

Policy Options for Unmanned Aircraft Systems

Over the next 10 years, the Department of Defense (DoD) plans to purchase about 730 new medium-sized and large unmanned aircraft systems based on designs currently in operation, while also improving the unmanned aircraft already in service. By the Congressional Budget Office's (CBO's) estimates, completing the investments in systems for which there are detailed plans will require about \$36.9 billion through 2020.

CBO has analyzed eight alternatives to DoD's fiscal year 2012 plan for expanding its fleet of medium-sized and large unmanned aircraft that are designed for reconnaissance and light attack missions. This study presents each alternative's likely effect on forcewide capability and acquisition costs. The alternatives—three for the Air Force and five for the Army—would change the mix of unmanned aircraft systems that are in or nearing production, the way that unmanned systems are assigned to units and operated in geographic areas where units are deployed, or both. The costs of those options would range from \$3.7 billion less than DoD's plan through 2020 to \$2.9 billion more. They would provide capability in several important dimensions ranging below and above that of the planned fleet.

Existing Systems and Future Plans

DoD currently has more than 6,000 unmanned aircraft. The majority of those aircraft are short-range reconnaissance systems that have a wingspan of a few feet and have handheld controls used by small military units in combat to look "around corners" or "over hills." Spending for those systems represents a relatively small proportion of the total investment planned for unmanned aircraft systems. The bulk of DoD's planned spending is for the more costly medium-sized and large unmanned aircraft systems that are designed to conduct reconnaissance missions or attack ground targets (see Summary Figure 1).

The armed services have developed detailed procurement plans, including estimated quantities and costs, for the unmanned aircraft systems that are in or nearing production.¹ Those plans would increase the inventory of the aircraft by 35 percent over the next 10 years. DoD also is investing in research and development for the next generation of more technologically advanced unmanned aircraft, which will provide improved reconnaissance and attack capabilities and will broaden the types of missions that can be accomplished. As the funding required for near-term systems begins to decline after 2015, funding for the next generation of unmanned aircraft will probably increase. Analyzing the longer-term plans will not be possible until they are defined in more detail.

