

MARICOPA COUNTY SHERIFF'S OFFICE
Aviation Services Compliance Audit



Bureau of Internal Oversight Audit
Report # A2017-0001 October 4th, 2018



| | |
|--|---|
| To: Lt. Larry Kratzer # S1520 Audit & Inspection Commander Bureau of Internal Oversight | From: Patty Huling, # 3184 Senior Auditor Bureau of Internal Oversight |
|--|---|

| | |
|--|-----------------------|
| Audit #: A2017-0001 Aviation Services Compliance Audit | Date: 03/12/18 |
|--|-----------------------|

The purpose of the audit is to review Policies, Procedures and Operating Manuals to determine compliance with best practices and safety guidelines as defined by the Federal Aviation Administration (FAA), the Airborne Law Enforcement Association (ALEA), the Department of Emergency and Military Affairs (DEMA) and any other related authority. This audit also included a benchmarking survey, to provide perspective on our Aviation operation relative to other law enforcement aviation divisions, both within our state and nationally. The following areas were addressed:

- Safety
- Training
- Equipment

This audit also revisited the Aviation Division findings documented in the MGT of America Staffing Study, which was completed in June of 2012. In that Audit, the MGT consultants stated: “If the MCSO and/or the County are not willing (to) provide the resources needed to maintain this unit, consideration should be (given) to closing it down and outsourcing its equipment and/or personnel needs to conduct only mandatory missions. County and MCSO leadership must be fully committed to this function or consider getting out of the aviation business.” (Reference pages 4-37 & 4-38).

This audit confirms that many of the needs identified back in 2012 are still relevant and are even more urgent than they were five years ago, including:

- The Lack of a Formalized Safety System and Dedicated Safety Personnel
- The Need to Replace Aircraft and Lack of a “Cradle to Grave” Asset Plan
- The Need for Standardized Training and Centralized Record Keeping
- The Need for a New Location with Centralized Hangar & Office Space
- The Need for a Contract Amendment to the Lease Agreement

The strong words spoken by the MGT Consulting Team stress the importance of County leadership fully supporting the Aviation Division and all of the financial commitments that go with insuring the safety of our Deputies and the public. MCSO is mandated by law to provide our county taxpayers with a means for the search and rescue of innocent victims and the extradition of lawbreakers who must be brought to justice. Accordingly, funding must be developed to meet these mandates.



Table of Contents



| | PAGE |
|--|------------------|
| Introduction..... | 4 |
| Background | 4 |
| Objectives..... | 8 |
| Scope..... | 8 |
| Methodology. | 8 |
| Findings and Recommendations | |
| 1. Internal Controls over Documentation Have Been Weak | 9 |
| 2. Frequent Changes in Management Reduces Accountability | 10 |
| 3. Formal Safety Management System is Lacking | 11 |
| 4. Span of Control is Large & Sergeant’s Position is Vacant | 14 |
| 5. Rotors Not Configured to Provide SAR Services | 17 |
| 6. Rotor FOX I Has Exceeded Conservative Timeline for Replacement..... | 20 |
| 7. Prisoner Intakes Have Increased Significantly | 24 |
| 8. Fixed Wing FOX 10 Nearing End of Useful Life | 26 |
| 9. Flight Hour Increase May Require Addtl. Mechanic | 27 |
| 10. On-going need for Consolidated Office/Hangar Space | 30 |
| 11. Flight Hour Rates Have Not Been Adjusted In Over 9 Years..... | 30 |
| 12. Internal Controls Over CAP Billing & Lease are Weak..... | 31 |
| 13. Internal Controls Over Inventories and Asset Lists Lacking..... | 33 |
| 14. Flight Crews Lack Training Needed To Deliver Seamless Services | 34 |
| 15. Universal Need to Assume Responsibility for Managing Data Accuracy..... | 34 |
| 16. Track SAR Expenditures and Pursue Reimbursements..... | 35 |
| 17. FLIR Digital Recording Policy Needed | 35 |
| Conclusion | 36 |
| Summary of Recommendations..... | 37-41 |
| Attachment: Aviation Benchmarking Study..... | 42 |
| References..... | 43. |

Introduction:

The Maricopa County Sheriff's Office (MCSO) provides law enforcement services in the fourth most populated County in the United States, which is also the fifteenth largest County by total area. Within the confines of Maricopa County there are 9,224 square miles of land which include 1,000 square miles of wilderness recreation areas and twenty four square miles of lakes, reservoirs and rivers. Due to the vast urban, rural and recreational areas that comprise Maricopa County, the MCSO relies heavily on its Aviation Services Division to "provide airborne law enforcement support to uniformed patrol, Lake Patrol, Search and Rescue operations, narcotics enforcement, extraditions and SWAT operations" (www.mcsso.org).

Background:

The Aviation Services Division (ASD)- The Aviation Services office is located on the Central AZ Project campus in North Phoenix and is presently staffed with a Division Commander (of Lt. rank), a Chief of Aircraft Maintenance and two mechanics (all civilians), a Chief Pilot (Sworn), four Helicopter pilots and four Helicopter TFO's, two Fixed Wing Pilots plus one Fixed Wing TFO, and an Administrative Assistant.

MCSO's air fleet presently consists of four aircraft (two helicopters and two airplanes) as listed below:

- Fox 1, a 1997 Bell Helicopter, model 407
- Fox 2, a 2014 Bell Helicopter, model 407GX with Garmin capability & enhanced avionics

- Fox 10, a 1977 Cessna airplane, model 206
- Fox 12, a 2014 Cessna airplane, model T206

The Aviation Service Division operates out of the CAP location by means of a lease which provides office space, maintenance space and hangar space for four rotor craft. In addition to the CAP site, the ASD maintains additional leased space at the Deer Valley Airport (approximately two miles from CAP) to house the fixed wing fleet. Aviation staff are scheduled and available to provide flight assistance around the clock, with 24/7 coverage.

In addition to supporting law enforcement activities through the provision of aerial patrol, surveillance, and extradition, the Aviation Division also works closely with our Lake Patrol Search and Rescue Coordinators and our various volunteer Posses to conduct various types of Search and Rescue missions, including swift water rescue, technical rock and rappel, cave/mine, and alpine rescue. Emergency medical services are also provided through our Aviation service staff, SAR Coordinators and Volunteer Posses. Although the MCSO has the support of many different types of specialty Posses, there are primarily four organizations which have historically supported the MCSO in providing SAR missions. They are listed as shown below:

Air Posse – The Air Posse consists of group of fixed wing aircraft owners who provide volunteer assistance in conducting aerial searches of large areas of land. This posse has been supporting law enforcement activities since 1941 and currently has nine active members.

D.A.R.E.S. Posse – The Desert Alpine Reserve Emergency Services posse provides ground rescue support by means of climbing, hiking, rappelling, or other physical/technical skill set and has been assisting law enforcement, since 1961. The D.A.R.E.S. posse presently has eleven active members.

Helicopter Posse- The Helicopter Posse consists of private helicopter owner/pilots who have completed the requirements to carry a weapon while volunteering and are available to provide on-call support to MCSO’s Aviation Division. Currently this posse consists of two active members.

Mountain Rescue Posse – The Mountain Rescue Posse is a highly-skilled, technical SAR Posse qualified to respond under any conditions and without direct supervision of the MCSO. This posse has been providing services as “MCSO’s official technical rescue team” since the early 1970’s, at the request of Sheriff Paul Blubaum (1973-76). Currently there are approximately 32 active Mountain Rescue Posse members and five of them remain “on call” to MCSO at all times and are available by pager 24/7, with response in five minutes. For more information: <http://mra.org/>

Presented below is a chart identifying the various categories of missions flown by our Aviation Services Division during the nineteen-month period under review:

- 55% of our rotor missions were initiated to assist/back-up our Deputies with patrol-related duties
- 15% of our rotor missions were conducted for search and rescue purposes
- 9% of our missions were for fixed wing prisoner transport/extradition
- 5% of our rotor missions were for canal surveillance, as required by Central AZ Project, to fulfill our property lease (i.e., office spaces and rotor hangar).

