



United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

FEB 10 2012

The Honorable Michael K. Simpson
Chairman
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
U.S. House of Representatives
2312 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

Enclosed is the Forest Service Large Airtanker Modernization Strategy as required in Division E of the Joint Statement of Managers in Conference Report 112-331. This strategy analyzes options to replace the current airtanker fleet.

In compliance with section 435 of Public Law 111-88, after 45 days this report will be posted to the Forest Service Web site at: <http://www.fs.fed.us/aboutus/budget/congressional-directives.shtml>.

A similar letter and copy of the report are being sent to Congressman James P. Moran and Senators Jack Reed and Lisa Murkowski.

Sincerely,

A handwritten signature in blue ink that reads "Thomas J. Vilsack". The signature is fluid and cursive, with the first name "Thomas" and last name "Vilsack" clearly legible.

Thomas J. Vilsack
Secretary

Enclosure



United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

FEB 10 2012

The Honorable James P. Moran
Ranking Member
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
U.S. House and Representatives
1016 Longworth House Office Building
Washington, D.C. 20515

Dear Congressman Moran:

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Thomas J. Vilsack
Secretary

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Washington, D.C. 20250

FEB 10 2012

The Honorable Jack Reed
Chairman
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
United States Senate
728 Hart Senate Office Building
Washington, D.C. 20510

Dear Mr. Chairman:

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A similar letter and copy of the report are being sent to Senator Lisa Murkowski and Congressmen Michael K. Simpson and James P. Moran.

Sincerely,

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Thomas J. Vilsack
Secretary

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United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

FEB 10 2012

The Honorable Lisa Murkowski
Ranking Member
Subcommittee on Interior, Environment,
and Related Agencies
Committee on Appropriations
United States Senate
125 Hart Senate Office Building
Washington, D.C. 20510-4403

Dear Senator Murkowski:

Enclosed is the Forest Service Large Airtanker Modernization Strategy as required in Division E of the Joint Statement of Managers in Conference Report 112-331. This strategy analyzes options to replace the current airtanker fleet.

In compliance with section 435 of Public Law 111-88, after 45 days this report will be posted to the Forest Service Web site at: <http://www.fs.fed.us/aboutus/budget/congressional-directives.shtml>.

A similar letter and copy of the report are being sent to Senator Reed and Congressmen Simpson and Moran.

Sincerely,

A handwritten signature in blue ink that reads "Tom J. Vilsack". The signature is written in a cursive, flowing style.

Thomas J. Vilsack
Secretary

Enclosure

USDA Forest Service

**LARGE AIRTANKER
MODERNIZATION STRATEGY**

Executive Summary

Wildfires affect millions of acres in the United States annually and hundreds of homes and businesses are destroyed by wildfires each year—the challenge of wildland fire management is growing. From 2000 to 2008, at least 10 States had fires of record-breaking size; in 2011, the Wallow Fire, at more than half a million acres, broke the record set in Arizona just 9 years earlier. Across the Nation, almost 70,000 communities are at risk from wildfires.

With the changing climate, fire seasons will likely become longer and more severe. This has already started to occur with the Western fire season now, on average, 78 days longer than in the mid-1980s¹. The trend for the number of acres burned annually by wildfire indicates a doubling of acres burned since 1960 (see Chart 1). Cumulative drought, extensive insect kill in western forests, and regional shifts of population into the wildland urban interface have resulted in an increased level of wildfire activity that is expected to continue into the future.² In response to this wildfire activity, the Forest Service's airtanker fleet has flown an average of 4,500 flight hours, dropping almost 20 million gallons of retardant annually in the last ten years. Individual airtankers have flown an average of 210 hours annually to meet initial attack and fire response requirements. The changes in the fire season and increased pressure from additional populated areas will result in more demand for firefighting response from the Federal government. However, although fire activity has increased, the Forest Service's airtanker fleet has been reduced as a result of airworthiness issues—from 43 airtankers in 2000 to 11 airtankers in 2011. In order to meet the continued demand for wildfire response in 2011, the Forest Service has had to employ more than 40 additional heavy and medium helicopters, Single Engine Airtankers, Modular Airborne Firefighting Systems, and cooperator aircraft.