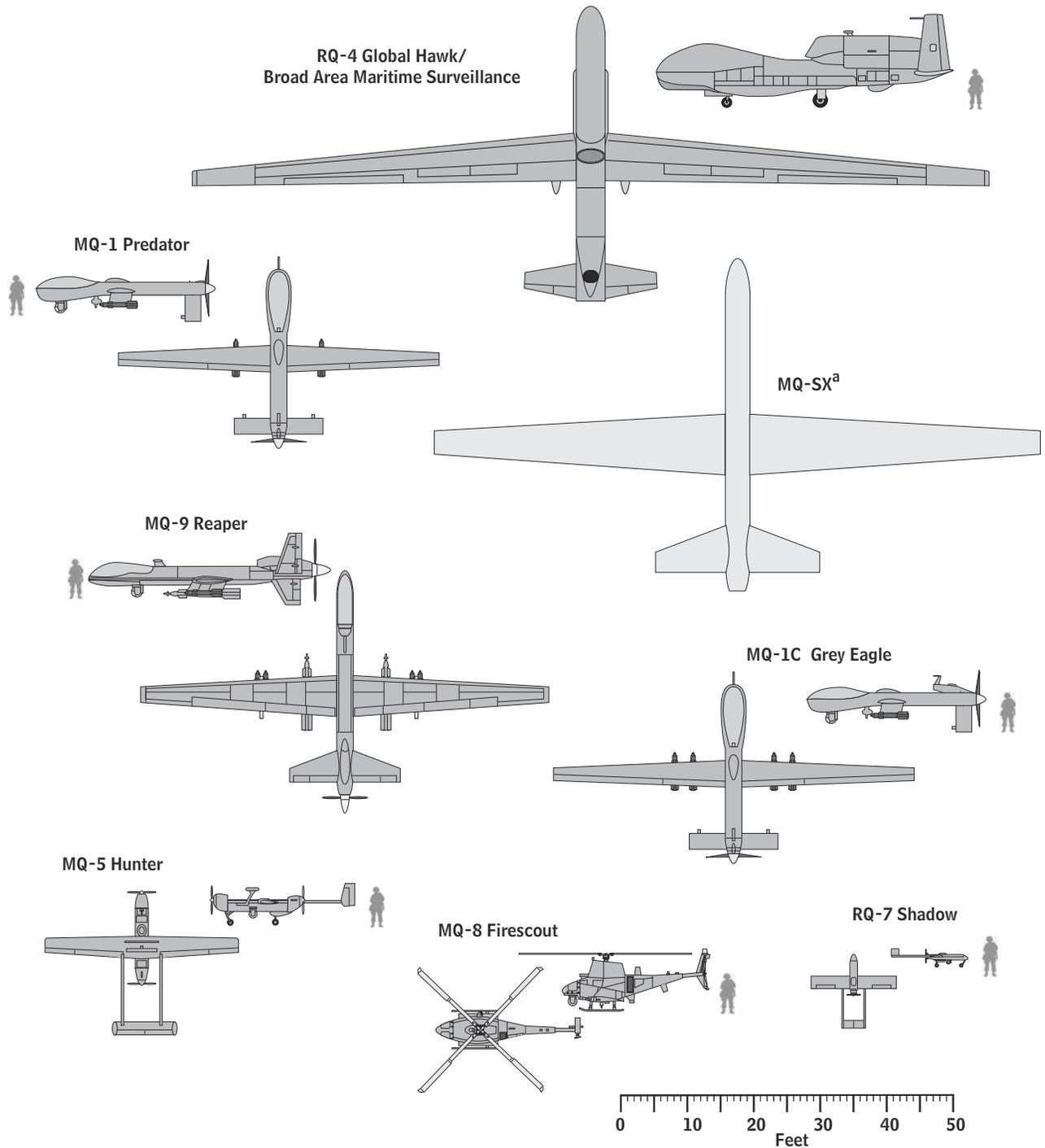
The Air Force's Plans

The Air Force currently operates at least four medium-sized or large unmanned aircraft: Global Hawks, Predators, Reapers, and Sentinels. The largest aircraft is the jet-powered RQ-4 Global Hawk, and the Air Force has 14 of them, according to CBO's information. The most numerous, at approximately 175 aircraft, is the MQ-1 Predator, a piston-engine propeller aircraft that can take still or video imagery and shoot Hellfire missiles. A larger version of the Predator, the turboprop-powered MQ-9 Reaper, is beginning to enter the force, and about 40 have been delivered as of 2011. (The "MQ-" designation for the Predator and Reaper identify them as multi-mission aircraft capable of reconnaissance and attack

1. The costs and quantities in the services' acquisition plans for unmanned aircraft systems are CBO estimates based on data from the Department of Defense's budget request for fiscal year 2012, Selected Acquisition Reports for December 2010, and *Aircraft Procurement Plan: Fiscal Years 2012–2041* (submitted with the 2012 budget, March 2011). CBO adjusted the costs using its projection of inflation.

Summary Figure 1.

Medium-Sized and Large Unmanned Aircraft Designed for Conducting Reconnaissance and Attacking Ground Targets



Source: Congressional Budget Office.

Note: All aircraft are drawn to the same scale. The silhouette figure is a 6-foot-tall soldier, also drawn to scale.

a. The MQ-SX is a notional unmanned aircraft system based on existing aircraft systems that is more capable than the Predator class in speed and altitude and less capable than the Global Hawk class. The illustration shows relative size but does not represent the actual design of the notional aircraft.

Summary Table 1.**Acquisition Cost of Medium-Sized and Large Unmanned Aircraft Systems Under the Department of Defense's 2012 Plan**

(Millions of 2011 dollars)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total, 2011- 2020
Air Force											
RQ-4 Global Hawk	1,200	1,060	890	790	810	710	1,160	530	80	60	7,290
MQ-1 Predator	30	10	10	10	a	a	a	a	a	a	60
MQ-9 Reaper	1,700	1,550	1,740	1,440	1,350	1,150	1,060 ^b	1,040 ^b	1,030 ^b	1,010 ^b	13,070
Army											
MQ-1C Grey Eagle	870	1,060	1,040	740	220	90	a	a	a	a	4,020
RQ-7 Shadow	610	250	270	200	300	280	a	a	a	a	1,910
Navy and Marine Corps											
RQ-4 Broad Area Maritime Surveillance	530	560	760	880	900	1,010	1,230	1,260	1,130	1,130	9,390
MQ-8 Firescout	60	70	60	80	80	90	130	160	150	150	1,030
RQ-7 Shadow	90	10	10	10	a	a	a	a	a	a	120
All Services											
Total	5,090	4,570	4,780	4,150	3,660	3,330	3,580	2,990	2,390	2,350	36,890

Source: Congressional Budget Office based on data from the Department of Defense's budget request for 2012, Selected Acquisition Reports for December 2010, and *Aircraft Procurement Plan: Fiscal Years 2012–2041* (submitted with the 2012 budget, March 2011).

