2008

Santa Barbara County

Air Support Unit

Report to the Board of Supervisors

Presenting the current structure and cost of the Santa Barbara County Aviation Program.

County of Santa Barbara

Air Support Unit

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EXECUTIVE SUMMARY

The purpose of this report is to provide the Board of Supervisors with an overview of the County's helicopter program. The County purchased the first two helicopters in 1995 and 1996 for Sheriff operations. In 1999, the County acquired two additional helicopters for the Fire Department. The program has continued to incrementally evolve since. Subsequently, the Board requested an update on the helicopter program. This report will discuss the evolution of the program to the joint Fire-Sheriff program it is today.

Board Hearing History

In 1995 and 1996 the Board authorized the Sheriff's Department to acquire two used military Oh-58 helicopters for law enforcement operations. Thereafter, in 1997 the Board of Supervisors authorized the Fire Department to acquire two used military UH-1 Huey helicopters and develop a Fire Department helicopter proposal. In 1999 the Fire Department's Helicopter program was approved by the Board. In 2005, the Board approved an agreement stipulating that the Fire and Sheriff Departments will share responsibility for search and rescue responsibilities at which point the Fire and Sheriff Departments began operating the helicopter program jointly at a single location and cross training staff. On August 28, 2007 the Board approved an agreement to make a fifth helicopter operational.

Current Status of County Helicopter Program

Both Sheriff and Fire staff operate and maintain the fleet, the budget for the program is divided between the two Departments, and the operations overlap. Today the County has four helicopters that are utilized for both Fire and Sheriff operations with a fifth helicopter being refurbished. The joint Air Support Unit today consists of seven Sheriff Department's staff and four Fire Department's staff, which jointly make up one on-site supervisor, four pilots, three observers, and three mechanics.

The Fire Department maintains the two larger helicopters, which are primarily used for Fire suppression and Search and Rescue missions, while the Sheriff's Department maintains the two smaller helicopters primarily used for observation. All of the helicopters currently operated by the unit were obtained through various Federal programs and have certain restrictions placed on them. In addition, the aircraft used by the unit has almost or already exhausted the life span accepted by militaries and many private industry operators for helicopter airframes.

The total operational Adopted Expenditures Budget for FY 2007-08 for the Aviation Program is $2,388,117, plus a one time $950,000 contract for refurbishment of the fifth helicopter. The program is funded primarily by General Fund, with the exception of intergovernmental revenue that the Fire Department receives from the State and Federal Departments of Forestry; the revenue is budgeted at $30,000 for FY 2007-08. Of the total expenditures for the program, $1,152,891 is appropriated from the Fire Department and $1,235,226 from the Sheriff's Department.

The operations of the combined Air Support Unit include search and rescue, fire suppression, law enforcement patrol, law enforcement assistance in vehicular pursuits, pursuit of fleeing suspects, evidence collection, and drug eradication. Based on 2006 calendar year statistics, law enforcement functions make up approximately 64.4% of total flight time by all helicopters, fire functions make up approximately 27.9% of total flight time, and search and rescue functions make up approximately 7.7% of the total flight time.

Comparable County Comparison

This report examines helicopter programs in comparable counties. Santa Barbara has eight comparable counties, which are often used as a basis for study. The helicopter programs of these counties were examined and compared to Santa Barbara County's program. In addition, Ventura County was also added to the analysis as a comparison county because of its proximity and because it has similar county responsibilities – namely it is also a California Department of Forestry (CDF) contract county.

By examining the comparable counties only Santa Barbara County and Ventura County have county helicopters used for fire suppression; Placer County is in the process of purchasing a helicopter for fire suppression. Most of the counties described do not have a full service county fire department.

Two counties, Placer and Sonoma, have helicopters devoted to law enforcement operations as does Santa Barbara County. In addition, Ventura County utilizes its helicopters for both fire suppression and law enforcement, as does Santa Barbara County.

Historical Context and Evolution Helicopters

The helicopter has evolved as a tool for law enforcement, fire suppression and search and rescue operations. Not until the post World War II years did helicopters become utilized for such purposes. Several studies indicate the benefits of helicopters in law enforcement operations. These benefits include crime deterrence, increased public and officer safety, enhanced observational capabilities, and efficient deployment of units. There are fewer studies on the impacts of helicopters for fire suppression and search and rescue operations which may be a result of the accepted benefits of helicopters to these activities.

Alternatives to helicopter programs

Helicopters augment law enforcement, search and rescue and fire suppression operations. As indicative by the comparable county analysis, the majority of counties provide these services without the aid of county owned helicopters. However, these counties do, to a certain extent, utilize mutual aid and CDF for helicopter services.

These counties primarily utilize conventional resources for law enforcement, search and rescue and fire suppression operations. As this report indicates, those options of using foot patrol, patrol cars, and fire apparatus are viable but result in less efficient search and rescue and law enforcement operations, and a potential delay in reaching the fire while in its early stages.

Some of the main factors and enhancements provided by the use of helicopters are support with foam or water drops, close aerial support of fire engines and hand crew for fire missions and furnishing units, enhanced apprehension of criminals, crime deterrence, staff safety, patrol of remote areas, insertion of special enforcement teams, and drug enforcement assistance for law enforcement missions.

Potential issues and challenges

Management structure: The unit is unique in its structure as it is a hybrid between the Sheriff's and Fire departments. The two departments show a great commitment to working together to maintain quality service within the managerial structure unique to Santa Barbara; this structure is discussed in further detail in this report.

Equipment replacement: Despite the diligent efforts of the two departments to bring in quality personnel and seek out creative ways to improve equipment, options to fund future equipment replacement costs should be considered if the County of Santa Barbara continues the commitment to an aviation program. While UH-1 Huey helicopters are still rated well by professionals in the field, newer helicopters may have advantages in ongoing operating costs even though they are more expensive to acquire. When planning for the future of the Aviation Unit, both the cost of acquisition and cost of operation should be considered. Currently, replacement costs are not budgeted and are treated as separate projects on ad hoc bases. An alternative to this method would be to use a depreciation schedule and guarantee future timely replacement of airframes.

Recommended solutions

The Aviation Unit provides quality service to the Santa Barbara County that is very unique in its capabilities and cannot be easily replaced with other means. Helicopters provide unique rescue, firefighting, and law enforcement capabilities. If budgetarily feasible, the recommendation is to place the equipment on depreciation schedules and smooth out the costs over time. In addition, when future equipment is purchased, it is recommended that a complete cost analysis be performed for different types of airframes which would include both the cost of acquisition and cost of operation over time.

SANTA BARBARA COUNTY HELICOPTER PROGRAM OVERVIEW

The Santa Barbara Joint Sheriff and Fire Aviation Unit performs Search and Rescue, Fire Suppression, Law Enforcement and Cargo and Personnel Transport functions. The following section of this report provides a description of governance of the program, chain of command for the unit, crew make-up, aircraft description, the budget, and activities performed by the unit.

Governance

As in all other non-aviation operations the Sheriff's Department and the Fire Department maintain responsibility over the law enforcement functions and fire protection functions respectively.

The two departments share responsibility for the search and rescue function according to a Memorandum of Understanding (MOU) approved by the Board in July of 2005. The MOU delineates search and rescue response as follows.

DEPARTMENTAL COMMITMENTS: Both departments agree that Search and Rescue (SAR) resources are generally designed to access victims utilizing equipment and personnel transported by foot or unconventional vehicles. SAR's strengths are in its ability to reach and operate in locations remote from vehicular access and in its members' personal self-sufficiency. Fire Response (F/R) resources are generally designed to be truck-based. F/R's strengths are in its rapid deployment and availability of heavy rescue and fire suppression equipment.

Both departments further agree that each incident may require the services of both agencies, and agree to utilize, as prescribed by SEMS, ICS Unified Command or a Liaison Officer/Agency Representative at a single Incident Command Post, as mandated by the Cooperative Agreement.

