

It Is Time to Make the Next Generation of America's ICBMs Road-Mobile

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KEY TAKEAWAYS

Ballistic missile submarines (SSBNs), impossible to track underwater, have been the United States' ace in the hole, creating the ultimate second-strike capability.

Technological breakthroughs, however, may make it possible at some future date for adversaries to find, track, and destroy these submarines.

The way to mitigate this threat is with road-mobile, nuclear-armed ballistic missiles—they can move hundreds of miles per day and are extremely difficult to target.

The threat from Russia's and China's expanding and diversifying nuclear forces is growing.¹ America's ability to deter aggression from these actors is based, in part, on the ability to field a credible and survivable nuclear force that cannot be destroyed by an adversary in an opening salvo of a nuclear first strike on the United States. For years, ballistic missile submarines (SSBNs), impossible to track while submerged, have been the United States' ace in the hole—since they cannot be detected, they create the ultimate second-strike capability.

Technological breakthroughs, however, may make it possible at some future date for adversaries to find, track, and destroy these submarines. Therefore, it is incumbent upon the United States to field an additional assured second-strike capability to hedge against the day when the SSBNs may be detectable.

This paper, in its entirety, can be found at <https://report.heritage.org/ib5337>

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Fortunately, an old solution can be re-employed to mitigate this danger—road-mobile, nuclear-armed ballistic missiles.

Background

For decades, the United States has fielded strategic nuclear weapons on three legs of the nuclear triad: (1) bombs or cruise missiles delivered by nuclear-capable bombers, (2) ground-based intercontinental ballistic missiles (ICBMs), and (3) submarine-launched ballistic missiles. Each one of these legs has a specific role.²

Nuclear bombers have flexibility and visibility—they are easily deployed and recalled and can carry a variety of munitions. They are a reliable means for an actor to signal nuclear intentions, which is important for deterring adversaries and assuring allies. Nuclear bombers can also be dispersed, making it difficult, but not impossible, for an adversary to destroy them.

ICBMs can strike almost any target on the planet in less than an hour. They are the fastest leg of the triad, giving them promptness and expediency. Their speed makes them almost impossible to intercept. Thus, once they are launched, their ability to hit a target is a virtual certainty.

SSBNs provide an assured second-strike capability due to their inability to be detected underwater, even by advanced acoustic sensors. That is, even if an adversary were to somehow take out another actor's nuclear bomber and ICBM force, the adversary would not be able to locate or destroy the submarine, which is loaded with multiple long-range sea-launched ballistic missiles, each of which carries multiple nuclear warheads. The result would be that even if an adversary carried out an exquisitely successful first strike on a nation's ICBM and bomber force, the adversary would still be vulnerable to an assured retaliatory strike from submarines lurking beneath the surface of the waves. Having this assured, second-strike capability is stabilizing: It removes all incentives for an actor to conduct a surprise strategic first.

The Current Ballistic Submarine Modernization Effort

Today, the United States is in the midst of replacing the *Ohio*-class nuclear SSBNs, which have been on duty since the 1980s, with the next-generation SSBNs, the *Columbia*-class. The *Columbias* have an expected life span of roughly 40 years, meaning that the boats will be operating into the early 2080s.³ It is assumed that these vessels, built using 2020s technology, will remain invisible throughout the majority of the 21st century; that

U.S. adversaries will not develop new technologies with which they can detect the submarines; and that the U.S. will therefore retain an assured second-strike capability that will disincentivize U.S. adversaries from attempting a first strike.

This assumption raises an important question, however: Is it *certain* that the *Columbia*-class submarines will be undetectable a half century from now? Is it *sure* that the technologies and capabilities developed in the 2020s will not be overcome by heretofore undeveloped detection technologies?

If the answer to these questions is “yes,” then the U.S. has nothing to worry about. If the answer is “maybe, maybe not” then it is in the U.S. interest to consider an additional survivable, second-strike capability as a hedge against the day when the SSBNs may no longer be undetectable.

Toward an Additional Survivable Second-Strike Capability

In addition to replacing the *Ohio*-class submarines, the Defense Department is in the midst of replacing the Minuteman III ICBMs, first fielded in the 1970s, with the next-generation ICBM, the Sentinel.⁴ Sentinels will be stationed underground in silos spread across the American West and high plains. They will be able to carry multiple nuclear warheads and will form the backbone of the ICBM leg of the triad for the next half century.

By putting a Sentinel on a vertical erector launcher attached to a truck, with security details on accompanying vehicles, it becomes a road-mobile ICBM—something that is, while not impossible, exceedingly difficult to target.