Note: Acquisition cost includes the cost of procuring air vehicles, sensors, and ground stations, plus the cost for research, development, test, and evaluation. The services' cost data have been adjusted using CBO's projection of inflation and rounded to the nearest \$10 million.

- a. The Department of Defense has no plans to acquire or modify the specified system in these years.
 b. The cost is for the follow-on aircraft the Air Force plans to acquire instead of the Reaper.

missions.) The RQ-170 Sentinel is a stealthy reconnaissance aircraft whose existence has only recently been acknowledged by the Air Force. Most performance characteristics of the Sentinel remain classified.

The Air Force's near-term goals are to increase the number of Global Hawk and Reaper aircraft that can be continuously and simultaneously operated. To meet that goal, the Air Force plans to purchase 288 Reapers (48 per year from 2011 through 2016) and 28 Global Hawks from 2011 through 2018. Documents provided to the Congress by DoD indicate plans to continue purchasing multimission unmanned aircraft after 2016, although the type of aircraft is not specified.² On the basis of the

information available, CBO assumed that the Air Force's purchases after 2016 would continue at 48 aircraft per year and would comprise either additional Reapers or a follow-on aircraft with range, payload, and cost similar to the Reaper. (Unless making a distinction is necessary, references to the Reaper in this study pertain to both the Reaper itself and the possible follow-on system.) The Air Force is also exploring the characteristics that would be desired in a larger aircraft a generation beyond the Global Hawk.

About \$20.4 billion will be needed for the aircraft the Air Force plans to purchase through 2020, CBO estimates: \$7.3 billion for Global Hawks and \$13.1 billion for Reapers and their follow-on (see Summary Table 1). Costs would average about \$2.0 billion per year through 2020.

2. Department of Defense, *Aircraft Procurement Plan: Fiscal Years 2012–2041* (submitted with the 2012 budget, March 2011).

The Army's Plans

The Army currently operates three medium-sized unmanned aircraft systems: Hunters, Shadows, and Predators. Overall, the Army's inventory includes about 20 MQ-5B Hunters (older aircraft scheduled for retirement by 2013), about 450 RQ-7 Shadows, and about 40 MQ-1 Predators in two versions (specifically, MQ-1 Warrior Alphas and MQ-1C Grey Eagles).³

Over the next five years, the Army plans to purchase 20 Shadows to replace losses, upgrade the existing Shadows with tactical data links and a laser targeting system, and purchase 107 more of the medium-altitude Grey Eagles. CBO estimates that those plans will cost about \$5.9 billion: \$1.9 billion for the Shadows and \$4.0 billion for the additional Grey Eagles. In the longer term, the Army is exploring concepts for an aircraft that has greater endurance (that is, can stay in the air for a longer time). It also may decide to resume efforts to increase the capabilities of unmanned aircraft used by combat brigades; those plans were shelved when the Army's Future Combat System was canceled in 2009.

The Navy and Marine Corps' Plans

The Navy is currently testing two new types of aircraft that it hopes to field in the near future—the long-endurance Broad Area Maritime Surveillance (BAMS) aircraft, which is a Global Hawk variant optimized for naval operations, and the MQ-8B Firescout unmanned helicopter. The Navy plans to purchase 36 BAMS aircraft at a cost of about \$9.4 billion by 2020 and operate them from a few bases worldwide to provide surveillance of activities on the oceans. The Navy also plans to purchase 61 Firescouts by 2020 at a cost of \$1.0 billion; those helicopters will be based on selected surface ships and will provide local reconnaissance and the capability to attack hostile surface targets. The Navy's plans call for purchasing a total of 65 BAMS through 2026 and 168 Firescouts through 2028.