Top 5 Missions, By Category – 07/15 to 01/17:

| Air Mission Category: | Air Missions, by Volume: | % Overall | Top 5 Missions: |
|---------------------------------|---------------------------------|------------------|------------------------|
| <u>Assist / Back-up</u> | 764 | 31.479% | 1 |
| <u>Patrol</u> | 587 | 24.186% | 2 |
| <u>Search and Rescue</u> | 365 | 15.039% | 3 |
| <u>Transport (Extradition)</u> | 219 | 9.023% | 4 |
| <u>CAP Flight</u> | 120 | 4.944% | 5 |
| <u>Maintenance</u> | 77 | 3.173% | 6 |
| <u>Suspect Search</u> | 65 | 2.678% | 7 |
| <u>Training</u> | 51 | 2.101% | 8 |
| <u>Public Relations</u> | 50 | 2.060% | 9 |
| <u>Photo</u> | 36 | 1.483% | 10 |
| <u>Special Assignment</u> | 33 | 1.360% | |
| <u>Other</u> | 21 | 0.865% | |
| <u>Drug Interdiction</u> | 10 | 0.412% | |
| <u>Radio Shop</u> | 8 | 0.330% | |
| <u>Pursuit</u> | 6 | 0.247% | |
| <u>Stolen Vehicle</u> | 6 | 0.247% | |
| <u>Surveillance</u> | 4 | 0.165% | |
| <u>No Description on Flight</u> | 3 | 0.124% | |
| <u>Traffic</u> | 1 | 0.041% | |
| <u>Weather</u> | 1 | 0.041% | |
| Total: | 2,427 | 100.000% | |

Data obtained through a query of the Digital AirWare System (DAW) for the period 07/15 -01/17.

An analysis of ASD’s flight hours by volume provides additional insight over our aviation activities during the nineteen month period under review. For example:

- The Top Five Missions account for 85% of all of Aviation’s flight hours
- The majority of total hours flown (33.87%) were expended on fixed-wing prisoner extraditions
- The second and third largest expenditure of flight hours (35.06% combined) was on rotor-craft patrol and patrol-related duties (assistance and back-up).
- The fourth largest expenditure of flight hours (or 10%) was on rotor search and rescue missions
- The fifth largest expenditure of flight hours (almost 8%) was spent conducting CAP Canal surveillance missions (rotor flight).

Top 5 Missions, by Flight Hr. Volumes – 07/15 – 01/17:

| <u>Mission Description</u> | <u>Total Cumulative Flight Hrs.</u> | <u>% of Total Flt. Hrs.</u> | <u>Total Volume of Missions:</u> | <u>Avg. Time Per Mission:</u> | <u>Top 10 Missions:</u> |
|--|-------------------------------------|-----------------------------|----------------------------------|-------------------------------|-------------------------|
| Fixed Wing Transport / Extraditions | 1,968.80 | 33.87% | 219 | 8.99 | 1 |
| Rotor Assistance / Back-up | 1,156.70 | 19.90% | 764 | 1.51 | 2 |
| Rotor Patrol | 881.20 | 15.16% | 587 | 1.50 | 3 |
| Rotor Search and Rescue | 581.90 | 10.01% | 365 | 1.59 | 4 |
| Rotor CAP Flight | 438.80 | 7.55% | 120 | 3.66 | 5 |
| Public Relations | 138.80 | 2.39% | 50 | 2.78 | 6 |
| Training | 136.30 | 2.34% | 51 | 2.67 | 7 |
| Maintenance | 126.70 | 2.18% | 77 | 1.65 | 8 |
| Photo | 87.10 | 1.50% | 36 | 2.42 | 9 |
| Suspect Search | 86.70 | 1.49% | 65 | 1.33 | 10 |
| Special Assignment | 82.60 | 1.42% | 33 | 2.50 | |
| No Description on Flight | 30.70 | 0.53% | 3 | 10.23 | |
| Other | 27.50 | 0.47% | 21 | 1.31 | |
| Drug Interdiction | 26.70 | 0.46% | 10 | 2.67 | |
| Radio Shop | 23.80 | 0.41% | 8 | 2.98 | |
| Surveillance | 8.50 | 0.15% | 4 | 2.13 | |
| Stolen Vehicle | 6.60 | 0.11% | 6 | 1.10 | |
| Pursuit | 3.30 | 0.06% | 6 | 0.55 | |
| Traffic | 0.30 | 0.01% | 1 | 0.30 | |
| Weather | 0.30 | 0.01% | 1 | 0.30 | |
| Total: | 5,813.30 | 1.00 | 2427 | 52.17 | |

Data obtained through a query of the Digital AirWare System (DAW) for the period July 2015 through Jan 2017.

The data summarized in these two charts puts Aviation Service’s missions into perspective:

- Aviation handles a large volume of specific types of missions (i.e., patrol-related/back-up assistance, and search and rescue missions) these types of missions are resolved fairly quickly, typically in two hours or less.
- Aviation may not conduct nearly as many extradition missions; however, the average extradition mission takes approximately 9 hours to complete.
- The CAP Canal Surveillance missions, although not as frequent as the others already mentioned, have the second longest duration, averaging a little over 3.5 hours each.

An overview of ASD’s Extradition trips during this same time period provides additional insight into this type of mission. Documentation indicates that both the volume of prisoners and the volume of flight hours tend to increase during the summer months as shown here:

ASD Extradition Trip Volumes- 07/15 to 01/17

| <u>FW Transport / Extraditions:</u> | <u>Volume, Prisoners:</u> | <u>Volume, Trips:</u> | <u>Extra. Flt. Hrs, per Mo:</u> | <u>Avg. Flight Hrs, per Trip:</u> |
|-------------------------------------|---------------------------|-----------------------|---------------------------------|-----------------------------------|
| July 2015 | 6 | 7 | 43.50 | 6.21 |
| August 2015 | 14 | 10 | 80.80 | 8.08 |
| Sept 2015 | 11 | 9 | 81.50 | 9.06 |
| Oct 2015 | 14 | 9 | 81.80 | 9.09 |
| Nov 2015 | 8 | 10 | 79.50 | 7.95 |
| Dec 2015 | 10 | 7 | 58.00 | 8.29 |
| Jan 2016 | 9 | 8 | 62.50 | 7.81 |
| Feb 2016 | 12 | 10 | 92.80 | 9.28 |
| March 2016 | 12 | 13 | 109.50 | 8.42 |
| April 2016 | 12 | 12 | 113.00 | 9.42 |
| May 2016 | 12 | 10 | 96.00 | 9.60 |
| June 2016 | 15 | 15 | 143.00 | 9.53 |
| July 2016 | 14 | 14 | 134.30 | 9.59 |
| August 2016 | 21 | 18 | 133.90 | 7.44 |
| September 2016 | 16 | 11 | 100.70 | 9.15 |
| October 2016 | 13 | 14 | 144.90 | 10.35 |
| November 2016 | 17 | 14 | 145.60 | 10.40 |
| December 2016 | 20 | 22 | 167.70 | 7.62 |
| January 2017 | 7 | 6 | 50.50 | 8.42 |
| Totals: | 243 | 219 | 1,919.50 | 8.76 |

Data obtained through a query of the Digital AirWare System (DAW) for the period 07/15- 01/17.

**Note: Total flight hours used for this analysis include only completed DAW entries (i.e., 49.3 hrs. were excluded)*

Scope:

The scope of the audit will focus on administrative and procedural functions of the Aviation Division and related SAR posse (i.e., Air, D.A.R.E.S, H.E.R.T and Mountain). MCSO Policies and Procedures will be reviewed and the results documented in the final audit report.

General Objectives:

The primary objectives of this audit are to:

1. Determine current practices
2. Define best practices
3. Improve efficiencies
4. Develop a plan for standardization
5. Adjust Policies

Methodology:

- Conduct Interviews, Surveys and Site Visits
- Review and Analyze Collected Data
- Conduct Research
- Review Best Practices
- Determine Variance
- Communicate Findings

Findings and Recommendations

1. Aviation's Control over Critical Internal Documentation Have Been Weak.

The Aviation Division's Operations Manual (dated June 2012) has not been reviewed or revised during the last five years and is not in compliance with its own requirements. The first page of text (immediately following the signatory page) states: "This Operations Manual will be reviewed by the Division Commander, or his designee, on an annual basis and updated as needed".