In this scenario, road-mobile Sentinels would be permanently stationed in garrisons on existing missile bases but could exit those garrisons and move around during exercises or times of crisis as a signaling tool. Air Force missileers could operate and drive them about on designated public and Defense Department roads and highways. By moving at a consistent speed along pre-approved (but not pre-planned) routes, road-mobile ICBMs could prove a near impossibility for adversaries to target, as the ICBMs would travel a few hundred miles every day. If they were armed with up to three nuclear warheads, they could present the equivalent striking power of a submarine-launched ballistic missile. Given that they would operate deep inside American territory in relatively unpopulated areas and move on pre-determined but randomized routes, it would be virtually impossible for adversaries to track, target, and destroy them in real time, given the necessary flight times for even very fast missiles to traverse from Russia or China to the center of the United States. Should a launch on the American

homeland be detected, the ICBMs could move to any number of launch sites to await further orders (to include launch or alert orders).

As a recent bipartisan study group organized by Lawrence Livermore National Laboratory noted, “enhancing the survivability of a significant portion of the U.S. ICBM force through mobility might significantly enhance the deterrent and warfighting value of the ICBM force in the face of two peer threats.”⁵ The Strategic Posture Commission, another bipartisan study group mandated by Congress, recommended in October “fielding some portion of the future ICBM force in a road mobile configuration.”⁶

Indeed, the utility of road-mobile Sentinels could serve as a crucial role in U.S. nuclear defenses should U.S. adversaries develop a means to detect the *Columbia*-class submarines in the coming decades. Road-mobile Sentinels “would provide a critically important hedge against a breakthrough in antisubmarine warfare imperiling the survivability of the U.S. ballistic missile submarine force.”⁷

This is not to say that road-mobile Sentinels would be impossible to destroy—but it would severely complicate the attack for enemy targeteers and provide a backup second-strike capability in case the U.S. SSBN force became compromised.

In addition, safety concerns would be minimal. While accidents are always possible, the nuclear force has, since 1945, transported, trained, and kept ready bombers, ships, submarines, and missiles loaded with nuclear weapons. Not once has a nuclear weapon detonated due to a training failure, accident, or mechanical failure. Indeed, while bombers loaded with nuclear weapons crashed multiple times during the Cold War, safeguards on the weapons themselves prevented the warhead from producing nuclear yield—even after crashing to the ground from 31,000 feet at 500 knots.⁸ By comparison, a 45-mph crash while loaded on the back of a tractor trailer, protected by highly trained security personnel, would do negligible damage to the integrity of a warhead.

From a technological perspective, this is not cutting-edge science. The Soviets fielded these very capabilities in the Cold War. And, given that the U.S. would be using existing missile technology from the Sentinel program, the only new design requirements would be building an erector launch that could be attached to the back of a heavy truck. All of which is technology that was developed more than half a century ago.

Support for road-mobile Sentinels, if not overwhelming, certainly seems to be growing. As noted, the bipartisan team of nuclear deterrence experts convened by Lawrence Livermore support this view, as do several current and former Republican and Democratic security and defense professionals.⁹

Recommendations for the Department of the Air Force

To hedge against an uncertain future and the potential of U.S. adversaries to detect and therefore hold at risk America's second-strike capability, the Department of the Air Force—no later than 2025—should:

- **Order an additional 50 Sentinel ICBMs for the purpose of making them road-mobile.** The United States is currently supposed to deploy no fewer than 400 Sentinels in the 2030s, to backfill the aged Minuteman III.¹⁰ Buying an additional 50 Sentinels would reduce the per-unit cost of the overall purchase, without increasing significantly the overall cost of the Sentinel program.
- **Identify a number of variable, pre-planned circuits on private and public lands in and around the existing ICBM fields of the American West.** The commanders would approve the particular circuits, and it would be up to their discretion each day which route to use, thus complicating the ability of adversaries to identify routes for such systems on any given day.
- **Develop and field 50 erector launchers.** These launchers should be tailored to the Sentinel specifications.
- **Develop the tactics, techniques, and procedures to keep these missiles and accompanying warheads secure while deployed on America's roads.** Without question, nuclear weapons security will be needed for any road-mobile ICBM. Convoys of security specialists will be needed. But securing sensitive materials and the people to operate and maintain them is a core competency for the U.S. military.

Conclusion

No serious defense thinker wants a larger nuclear arsenal for the sake of a larger arsenal. America must field a credible strategic deterrent, based on the three legs of the nuclear triad—bombers, ICBMs, and SSBNs—that will provide stability in an uncertain future. Making a comparatively modest investment (an additional ballpark cost of \$20 billion spread out over the next 50 years) in a slightly more diversified strategic arsenal will be well worth it.¹¹

Endnotes

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