INCIDENT RESPONSE MATRIX

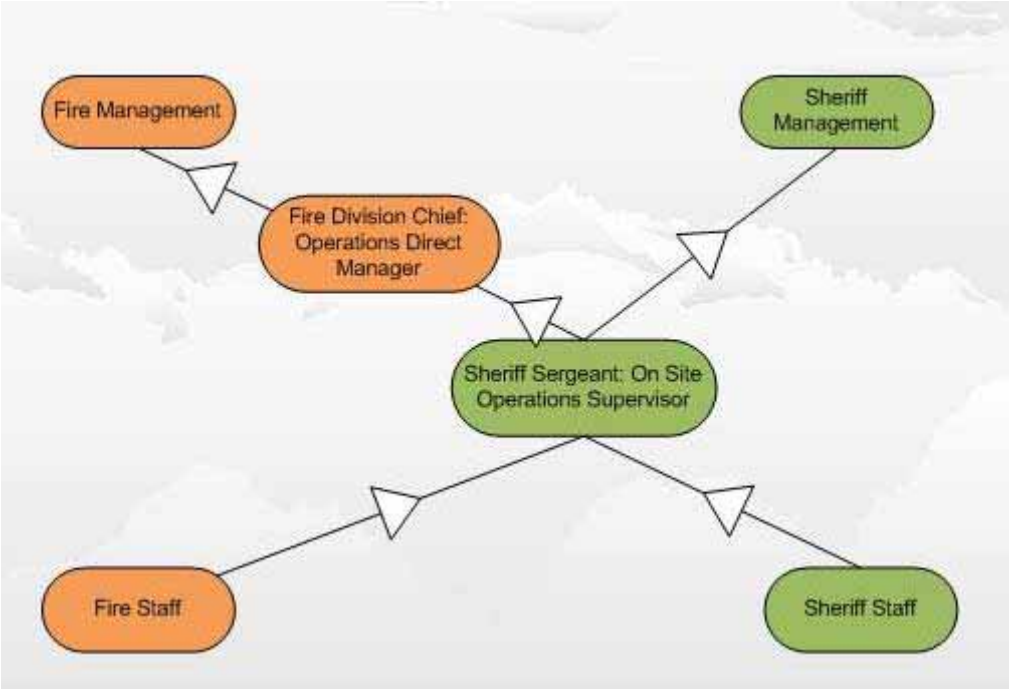
TYPE	LEAD AGENCY	SELECTION CRITERIA
CAVE RESCUE	SAR	Requires specialized team; usually a SAR resource.
CONFINED SPACE RESCUE	F/R	Training/equipment specific to F/R.
CRIMINAL ACTS, INCIDENTS RESULTING FROM	REQUIRES LAW NOTIFICATION	Lead rescue agency depends on nature and location of incident, however, law enforcement must be notified to facilitate concurrent criminal investigation.
DISASTER SCENE SIZEUP	SAR / F/R	In the initial stages of a disaster, both agencies may be required to determine the type and extent of rescue necessary.
DIVE RESCUE (NEAR DROWNINGS)	SAR / F/R	Nearby Dive Rescue resources from both agencies should respond, if available. Quick response is critical.
DOWNED COMMERCIAL AIRCRAFT	SAR / F/R	Combined response because of requirements for rescue, EMS, investigation, evidence preservation, site security, morgue details.
DOWNED LIGHT AIRCRAFT, ACCESSIBLE BY VEHICLE	F/R	Accessibility reduces time and resource load.

DOWNED LIGHT AIRCRAFT, NOT ACCESSIBLE BY VEHICLE	SAR/ F/R	Unlikely to have large number of victims, and may be time and resource intensive.
FLOOD RESCUE	SAR / F/R	Both SAR and F/R should respond if properly trained and equipped.
INDUSTRIAL ACCIDENT, CHEMICAL SPILL, OR TRANSPORTATION ACCIDENT (INCLUDES MOST 'IDLH' INCIDENTS; ALSO SEE MINE RESCUE)	F/R	Training and equipment specific to F/R.
MINE RESCUE	SAR / F/R	Usually in rural or remote locations; requires specially trained and equipped team.
OCEAN / SURF RESCUE	SAR / F/R	Quickest available resource should respond. Emphasis is on keeping rescuers not properly trained and equipped out of the water.
OFF-HIGHWAY RESCUE, KNOWN LOCATION, LONG DURATION	SAR	Time and resource intensive.
OFF-HIGHWAY RESCUE, KNOWN LOCATION, SHORT DURATION	SAR / F/R	Depends on accessibility from roadway.
OFF-HIGHWAY SEARCH OR RECOVERY, UNKNOWN LOCATION	SAR	Time and resource intensive.
STRUCTURE COLLAPSE	F/R	Training specific. SAR may be utilized in support role.

SWIFTWATER RESCUE	SAR / F/R	Quickest available resource should respond. Emphasis is on keeping rescuers not properly trained and equipped out of the water.
TRENCH RESCUE	F/R	Similar to confined space rescue. Training specific.

Chain of Command

Since the Air Support Unit became integrated between the Fire and Sheriff's departments, the following Chain of Command was established:



The Air Support Unit Policy outlines the following Chain of Command Structure:

"The Sheriff and Fire Chief shall be the final authority in all matters which affect the operation of the Air Support Unit.

1. The Air Support Unit supervisor shall be assigned to the Aviation Unit by executive discretion of the Sheriff/Fire Chief and shall be responsible directly to the designated fire Division Chief.

2. The Supervisor shall direct all operational activities including, but not limited to, the following:

a. Direct and control the activities of assigned Air Support Unit personnel

b. Aircraft and facility maintenance

c. Coordination of scheduled flights

d. Development of training protocol

e. Preparation and administration of the Sheriff's program budget and will be kept informed of the Fire program budget by the assigned Fire Captain

f. Compilation of statistical information

g. Preparation of staff research projects necessary to the achievement of operation objectives"

The following chain of command integrates not only the Search and Rescue function outlined by the Board as an integrated effort between the Sheriff's and Fire Departments, but also creates integration within law enforcement and fire missions, according to the policy manual. The immediate, on scene supervisor, of the unit is a Sheriff's Department's Sergeant. The Sergeant is "responsible directly to the designated fire Division Chief."

Nonetheless, the law enforcement functions and fire suppression functions remain distinct. Some of the main factors and enhancements provided by the use of helicopters are support with foam or water drops and close aerial support of fire engines and hand crews for fire missions and furnishing units, enhanced apprehension of criminals, crime deterrence, officer safety, patrol of remote areas, insertion of special enforcement teams, and drug enforcement assistance for law enforcement missions.

All crew members are to some extent trained in both functions; however, only the sheriff's department's personnel have the powers of peace officers and can apprehend suspects and testify in court under the standard of a peace officer.

Moreover, despite the fact that the crew works in fair harmony, the differences in training and nature of business of the two departments remain apparent. The Sheriff's Department, within the culture of law enforcement in general, affords much greater discretion to individual deputies in the field. The Sheriff's staff is much more prone for self-dispatch and mutual aid without specific instruction through the dispatch. Deputies, in their profession, are trained to be proactive in spotting the crime and taking action. The firefighters, on the other hand, do not self-dispatch. The location of a fire and whether a fire is a prescribed burn are first evaluated before the crews are dispatched. Fire also operates within policies outlined by their contract with the State and other mutual aid agreements with Federal Forestry, etc.

The flight crews are normally on duty seven days a week: Sunday through Wednesday from 9am to 7pm, Thursday from 9am to 8pm, and Friday and Saturday from noon to 10pm. The schedule was developed to best match the needs of fire and law enforcement missions. Helicopters are most needed on Friday and Saturday night when crime activities are the highest. Whereas, for fire missions, helicopters tend to be more frequently used during daylight to satisfy CDF regulations, which do not allow for flight during poor visibility hours.