There are many areas of the Operations Manual that do not reflect the Division's current status and is in dire need of review and revision. A few examples include:

- The signatory page identifies the physical address for the Fixed Wing Hangar as Glendale, AZ, although our aircraft have been housed at the Deer Valley Airport for approx. 18 months.
- The organizational chart on Page 11 is no longer current and indicates more positions than are currently allocated to the Division (i.e., 20 positions in 2012 versus the 17 positions currently employed).
- The Manual's reporting and documentation requirements (see pages 12-13) do not accurately reflect the current repository for many of these items (i.e., now part of Blue Team entries and/or included in the Digital AirWare Software System).
- The Equipment Inspections Section 403 (see page 46) incorrectly lists three rotorcraft that have not been a part of ASD for years, including: FOX 3 & 4 (Bell Model OH-58C obtained through the Dept. of Defense) and Fox 5 (a Hughes/Schweitzer model 269A/TH-55A).

While these inaccuracies in documentation may initially appear to be a non-critical matter, compliance with procedural issues is a critical matter in the aviation field, a high-risk area where safety is dependent on documentation, as illustrated below:

One example of an aviation documentation and accountability failure resulted in fatalities several years ago when a Police helicopter crashed and killed four on board. The National Transportation and Safety board (NTSB) cited "inadequate management oversight" as a contributing cause. The accident sequence began with an in-flight loss of engine power that the NTSB attributed to fuel contamination, and the emergency autorotation resulted in a fatal crash. The investigation found that there were "no training programs in place, no standard operating procedures, and the agency's fuel storage tanks had not been serviced in 14 years – all management issues" (Shinnamon, Winter 2003-4).

Another example which illustrates the importance of aviation documentation was voiced in an audit of the Maryland State Police Department which came as a result of a medical evacuation mission which ended in a crash claiming four lives. The audit found that the state police lacked reliable data systems to track maintenance requirements and that the unit had high employee turnover. The audit found that "certain tasks were not performed because inspection procedures were not updated in accordance with" FAA and Eurocopter directives (Washington Post, 2008).

Recommendation: Aviation Service’s Internal Controls Over Documentation Must Be Remedied and Continue to Show Improvement Over Time.

- 1A). It is recommended that the MCSO develop a system-wide “Transition Policy” which requires all Command staff to verify that Policies, Procedures and any other documents are current and in compliance prior to accepting a new command post. It is the responsibility of existing Command Staff to support the new Command staff by identifying all critical tasks and developing checklists with timelines to ensure the success of new command staff, and ultimately the success of the Sheriff’s Office, during the next rotation.
- 1B). Current Aviation Command staff must prioritize the review and revision of the 2012 Operations Manual and submit the corrected copy to senior management for approval and authorizing signature. Note: Command staff project the completion of the revised the Policy by September of 2017.

2. Frequent Changes in Management Reduces Accountability Over Time and May Increase Safety Risks.

Based on a review of the original Operations Manual, it appears that a Safety Management System which was in alignment with ALEA standards was in the process of being developed when the Manual was approved in 2012. However, it appears that with each succession of Aviation Command staff that followed, the focus on Safety Management as a priority and means to mission accomplishment, was lost.

A factor common to many law enforcement agencies is that staff transition through positions fairly quickly. While these promotional moves generate growth opportunities for many Deputies, these changes can also be debilitating for a Division requiring specialized expertise, such as Aviation. Typically, the experienced command staff takes their hard-earned knowledge and experience with them, leaving a significant learning curve for the new staff to negotiate on the job with each transfer “diluting” the knowledge base further and potentially reducing accountability over time.

Here at the MCSO, the aviation command assignment has lasted less than 2 years for 80% (or 4/5) of the Commanders, as shown below:

ASD Leadership Turnover: 2012-2016

| <u>Rank:</u> | <u>Period at ASD:</u> | <u>Duration of Term:</u> |
|---------------------|------------------------------|---------------------------------|
| Captain | 02/06/12 to 09/01/13 | 20 mos. |
| Lt. | 12/15/08 to 09/14/14 | 69 mos. |
| Captain | 08/31/15 to 09/09/16 | 13 mos. |
| Lt. | 09/15/14 to 05/22/16 | 21 mos. |
| Lt. | 08/29/16 to Present (11/16) | 3 mos. |

Because “nothing in the traditional police/government career prepares someone to manage an aviation operation” (with the exception of a pilot’s license or other relative experience) it is critical to bring the new Commander “up to speed” through an accredited training program that stresses aviation safety (Shinnamon, Winter 2003-4).

The Sheriff’s office has a responsibility to support each new Aviation Commander and to provide any specialized training which may be required to ensure the safety of all aviation staff, the general public, as well as the reputation of our Agency (Shinnamon, winter 2003-4).

Recommendation: Newly assigned, inexperienced Aviation Command staff should automatically be enrolled in accredited coursework to obtain the background needed for this position.

- 2A). There are many options for obtaining the knowledge base needed to manage an aviation division. Some examples include the Airborne Law Enforcement Association (ALEA) annual conference which offers a 24-hour course for Aviation Unit Managers, or the GSA's Federal Aviation Safety Officer Certificate Program, and accredited University flight program, etc.
- 2B). Command assignments requiring the attainment of a specialized knowledge base (such as Aviation) should be retained for a minimum assignment of three years (or longer), as required to provide the best value for both the Division and the Sheriff's Office.

3. The Aviation Services Division Lacks a Formal Safety Management System (SMS) and Requires Personnel Specifically Dedicated to Managing the Safety System.

The Aviation Service's Operations Manual dated 06/06/12 (see Section 208) states "The Division Commander will appoint a Safety Coordinator responsible, in addition to his other duties, for reviewing safety procedures and practices, and to issue recommendations to the Supervisors of the Division". In addition, the Manual defines the responsibilities of the Safety Coordinator, as follows:

- A. Serve as the central collection point and dissemination for all safety concerns, information, and training to include in the continued development & support of a Safety Management System.
- B. Provide updates on current concerns or safety practices in the aviation industry.
- C. Schedule and implement quarterly safety training & ensuring personnel sign a roster acknowledging the review of information provided.
- D. Coordinate the Aviation Service Divisions' Safety Committee.
- E. Participate in safety seminars, surveys and programs.

In discussion with the current Commander of ASD, it was discovered that the Safety Coordinator position has been "farmed out" to multiple personnel, with the Chief Pilot providing safety training and oversight over the pilots, while another pilot is responsible for the Tactical Flight Officer (TFO) staff, and the Maintenance Director is responsible for the mechanical staff. He also pointed out that his staff decreased in several critical areas, which resulted in him also assuming the primary responsibility for the Safety Coordinator position. It is not an ideal situation for the Commander to manage both the business operations of the Division and the entire Safety Program simultaneously – doing so dilutes accountability for both tasks.

An aviation safety article written for Police Managers deftly identifies several common obstacles to improving an Agency's safety culture: First, departmental statistics which identify the number of flight hours without an accident provide a false sense of security, as "We haven't had an accident – YET." Second, voluntary initiatives must compete for limited budgetary dollars and man hours. Third, aviation is such a specialized area that managers do not even know what questions to ask. Fourth, false claims of safety issues can result in legitimate problems being overlooked. And finally:

"Aircraft Accidents are the Second Leading Cause of Accidental Death of Law Enforcement Officers."
(Shinnamon, Winter 2003-4).

A benchmarking survey was completed for the purposes of this audit and included every law enforcement aviation division in Arizona, and also three of the larger Agency's located out of State (i.e., Las Vegas Metro Police, the Los Angeles Sheriff's Department and the San Bernardino Sheriff's Office). The chart below identifies previous aircraft fatalities and the current safety culture of each Agency. In summary:

- Fatalities were evenly split by type of flight, with 50% occurring on fixed wing and 50% on rotor
- Fixed wing flight fatalities were more common in the earlier years (i.e., 1928-73) while rotorcraft fatalities are much more prevalent today (i.e., 1968-2008).