While airtankers are only one part of a multi-faceted interagency wildfire response effort, they are important to the Federal, state, and local wildland firefighting missions of protecting communities and natural resources from wildfires and to successfully managing wildfires in this country. Airtankers are used to deliver fire retardant to wildfires, thereby reducing fire intensity and rate of spread until ground personnel can reach the fire. Airtankers play a key role in successful initial attack, which is one of the most difficult and critical components of wildfire management. Successful initial attack of new and emerging fires that qualify for suppression is a critical part of keeping unwanted wildfires small and less costly.

The current fleet of large airtankers is old, with an average age of more than 50 years, and ten of the remaining eleven P-2V airtankers face retirement by 2021. With rising age, the cost of maintaining large airtankers is rapidly increasing, as are the risks associated with using them. To maintain mission safety and effectiveness, the Forest Service and Department of the Interior (Agencies) have concluded that the airtanker fleet needs to be replaced with safer aircraft. These replacements should be a newer, faster and more cost-effective mix of next-generation large airtankers better suited to the complex wildland fire environment of the 21st century. The Nation needs to invest in the right mix of aircraft for aerial firefighting. Our joint strategy for ensuring that the nation is equipped with a viable fleet of large airtankers is explored in this document.

¹ Westerling et.al. *Science*, Vol. 18 August 2006

² 2009 Quadrennial Fire Review, January 2009 (http://www.iafc.org/files/wild_QFR2009Report.pdf).

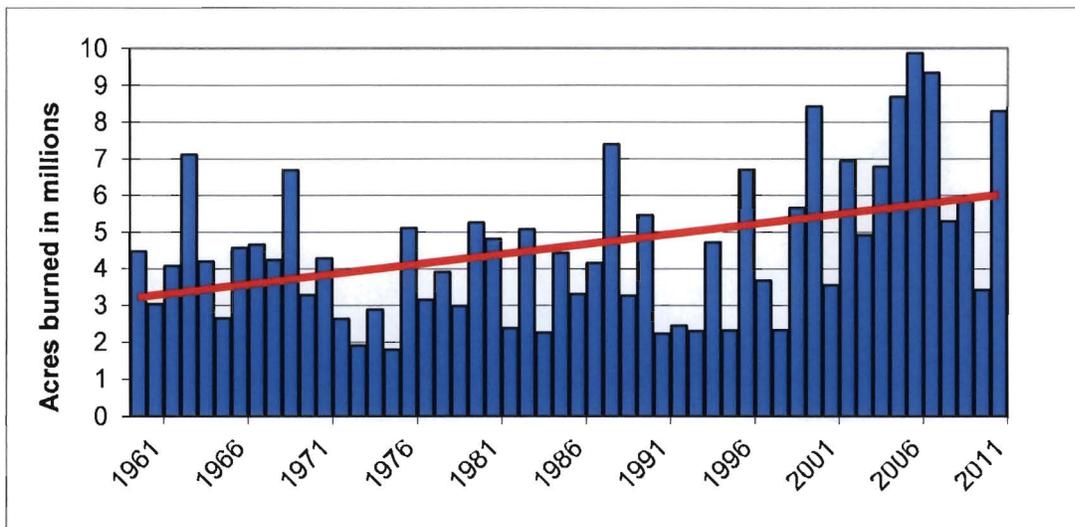
This strategy analyzes the options for next generation large airtankers. Recommendations in this strategy include:

- The Forest Service and the Department of the Interior should replace existing (legacy) large airtankers with a core fleet of next-generation large airtankers (Type 1, >3000 gallon capacity and Type 2, 1800-2999 gallon capacity). Continued work is ongoing to determine the optimum number of aircraft to meet the wildfire response need, but studies have shown that it is likely that between 18 and 28³ aircraft are needed.
- For large airtankers operated by private companies there is a need to explore additional acquisition models, such as different contracting instruments and leasing, which could provide more flexibility for private industry and reduce contract costs to the Federal government.
- The Federal wildland firefighting aircraft fleet should be a mix of Type 1, Type 2, Type 3 (800 to 1,799 gallons) and Type 4 (<799 gallons) airtankers, water scoopers, Very Large Airtankers (>8000 gallons) and heavy (Type 1) helicopters.