Unit Personnel and the Crew Structure

The following positions and costs have been budgeted for the Fire and Sheriff Departments for FY2007-08 under the Aviation Program:

Position	Avg Cost/ Position FY07-08 Adopt	Number of Positions	Total Cost FY07-08 Adopt
SHERIFF			
Sheriff's Sergeant	$141,667.00	1	$141,667.00
Sheriff's Deputy Pilot	$120,057.25	2	$240,114.50
Sheriff's Deputy Observer	$120,057.25	2	$240,114.50
Aircraft Mechanic	$84,355.00	2	$168,710.00
Other Benefits, Overtime (less salary savings)			$39,724.00
Total Sheriff		**7**	**$830,330.00**
FIRE			
Fire Pilot	$132,440.50	2	$264,881.00
Fire Captain Observer	$144,231.00	1	$144,231.00
Aircraft Mechanic	$87,068.00	1	$87,068.00
Other Benefits, Overtime (less salary savings)			79,616
Total Fire		**4**	**$575,796.00**
Total Combined		**11**	**$1,406,126.00**

The Air Support Unit uses two person crews. Both the Fire and Sheriff's departments consider this to be the optimal make-up for a crew. One member is a pilot and one is an observer. Having an observer on board provides a safer environment for observation rather then using the pilot as an observer. All members of the Air Support Unit are cross trained. Naturally, the Sheriff's Department crew members have greater experience and expertise in law enforcement while the Fire Department crew members have greater experience and expertise in fire suppression techniques. It should also be noted that the only pilot from the Fire Department, who is currently active in the Unit, is a retired peace officer with 20 years of experience in law enforcement. The only full-time Fire Department employee with greater skills in fire suppression as opposed to law enforcement is the Fire Captain who serves as observer. Based on 2006 calendar year flight statistics, law enforcement functions constitute 64.4% of flight time, fire functions 27.9%, and Search & Rescue 7.7% of the time. The Sheriff's Department employees, assigned to the Air Support Unit, are all Peace Officer Standards and Training (POST) certified. They, therefore, have the powers of arrest afforded to a peace officer. Even though not frequently required, but if needed, they are able to land in a remote area and apprehend a suspect themselves as opposed to waiting for a ground unit to arrive.

Aircraft

Currently, the County operates two types of helicopters: UH-1 Huey and OH-58 Kiowa. There are two airframes of each type in operation. In addition, there is a third UH-1 Huey helicopter, which is operational and available for back-up but not regularly operated and a currently non-operational Cessna airplane.

The OH-58 Kiowa helicopters, used by the Sheriff's department were obtained through the Federal Program 1208 in 1995 and 1996 and are owned by the County. The Sheriff's Department was on a waiting list to receive these used military airframes since 1989. The airframes each required approximately $200,000 worth of refurbishment prior to being placed into operation. Currently the Federal Program 1208 has become Federal Program 1033 and now gives fewer ownership rights to receiving agencies. Under the Federal Program 1033, if an agency decides to no longer use an aircraft, the agency has to coordinate with the Federal program as to how the aircraft may be transferred from the agency; therefore, even though the title of the aircraft does list the County as owner, it is owned with conditions attached to it.

The UH-1 Huey airframes were obtained by the Fire Department through the Federal Excess Property Program (FEPP): these airframes have imposed restrictions such as a requirement that the primary use must

be for state fire protection purposes with an allowance of 10% for incidental use. The FEPP Huey helicopters have been used for emergency type search and rescue under the premise that medical assistance may be necessary. Such operations with a medic in the Huey places the use within the fire 90% rule. This procedural question appears to be unresolved and the County has not been challenged or audited on this issue. The USDA Forest Service (USDAFS) has the following information posted on their website.

> "The Federal Excess Personal Property (FEPP) program refers to Forest Service-owned property that is on loan to State Foresters for the purpose of wild land and rural firefighting. Most of the property originally belonged to the Department of Defense. Once acquired by the Forest Service, it is loaned to State Cooperators for fire fighting purposes. It is technically no longer excess at that point.
>
> The State Forester makes the initial decision that a FEPP item is appropriate for use, and the USDA Forest Service must concur. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. Approximately 70% of the property involved in the Forest Service FEPP program is sub-loaned to local fire departments.
>
> State Foresters and the USDA Forest Service have mutually participated in the FEPP program since 1956. Program authorities include the Federal Property and Administrative Services Act of 1949 and the Cooperative Forestry Assistance Act of 1978."

Under the Federal Excess Property Program, the title of the aircraft does not transfer to the County and the aircraft is still owned by the Federal government. If the Fire Department decides to no longer use the aircraft, the aircraft will be transferred from the County based on direction given from the Federal government.

In addition to the four operational airframes, the Board of Supervisors recently approved a contract to rebuild a UH -1 Huey helicopter received by the Sheriff's Department through the Federal Program. The airframe is currently non-operational and will require approximately $950,000 to be rebuilt. The source of funding for the contract was donations received from the Sheriff's Council in FY2006-07.

The County built Huey will be used without manipulating the 90%/10% protocol therefore alleviating the potential controversy of a challenge and/or audit by the State of California or the US Dept. of Agriculture. It was proposed by the Sheriff's Department that the newly built UH-1 Huey airframe will replace one of the FEPP UH-1 Huey airframes. That proposal was approved by the Board.

With the new airframe, maintenance and up-grades conducted on the County Huey will not be mandated and controlled by the California Department of Forestry (CDF) as they are with the FEPP aircraft. In addition, the County funds spent on maintenance and up-grades will be dedicated to a County owned asset, which an FEPP aircraft is not.

Currently any and all maintenance or any other work performed on the FEPP aircraft cannot be done without approval and cooperation of CDF, as they are the guiding authority. Additionally if CDF or the USDAFS directs the County to conduct specific maintenance, revise certain standards, employ additional restrictions, upgrade maintenance documents or create additional maintenance documents, the County is mandated to do so. The costs involved in these possibilities can be substantial and the County is responsible for such costs, not the controlling agencies (CDF or USDAFS). Additionally CDF requires on-going documentation of FEPP aircrafts' utilization and performed maintenance performed. These requirements are a substantial use of county personnel time that is not reimbursed.

From an operations standpoint, the County Huey will allow pilots to utilize enhanced performance charts, factor in higher weight calculation and have the ability to fly at higher altitudes due to enhanced and more modern equipment installed on the aircraft. This ability will benefit not only law enforcement missions but will assist with fire missions as well. A recent example was that the Air Support Unit could not assist with fighting a major wild-land brush fire on lands within Santa Barbara County because of high altitudes and high external load weights. Finally, the current FEPP aircraft cannot transport the required amount of crew personnel, due to weight restrictions, as normally required by the USDAFS. The County Huey will allow the Unit to perform these functions.

The County owned UH-1 Huey is planned to provide enhanced operational capabilities. There will be no restrictions placed upon it by other governmental agencies outside the County and it will be a superior aircraft equipped with modern technology and a more powerful machinery.

Budget

Budget / Sheriff Expenditures (Includes Sheriff Personnel and two OH-58 Helicopters)

	2005-06 Actual	2006-07 Actual	2007-08 Adopted
Salaries and Employee Benefits	$844,935	$747,223	$830,330
Services and Supplies			
Maintenance and Equipment	$37,022	$123,425	$65,000
Gasoline-Oil-Fuel	$54,373	$49,685	$55,000
Rents-Leases-Structure	$24,948	$28,877	$22,000
Other Charges			
Motor Pool	$28,384	$50,465	$38,881
Liability Insurance	$62,463	$59,740	$94,833
Fixed Assets	$21,141	$0	$950,000
Intrafund Transfers (Fire)	$88,750	$84,116	$85,020
***Includes: SET Medical (approx $22k)**			
and ½ cost of Fire Department Pilot (approx $60k)			
Other (Captures all Other Items)	$65,010	$54,581	$44,162
Total	$1,227,026	$1,198,112 + $950,000 Donations Designation Placed	$1,235,226 GF + $950,000 Donations Used

Note: Cessna variable costs are not currently included in the budget: the variable costs are approximately $100 per hour based on an industry standard for the type of airplane. The Cessna flew approximately 150 hours per year when the airplane was operational, which would result in approximately $15,000 in additional expenditures. The Cessna airplane has been none-operational since 2006.