The Marine Corps is in the process of fielding the Shadow to support ongoing operations in Southwest Asia. Thirteen systems (with four aircraft per system) had been delivered by the end of calendar year 2009. The Marine Corps does not plan to purchase additional

Shadow systems but instead will spend about \$120 million to upgrade some Shadows already in its inventory.

In the longer term, the Navy is exploring concepts for a carrier-based unmanned aircraft, called the Unmanned, Carrier-Launched Airborne Surveillance and Strike aircraft, and is currently flying a demonstrator aircraft to help develop the technologies and procedures needed to operate such an aircraft. The Marine Corps is exploring concepts for a medium-sized system (currently referred to as the Group 4 Unmanned Aircraft System) that would be designed to perform various missions in support of amphibious operations. Both systems might enter service by 2020.

Assessing Policy Options

The Congressional Budget Office examined the implications—both for the capabilities of the armed forces and for DoD's acquisition budget—of eight possible alternatives to DoD's fiscal year 2012 plan (three for the Air Force and five for the Army). Acquisition cost includes the cost of procuring an unmanned aircraft system (the aircraft, sensors, and ground stations), plus the cost of research, development, test, and evaluation.

The options would alter DoD's acquisition plans through 2020 (see Summary Table 2). Three of the options would improve capabilities—as measured by the weight the fleet of aircraft can carry (its payload) and the time the aircraft will be able to remain in the air (its endurance)—for the same cost as DoD's plans. Two options would improve capabilities but would also increase acquisition cost, and three options would reduce cost but would also yield some reduction in capabilities.

The options are meant to illustrate the cost implications of different approaches to enhancing capabilities and are not designed to reach any specific goal or to counter any specific adversaries that might arise in the future. CBO did not examine longer-term options requiring significant technological development because the uncertainty surrounding what could be fielded and what might be needed is too great for a detailed analysis. Nor did CBO examine options for the Navy and Marine Corps—not only because those services will have relatively few unmanned aircraft systems in the near term but also to keep the number of options to a manageable level. In addition, this study does not assess the operation and support costs of the options. In CBO's estimation, those costs would change little in the eight options because

3. In August 2010, the Army adopted Grey Eagle as the official name for the General Atomics MQ-1C. Earlier, the Army had called the system the Extended Range Multi-Purpose (ER/MP) and Sky Warrior. The MQ-1 Warrior Alpha is essentially the same as the Air Force's Predator.

Summary Table 2.**Overview of Options for the Air Force and the Army and Their Cost Relative to the Department of Defense's 2012 Plan**

Approach	Option	Cost Relative to DoD's 2012 Plan (Billions of 2011 dollars)
	Air Force	
Buy New, Stealthier Aircraft	1. Buy 224 MQ-SXs and 336 Fewer Reapers ^a	0
	2. Buy 336 MQ-SXs and 336 Fewer Reapers ^a	2.9
	3. Buy 24 MQ-SXs and 24 Fewer Global Hawks ^a	-3.7
	Army	
Buy More-Capable Aircraft	4. Buy 69 Reapers and 78 Fewer Grey Eagles	0
	5. Buy 78 Reapers and 78 Fewer Grey Eagles	0.5
Buy More, Less-Expensive Aircraft	6. Buy 350 Firescouts and 78 Fewer Grey Eagles	0
Change the Way Aircraft Are Operated by Conducting Remote-Split Operations ^b	7. With 42 Fewer Grey Eagles	-1.3
	8. With 36 Reapers and 78 Fewer Grey Eagles	-1.0

Source: Congressional Budget Office.

- a. The MQ-SX is a notional unmanned aircraft system based on existing aircraft systems that is more capable than the Predator class in speed and altitude and less capable than the Global Hawk class.
- b. In remote-split operations, deployed divisions would have operational control of aircraft from a central fleet rather than be equipped with their own aircraft.

most of the options would require only modest changes in the number of personnel—a major contributor to those costs—and because differences in fuel consumption and the cost of spare parts probably would be minimal.⁴

To compare the capability that could be expected under the options, CBO calculated an aggregate measure—the payload-duration—for each aircraft. Payload-duration is the weight (payload) that an unmanned aircraft could carry to a location, multiplied by the amount of time the aircraft could be kept there on orbit (duration). In this case, “on orbit” means that the unmanned aircraft is circling the target area continuously.⁵