Benchmarking Survey: Aviation Fatalities and Current Safety Structure

| Responding Agency: | Fallen Officers / EOW | Rotor Craft Fatalities | Fixed Wing Fatalities | Total Fatalities: | Q #13. Dedicated Safety Officer? |
|--|---|---------------------------------------|--------------------------------------|------------------------------|---|
| AZ DPS | Bruce Harrole, 10/13/08 Thomas McNeff, 10/02/83 Richard Stratman, 10/02/83 | 3 | 0 | 3 | Yes, Safety Officer repts. to Comm., has 12 member council. |
| Las Vegas Metro Police: | None | 0 | 0 | 0 | Yes |
| Los Angeles Sheriffs Dept | James McSweeney, 10/24/88 Roy Chester, 10/24/88 Gary McCullah, 09/30/68 Robert Schnur, 09/30/68 Vernon Corbell, 10/15/57 Raymond Willis, 04/15/57 Frank DeWar, 10/29/32 | 4 | 3 | 7 | Yes, position has dual roles, as a flight Sgt & "Safety & Training" Officer |
| MCSO Aviation Services: | Gerald Barnes, 10/05/57 | 0 | 1 | 1 | No |
| Mesa Police Dept. | None | | | | Yes |
| Mohave County Sheriff's Office | Frank Howard, 11/08/73 Lloyd Heilman, 11/08/73 | 0 | 2 | 2 | No |
| Phoenix Police Dept: | None | 0 | 0 | 0 | Two Safety Officers, 1 for Rotor & 1 for FW |
| Pima County Sheriffs Office: | Clifford Nelson, 10/23/28 | 0 | 1 | 1 | Yes, Safety Officer is also a pilot |
| Pinal County Sheriffs Office: | Melvin Morgan, 02/25/73 | 0 | 1 | 1 | Yes |
| San Bernadino County Sheriffs Dept. | Donald DeMeulle, 07/31/1986 | 1 | 0 | 1 | Yes, organization also has 10 staff dedicated to safety |
| Tucson Police Department: | None | 0 | 0 | 0 | Yes, is also a sworn pilot. |
| | Total: | 8 | 8 | 16 | |

Law enforcement aircraft fatality data was retrieved from the Officer Down Memorial, at: <https://www.odmp.org/>

With the exception of MCSO and Mohave County, every agency which has experienced an aviation tragedy has committed to putting a safety program in place. In addition, the majority have established a dedicated Safety Officer position and already subscribe to the Safety Management System model. It should be noted that the AZ Department of Public Safety is the only Agency currently working towards achieving safety accreditation through the Airborne Law Enforcement Accreditation Commission (ALEAC).

The Airborne Law Enforcement Accreditation Commission (ALEAC) dba the Public Safety Aviation Accreditation Commission (PSAAC) has developed Standards which define best practices in law enforcement aviation. The Safety Standards (see section 03.01 through 03.02.05) specify that:

- The Aviation Commander defines the Unit's Safety Policy and conveys its expectations to all unit personnel. The Commander's leadership sets the tone for the Aviation Unit and he must demonstrate that the Safety Policy will be supported by management. Accordingly, the Commander must develop measurable safety objectives which all unit personnel will be held accountable for achieving, and will be updated quarterly. The Commander shall appoint a Safety Officer.
- The Aviation Safety Officer (ASO) is responsible for managing, monitoring & coordinating the Safety Program (aka Safety Management System, or SMS) throughout the unit. The ASO shall:
 1. Successfully complete a formal SMS training course.
 2. Report directly to the Aviation Commander
 3. Manage the SMS for the Aviation Commander
 4. Facilitate Safety Committee Meetings
 5. Manage the Hazard Reporting Program (HRP)
 6. Coordinate safety training for the unit
 7. Identify and evaluate safety problem areas
 8. Review OSHA notices and disseminate information
 9. Provide technical safety guidance in unit operations and training
 10. Periodic review of hazards listed on hazard board
 11. Conduct periodic safety inspections
 12. Conduct periodic safety meetings and briefings
 13. Review unit incident & accident reports for the purpose of accident prevention
 14. Assist management in formulating safe operating practices & policies
 15. Develop risk control/intervention based on SMS process
 16. Work with Training Officer to develop training consistent with risk control measures

Note: Because the ASO "must have the credibility, skills, knowledge, training and experience to effectively manage the aviation unit's SMS" this position is often held by a licensed pilot.
- Appoint a Safety Committee- The Safety Committee consists of representatives from Management, the Safety Officer, Pilots, TFO's, Training, Maintenance and any other staff, as needed. The Committee will have responsibility for the identification & correction of hazards, review of procedures relative to occupational injuries, review of accident/injury reports and issuing recommendations, and any other duties assigned by Management. In addition, the Committee must hold quarterly safety meetings, utilize a written agenda and keep minutes of all meetings.

As shown above, aviation safety is a critical function in which *every staff member must be held accountable*. Accordingly, Aviation's organizational chart must be reviewed and adjusted to accommodate the addition of a dedicated Safety Officer, whose function is to provide oversight and ensure the effectiveness of the safety program.

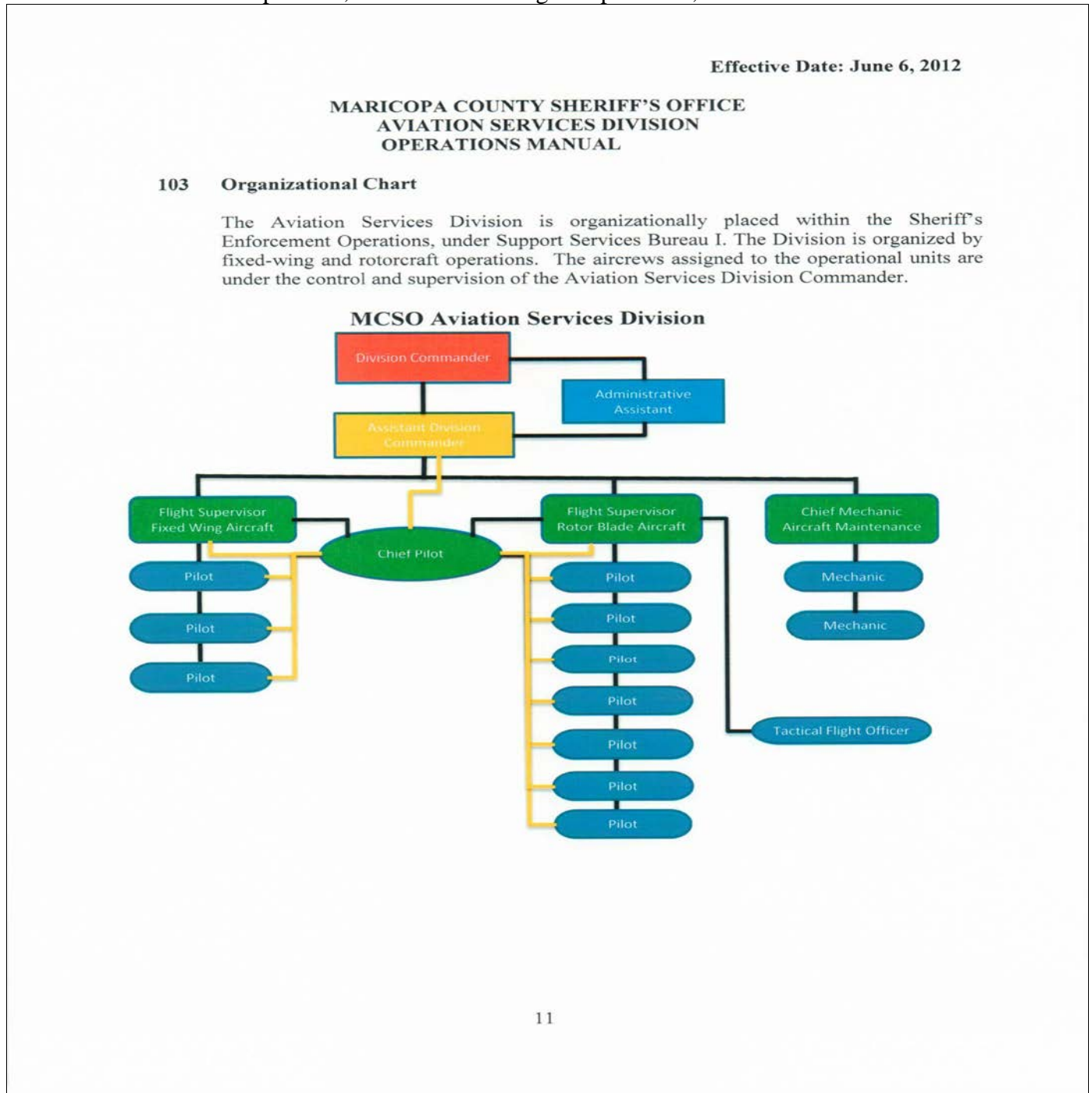
Recommendation: Aviation should implement a cohesive Safety Management System and add a Safety Officer position, in accordance with best practices established by ALEAC/PSAAC.