Budget: Fire Expenditures (Includes Fire Personnel, two operational UH-1H helicopters, and one UH-1H back-up helicopter)

	2005-06 Actual	2006-07 Actual	2007-08 Adopted
Salaries and Employee Benefits	$574,280	$558,897	$575,796
Services and Supplies			
Maintenance and Equipment	$145,113	$335,126	$292,600
Gasoline-Oil-Fuel	$55,398	$96,869	$100,000
Rents-Leases-Structure	$24,848	$27,474	$27,800
Other Charges			
Motor Pool	$30,679	$13,985	$12,133
Liability Insurance	$46,399	$38,148	$47,775
Fixed Assets	$21,141	$10,548	$30,000
Other (Captures all Other Items)	$23,120	$37,282	$66,787
Total	$920,978	$1,118,329	$1,152,891
Fire Protection Revenue	**$24,955**	**$64,402**	**$30,000**

The Fire Department is reimbursed $1170 per flight hour by the US Department of Forestry and California Department of Forestry.

The Contract with CDF provides for pre-negotiated reimbursement for the first helicopter and with approval prior to dispatch reimbursement for the second helicopter.

Overtime costs are not reimbursed additionally for CDF fires but are reimbursed on per incident basis for USDF fires.

The rates have not been adjusted since 1999.

Functions of the Two Types of Helicopters and Activities Performed

UH -1 Huey: **Search and Rescue, Fire Protection, Insertion of Special Operation Teams; Personnel and Cargo Transport**

The UH-1 Huey airframe is a larger type of helicopter that can fit at least 6 passengers. The size of this type of helicopter allows for its use as a hoist in search and rescue operations to lift injured and crew. The size and structure of the helicopter also allows for its use for fire suppression and insertion of Special Team Crews.

Operational Cost of UH-1 Huey (Approximate Direct Flight Cost based on average FY05-06 and FY06-07 Actuals = $ 240,120 Maintenance and Equipment + $76,134 Fuel + $42,274 Liability Insurance + $15,845 Fixed Assets = Total Budget $374, 371).

Based on 2006 Calendar Year Stats	Total Budget (using ½ FY05-06 + ½ FY06-07)	Flight Hours	Cost Per Flight Hour	Medical Transport & People Rescued	Cost per Hour for Medical Transport & Rescue Occurrence (34.1hrs or 1.705 hours per occurrence)
Two Helicopters	$374,371	234.6	$1,596	20	$2721
One Helicopter	$187,185	117.3	$1,596	10	$2721

OH- 58 Kiowa: **Most of the law enforcement patrol assistance and investigations functions**

The OH-58 Kiowa helicopters are a smaller type of airframe that can fit only two passengers. This type of aircraft is less noisy and costs approximately half the cost to operate compared to UH-1 Huey airframes. These helicopters are used by the Sheriff's department to perform most of their missions, with the exceptions being Search and Rescue and Insertion of Special Enforcement Teams.

Operational Cost of OH-58 Kiowa (Approximate Direct Flight Cost based on average FY05-06 and FY06-07 Actuals = $ 80,224 Maintenance and Equipment + $52,029 Fuel + $61,102 Liability Insurance + $10,571 Fixed Assets = Total Budget $203,925).

Based on 2006 Calendar Year Stats	# Events	Fire Support Hours (8.1)	Patrol General and Investigative Hours (182)	Law Enforcement Hours (419) *excludes training, fire, maintenance, SAR	Search & Rescue Hours (18.1)	Total Hours Flown (441.10)	Cost Per Hour of Flight ($462.31)
Budget ($203,925)							
Calls Responded to	299		1.64 calls responded to per 1 flight hour				Cost per call response $282
Initiated Action	91		Initiated 1 action per each 2 hours of patrol flight				
Vehicle Pursuits	7						
Foot Pursuits	3						
Vehicles Recovered	5						
Arrests	31		1 arrest per 5.87 hours of flight	1 arrest per 13.5 hours of flight			Cost per arrest $6241
First on Scene	47						
Fires Assisted	7	1.16 flight hours per fire					$494.5 per fire
Missing Persons & Rescues	30				0.66 hours per person		Cost Per Missing or Rescued Person $279

BENCHMARK COUNTIES

This section of the report reviews the helicopter programs and/or use of helicopters by the eight comparable benchmark counties to the Santa Barbara County.

The county of Sonoma, Monterey, Solano, Tulare, Placer, San Luis Obispo, Santa Cruz, and Marin are considered to have common characteristics including, but no limited to, the following: total population of more then 250,000 but less than 500,000; suburban to rural environments; not containing a large metropolitan city, and known for their scenic beauty and environmental focus. In addition to the eight common characteristic counties, this section looks at the County of Ventura, based on its proximity to Santa Barbara County.

All of the nine counties described in this section, have a Sheriff's Department as outlined by the California Government Code. Most of the counties described do not have a full service county fire department. There are only five counties in the State of California that have full service primary responder contracts with CDF: Los Angeles, Orange, Ventura, Kern, Santa Barbara, and Marin.

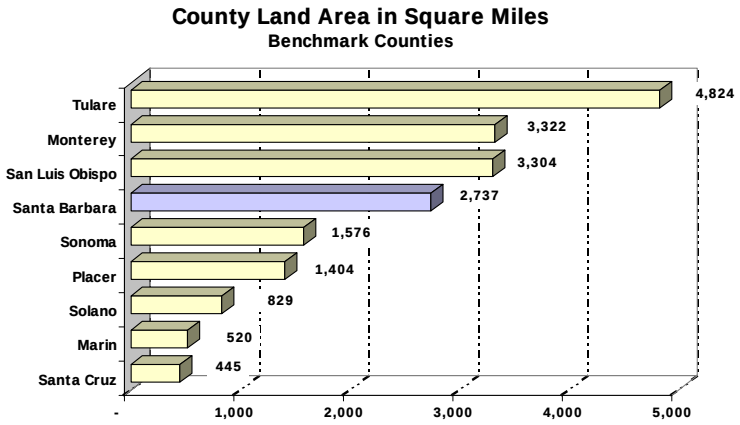
Thus, the report includes three out of the five CDF contract counties, which are Santa Barbara, Ventura, and Marin. Santa Barbara County is the only county that has helicopters managed by the Fire Department. Ventura County's helicopters are managed by the Sheriff's Department but do fly fire suppression missions, while Marin County does not have a county helicopter for law enforcement purposes and uses CDF helicopters for the fire suppression missions. The average flight time for a CDF helicopter from nearest helitack to Marin County is approximately 35-40 minutes, while the average flight time from the nearest CDF helitack base to Santa Barbara County is approximately one hour and 15 minutes according to a CDF flight crew records.

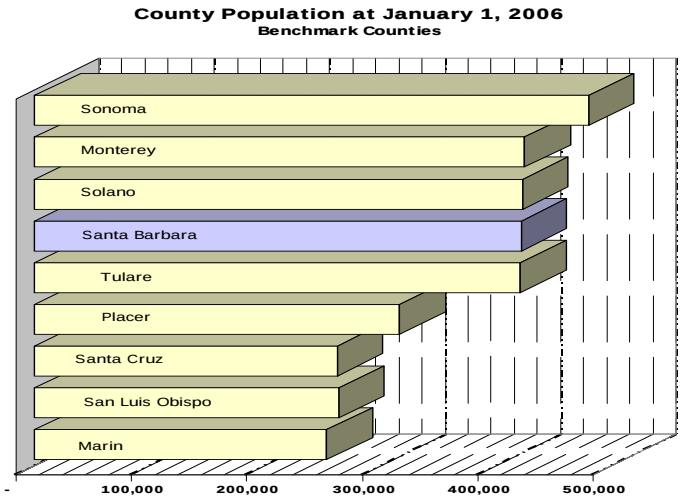
County	Sheriff Aviation	Sheriff Use Helicopter Ownership	Fire Aviation	Fire Use Helicopter Ownership	Cost If Known
Sonoma **Population: 479,929** **Land Area: 1,576 square mi**	Yes	1 smaller frame helicopter private contract, currently considering purchase of a helicopter	n/a	CDF	Sheriff Contract Approx $1 mil /year, includes labor and 500 flight hours
Monterey **Population: 424,842**	No	Use aid from neighboring jurisdictions on limited	n/a	CDF	n/a