CBO calculated payload-duration for individual aircraft at orbits positioned at various distances from where the

aircraft are based. The distance, or range, to the orbit affects duration: The farther the mission is located from where the aircraft is launched, the less time the aircraft will be able to remain at the target location. The aircraft's endurance and speed also affect duration: The faster the aircraft can travel, the more time it can spend at the target location. Payload capacity serves as a simplified measure of the types and quality of sensors and weapons that an aircraft could carry—under the general assumption that, all else being equal, a greater payload capacity enables the aircraft to carry more-capable sensors and a greater number or variety of weapons. The total payload-duration of all aircraft in the force captures the effects of aircraft inventory, transit speed, endurance, and payload capacity. Payload-duration better captures reconnaissance capability than does the number of orbits because it incorporates the capacity of the aircraft to carry equipment and to spend time on reconnaissance missions.

4. Some options would require modest changes in the number of personnel. Option 6 for the Army, for example, would increase the number of unmanned aircraft operators, but CBO assumed that the Army would provide those people from existing ranks, as it has done when adopting other unmanned aircraft systems. Conversely, Options 7 and 8 would require fewer personnel, but those savings are not included in CBO's analysis.

5. The orbit may also be called a continuous, persistent, or loitering orbit, in which the aircraft remains on station, waiting for orders to perform a required mission. In military parlance, an aircraft orbit is known as a combat air patrol, or CAP.

Options for the Air Force

CBO's options for the Air Force examine the implications of more quickly developing and fielding a new aircraft that would have improved payload-duration plus other characteristics such as a lower chance of being detected (stealth) and higher speed—traits that would be advantageous in conflicts against technologically capable adversaries.

Under the options, the Air Force would purchase a notional MQ-SX—an aircraft that would have some characteristics consistent with those the Air Force is considering for its proposed MQ-X—in lieu of some of the Reapers or Global Hawks in current plans. The MQ-SX postulated by CBO would be a jet-powered aircraft about one and a half times the size of the Reaper with an airframe designed to be more difficult to detect and target by air-defense systems. Relative to the Reaper, the larger size of the MQ-SX would enable it to carry a greater payload (sensors, weapons, or fuel); jet power would allow the aircraft to reach its destination (a target or orbit location) in less time; and stealth features would improve its ability to operate in defended airspace.⁶ CBO's cost estimate for the notional MQ-SX assumes modest improvements in stealth relative to that of Global Hawks, Predators, and Reapers. A highly stealthy design would probably cost more.

Option 1—Buy 224 MQ-SXs and 336 Fewer Reapers (Same Cost). Instead of purchasing 480 Reapers, the Air Force would buy only 114 (336 fewer) and would also buy 224 MQ-SX aircraft to arrive at the same overall acquisition cost as its current plan. Although the option would yield a smaller inventory of multimission unmanned aircraft, the force's total payload-duration would remain about the same relative to current plans for orbits at short range because the speed and payload advantage of the MQ-SX would compensate for the smaller inventory (see Summary Figure 2). Payload-

duration would improve about 35 percent relative to current plans at intermediate ranges (1,500 nm) by 2020 because the higher speed of the MQ-SX would increase the proportion of time it could spend on station relative to the slower Reaper. Payload-duration would be unchanged at long range (2,500 nm) because only the Global Hawk has significant capability at that range.