- 3a). Aviation should review the current organizational chart and adjust the reporting structure to accommodate a dedicated Safety Officer position which reports directly to the Commander.

- 3b). Aviation should appoint designated personnel from within the Division to serve on the Safety Committee.
- 3c). Aviation should seek Safety Accreditation through ALEAC as a long-term performance goal.

4. Aviation Services Span of Control is Large and the Sergeant’s Position is Vacant.

The 2012 Operations Manual also includes an organizational chart that identifies a total of 20 staff, including an Assistant Commander position, and two sworn Flight Supervisors, as illustrated here:



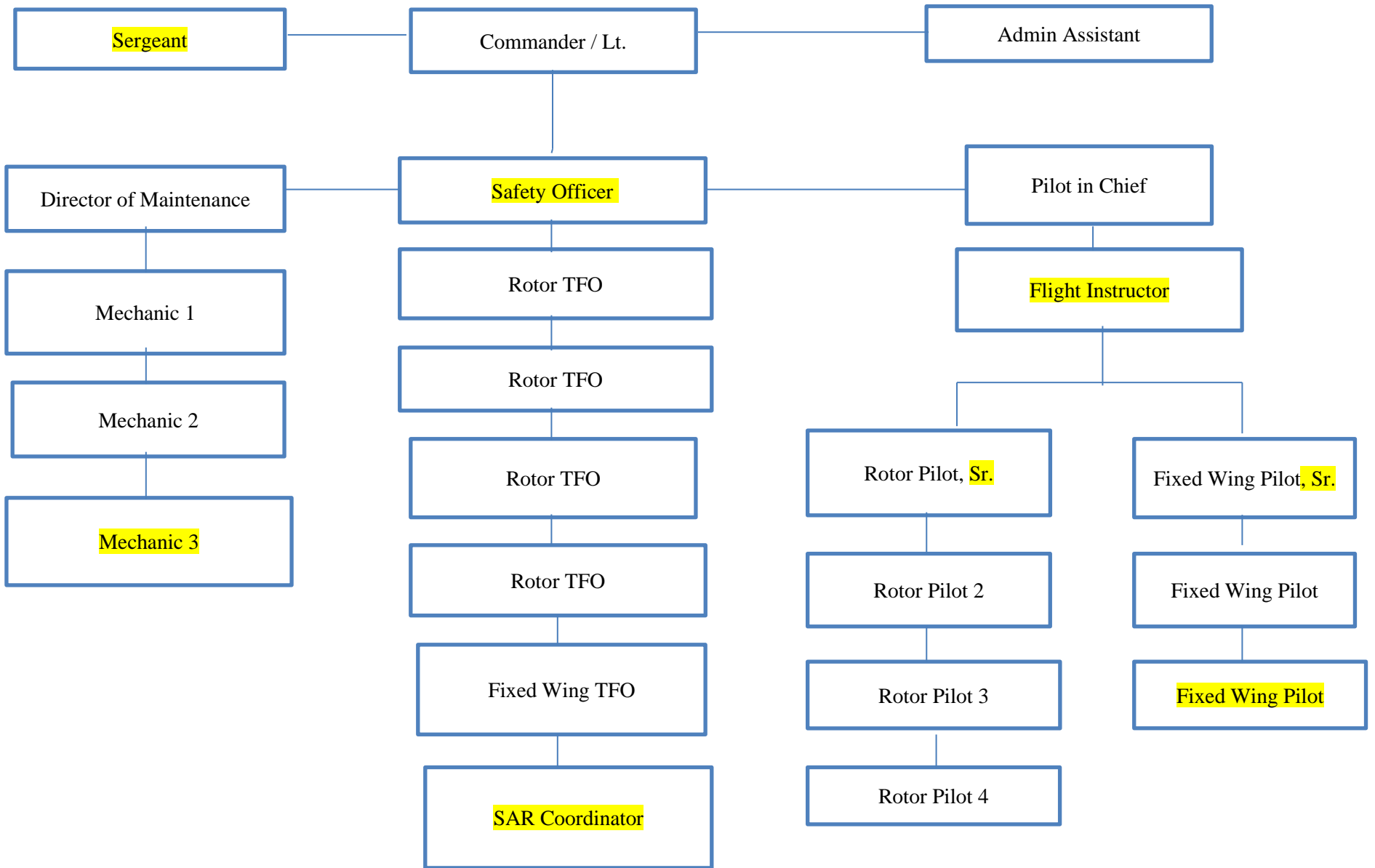
In the five-year interim since the first version of ASD's Operations Manual, the Division's reporting structure has changed drastically. Most notably, the Commander position has changed from a Captain's to a Lieutenant's rank, the Asst. Commander's position has remained vacant, and the two Sworn Flight Supervisor's positions have not been filled. The volume of pilots has decreased and the volume of Tactical Flight Officers has increased proportionately, as shown below:

ASD Organizational Changes

| Org Chart - June 2012 | | Org Chart - March 2017 | | Variance (+/-): |
|-------------------------|--------------|---------------------------------|--------------|-----------------|
| Position Description | Staff Volume | Position Description | Staff Volume | Current Status: |
| Commander - Capt | 1 | Commander - Lt. | 1 | 0 |
| Asst. Commander - Lt. | 1 | <i>Asst. Commander - Vacant</i> | 0 | -1 |
| Admin. Asst. - Civ. | 1 | Admin. Asst - Civ. | 1 | 0 |
| Chief Pilot - Sworn | 1 | Chief Pilot - Sworn | 1 | 0 |
| Rotor Flight Sup - Sgt. | 1 | <i>Rotor Flight Sup - Sgt.</i> | 0 | -1 |
| Rotor Pilots | 7 | Rotor Pilots | 4 | -3 |
| Rotor TFO's | 1 | Rotor TFO's | 4 | 3 |
| FW Flight Sup. - Sgt. | 1 | <i>FW Flight Sup. - Sgt.</i> | 0 | -1 |
| FW Pilots | 3 | FW Pilots | 2 | -1 |
| FW TFO's | 0 | FW TFO's | 1 | 1 |
| Chief Mechanic - Civ. | 1 | Chief Mechanic - Civ. | 1 | 0 |
| Mechanics - Civ. | 2 | Mechanics - Civ. | 2 | 0 |
| Total: | 20 | Total: | 17 | -3 |

Recommendation: It is recommended that Management re-evaluate the organizational structure of the Aviation Services Divisions and add personnel as needed to meet the additional administrative duties (which have increased since 2014) and to also address the need for additional supervisory support of MCSO's fixed wing and rotor fleets.

- 4a). The former Assistant Commander position should be filled with a Sergeant to provide managerial assistance commensurate with the increase in administrative tasks.
- 4b). The Fixed Wing and Rotor Flight Supervisor positions formerly held by Sergeants should be revised to accommodate a senior pilot in each Division, based on merit (either of sworn or civilian status).



Note: Areas highlighted in yellow are not presently allocated positions.

5. The Sheriff’s Office Provides Air Rescue Services but MCSO’s Rotor Craft Are Not Ideally Configured to Accommodate these Initiatives.

The Arizona Revised Statutes defines the powers and duties of the Sheriff’s Office under Section 11-441 parts C and D (Reference Title 11, Chapter Three, Article Two) which state:

“The Sheriff **shall** conduct or coordinate within the county search or rescue operations involving the life or health of any person, or may assist in such operation in another county at the request of that County’s Sheriff, and may request assistance from any persons or agencies in the fulfillment of duties under this subsection” and “The Sheriff, in the execution of the duties prescribed in this section, may request the aid of volunteer posse and reserve organizations located in the County”.

The ASD Operations Manual states (Reference Section 303, Mission Priorities, Part 2 A) that “air support calls are to be prioritized in order of importance” with the “*search and rescue of innocent victims*” taking precedence over all other types of calls.

