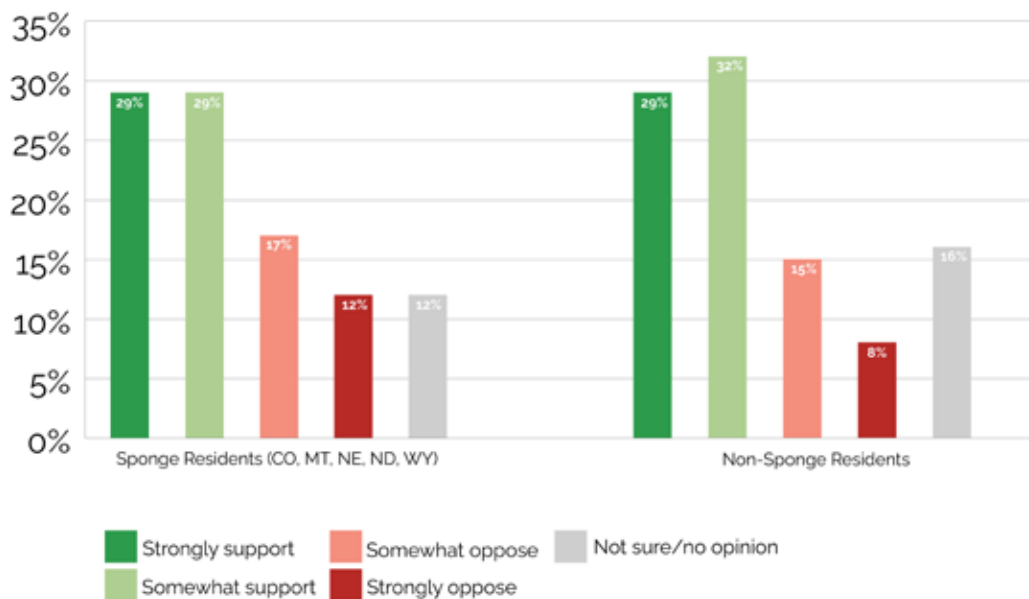
55 Congressional Budget Office, “Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046,” p. 41.

In reality, savings from cancelling the GBSB are likely to be even greater than initially projected by the Congressional Budget Office, given that the GBSB’s price tag has risen substantially since those estimates were made in 2017.

This option would allow the federal government to redirect billions of dollars towards other priorities. Analysis by the Costs of War Project shows that defense investment is among the least productive of federal investment opportunities, and that an investment of \$260 billion—the approximately life-cycle cost of the GBSB program—could create millions of additional jobs if it were directed towards other priorities like clean energy (700,000 additional jobs per year), infrastructure (700,000 additional jobs per year), healthcare (two million additional jobs per year), and primary and secondary education (three million additional jobs per year).⁵⁶

Redirecting defense dollars towards these priorities would also help increase local communities’ resilience to the potential economic impacts of ICBM elimination. Analysis of previous military base closures indicates that most military communities have actually increased their employment levels—in many cases, by several hundred percent—after their nearby bases closed and those federal investments were reallocated towards other priorities.⁵⁷

Would you support or oppose a proposal to phase-out of ICBM activities in “nuclear sponge” states, with a guaranteed job and income provided for anyone whose job was displaced in doing so?



56 Heidi Garrett-Peltier, “War Spending and Lost Opportunities,” *Costs of War Project* (March 2019), <<https://watson.brown.edu/costsofwar/files/cow/imce/papers/2019/March%202019%20Job%20Opportunity%20Cost%20of%20War.pdf>>.

57 Data retrieved from the Office of Economic Adjustment, Department of Defense.

To that end, it is no surprise that a majority of Americans strongly support phasing out ICBMs from the US nuclear arsenal, provided that guaranteed job and income opportunities are created to replace them. National polling commissioned in October 2020 by the Federation of American Scientists indicates that approximately 60% of respondents living both inside and outside of the “nuclear sponge”—the five states that host ICBMs⁵⁸—support this option, compared to the approximate 25% of respondents opposed.

58 The five states of the “nuclear sponge” are Colorado, Montana, Nebraska, North Dakota, and Wyoming.



Federation
of American
Scientists