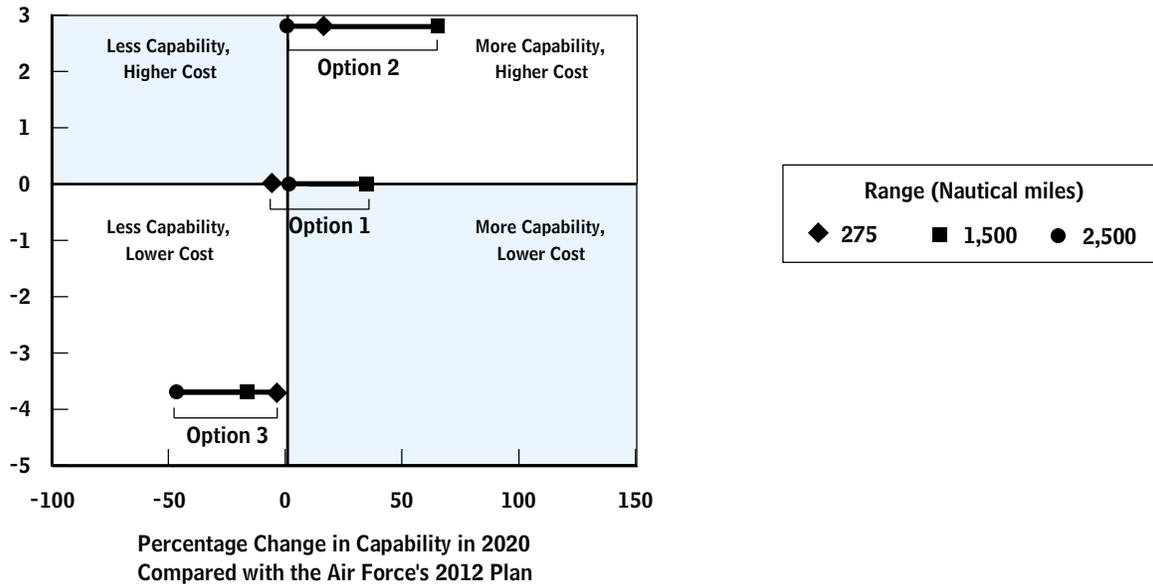
Option 2—Buy 336 MQ-SXs and 336 Fewer Reapers (Higher Cost). The Air Force would substitute purchases of 336 Reapers with 336 MQ-SXs. The number of aircraft purchased each year would remain almost unchanged through 2020 but would shift from all Reapers in 2011 to all MQ-SXs by 2015. Relative to the Air Force's 2012 plan, the total cost would increase by about \$2.9 billion because the MQ-SX would be more expensive than the Reaper. Although the Air Force's total inventory of MQ-type unmanned aircraft systems would remain essentially unchanged under this option, the larger size and higher speed of the MQ-SX relative to the Reaper would result in a force capable of maintaining a payload-duration at intermediate ranges that was 67 percent higher by 2020 than under the Air Force's plan. Furthermore, the improved survivability of the MQ-SXs could make them more useful in environments posing a greater threat.

Option 3—Buy 24 MQ-SXs and 24 Fewer Global Hawks (Lower Cost). Starting in 2012, the Air Force would buy 24 fewer Global Hawks and the same number of MQ-SXs. Although the total number of aircraft purchased would be nearly the same as under the Air Force's current plans, the total cost would decrease by about \$3.7 billion. The overall payload-duration would be reduced at all ranges under Option 3 because the MQ-SX would be slower (and therefore take longer to reach the target area), have less endurance, and have a slightly lower payload than the Global Hawk. In addition, the sensors available with the MQ-SX might be less effective than those designed for the Global Hawk, but with further investment it might be possible to modify Global Hawk sensors for use on the MQ-SX. Although payload-duration would decrease, weapons payload would increase because the Global Hawk is not currently configured to carry weapons. Also, the stealth features of an MQ-SX might enable it to operate in defended airspace that would be too hazardous for a Global Hawk.

6. At least two aircraft that might meet those criteria are flying today—the General Atomics Avenger and the RQ-170 Sentinel. The two aircraft have significant differences: the Avenger resembles a Global Hawk with the addition of airframe shaping for stealth, whereas the Sentinel has a tailless design resembling the B-2 bomber. Aircraft at this stage of development could enter production more quickly than would be possible if starting from scratch.

Summary Figure 2.**Change in Capability at Different Ranges and in Acquisition Cost in 2020 Under CBO's Options for the Air Force**

(Billions of 2011 dollars)



Source: Congressional Budget Office.

Notes: The overall approach of the options would be to buy new, stealthier aircraft, as follows:

- Option 1—Buy 224 MQ-SXs and 336 Fewer Reapers
- Option 2—Buy 336 MQ-SXs and 336 Fewer Reapers
- Option 3—Buy 24 MQ-SXs and 24 Fewer Global Hawks

The MQ-SX is a notional unmanned aircraft system based on existing aircraft systems that is more capable than the Predator class in speed and altitude and less capable than the Global Hawk class.