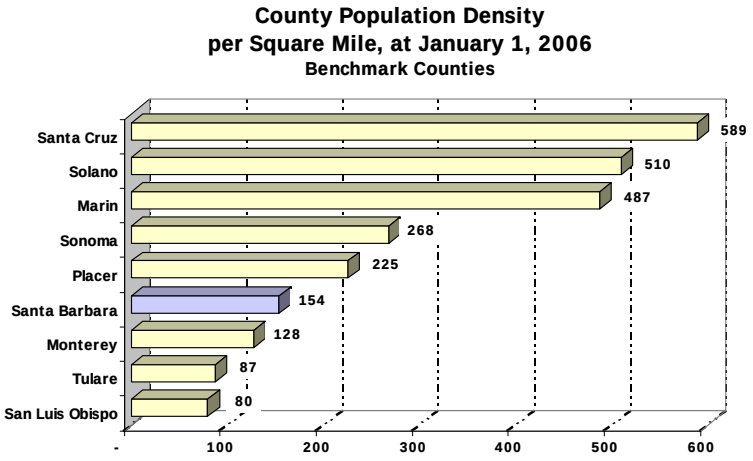
Land Area: 3,322 square mi		basis			
Solano **Population: 422,848** **Land Area: 829 square mi**	No	Use aid from neighboring jurisdictions on limited basis	n/a	CDF	n/a
Tulare **Population: 420,619** **Land Area: 4,824 square mi**	No	For limited functions use a volunteer pilot with private helicopter and National Guard for Marijuana Eradication	n/a	CDF	n/a
Placer **Population: 316,508** **Land Area: 1,404 square mi**	Yes	County Owned OH-58, In process of purchasing an additional AerostarAS350 B3 helicopter	n/a	CDF	Operational Budget for two helicopters is $1,142,522 per FY, excluding Service Life Costs, includes approximately, 750 flight hours and 2 FTE (staffing recommended to be increased to 7 FTE by 2010)
San Luis Obispo **Population: 263,242** **Land Area: 3,304 square mi**	No	Use aid from neighboring jurisdictions on limited basis (frequently Santa Barbara County)	n/a	CDF	n/a
Santa Cruz	Volunteer Air Squadron	All planes and helicopters used are	n/a	CDF	n/a

Population: 262,351 **Land Area: 445 square mi**	Only	privately owned, the department is expressing the desire for department owned helicopters to expand functions			
Marin **Population: 253,341** **Land Area: 520 square mi**	No	Use helicopters on limited basis from Sonoma County, CHP, and Coast Guard	CDF Contract County, None Owned by Fire Department	Use CDF helicopters: the nearest Helitack station is located approximately 35-40 min flight time from Mid-Marin County	n/a
Ventura **Population: 799,720** **Land Area: 1845 square mi**	Yes	County Owned: 2 Bell Uh-1H, and 1 Bell BH25	CDF Contract County, None Owned by Fire Department	Sheriff's Department flies Fire Missions, 1 observer from Fire Department works full-time with the Sheriff Aviation Unit	unknown

Benchmark Counties Profiles:







HISTORICAL BAKGROUND OF HELICOTPER USE

"Although helicopters were developed and built during the first half century of flight, some even reaching limited production, it wasn't until 1942 that a helicopter designed by Igor Sikorsky became the first helicopter to enter full-scale production, totaling over 400 copies. Even though most previous designs utilized more than one main rotor, it was the single main rotor with antitorque tail rotor configuration of this design that would come to be recognized worldwide as the helicopter." (Wikipedia)

Search and Rescue

"The helicopter first demonstrated its superiority over conventional fixed-wing aircraft for search and rescue missions during World War II.

In spite of their limitations, military leaders soon realized that helicopters were ideal for searching for downed airmen and for sailors stranded at sea as well as for civilians, although bigger helicopters with greater internal capacity and more powerful engines were needed.

The most important requirement for a search and rescue helicopter, in addition to long range, is its ability to mount a strong winch, or hoist, so the person being rescued can be lifted to safety. This is necessary because usually the helicopter cannot land. The downed pilot or injured hiker may be in a heavily wooded area and may need to be lifted out through the trees, or sailors have to be lifted off the pitching decks of sinking ships in bad storms." (US Centennial of Flight Commission)

Fire Suppression

According to a California Department of Forestry (CDF) report published on the State's website, the first use of helicopters for firefighting was proposed in 1931 and then again just after World War II. The CDF started using helicopters in 1960s. At first, the CDF used contractor helicopters from private sector. However, when the number of accidents increased over time, the CDF brought in helicopters through the Federal Excess Property Program (FEPP). The first FEPP helicopters used by CDF were Bell F series. Later as the model was phased out by the U.S. Forest Service, CDF began using Bell H series, beginning in early 1990s. The Bell H series are still used today. According to the State's website the CDF has the following equipment as part of their Aviation Program. "In support of its ground forces, the CDF emergency response air program includes 23 Grumman S-2T 1,200 gallon airtankers (one is kept as maintenance relief), 11 UH-1H Super Huey helicopters (two are kept as maintenance relief, and 14 OV-10A airtactical aircraft (one is kept as maintenance relief). From 13 air attack and nine helitack bases located statewide, aircraft can reach most fires within 20 minutes." (California Department of Forestry)

Law Enforcement

The first aviation units created for law enforcement purposed were in New York and Los Angeles. The utility of the use of helicopters in law enforcement has become well known since. The first helicopter was purchased by Los Angeles County in 1956 for traffic enforcement purposes (Hoffman, 1996). Today the City of Los Angeles, for example, has twelve Aerospatiale B-2 Astars, four Bell 206 Jet Rangers, one UH-1H Huey helicopters, and one King Air 200 airplane. The County had conducted a study by Jet Propulsion Laboratory Space Technology Applications Office, which presented the following findings: the number of part one property crimes is reduced when an LAPD helicopter is overhead; the number of arrests associated with radio calls is three times higher with the involvement of LAPD aircrews; the citizens of Los Angeles accept helicopter patrols as a necessary part of the City's police system and strongly favor their continuation; department

ground based officers universally support a strong airborne law enforcement program within the department (www.lapdonline.org) .

More then 600 law enforcement agencies reported the use of helicopters by 1994 (Morrison, 1994). Based on financial considerations, helicopters have traditionally been used more by larger law enforcement agencies. Departments serving populations of more then one million, for example, are reported to have a 75% greater chance to have at least one helicopter at their disposal (Local Police Department, 1993). Seventy –one percent of Agencies serving populations of 500,000 have access to a helicopter (Local Police Departments, 1993). Forty-two percent of agencies serving populations of 250,000 to 499,999 are reported to have access to a helicopter (Local Police Departments, 1993). Only some agencies serving a population under 250,000 are reported to operate at least one helicopter (Local Police Departments, 1993).

Cost vs. Benefit

An important question for policy makers is the cost versus benefit of the use of helicopters in the public sector. The utility of helicopters needs further empirical study and, yet, some utility of the use of helicopters may not be of the nature that can be quantified.

The benefits provided by helicopters for Search and Rescue purposes, which has been recognized since World War II, are the quick response time, as compared to ground search and rescue, and the ability to hoist in otherwise inaccessible terrain. These two factors lead to enhanced capabilities to provide quicker medical attention.

Other factors may be taken into account by policy makers when deciding whether ownership of helicopters is feasible. These are the accessibility and partnership with other agencies that can provide helicopter service for search and rescue purposes, the number and availability of helicopters owned by other agencies which could be partners in delivery of the mission, and the frequency of events when a search and rescue needs to be performed.

The cost and benefit analysis for fire suppression purposes lacks empirical studies, although, the use of helicopters in firefighting is generally accepted and recognized as an integral part of initial attack response. The benefits presented by helicopter use in firefighting are the ability to transport large amounts of water, observational capabilities, and quick response. The enhanced firefighting capabilities provided by helicopters decrease costs to society when a fire is contained to origin by saving the cost of fire per acre and structure, and providing greater safety by keeping fire from population bases as well as increasing firefighter safety.

In law enforcement the cost and benefit analysis is based on efficiency factors and empirical research showing the benefits of the use of helicopters. Although still predominant in larger more populated areas, more and more departments express the desire to use helicopters in everyday operations. The costs of utilizing a helicopter in law enforcement can be approximated by comparing a helicopter to a ground unit. A number of empirical studies have been completed to analyze the effect of helicopters in law enforcement. The studies have concluded some of the following results: a two-man crew helicopter was equivalent in its effectiveness to approximately 10 to 15 ground units (Stone & DeLuca, 1985; Yates, 1994); helicopters can handle up to three times as many service contacts than ground units (Simonsen, 1975); a helicopter can observe a subject from 500 feet at 60 miles per hour 10 time faster than a ground unit (McGowan, 1978a).