Background

Wildfires affect millions of acres in the United States annually, and hundreds of homes and businesses are destroyed by catastrophic wildfires each year. On average, wildfires burn more than 7 million acres in the U.S. annually, with almost 1.5 million acres burning on National Forests and over 500,000 acres burning on Department of the Interior lands. The trend for the number of acres burned annually by wildfire indicates a doubling of acres burned since 1960.

Chart 1 – Total Wildfire Acres Burned – All US Lands, 1960-2011



A large number of communities across the country are at risk from wildfires—almost 70,000. The cost of wildfire suppression and restoration amounts to billions of dollars each year, and the challenge of managing wildfires continues to grow more complex due to a changing climate, hazardous fuels build-

³ The requirements for large airtankers have been derived from the National Interagency Aviation Council Phase III Report, December 7, 2007 and the Interagency National Study of Large Airtankers to Support Initial Attack and Large Fire Suppression, Phase 2, November 1996.

up, and an expanding wildland-urban interface. The current drought cycle is expected to last for another 20 years⁴, which will contribute to a scarcity of water in ecosystems, continued problems with insects, and dryer vegetation that will make fuels more flammable and lead to more extreme fire behavior. For example, from 2000 to 2008, at least 10 States had fires of record-breaking size. In 2011, the Wallow Fire in Arizona burned more than half a million acres, breaking the record for the largest wildfire in Arizona set just 9 years earlier. With shorter winters and warmer, drier summers, the amount of fire on the landscape will increase and likely escalate in the future, and fire management efforts must be prepared to cope with a wildfire season that affects 10-12 million acres annually by the end of the decade⁵. These challenges will demand more flexible and agile firefighting response from the Federal government—requiring different capabilities within Federal fire management agencies.

Fire management is central to meeting the Forest Service and Department of the Interior missions of protecting and conserving natural resources and cultural heritage, restoring ecological health, and protecting communities. The Forest Service manages wildland fires on or threatening the 193 million acres of National Forest System lands and 20 million acres of non-federal lands under fire protection agreements. The Department of the Interior manages over 500 million acres of public land. The Agencies work in concert with their interagency wildland firefighting partners at the Federal, state and local levels to respond to fires on non-federal system lands across the country. Since the 1950s, fixed wing airtankers have contributed to this effort as a key part of the Nation's aerial firefighting force.

The Agencies have long agreed on the principles that serve as the basis for the acquisition and management of aviation resources for fire operations. Aviation resources are one of a number of tools available to accomplish fire-related land management objectives, and they seldom work independently from ground-based resources. Aviation use must be prioritized based on management objectives and the probability of success. Also, risk management is a necessary requirement for the use of any aviation resource. In addition, the effect of aviation resources on a fire is directly proportional to both speed at which the resource can initially engage the fire and the effective retardant capacity of the aircraft.

Airtanker Use and Need

Initial attack of new and emerging fires is one of the most difficult and critical components of wildfire management. Initial attack success is a critical part of keeping wildfires small and less costly. A 1.5% drop in initial attack success rate is estimated to represent approximately 150 fires that could escape initial attack, which would cost the Forest Service an additional \$300 million to \$450 million to suppress⁶. The ability to successfully suppress unwanted fires during initial attack has become increasingly more complex due to the increased forest and rangeland vegetation available to burn, the continued growth of the wildland urban interface, the rapid expansion of insect and disease infestations across landscapes, and persistent higher temperatures and drought due to climate change.

Airtankers play a key role in suppressing wildfires. Airtankers deliver fire retardant to wildfires, thereby reducing fire intensity and rate of spread until ground personnel can reach the fire or in support of ground personnel already on the fire. The reduced intensity and rate of spread can allow more effective

⁴ 2009 Quadrennial Fire Review, January 2009.