Capability is measured as payload-duration—a comparative performance metric developed by CBO. It measures the weight (payload) an unmanned aircraft could carry to a location, multiplied by the amount of time the aircraft could stay there on orbit (duration). The symbols in the figure represent that capability for the overall fleet in orbits at three distances from the airbase (275, 1,500, and 2,500 nautical miles) for each option.

The figure compares payload-duration at different ranges with cost, but each option has other advantages and disadvantages not reflected in the comparison.

Acquisition cost includes the cost of procuring air vehicles, sensors, and ground stations, plus the cost for research, development, test, and evaluation.

Options for the Army

CBO examined five options for the Army. Two (Options 4 and 5) explore the implications of buying systems that are more capable than the ones the Army plans to buy. A third (Option 6) examines the effects of buying a greater quantity of less capable systems. Two others (Options 7 and 8) illustrate the effects of changing the way that unmanned systems are assigned to military units and are operated in the theater of combat: Instead of being

equipped with their own aircraft, deployed divisions would be given operational control of aircraft from a central fleet. That approach, called remote-split operations, is one the Air Force has used successfully with its unmanned aircraft. Options 7 and 8 would result in savings from buying fewer aircraft because of the remote-split technique. None of the five options consider systems or concepts that are in the early stages of development, such as the Long Endurance Multi-Intelligence

Vehicle—an unmanned airship that the Army is currently investigating.

Option 4—Buy 69 Reapers and 78 Fewer Grey Eagles (Same Cost). The Army would replace future purchases of 78 Grey Eagles with 69 larger, more costly Reaper aircraft to arrive at the same overall acquisition cost as its current plan. The Grey Eagles already purchased would remain in service. Because of its greater payload, range, and endurance, the Reaper would provide 53 percent to 86 percent greater payload-duration by 2020 than the Grey Eagle (see Summary Figure 3). Although the Reaper costs more than the Grey Eagle, the difference in unit cost is less than one might expect, because the aircraft is only part of the system being purchased. Both systems require essentially the same ground stations and communications links. Another advantage of the Army's buying Reapers rather than continuing to develop its own unique system is that doing so would increase commonality between the Air Force and Army systems. Commonality could reduce production costs because economies of scale affect the manufacturing process. CBO did not include any such savings in its calculations.

Option 5—Buy 78 Reapers and 78 Fewer Grey Eagles (Higher Cost). The Army would replace future purchases of 78 Grey Eagles with the same number of larger, more costly Reaper aircraft. The Grey Eagles already purchased would remain in service. CBO estimates that this option would provide 67 percent to 105 percent more payload-duration than the Army's plan but would cost about \$520 million more.

Option 6—Buy 350 Firescouts and 78 Fewer Grey Eagles (Same Cost). The Army would purchase 350 MQ-8 Firescout unmanned helicopters and 78 fewer Grey Eagles to arrive at the same overall acquisition cost as the 2012 plan. The Grey Eagles already purchased would remain in service. The range and payload of the Firescouts are much lower than those of the Grey Eagle, but because the Firescouts cost less, the Army could purchase more of them.⁷ The resulting payload-duration of

7. The Class IV MQ-8 Firescout is a small helicopter and therefore does not require a runway from which to operate. Option 6 would replace the division-level Grey Eagle with the Firescout, which could be assigned to either a division or separate brigades. The Army has considered purchasing Firescout for its combat brigades but has not yet done so.

Option 6 would be 60 percent greater than that of the 2012 plan at a range of 40 nm but would fall to about half that of the plan at 650 nm.