The benchmarking survey completed for the purposes of this audit inquired about the total flight hours and types of missions flown by each agency during 2016. In summary:

- MCSO completed almost half as many SAR missions within the county as DPS completed state-wide
- MCSO completed more extradition missions than any of the other respondents.

Benchmarking Survey: Overview of 2016 Flight Activities

| <u>Responding Agency:</u> | <u>11. Annual Flt. Hrs (FW & Rotor)</u> | <u>11. # of SAR Missions (rotor asst.)</u> | <u>11. # of FW Extradition Missions</u> |
|--|---|--|---|
| AZ DPS: | 5,200 hours (2,665 missions) | 491 | 10 |
| Las Vegas Metro Police: | over 4,000 hrs | 150 | 0 |
| Los Angeles Sheriffs Dept: | Not provided | 546 | 2 |
| MCSO Aviation Services: | 4,135 hrs | 234 | 219 |
| Mesa Police Dept: | 2,497 hrs | 0 | 0 |
| Mohave County Sheriff's Office | 340 hrs | 0 | 165 |
| Phoenix Police Dept: | 3,871 rotor & 1K Fixed Wing | 84 | 0 |
| Pima County Sheriffs Office: | 1,512 Flt. Hrs. | 81 | 10 |
| Pinal County Sheriffs Office: | 401 hrs | 29 | 0 |
| San Bernadino County Sheriffs Dept: | 4,481 hrs | 247 | 0 |
| Tucson Police Department: | 1,446 hrs | 0 | 0 |

ASD's Search and Rescue fleet consists of two, four-blade, single-engine Bell 407 helicopters, commonly recognized as "light" helicopters. This model can be configured internally to meet the demands of either corporate, law enforcement or air ambulance use. While the Bell 407 is a very versatile aircraft for law enforcement and patrol operations, there are some drawbacks to using this particular model for Search and Rescue missions:

- MCSO helicopter Fox 1 (manufactured in 1997) and Fox II (manufactured in 2014) were both configured with the passenger style seating option instead of the air ambulance configuration. As a result, any injured SAR victims must be strapped cross-wise onto the bench seat with their head and feet resting against the body of the aircraft (rather than loaded into the center, length-wise, similar to a ground transport ambulance). With direct physical access limited to only the "open side" of the bench seat, the provision of medical support may be hampered and victim outcomes compromised.
- MCSO's rotor fleet are equipped to conduct SAR victim extractions by means of either a short-haul line (with cables of up to 100 feet in length) or by means of long-haul (with cables up to 200 ft. in length). During these types of rescue missions, a Deputy must be lowered from the hovering rotor craft by a suspended basket to the victim's location. Next, the Deputy must provide whatever immediate medical assistance required, load the injured person into the basket, secure them in place and prepare the victim for lift-off, unattended (our aircraft is only rated to hoist a total of 300 lbs.). The hovering rotor craft lifts the injured party, dangling in the air outside of the aircraft, to a safe, flat location for further medical assistance and final transport via ground ambulance. This external loading maneuver puts both the Deputy and the civilian at potential risk for additional injury or fatality and the County for at risk for any associated legal liability. To reduce such liabilities, SAR rotor craft can be equipped with a winching system which would allow both the Deputy and the civilian to be simultaneously air-lifted directly into the interior of the aircraft for safe transport to the final destination without any additional delay or need for ground transport. Our ASD does not have internal winching capabilities in either of their rotor craft.
- MCSO's rotor fleet consists of two aircraft of the same make and model which share the same strengths and weaknesses and therefore define how we carry out our flight missions. For example, our older model Fox I has a "useful load" of 1,739 lbs., and our newer Fox II has a useful load of 1,832 lbs. This means that our aircraft can accommodate any combination of cargo, passengers or fuel which does not exceed the useful load limit. As a result, our pilots must carefully assess several factors prior to departing for any specific mission as the Bell 407's useful load size does not allow for much "wiggle room" in planning. For example, in the case of a SAR mission, the pre-flight calculations must address:
 1. Fuel – the amount of fuel required for the specific destination. Although a gallon of jet fuel weighs approximately 6.8 lbs., the pilot must also consider the current temperatures (as fuel weight is dependent on the temperature), the number of miles to the destination and the altitude of the destination, as aircraft performance decreases in either very hot temperatures or very high altitudes.
 2. Cargo – the supplies and equipment required to meet the needs of the specific mission. The pilot must anticipate the equipment needed to accomplish the goal of the mission and must factor in the cumulative weight of a rescue basket, ropes/cables, medical supplies, etc.
 3. Passengers – the combined body weights of the pilot, TFO and EMT's must be considered in addition to the (yet unknown) weight of the victims.

Because the exact location of a victim may not initially be known, it is often necessary for a SAR mission to begin with an assessment flight, to a). define the exact location of the victims b). determine what type of rescue equipment and supplies will be required, and c). return to the hangar (or other location) to retrieve the specific supplies and personnel necessary to complete that particular mission.

In some cases, the mission may require multiple trips, or even require the pilot to burn-off fuel to lighten the aircraft to complete of the mission. Such delays in the provision of aid or extraction of the injured may mean the difference between life and death for the victims.

In addition to SAR missions, our rotor craft are also utilized in support of our first-responders status (per MCSO Policy GK-1, Organizational Structure of the Sheriff’s Office dated 10/30/98). For example, if a disturbance were to occur at the Palo Verde Nuclear Power Plant located in Tonopah (approximately 50 miles West of Phoenix), our Bell 407’s useful load capability would restrict our ability to provide a timely response due to the weight-limitations presented by our fully-gearred SWAT team members (i.e., only two to three members could be transported at one time and multiple trips would be required to insert the entire team). It should be noted that the ability to move quickly in an emergency situation is paramount to providing an effective outcome.

Another limitation with the Bell 407 is that they are under-powered for SAR work. This model’s hoist lift rate specifies that external loads are not to exceed a total combined weight of 300 lbs (including the weight of the basket), which limits rescue extractions to one person at a time, without Deputy assistance. In addition, while the Bell 407’s have great hovering ability under general conditions, altitude, temperature and wind will affect their ability to perform, making rescue a risky operation for the crew and victims. As a result, many law enforcement agencies and most air ambulance operations have upgraded their fleets to include the more powerful, two-engine helicopters which can easily handle higher useful loads, carry more fuel and provide winching capability regardless of weather conditions.

Provided below, are manufacturer’s information on the useful load per various model and type of helicopter. Due to the large volume of SAR missions conducted by MSO and our First-Responder status, it would be prudent to plan for the purchase of a larger, more powerful helicopter with a higher useful load rating.

Helicopter Make and Model Specifications: Useful Load Capacity

| <u>Rotor Craft Make/Model:</u> | <u>Engine:</u> | <u>Seating:</u> | <u>Maximum Cruise Speed:</u> | <u>Max Gross Weight</u> | <u>Useful Load/Lbs.:</u> | <u>Estimated Cost:</u> |
|--------------------------------|----------------|-----------------|------------------------------|-------------------------|--------------------------|------------------------|
| Airbus H-145 | Twin | 2 + 9 | 133 Knots | 7,903 | 3,990 | Unk |
| Airbus Super Puma AS332 | Twin | 19 | 140 Knots | 18,960 | 9,249 | \$15M |
| Augusta A109E | Twin | 1 + 7 | 150 Knots | 7,000 | 3,351 | Unk |
| Bell 212/Eagle Single | Twin/Single | 9 | 110 Knots | 11,200 | 5,210 | \$3.7M |
| Bell 407 | Single | 1 + 6 | 133 Knots | 5,250 | 2,308 | \$2.4M |
| Bell 412 | Twin | 1 + 14 | 140 Knots | 11,900 | 5,100 | \$8M |
| Bell 429 | Twin | 1 + 7 | 155 Knots | 7,000 | 2,535 | \$6M |

Note: Manufacturer specifications currently indicate that the Bell 407 helicopter has a useful load of 2,308. As cited previously, our 407’s useful loads are documented at 1,739 and 1,832 lbs.

Because we are utilizing aircraft which were configured outside of their intended scope, it is suggested that we consider trading in our older aircraft for a larger, more powerful aircraft, specifically suited for the purpose of SAR work.