⁵ *Id.*

⁶ USDA Office of Inspector General Audit 08601-53-SF.

use of hand crews and engines. As fires increase in intensity or as fire spread rates increase, they become more difficult to control and costly to extinguish. Accessibility of terrain or the location of a wildfire can delay the deployment of ground forces. Consequently, aerial delivery of fire retardants to slow the growth of wildfires is often the only available method of containment until ground-based firefighters can establish control lines. As the fire grows, airtankers also respond to spot fires that pop up; slow fire growth along fire edges; and concentrate protection around key assets. The effectiveness of different airtanker types is often dependent on the fuels being treated. It can take a large quantity of retardant to penetrate dense forest canopies, and large airtankers are more capable of being effective in thick forest canopies and areas with dense brush. The larger load capacity also allows large airtankers to split their loads to provide critically needed support on different parts of a fire without delay.

The Current Airtanker Fleet is Unsustainable

The existing large airtanker fleet is old. The average age of the aircraft still in service is more than 50 years. Based on contractor information, ten of the remaining eleven P-2V airtankers face retirement by 2021 (Table 1 – Estimated Operational Service Life Remaining for the Lockheed P-2V, below). As these aircraft age, it becomes increasingly difficult for them to meet safety and airworthiness requirements. The cost of maintaining airtankers is rapidly increasing, as are the risks associated with using them. Since 2007, contract costs for daily airtanker availability have more than doubled—from just over \$15 million in 2007 to \$33 million in 2010.

Table 1— Estimated Operational Service Life Remaining for the Lockheed P-2V

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
P-2Vs	11	11	11	10	10	10	9	9	7	4	1	1	1	1	1	1	1	1	1	1

Historically, the Agencies based the selection of aircraft used for airtankers on the availability and low cost of acquisition rather than on firefighting airworthiness requirements. Six airtanker accidents since 1980, caused by in-flight structural failures, motivated the Agencies to pursue this strategic planning process to secure a safe and reliable large airtanker fleet. Following the 2002 fatal airtanker crashes caused by in-flight structural failures, the Agencies were required to ensure the airworthiness of airtankers. Maintenance and inspection programs applicable to the airtanker mission were developed for the P-2V and P-3 aircraft. Beginning in 2008, the Forest Service, the sole Federal contractor for large airtankers on behalf of all the agencies, began requiring vendors supplying Type 1 and Type 2 airtankers to develop and implement a comprehensive maintenance and inspection program approved by the FAA. Due to the age of the current fleet, these requirements are costly to comply with. The increase in airtanker availability costs in the last few years is directly attributable to maintaining the airworthiness and safety of 50-year old aircraft for the firefighting mission.

The rapidly aging fleet will not be able to comply with these airworthiness and safety requirements indefinitely. The number of contracted airtankers has been reduced from over 40 ten years ago to 19 on the current (2008-2012) contract because some previous airtankers could not meet airworthiness requirements. With the recent termination of one of the airtanker services contracts, there are currently

only 12⁷ airtankers on Forest Service contract. The current fleet consists of eleven Type 2 P-2V airtankers and one BAe-146, operated by two different contractors⁸. Surge capacity is available, when circumstances allow, through additional call-when-needed helicopters, cooperator airtankers (domestic and foreign), call-when-needed Very Large Airtankers and through the Department of Defense's (DoD) eight Modular Airborne Fire Fighting Systems (MAFFS) on Lockheed Martin C130H/J aircraft. However, relying on an aging, diminishing airtanker fleet and other aircraft for surge capacity when needed is not a sustainable path for the future.

Analysis and Options

The Forest Service and the Department of the Interior have concluded that the large airtanker fleet must be replaced with newer, faster, more cost-effective airtankers⁹. The interagency National Study of Large Airtankers to Support Initial Attack and Large Fire Suppression (NATS 2) made recommendations regarding optimum airtanker numbers, sizes, and performance criteria by location, specifically focusing on airtanker size and performance in relation to economic efficiency and suppression effectiveness and stated the future airtanker should be 3000-5000 gallons in capacity and be turbine powered. The National Interagency Aviation Council (NIAC) report (Phase III- 2007) included acquisition costs, retardant tanks and program costs and noted the C-130J as an option for the large airtanker program. Large airtanker requirements should include turbine power, 250-350 knot cruise speed and a minimum capacity of 2000¹⁰ gallons. The large airtanker program in the NIAC report proposed government acquisition of 25 new C-130Js as the high cost option.