One of the most recent studies presented to policymaker in Toronto Canada, completed in 2000, showed the following findings and recommendations. The outcome of the study was favorable for the use of helicopters in law enforcement. Some of the considerations taken into account were the

positive feedback from ground unit officers. Furthermore, the study established, for example, that out of 97 arrests made on calls where a helicopter assisted, based on ground unit officer's opinion, 24 arrests were attributable to helicopter assistance. Finally, based on research of other agencies using helicopters for law enforcement, the study recommended that a helicopter is much more useful if it is used for regular patrol rather then when it is grounded and dispatched on as needed call basis. Quick response time is one of the benefits provided by a helicopter, when present on scene a helicopter provides aid in apprehension, evidence collection, and dispatch of ground units. First on scene, a helicopter crew can assess the situation and either provide information for best positioning ground units or cancel ground units if they are no longer needed (City of Toronto, Policy and Finance Committee report, 2000).

A cost and benefit of helicopter use in the public sector is a challenging concept, when considering public safety factors. Governmental agencies face the dilemma of how to best allocate resources to provide the greatest benefit to their citizens.

In considering whether to create or upkeep an aviation program, policymakers can consider the cost and utility of helicopters versus other means that can achieve the same service while using the resources with the greatest efficiency among various aviation program structure options and alternatives. Some of the factors that should be kept in mind when considering feasibility of an aviation program by an agency are the goals to provide quick response, perform functions more efficiently by enhanced observation capabilities, enhance dispatch and the allocation of ground units, deter crime, enhance capabilities to contain a fire, enhance the apprehension of criminal suspects and evidence.

HELICOPTER EFFECTIVENESS BY FUNCTION AS USED IN THE SANTA BARBARA COUNTY

Joint Primary Responsibility between Fire and Sheriff Departments Functions

Search and Rescue

The Santa Barbara County Air Support Unit carries out the mission of Search and Rescue in accordance with a Memorandum of Understanding entered into on July 28, 2005 and approved by the Santa Barbara County Board of Supervisors.

Helicopters are a useful and, sometimes, the only tool available in a disaster, search, or rescue situation. Helicopters can be used where and when there is no available access for ground transportation. Helicopters are a speedy tool for insertions of rescue personnel, rescuing injured persons from difficult access locations, and may be the only transportation available in an event of a major disaster. Helicopters were first recognized as superior tools for search and rescue over fixed-wing aircraft during World War II. Helicopters are recognized by militaries as an essential tool for search and rescue operations. Helicopters are used for individual searches and rescues as well as in mass emergencies and disaster relief operations. Helicopters have been irreplaceable tools during mass emergencies such as the Katrina and other disasters.

Personnel and Cargo Transport

Helicopters may also be used by the County on an as needed basis to transport groups of personnel or cargo. This is a secondary function to emergency response, but can be requested based on availability and the suitability of such service.

Sheriff Primary Responsibility Based on Sheriff Department's Departmental Mission and Responsibilities Functions

Routine Ground Patrol Units Support (Furnish Units, Increased Apprehension, Crime Deterrence, Officer Safety)

Crime Deterrence

One of the first studies to determine whether helicopter patrols deter crime was a case study of the City of Lakewood and Los Angeles County. The City of Lakewood used helicopter patrols from 1965 through 1966. The crime rates were compared between the City of Lakewood and Los Angeles County, which at the time did not utilize helicopters for patrol. The results show that while crime rates for the increased in Los Angeles County, they decreased in the City of Lakewood (Whitehead, 2001).

The results were:

Change in Number of Crimes	Major Crimes	Crime Rate/100,000 population	Robberies	Burglaries
Lakewood	-8%	-11%	-6%	**-7%**
Los Angeles County	**+9%**	**+8%**	**+22%**	**+9%**

Furthermore, data published by Whitehead in *The Eye in the Sky: Evaluation of the Police Helicopter Patrols*, shows the following.

Apprehension Rates	Assaults	Weapons	Missing Persons	Residential Break	Disturbances	Suspicious Persons	Suspicious Vehicles
With Helicopter	36%	46%	28%	29%	25%	33%	41%
Without Helicopter	**22%**	**13%**	**2%**	**6%**	**13%**	**5%**	**4%**

A third study published by Whitehead took place in Kansas City, MO in 1969. In this experimental study, helicopter patrol was used for the period of three months which was then compared to a timeframe when helicopter patrol was not utilized. The study showed that crime decreased 13.5% in the "test period" compared to the previous six months.

Another study from Nashville, Tennessee determined through an interrupted time-series evaluation, that the number of burglaries decreased during a twelve day period when a helicopter was flown with no evidence that this type of crime was displaced to other areas (Shnell, J. F., and Kirchner, R. (1981).)

Furnish Units

Helicopters are also regarded useful in being the "eyes" for ground units, providing information for better distribution of units in certain events such as securing a containment parameter. Helicopters may also eliminate the need for high response speeds by ground units by being a first responder on scene and can provide information to terminate a ground patrol response if the response is no longer needed (McLean, 1990). A helicopter can also assist with traffic management in cases of large scale collisions and natural disasters. Video equipment and capabilities of an Air Support Unit provide valuable video footage that can be used in court as evidence, thus, increasing the likelihood of obtaining a conviction or for any other purpose of proving a true fact with efficiency.

Increased Apprehension of Suspects

The most common advantage of a helicopter is the observational capabilities. A helicopter can provide information to the ground units including a location of a fleeing suspect, direction in which the suspect is fleeing, traffic and environmental conditions. Successful apprehension of suspects is increased by the use of helicopter due to quicker response time, increased observational capabilities, and the ability to follow a suspect where a ground unit would not be able to due to safety considerations for the public and officer safety (McLean, 1990).

Assistance in Pursuits

Assistance in pursuits is one of the major areas for public concern. In as much as it is important for law enforcement to ensure apprehension of a suspect and to discourage fleeing from law enforcement officers, vehicular pursuits are a major hazard to the public.

The use of helicopters in vehicular pursuits enables law enforcement to maintain visual contact with the suspect without further aggravating the situation (Alpert and MacDonald, 1997). When pursuing a suspect, law enforcement considers not only apprehension of the suspect but first and foremost the safety of the public. Maintaining visual contact with the suspect while allowing for ground patrol units to pursue at a distance maximizes public safety; the suspect is less likely to flee at extreme speed and the helicopter observers are able to foresee potential public safety hazards in the path of a pursuit. If a public safety hazard is identified, such as school or other heavy pedestrian traffic, a pursuit is likely to be terminated to safeguard the citizens. In the event that a ground unit pursuit is called off, the helicopter is able to maintain visual contact with the suspect, thus, increasing the likelihood of apprehension.

The data published by the National Highway Traffic Safety Administration highlights the dangerous nature of vehicular pursuits. For instance, in 1994, there were 388 pursuits that ended in some type of fatality. Many of these deaths were to a third party victim.

In addition, forty-nine percent of police departments with over 500 employees have been involved in litigation involving a vehicular pursuit.

Officer Safety

Officer safety is also increased with the use of helicopters due to observational capabilities and an ability to have a show of force if necessary (Hoffman, 1996).

Assistance in Patrol of Remote Areas

Santa Barbara County's geography is diverse and varies from coastal communities with denser population and easy access to remote, scarcely populated mountain communities. Certain areas are difficult to reach by ground patrol units. Crime rates in these areas do not justify frequent ground unit patrol based on the departmental analysis and overall law enforcement operations

across the nation. Thus, in an event of a crime occurring, the response time for a ground patrol unit to the remote locations can be significant. Air patrol can both spot the suspicious activities as well as provide a quick response to calls in remote areas.

Insertion and Withdrawal of Special Enforcement Teams

As part of managing high risk emergencies or disasters, law enforcement teams may need to be transported to distant or remote areas. Special Enforcement Teams are comprised of professionals trained to respond to a particular type of situation.