Recommendation: A procurement plan should be developed for the purchase of one new helicopter specifically configured to provide safe and effective SAR missions and effectively deploy Deputies in accordance with our First-Responder status.

- 5a). Interior space of new helicopters must be configured specifically for SAR missions
- 5b). Helicopter must include winching capability and ability to hoist minimum of 600 lb. external load.
- 5c). Helicopter must be more powerful model with the ability to hover in hot/high/windy conditions, with a useful load capability in excess of 5,000 lbs.

6. Aviation’s FOX 1 Has Exceeded Conservative Lifespan Parameters and Should Be Replaced.

A performance audit of the Department of Public Safety’s Aviation Division was completed by the Office of the Auditor General in June of 2012 and determined that DPS’s air fleet included several aircraft which should be replaced. The audit included the formula used to calculate rotorcraft replacement based on feedback provided by the Federal Aviation Administration (FAA), and has also used for the purpose of this audit (as shown in chart, below).

The DPS standard states that helicopters should be replaced when the aircraft reaches 10 years of age, or surpasses 10,000 flight hours, whichever one comes first. In addition, the type of flight hours should be considered, as those missions which require frequent landings (such as a SAR mission) are much more demanding and will require replacement sooner.

Further clarification was requested on the decision-making process used for rotorcraft replacement. The FAA stated that they do not use a specific formula and the standard used by DPS is internal to their agency and is considered a “conservative” measurement. However, it is critical that all aircraft must be regularly serviced and maintained in accordance with all manufacturer directives and in compliance with all aviation regulations to be considered airworthy.

Our FOX 1 has exceeded both “conservative” parameters and therefore should be the first to be considered for replacement, as illustrated here:

Replacement Indicators for ASD Rotor craft (per DAW System) as of 04/13/17:

| <u>Aircraft Call Sign:</u> | <u>Make/Model:</u> | <u>Mfg. Date:</u> | <u>Age</u> | <u>Registration:</u> | <u>SN:</u> | <u>Flight Hours</u> | <u>Landings:</u> |
|----------------------------|--------------------|-------------------|------------|----------------------|------------|---------------------|------------------|
| Rotor Craft - Fox 1 | Bell 407 | Nov. 1997 | 20 | N905MC | 53214 | 10,460 | 22,849 |
| Rotor Craft - Fox 2 | Bell 407 | Aug. 2014 | 2.5 | N977MS | 54519 | 1,749 | 3,407 |

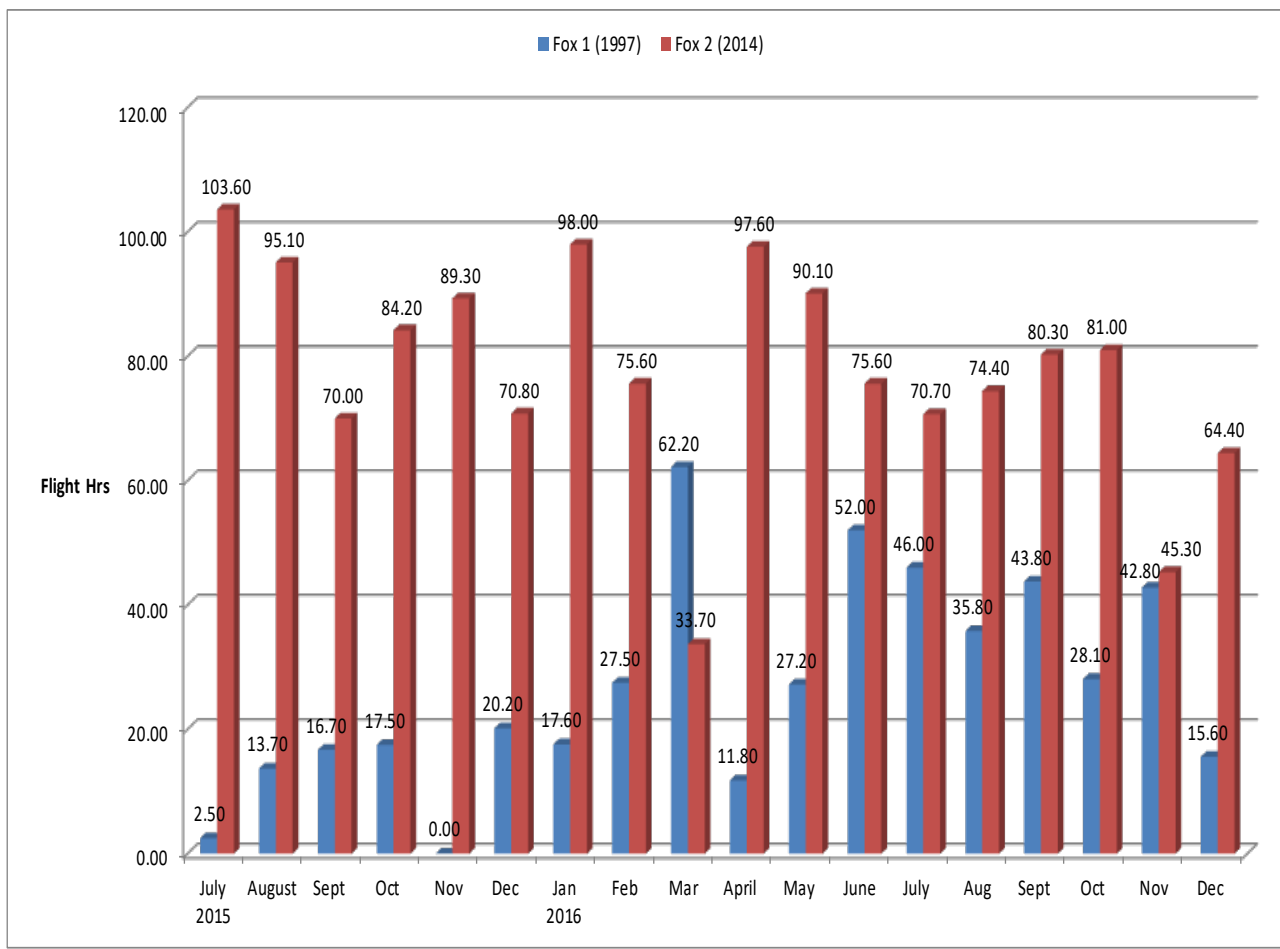
Reference: AZ Auditor General’s Report (2000, June). Performance Audit: The Department of Public Safety Aviation Section. Report # 00-7.

Of our two rotor craft, the newer FOX 2 (Bell 407GX, with Garmin Flight Instrumentation) is utilized the most due to its advanced avionics system and the addition of FLIR technology (Star Safire, 380-HDc) which provides high definition thermal imaging and digital camera recording capability. As a result, FOX 1 is utilized more frequently as a back-up aircraft, as indicated in the chart, on the following page.

With the exception of March 2016, FOX 2 has flown an average of approximately of 51 more hours per month than FOX 1 (or, a total of 918 more flight hours during this period). In summary:

- **74.42%** of all rotor flight hours are flown in FOX 2, while only
- **25.58%** of all rotor flight hours are flown in FOX 1.

Annual Flight Hours, Fox 1 Vs. Fox 2 (07/15 – 12/16):



The recently completed Benchmarking Survey included an inquiry regarding each respondent’s air fleet and the means used to procure their aircraft. Of the eleven respondents, only 36% (or 4/11) were completely self-funded: the Los Angeles Sheriff’s Department, the Mesa Police Department, the Mohave County Sheriff’s Office and the Tucson Police Department.

The majority of Law Enforcement Organizations queried utilized a combination of funding sources to procure their air fleets, including: the Department of Defense’s Federal Surplus 1033 Program, the Department of Homeland Security’s Stone Garden Grant Program, RICO Funding, an AZ Dept. of Transportation Agreement, Capital Improvement Bonds, Insurance, Legislative Approvals, etc.