Large airtankers are only one part of a multi-faceted aerial firefighting fleet and are not the only aircraft critical to aerial firefighting support. For example, water scoopers and heavy helicopters are very effective in locations where fires are in close proximity to water sources adequate to safely allow access. Single Engine Airtankers are very effective in lighter fuel types such as grass and brush, but the 500-800 gallon capacity generally cannot penetrate the closed timber canopy common to most forested landscapes but can reload from temporary forward operating bases. A mixture of next-generation large (Type 1 and Type 2) airtankers, water scoopers, SEATs, Very Large Airtankers (VLATs) and heavy helicopters, is necessary to continue to provide effective aerial support for managing wildfires.

The section below will focus only on the next-generation large airtanker portion of the aerial firefighting fleet.

Next Generation Large Airtanker Options

Ideally, next-generation large airtankers should be designed for the maneuver load impacts of the airtanker mission. Large airtankers should be turbine (turbo- prop or turbo-fan) powered (because of the much greater reliability, less maintenance and increased fuel economy of turbine engines over older

⁷ On September 29, 2011 a Neptune Aviation BAe-146 was added to the existing airtanker contract through December 20, 2011 and mobilized to Texas. This airtanker will be evaluated during the 2011 and 2012 fire seasons.

⁸ In July 2011, the Forest Service terminated the contract with the contractor operating P-3 aircraft for failure to implement a continued airworthiness program, and those aircraft are not currently available to support Federal wildland firefighting.

⁹ The requirements for large airtankers have been derived from the National Interagency Aviation Council Phase III Report, December 7, 2007 and the Interagency National Study of Large Airtankers to Support Initial Attack and Large Fire Suppression, Phase 2, November 1996.

¹⁰ NIAC uses various airtanker capacity including 3000-5000 gallons and 4000-5000 gallons.

reciprocating aircraft engines), and should be able to cruise at a speed at or greater than 300 knots - or 345 mph - to allow for quick response at long distances. Minimum capacity should be at least 2000 gallons of retardant, 3000 gallons or more would be preferred. For the specific aerial firefighting missions in dense forests, the need for canopy penetration is particularly acute, and larger loads and higher speeds are preferred.

Like other firefighting aircraft, next generation large airtankers must meet Forest Service contract Structural Integrity Program (Continued Airworthiness Program) requirements¹¹ that contain the baseline airworthiness standards of 14 CFR wherever practicable and may use additional 14 CFR evaluations, processes, and inspections not originally required of an aircraft during original FAA certification to ensure airworthiness while operating in the airtanker mission. Requirements include but are not limited to: certificated by the FAA in the standard or restricted category; supported by the original equipment manufacturer (OEM); have an FAA-approved maintenance and inspection program designed for an airtanker; and have FAA approval of all modifications and alterations to the aircraft that change the configuration to the firefighting role.

In addition, next generation large airtankers must also meet the requirements of the Interagency Airtanker Board (IAB), established under the auspices of the National Wildfire Coordinating Group (NWCG) and National Interagency Aviation Council, with members that include NWCG agencies and organizations. The IAB inspects retardant tanks and gating systems installed on proposed airtankers, which are evaluated in terms of aircraft operating requirements; tank performance criteria; airtanker configuration limitations and restrictions; and weight, balance, and center-of-gravity analysis. Actual retardant drop evaluation includes a static evaluation demonstrating target flow rates and a drop test evaluation over a standardized grid. Retardant systems that pass the tests are subject to a 1-year interim approval. Final retardant delivery system approval is based on field review and evaluation.

Only two aircraft have been specifically built in North America for the firefighting mission; a water scooper (Bombardier CL-215/415) and a Single Engine Airtanker (AT-802 and other variants). No large airtanker has been built for the specific purpose of firefighting. However, there are large aircraft that were designed for missions that are similar to the maneuver load impact of the airtanker mission. There are also several modern commercial passenger transport aircraft that have been proposed to be reengineered and rebuilt for the firefighting mission. All aircraft would require additional inspection and maintenance programs to safely function as airtankers. To date, only one next generation aircraft (BAe-146) has been approved and contracted by the Forest Service for the demanding airtanker mission.