Observation

A helicopter acts as the "eyes" of law enforcement: it provides enhanced operational decision making and facilitation of ground units to be more economically, effectively and safely deployed at large disturbances, public events, crime scenes.

Search for Missing Persons and Stolen Property

A helicopter can observe a subject from 500 feet at 60 miles per hour 10 times faster than a ground unit (McGowan, 1978a). That capability can be valuable in certain searches of missing persons. In addition, during regular patrol, helicopters have great advantages in locating stolen vehicles. With a superior view and modern equipment, Air Unit observers are able to locate a stolen vehicle with much greater efficiency then ground patrol units.

A study from England performed in 1988 showed the following results when comparing the use of helicopters, fixed-wing airplanes, and persons on foot.

	Bolkow helicopter	Optica fixed-wing	Islander fixed-wing	Persons on foot
Time to Search 1 Square Mile	12 minutes	18 minutes	22 minutes	454 hours
Cost to Search 1 Square Mile	105 £	27 £	77 £	6946 £

Narcotics Unit Assistance

Air Units are able to identify marijuana fields, suspicious gatherings, and use infra-red capabilities to the extent allowed by law, thus, facilitating eradication of drugs (Gaines, Kappeler & Vaughn, 1994). One of the studies showed that approximately 85% of helicopter flight time in law enforcement was attributable to the area of drugs enforcement (McLean, 1990).

Fire Primary Responsibility Based on Fire Department's Departmental Mission and Responsibilities Functions

Fire Suppression

The Fire Department has the primary responsibility for fire protection on the County land and under a contract with the State of California for the State Forest land within the County. The Fire Department does not engage in regular surveillance of fire activity and has detailed protocols for response. The Fire Department staff does not self dispatch to a fire as an investigation is usually needed to determine whether a fire was set intentionally for a legitimate purpose and whether the Santa Barbara County Fire Department is the first responder.

An Air Support Unit provides observational and water drop capabilities for the Fire Department, which enhances the Fire Department's ability to strategically fight a fire and provide water dropping capabilities other then those that could be provided by ground units. (See Attachment B

– break down of County area by first responder responsibility. Red gridline = County of Santa Barbara Fire Department Primary Responsibility Area).

In March of 1999, the Santa Barbara County Board of Supervisors was addressed by the Fire Department with a request to approve a firefighting and other all-risk Helicopter Program for the Fire Department. The request was approved by the Board.

The report provided by the Fire Department in support of the request stated the following:

"The consideration of implementing a Fire Department Helicopter Program is a timely and important public safety concern for the residents of the County. The effective use of aerial firefighting equipment has been demonstrated time and time again as the most cost effective and productive weapon against the destructive spread of wildland fires. Helicopters minimize the loss of life and property and reduce the need for firefighters to combat fires over a long period of time. This is particularly critical in the areas of "urban interface" – where pockets of residential and commercial development exist in wildland areas. The potential for loss of life and property is greater than in urban areas where emergency response personnel are more readily available. Remote, hard to reach locations can effectively be protected with the use of aerial firefighting equipment. Additionally, while there is not a sufficient property tax base to support the construction and staffing of fire stations strategically located throughout our many mountain and rural communities, implementation of a helicopter firefighting program can effectively provide the needed fire protection at much lower cost…

For the sake of comparison, a Fire Department Helicopter is similar to a fire engine in that it can respond immediately to wildland fires and other emergencies. The helicopter provides support with foam or water drops, close aerial support of fire engines and hand crews, structure protection, holding actions, and aerial ignition delivery and can be provided at a moment's notice. Support operations, such as reconnaissance and mapping, crew shuttles, cargo delivery, and transporting injured firefighters can be accomplished throughout the course of the fire as needed."

ALTERNATIVE OPPORTUNITY COSTS

The following table shows a rough estimation of how the same functions performed by helicopters could be performed by other means. A number of assumptions are made in these calculations and analyses. The assumptions are listed below in a following section of the report. Aviation units are very distinct in their functions and capabilities, which makes it more difficult to equate the costs of operation of aviation as compared to ground units. Some of the distinct benefits provided by helicopters that are virtually not quantifiable are the time of response which can make a health and welfare difference in any rescue situation and observation capabilities providing increased safety to citizens, officers, and firefighters. Due to the difficulties in quantitative evaluation of helicopters, only a very limited number of studies have been completed to evaluate helicopters by various functions; yet, there are no studies providing a full cost and benefit analysis of helicopters. The decisions to provide aviation support by agencies have been based on each agency's financial abilities and availability of aviation support from other agencies and jurisdictions for at least extreme situations.

This table lists some of the approximate cost comparisons between providing the service with the use of helicopters and without and identifies qualitatively the benefits provided by the Aviation Unit that cannot be quantified with reasonable precision.

Service Type	Alternative	Cost
Search & Rescue	Provide Service by Other Means: Search by Foot (assuming difficult terrain)	Cost Per Hour of One Person (Deputy) on Foot to search one square mile * Number of Hours = $54.91*454 hours = $24,929 Time is of essence. Lack of timely rescue may result in loss of human life.
Fire Containment	Lost Efficiency (especially during initial attack)	Cost per Acre Burned = approx $388 (Source: US Department of Forestry)
Personnel and Cargo Transport	Use Ground Transportation or Commercial Transportation	Cost differs on case basis Recommend development of policy when personnel and cargo transport services should be offered by the Aviation Unit
Law Enforcement: Ground Units Support	1. Crime Deterrence: Equivalent to 10-15 ground patrol units in deterring crime 2. Arrest by Ground Patrol Units Only 3. Respond to Calls by Ground Units Only	1. Ground patrol unit cost * 12.5 avg. = $823.25 cost per hour in equivalent patrol 2. Cost per arrest ground units = $2739.78. Cost per arrest Aviation Unit = $6363.57 (Note that Aviation Units have superior capabilities in assisting arrests only when special circumstances are present such as a fleeing suspect, officer safety concerns based on visibility, other observational needs such as setting a containment parameter or preservation of evidence. Therefore, helicopters spend more time using flight hours on functions other then arrests. Consequently, the cost numbers are not truly comparable. The analysis does not quantify increased safety and enhanced ability for immediate capture of fleeing suspect, therefore, avoiding future costs of investigation and search.) 3. Cost per call response ground units = $163.26 Cost per call response Aviation Unit = $404.57 (Same as above: lacks analysis of increased safety, apprehension of suspects and evidence collection)
Law Enforcement: Patrol of Remote Areas	Additional Assignments of Ground Units/ Permanent Staff	Sheriff's Department Staffing Ratio: 1. To population - 730.3 citizens per deputy 2. To square mile – approx 10.13 square miles per

		deputy Santa Barbara County City Police Departments Average Staffing Ratio: 1. To population – approx 760.4 citizens per officer 2. To square mile – approx 0.17 square mile per officer.
Law Enforcement: Assistance in Pursuits	Decreased Apprehension of Criminals, Increased Danger to Society	Cost of Decreased Deterrence or Cost to health and welfare due to the dangerous nature of pursuits
Law Enforcement: Observation	Decreased Efficiency in Ground Unit Deployment, Decreased Evidence Collection	Inefficiency Cost
Law Enforcement: Search for Stolen Property	Hours to Search by Ground Units	Number of hours to search one square mile by foot = 454 hours Average walking speed = 3 mph Average driving speed feasible for search = 30mph (assumption) Thus, search by vehicle is 10 times faster then by foot It would take approximately 45.5 hours to search one square mile by vehicle
Law Enforcement: Narcotics Assistance	Ground Units Utilization to Search for Marijuana Fields, Loss in Observational Capacity and Deployment of Ground Units	Same as Above. Aviation has superior capability for observation.
Law Enforcement: Insertion of Special Enforcement Teams	Ground Transportation (loss in response time which may be critical)	Potential impact to health and welfare of citizens or peace officers

POTENTIAL ISSUES AND CHALLANES

As shown by numerous studies, helicopters are a very unique tool that can be irreplaceable in crisis situations. Both law enforcement and firefighters find great benefits in the use of helicopters to successfully achieve their missions. The aviation program has some significant costs associated with it however and not all counties are able to afford to maintain their own aviation program, as can be seen in examining the benchmark counties. Santa Barbara County has a well developed aviation program compared to most of the benchmark counties.