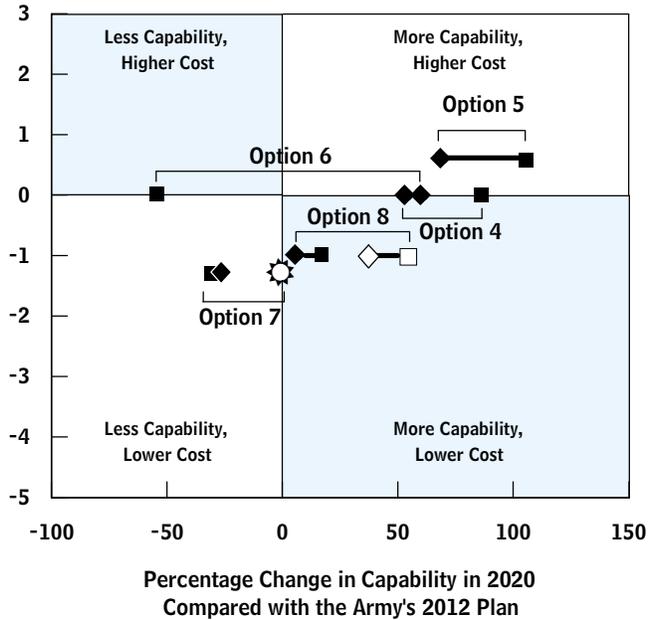
Option 7—Conduct Remote-Split Operations with 42 Fewer Grey Eagles (Lower Cost). The Army would change the way it assigns and operates unmanned aircraft in combat theaters. It would centralize its force of medium-altitude unmanned aircraft systems in operations referred to as remote-split—an approach that has worked well for the Air Force in Iraq and Afghanistan. Deployed divisions would be given operational control of aircraft from a central fleet, instead of being equipped with their own aircraft. Although the aircraft would be under the control of the division commander, they could be operated over satellite links from the United States or other secure locations.

In this option, the Army would buy 42 fewer Grey Eagles, saving \$1.3 billion relative to the 2012 plan. A set of 113 Grey Eagles would provide support for up to six divisions on the ground—about the size of the peak U.S. deployment in Operation Iraqi Freedom—and three additional division sets would be available for special operations, training, or holding in reserve. Although the Army would have less overall payload-duration at all ranges compared with its 2012 plan, deployed units would have the same payload-duration as they would under that plan because the divisions would have the same number of aircraft supporting them, although those aircraft would be operated centrally in the geographic areas where units are deployed.

Option 8—Conduct Remote-Split Operations with 36 Reapers and 78 Fewer Grey Eagles (Lower Cost). The Army would adopt remote-split operations, as in Option 7, but would replace some of the Grey Eagles with Reapers: The same-size force of 113 medium-altitude unmanned aircraft would consist of 77 Grey Eagles and 36 Reapers. As in Option 7, the fleet of unmanned aircraft would be able to support up to six divisions on the ground, and three additional division sets would be available for special operations, training, or holding in reserve. Under this option, deployed units would have 37 percent to 56 percent greater payload-duration at short and long ranges, respectively, than in Option 7 and the Army's plan. This approach would cost \$1.0 billion less than the Army's plan.

Summary Figure 3.**Change in Capability at Different Ranges and in Acquisition Cost in 2020 Under CBO's Options for the Army**

(Billions of 2011 dollars)



Range (Nautical miles)	Overall Fleet	Deployed Divisions
40	◆	◇
650	■	□
40 and 650	n.a.	⊗

Source: Congressional Budget Office.

Notes: Under the options, the Army would buy more-capable aircraft (Options 4 and 5); buy more, less-expensive aircraft (Option 6); or change the way aircraft are operated (Options 7 and 8), as follows:

- Option 4—Buy 69 Reapers and 78 Fewer Grey Eagles
- Option 5—Buy 78 Reapers and 78 Fewer Grey Eagles
- Option 6—Buy 350 Firescouts and 78 Fewer Grey Eagles
- Option 7—Conduct Remote-Split Operations with 42 Fewer Grey Eagles
- Option 8—Conduct Remote-Split Operations with 36 Reapers and 78 Fewer Grey Eagles

Capability is measured as payload-duration—a comparative performance metric developed by CBO. It measures the weight (payload) an unmanned aircraft could carry to a location, multiplied by the amount of time the aircraft could stay there on orbit (duration). The symbols in the figure represent that capability for the overall fleet in orbits at two distances from the airbase (40 and 650 nautical miles) for each option. Options 7 and 8 show a further comparison of capability for deployed divisions, in case the Army decides to employ the remote-split technique (in which deployed divisions would have operational control of aircraft from a central fleet rather than be equipped with their own aircraft).

The figure compares payload-duration at different ranges with cost, but each option has other advantages and disadvantages not reflected in the comparison.

Acquisition cost includes the cost of procuring air vehicles, sensors, and ground stations, plus the cost for research, development, test, and evaluation.

n.a. = not applicable.