Current and Potential large airtankers include¹²:

- **C-130J (Lockheed Martin)**. This is a current production aircraft. This aircraft has a speed of 380 mph; carries 4,000 gallons of retardant; has 4 turbo-prop engines; is supported by the original manufacturer; is designed for combat purposes with maneuver load impacts similar to the

¹¹ Complete airworthiness requirements for airtankers including foreign aircraft are available in the USDA – Forest Service, *Special Mission Airworthiness Assurance Guide*, November 5, 2010.

¹² VLATs, SEATs and water scoopers are not included in this list of potential large airtankers. The VLAT and SEAT are specialized airtankers because of performance, capacity, and operational limitations; they do not constitute the core aerial firefighting resource. Water scoopers are not considered airtankers, but more comparable to heavy helicopters.

wildland firefighting airtanker environment; and can meet agency and FAA airworthiness and safety requirements. The C-130J is a multi-role aircraft capable of performing other missions such as firefighter transport, smokejumper deployment, and cargo delivery. The C-130 has been in use as an airtanker in the MAFFS program since 1973. The C-130J is the latest variant used for MAFFS in use since 2009.

- BAe-146 (British Aerospace). This aircraft is no longer in production and would only be available as previously-used. This aircraft has a speed of 380 mph; carries 3,000 gallons of retardant; has 4 turbo-fan engines; is supported by the original manufacturer; and was designed for commercial passenger transport, a mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. It has been evaluated for the airtanker mission, and one variant recently passed the required retardant drop tests to perform as an airtanker; and has met agency and FAA airworthiness and safety requirements. It has been approved by the Forest Service as an airtanker. The BAe-146 will not be capable of multi-role missions. One BAe-146 airtanker (T-40) is currently on the existing airtanker contract.
- MD-87 (Boeing). This aircraft is no longer in production and would only be available as previously-used. This aircraft has a speed of 380 mph; carries approximately 4,000 gallons of retardant; has 2 turbo fan engines; and was designed for commercial passenger transport, a mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. Original manufacturer support for this aircraft has not yet been obtained. This aircraft has not gone through the required testing, evaluation, and application phase for the airtanker mission, but it would be expected to meet agency and FAA airworthiness and safety requirements. The MD-87 will not be capable of multi-role missions.
- B-737 (Boeing). Early series (737-100 through 500) are not in production and would therefore only be available as previously-used. These aircraft have a speed of 380 mph; carry approximately 4,000 gallons of retardant; have 2 turbo fan engines; and were designed for commercial passenger transport, a mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. Original manufacturer support for this aircraft has not yet been obtained. These aircraft have not gone through the required testing, evaluation, and application phase for the role of an airtanker in the wildland firefighting environment, but it would be expected to meet agency and FAA airworthiness and safety requirements. The B-737 will not be capable of multi-role missions.
- Q400 (Bombardier). This aircraft is currently in production and can either be acquired as new or used. Two multi-role versions (Q400 MR) are currently operating in France. The MR variant is capable of operating as an airtanker or hauling cargo and passengers. An airtanker only version is also available. The aircraft has a speed of 380 mph, carries 2,600 gallons of retardant, meets Inter-Agency Airtanker Board (IAB) delivery system requirements, has 2 turbo-prop engines, and is supported by the original manufacturer. The Q400 was designed for commercial passenger transport—a mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. These aircraft have not gone through the

required testing, evaluation, and application phase for the role of an airtanker in the wildland firefighting environment, but it would be expected to meet agency and FAA airworthiness and safety requirements.