Some of the most evident challenges the Aviation Unit faces and should plan for is the need for equipment replacement. It is anticipated that the unit will require the need to replace airframes in the foreseeable future if the unit is going to maintain the same number of airframes. The two larger UH-1 Huey helicopters have high number of hours flown and will be due for replacement first. The Fire and Sheriff's Department should plan to replace the helicopters within the next few years. Each replacement is costly and must be planned for. The Sheriff's Department has recently successfully acquired a used UH-1 Huey airframe and was able to receive donations in order to refurbish the airframe in order to place it in operation. This helicopter is planned to replace one of the UH-1 Huey helicopters currently in operation. The Fire Department has submitted a request in the Capital Improvement Plan that starts to prepare for the future equipment replacement need. When replacing airframes, however, long term costs must be considered, which are a combination of both the acquisition and the operations costs.

RECOMMENDED SOLUTIONS AND ANALYSIS

Future Equipment Needs

All of the helicopters used by the Air Support Unit were manufactured in the 1960s -70s. Despite the fact that the aircraft have been maintained and upgraded, most of the airframes will, in the next two to five years, need to be replaced or undergo a major maintenance effort if the County continues to commit itself to the same level of service within the Aviation program. Generally, the standard use for helicopters is approximately 10,000 hours.

	Total Hours Current	Major Maintenance Cost to Prolong Useful Life if an Option
OH-58 #1	9692 hours	250,000
OH-58 #2	5425	250,000
UH-1H #1	13190	1,000,000
UH-1H #2	13928	1,000,000

The Aircraft can be replaced with used or new airframes. UH-1 Huey airframes continue to be a competitive type of aircraft among refurbished airframes. This type of helicopter has a wide range of capabilities and is moderately cost effective. It also creates a moderate amount of noise, thus, minimizing the disturbance to our communities. Other, more modern used airframes can also be considered.

Another option is to replace the aircraft with new airframes. For example, the Euro EC-135 is a modern aircraft widely used amongst police and ambulance services at a cost of approximately $5 million. Such an aircraft has all of the capabilities of a fully refurbished UH-1 Huey, yet, costs nearly the same as the OH-58 Kiowa to operate.

The table below shows approximate cost and methodology for valuing the cost on hourly basis of operating a new Eurocopter EC-135. The total cost is approximated at $5 million in today's US dollars and properly equipped to satisfy the missions. Currently, the Aviation Program receives funding separately through the Sheriff's Department and the Fire Department. The departments budget on yearly basis, including maintenance. The table below is an example of methodology to allow for accumulation of funds for major maintenance or replacement costs of the airframes. Helicopter maintenance costs are similar to any other machinery and run unevenly from year to year. Creation of a designation to cover maintenance costs would more evenly match the benefits provided by the air support and the costs associated with the benefit.

Assumes 20 years useful life, 58 gal/hr average fuel consumption based on published standard for the helicopter type, and 350 operational hours per year, and $100 maintenance which has not been determined with certainty at present time.

	Unit	Useful Life in months	Salvage Value	Depreciation per year	Depreciation per month	Cost per Flight Hour
Approximate Purchase Price of New EuroCopter 135	5,000,000	240.00	500,000.00	225,000.00	18,750.00	53.57
Operational Costs:		Annual operational hours-----		350		
	Gal Per Hour	$ per Gallon				
Fuel	58.00	$3.75		76,125.00		217.50
Maintenance		100.00		35,000.00		100.00
Total Operational Cost Per Hour (excluding labor)						**371.07**

Note: Internet research suggests direct operating costs claimed for EC 135 to be approximately $360 US dollars per hour

Placer County Case Study

The County of Placer recently completed and presented to the Placer County Board of Supervisors a Helicopter Acquisition Study. The study examined Placer County aviation program. Placer County to date had one OH-58 helicopter operated by the Sheriff's Department that performed law enforcement and Search and Rescue missions only. The final recommendation to the Board of Supervisors was to purchase an additional new helicopter to be operated by the Sheriff's Department, which will enhance the capabilities of Placer County Aviation Program and add capability to fly fire missions (See Attachment I – Placer County study).

A number of helicopters were considered by the committee and a purchase of AS350 B3 helicopter from American Eurocopter was recommended. The evaluation of options included detailed evaluation of equipment to best facilitate mission performance and life cycle costs for operation.

In addition the study identified the following sources of revenue as qualifying for funding of the aviation program: a Homeland Security Grant, Community Oriented Policing Services grants and earmarks, HR 2389 Support of SAR on Federal Land, and Partnerships with Cities and Neighboring Jurisdictions.

Recommendations

The Aviation Unit provides quality service to the Santa Barbara County that is very unique in its capabilities and cannot be easily replaced with other means. Helicopters provide unique rescue, firefighting, and law enforcement capabilities. If budgetary feasible, the recommendation is to place the equipment on a depreciation schedule and plan costs over time. In addition, when future equipment is purchased, it is recommended that a complete cost analysis is performed for different types of airframes which would include both cost of acquisition and cost of operation over time.

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APPENDIX I

Note: The following cost assumptions are used for calculations of Alternative Costs above.

I. Cost of 1 ground patrol unit per hour

	Unit	Annual	per hour (2,080)
Average Deputy cost, fully loaded from CSA Calc	54.91	114,209.00	54.91
Patrol Car cost			
Depreciation, per month	858.00	10,296.00	4.95
Overhead, per month	36.00	432.00	0.21
Mileage at 26,000 miles/year	0.39	10,140.00	4.88
	894.39	20,868.00	10.03
class 1710 from FY07-08 Rates			
Mobile Radio & portable Radio From FY07-08 Rates	73.00	876.00	0.42
Other consumable supplies; flares maps, etc.	1,040.00	1,040.00	0.50
	$ 2,062.30	$ 136,993.00	$ 65.86

Hourly costs are spread from the annual costs based on 2,080 hours per year.

Costs not allocated include build-out costs incurred when placing a new patrol vehicle in service. Examples include firearms, computer and rack, light bar, etc.

II. Cost of Search by alternate means

Time to Search 1 Square Mile
Helicopter = 12 minutes
Person on Foot = 454 hours

III. Cost per Arrest and Call Responded To by Ground Units

There are approximately 6733 arrests per year made by the Sheriff's Department, which results in 1.3 hours per arrest per hour countywide within the Sheriff jurisdiction. Approximately 32 ground units are on patrol at any given time, which results in 41.6 hours spent by all 32 units to make one arrest. 41.6 hours times the cost of operating one ground unit without cost of labor is the total cost per arrest for the patrol divisions $2739.78.

**number of arrests is approximated based on bookings (Sheriff 36% of countywide bookings, 18703 FY05-06 bookings)*

There were 113,082 calls responded to by the Sheriff's Department in FY05-06, which results in 0.08 hours per response per hour countywide within the Sheriff jurisdiction. Approximately 32 ground units are on patrol at any given time, which results in 2.47 hours spent by all 32 units to respond to one call or $163.26 in cost per hour for one response.

III. Cost per Arrest and Call Responded To by an Aviation OH-58 Unit

Cost per arrest $6241 – Equipment Operation Only per Hour

Crew Labor Cost per Hour = $60.98 Pilot Average Cost + $61.59 Observer Average Cost = $122.57

Total Cost per arrest per hour = $6363.57

Cost per call responded to $282 – Equipment Operation Only per Hour

Crew Labor Cost per Hour = $60.98 Pilot Average Cost + $61.59 Observer Average Cost = $122.57

Total Cost per call per hour = $404.57

IV. Staffing Analysis Data

	SHERIFF JURISDICTION (INCLUDES CONTRACT CITIES) APPROX 265 SWORN EMPLOYEES	**CITY POLICE DEPARTMENTS APPROX 300 SWORN EMPLOYEES**
Population	193,535	228,120
Area (square miles)	2,685	51.3

Source: California Department of Justice Law Enforcement Personnel Data 2005 and California Department of Finance Population Data 2007

Report of the County Executive Office Budget and Research Division

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