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By John A. Tirpak, Executive Editor

No Easy Answers on New Bomber

There is no obvious answer to the question of how the Air Force should fulfill its assignment to get a new long-range strike system in place by 2018, according to the Congressional Budget Office.

In a study titled "Alternatives for Long-Range Ground-Attack Systems," released in April, the CBO looked at eight current and future approaches to long-range strike, evaluating them on attributes such as speed, payload, survivability, and cost.

CBO concluded that no single solution stuck out as a clear winner, although some were decidedly cheaper than others. For example, the report projected that new supersonic bombers would cost more than \$900 million apiece, while new high-speed cruise missiles could cost just \$1.4 million apiece. Whether the cruise missile would be more cost-effective, however, was not stated.

The CBO did not identify a preferred solution, instead suggesting that policy-makers sort out the pluses and minuses of the various options and then decide. If the critical need is extremely quick response time, for example, then the Pentagon might be willing to pay a premium to get it.

CBO also said there may not be a single solution to the long-range strike requirement, noting that it may involve "more than one of the systems CBO examined." The eight alternatives were:

- Specialized "arsenal aircraft"
- Medium-range subsonic bomber
- Medium-range supersonic bomber
- Long-range subsonic cruise bomber
- Long-range supersonic cruise bomber
- Medium-range, surface-based hypervelocity vehicle
- Long-range, surface-based hypervelocity vehicle
- Space-based re-entry vehicle

As a general rule, the faster the response time of a given solution, the more expensive it tends to be, the CBO found.

Of all the options considered, CBO gave the nod to large, stealthy subsonic bombers as being able to offer the greatest firepower in a single package, able to loiter in the target area for long periods while dispensing low-cost ordnance. While the time of flight of a weapon released from a loitering bomber was quick in an established conflict, where the aircraft were already over the battlefield, it was much slower than other options from a "standing start," said the report.

In More Detail

Arsenal Craft. CBO considered the prospect of using USAF's C-17 airlifter as the basis of a new kind of arsenal aircraft, one capable of carrying many cruise missiles internally and releasing them out the rear cargo door for launch.

This, CBO found, was the least expensive of the eight options. It might not even be necessary to buy any new aircraft for this approach, CBO said, if the strike mission could be accommodated by using existing airplanes.

A drawback is that the nonstealthy C-17 would have to loiter outside a danger zone and launch its missiles from there, thus reducing its reach. Large and not designed for evasive action, the C-17 would make an attractive target.

Over all, said CBO, arsenal airplanes would offer “significant firepower” at a cost well below that of bombers. The C-17 would carry missiles that could fly at Mach 3 and travel at least 575 miles, at a cost of under \$2 million apiece.

Medium-Range Bombers. CBO’s medium-range bombers were projected at sizes in the F-111 class. Both would be stealthy, but the subsonic version would have a payload greater than that of the supersonic type, which CBO likened to the FB-22 concept. (See “[The Raptor as Bomber](#),” January 2005, p. 28.) The fast version could dash at a speed of Mach 1.5. Either could be manned or unmanned.

The medium bombers would offer “reach and firepower improvements over current long-range strike fighters,” the CBO said, but wouldn’t address the need for global reach or be able to loiter in the target area very long. The Air Force could buy more of them than larger bombers, but not necessarily have greater net firepower, the CBO noted. A larger fleet of aircraft also would entail higher support costs but cover more geographical area at the same time.

The CBO postulated that it would cost \$188 million apiece—average unit procurement cost, including research and development—to build a subsonic medium bomber, over a run of 275 aircraft, while a similar number of the supersonic dash version would cost \$220 million apiece.

Long-Range Bombers. The large subsonic bomber would be “similar in concept (although not necessarily in specific design) to the stealthy, subsonic B-2,” said CBO, while the large, supersonic craft would be capable of sustaining Mach 2 over most of its mission. Again, the slower model would possess more firepower, but the faster version would reduce the response time. These aircraft, too, could be manned or unmanned.

The big subsonic bombers offer global reach, loitering ability, and a response time of about 15 hours from a “go” order. The supersonic big bombers would sacrifice loitering time and some payload in exchange for a shorter response time, which the CBO did not specify.

The CBO said it would cost about \$409 million each for 150 long-range subsonic bombers, including R&D, but the cost would shoot up to \$912 million apiece if they were required to cruise at supersonic speed.

The Air Force and the Pentagon have both expressed a desire for a strike platform that could put ordnance on targets within a few minutes of a launch order, but CBO said that doesn’t seem to be technically possible given the state of the art.

Hypervelocity Vehicles. The high-speed missiles would be derived from the Common Aero Vehicle, which has been studied by the Air Force and Defense Advanced Research Projects Agency for several years. The CBO looked at land-launched models, as well as those fired from ships, submarines, and aircraft. The most expensive but fastest on the spectrum of options was

the “re-entry vehicle” version of the CAV, which would be maintained in orbit, ready to descend on a time-sensitive target at any time.

The CAVs would be unmanned vehicles “capable of flying through space on suborbital trajectories ... shaped to generate sufficient lift so that, after re-entering the atmosphere, they can glide many thousands of miles to their targets at hypersonic speeds with a combination of thrusters and flaps providing maneuvering control.”

Space Vehicles. Orbital CAVs would be in equatorial low Earth orbits until needed, while ground-based CAVs could be launched by a converted intercontinental ballistic missile.

The CBO found that even the hypervelocity CAVs would need about an hour to get to their targets from a standing start but that it would be nearly impossible to defend against them.

“However, their high unit cost implies that they probably could not be purchased in sufficient numbers to provide the sustained firepower offered by aircraft forces,” CBO concluded.

The CBO posited a program unit cost of \$26 million each for 48 surface-based CAVs; \$36 million each for 24 long-range surface-based CAVs (likely launched on excess ICBMs); and \$55 million each for 128 space-based CAVs.