- P-3 Orion (Lockheed). This is a legacy airtanker and is not in production. This used military aircraft was obtained by private vendors from the Forest Service. This aircraft has a speed of 290 mph; carries 2,550 gallons of retardant; has 4 turbo-prop engines; and was designed for a military mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. These aircraft are 50 years old. This aircraft is supported by the original manufacturer, has met agency drop standards, and has an FAA type certificate. However, there are currently no P-3s under Forest Service contract due to a contract termination that was the result of failed implementation of a continued airworthiness maintenance program. The P-3 was not capable of multi-role missions.
- P-2V Neptune (Lockheed). This is a legacy airtanker and is not in production. This used military aircraft was obtained by private vendors from the Forest Service. This aircraft has a speed of 230 mph; carries 2,082 gallons of retardant; has 2 radial reciprocating engines and 2 jet assist engines; and was designed for a military mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. These aircraft are 60 years old. This aircraft is not supported by the original manufacturer in the airtanker role. These airtankers have FAA type certificates. This aircraft has met agency and FAA airworthiness and safety requirements. The P-2V is not capable of multi-role missions.
- Convair CV-580 (Convair). This is a legacy airtanker and is not in production, but is in operation in Canada, contracted by the State of Alaska and used through cooperator agreements in the U.S. It has two turbo-prop engines, a speed of 290 mph, carries 2,000 gallons and is equipped with constant flow retardant tanks. These aircraft are 50 years old. The CV-580 was designed for commercial passenger transport—a mission that is not comparable to the maneuver load impacts of an airtanker in the wildland firefighting environment. These aircraft are approved by Transport Canada (FAA equivalent in Canada) for the airtanker mission. The CV-580 is not capable of multi-role missions.

Based on the options above, the Forest Service and Department of the Interior believe the best immediate option for next generation airtankers is contracted passenger transport category aircraft, such as the BAe-146, Q400 and/or similar aircraft. Legacy airtankers such as the P-2V will continue to be contracted and eventually transitioned out of service as approved next generation large airtankers become available. As we learn more about the operation of these passenger transport category aircraft, and potentially other aircraft in the coming years, the mix of aircraft might change over time. Long term, the Agencies will continue to explore the costs and benefits of leased and/or government-owned aircraft like the C-130J.

Additional Considerations

The Agencies believe the number of next-generation large airtankers needed in today's wildland firefighting environment is between 18 and 28. If surge capacity is required during difficult fire years,

additional large airtankers could be available through cooperator agreements and through the MAFFS program. Additional large helicopters and Very Large Airtankers could be available through call-when-needed contracts. Private industry has been, and will continue to be, a key source of airtankers for the Federal wildland firefighting effort. Currently, all of the airtankers under contract to the Federal government are owned and operated by private industry, (this model is referred to as "contractor owned/contractor operated").

Unfortunately, there are only two vendors¹³ currently contracting with the Forest Service for airtankers. If contracting authority for this purpose were to be extended from 5 years to 10 years, additional incentive might be provided to existing and potential private vendors to invest in next-generation aircraft. However, this would likely not be sufficient for private vendors to acquire the most expensive of the above aircraft options.

Dependency upon a few vendors and a few aircraft makes/models, combined with the economic difficulty for new vendors to enter the market or current vendors to upgrade their fleets, demonstrates the vulnerability of the current situation and suggests the need to explore a full range of acquisition options. The Agencies commit to reviewing current acquisition methodologies to determine how best to incentivize contractors to provide the best available technology. In the current fiscal environment, acquiring government leased or owned large airtankers presents a significant challenge.

Cost Considerations

The availability (fixed) costs and flight use (variable) costs associated with contractor-owned and government-owned aircraft contrast due to the ownership and operations model. A contractor will recoup their initial acquisition investment, conversion costs and profit margin over the life of the contract (currently 5 years). A new government-owned aircraft is paid for up front, is capitalized over a 20-year life span, and retains some residual value at the end of the 20 years. Further, fixed and variable costs reflect only the cost of operation and ownership.

Based on Air Force, aviation industry, and Forest Service estimates, the C-130J flight cost is approximately \$6,660 per flight hour and \$13,740 per day for availability costs (2011 dollars), per day availability includes costs not associated with actual flight, such as pilots, facilities, depreciation, replacement costs, overhead, and training. Successful transition to a multi-role operation would require additional pilot staffing, changes in concept of operations, and close coordination to enable airtanker operations and other missions. However, ownership results in full-year fixed costs comparable to the contractor model that incorporates ownership in the availability for the term of the contract.

The BAe-146 large airtanker cost is \$9,983 per flight hour and \$19,646 per day for availability costs. These costs are from the current contract for an 84-day Mandatory Availability Period (MAP). Other BAe-146's were proposed in a recent Request for Information (RFI). Daily availability was estimated at \$20,000 - \$22,000 per day. Flight costs were estimated at \$10,000 per hour.

The MD-87 airtanker proposed in the RFI did not include any cost estimates. Actual contract costs will be forthcoming in the RFP for next generation airtankers, which closes on January 31, 2012.

¹³ One additional vendor has a Call- When- Needed contract to provide up to 2 Very Large Airtankers.

Several companies proposed Bombardier Q400 airtankers in the RFI. Daily availability was estimated at \$28,000 per day, and flight costs were estimated at \$8,000 per hour.

The current contracted P-2V large airtankers cost is \$5,800 per flight hour and \$9,400 per day for availability costs. The availability costs have increased over 40 percent since 2007.

A new C-130J would cost about \$79 million to purchase. Included in any acquisition option for the C-130J would be a next generation retardant delivery system that can be rolled on and off the aircraft to take advantage of the 4,000-gallon payload. The next generation contractor owned aircraft (BAe-146, MD-87, and Q400) are estimated to cost approximately \$7 million to purchase. Estimates to convert the commercial transport aircraft into an airtanker are \$1- 4 million per aircraft based on the tank system and the aircraft. These used aircraft have a limited service life, which would be based on the previous use and annual airtanker use. Airtanker use is considered to be approximately four times more demanding than the designed use as a commercial transport aircraft.

Table 2 - Current and Potential Airtanker Information

Model	Speed (mph) ^a	Load (gal)	Sorties ^b	Estimated Retardant Delivered in 6 hrs (gal)
Next-generation aircraft				
C-130J (Lockheed Martin)	380	4,000	7	28,000
BAe-146 (British Aerospace)	380	3,000	7	21,000
Q400 (Bombardier)	380	2,600	7	18,200
Legacy aircraft				
P-3 (Lockheed Martin)	290	2,550	6	15,300
P-2V (Lockheed Martin)	230	2,082	5	10,400

a. Cruise speed for a 200-mile round trip.

b. The number of initial-attack missions of 100 miles possible within 6 hours, based on cruise speed and reload/taxi times.

Solutions

The Forest Service, in partnership with the Department of the Interior, is already moving forward to contract for next generation aircraft. The recent RFI gauged interest in next generation large airtankers that could carry more than 3,000 gallons, were turbine powered, and could fly faster than 300 knots. It drew an overwhelming response from industry. A dozen vendors responded with a dozen different aircraft alternatives. Aircraft proposed included the BAe-146, Boeing MD-87, and Bombardier Q400. There is interest and ability by a wide range of sources to provide aircraft to meet Federal next generation large airtanker requirements.

The Request for Proposals (RFP) has been posted and was open until January 31, 2012. This solicitation was specifically designed to allow new and existing contractors flexibility to enter into the

next generation large airtanker business with time to develop airtankers, reducing financial risk and a stepped approach to contract awards.

There is a need to explore different acquisition models that would provide more flexibility in the acquisition of next-generation aircraft, as well as reduce costs to the Agencies. The Administration will work with Congress to explore these alternatives.

Even with this RFP moving forward, it will take time to transition from the current legacy airtankers to next generation airtankers. During the transition, the Agencies will need to rely on existing contract aircraft (current LATs, helicopters, SEATs, and VLATs), cooperator aircraft, and DoD C-130 MAFFS.

Conclusions

Providing large airtankers is important to the Federal, state, and local wildland firefighting mission of protecting communities and natural resources from wildfires. As fire seasons become longer and more severe, the need for having multiple and flexible methods of fighting wildfires will only grow. The nation needs to invest in a modernized fleet with a mix of aircraft for aerial firefighting. We must replace our aging fleet with newer, faster, more efficient, and cost-effective large airtankers better suited to today's complex wildland fire environment.

A core fleet of next-generation large airtankers will be needed, comprised of a mix of aircraft makes/models and provided by a variety of sources, to meet the firefighting challenges of the future. This process is a long-term effort where the interagency firefighting community will continue to learn and adjust accordingly. The appropriate mix of tools for wildland firefighting will continually be analyzed, including ground and air resources. The Agencies must maintain flexibility to bring on new resources as they become available and modify resource needs as necessary to maintain the effectiveness of our firefighting operations. These efforts will ensure that Federal, state, and local wildland firefighting agencies are able to continue to effectively carry out the wildland firefighting mission into the 21st century.