The chart below lists each respondent's air fleet details, as provided by the responding agency:

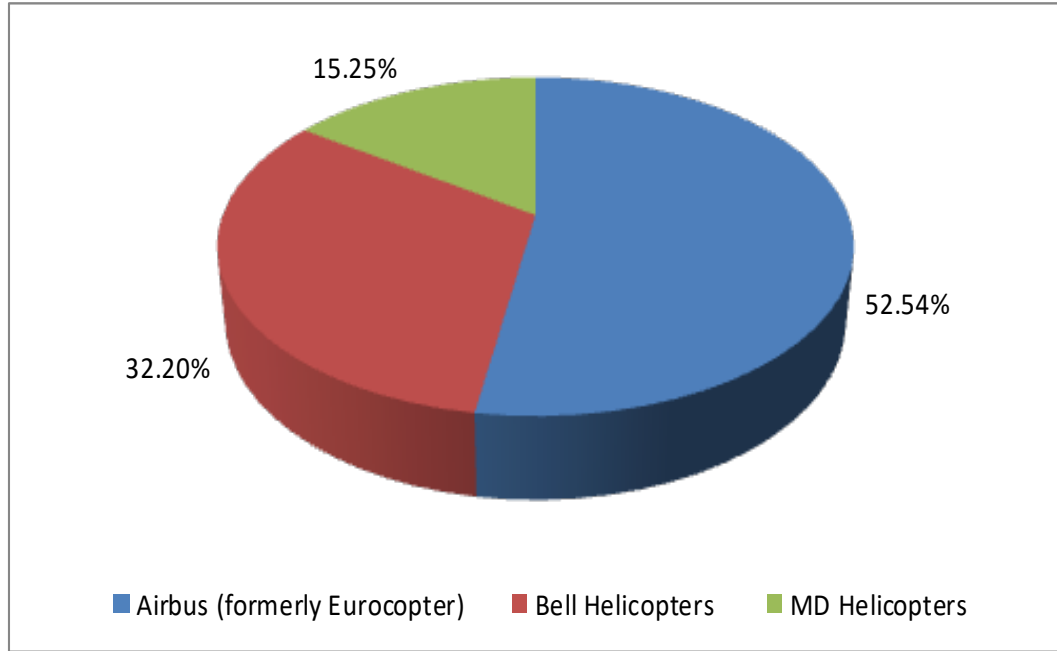
2017 Benchmarking Survey: Respondents Current Air fleet

| <u>Responding Agency:</u> | <u># of Rotors</u> | <u>Make / Model</u> | <u># of Fixed Wing</u> | <u>Make / Model</u> |
|--|--------------------|---|------------------------|---|
| AZ DPS: | 5 | Bell 407: (5)1998, 99, 04, 05, 06. (1) New Bell 429 Twin Engine in 2017 | 9 | King Air: (5) 1988, (3) 2007, (1) 2014, Sky Truck: (2) 2014, Aero Command (1) '77, Cessna: (1) 1980 |
| Las Vegas Metro Police: | 6 | MD 530 FF: (3) Bell HH-1H: (2) New Twin Airbus H-145 (1) Arriving May 2017 | 0 | none |
| Los Angeles Sheriffs Dept: | 18 | Airbus Astar: (15) 2012, Super Puma Twins: (3) 2004 | 3 | Cessna C210: (2) 1978 and 1982 Super King Air: (1) 1990 |
| MCSO Aviation Services: | 2 | Bell 407: (1) 1997 Bell 407GX: (1) 2014 | 2 | Cessna 206: (1) 1977 Cessna T206: (1) 2014 |
| Mesa Police Dept. | 3 | MD 500 E: (2) 1998, 2001 MD 530F: (1) 2015. | 2 | Cessna 172N: (1) 1978 Cessna 210N: (1) 1981 |
| Mohave County Sheriff's Office | 0 | not applicable | 2 | Cessna T210L: (1) 1976 Cessna T210M: (1) 1998 |
| Phoenix Police Dept: | 6 | Eurocopter Airbus: (5) 2002-2009 Augusta Twin W/Hoist: (1) 2006 | 4 | Cessna 172, 182 & 210: (3)19 81, '79, '86 Pilatus Spectre: (1) 2006 |
| Pima County Sheriffs Office: | 1 | Airbus AS350b3e: (1) 2011 | 3 | Cessna T206: (2) 1999 Cessna 310R: (1) 1977 |
| Pinal County Sheriffs Office: | 4 | MD 600N: (1) 1997 Bell UH-IV: (1) 1973 Bell OH-58: (1) 1973 Hughes OH-6A: (1) 1969 | 2 | Cessna T206H: (1) 2007 Piper Supercub: (1) 1976 |
| San Bernadino County Sheriffs Dept: | 10 | Airbus 350B3: (6) each Bell UH-1H: (2) Bell 212: (1) MD500: (1) | 5 | King Air: (2) each Twin Commander: (1) Airvan: (1) Cessna 207: (1) |
| Tucson Police Department: | 3 | Bell 206 B3: (1) 1999, (2) 2005 | 0 | None |

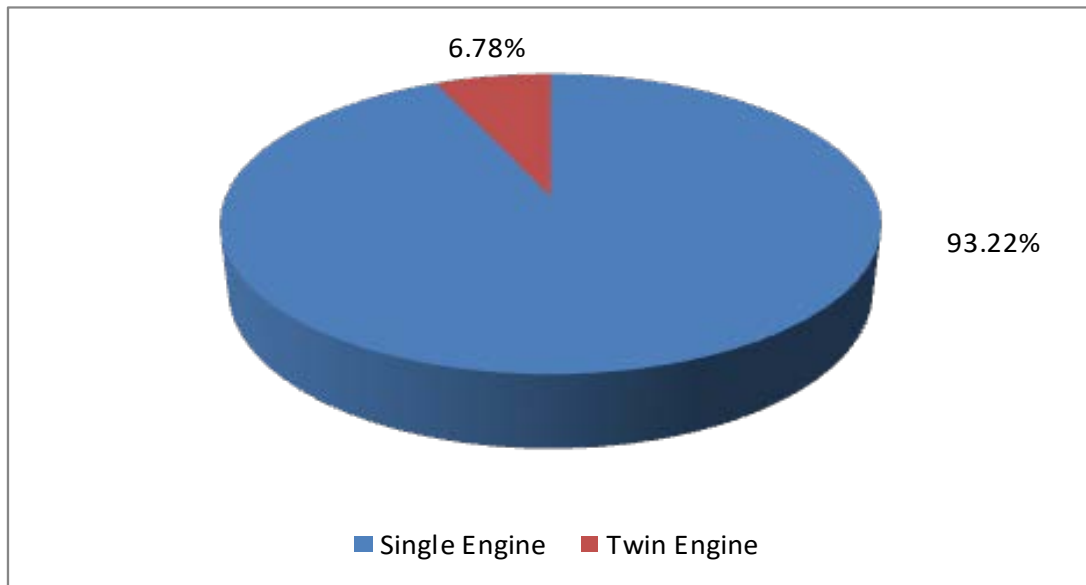
Respondents Utilizing Twin Engine Rotorcraft for Search and Rescue

| <u>Responding Agency:</u> | <u># of Twin Engine Rotors in Fleet</u> | <u>11. # of SAR Missions</u> |
|-----------------------------------|---|------------------------------|
| Los Angeles Sheriffs Dept: | 3 | 546 |
| AZ DPS: | 1 | 491 |
| MCSO ASD | 0 | 234 |
| Las Vegas Metro Police: | 1 | 150 |
| Phoenix Police Dept: | 1 | 84 |

Respondent Rotor Fleet, by Manufacturer



Respondent Rotor Craft, by Engine Type



Reference: www.bellhelicopter.com and www.helinews.com

A cradle to grave procurement plan is needed to develop “set aside” funding on an annual basis to prepare for eventual replacement costs of our existing aircraft. The plan must also include a disposal timeline which optimizes the value of aged aircraft before they become obsolete. In addition, there are many specialized law enforcement grants, such as the Department of Defense 1033 Program and the Dept. of Homeland Security’s Stone Garden Grant and other funding sources including RICO, Improvement Bonds, Asset Forfeiture, etc. that should be pursued as a means to relieve the financial burden on behalf of our Agency.

Recommendation: Aviation Services must seek to develop a “Cradle to Grave” procurement plan for its air fleet and explore funding opportunities.

- 6A). Due to the need for a more powerful aircraft for SAR missions, FOX 1 should be considered for a trade-in towards a SAR- specific aircraft.
- 6B). Based on the 10-year/10,000-hour guideline for replacement, budgetary dollars will need to be set aside annually in preparation for FOX 2’s eventual replacement, which is estimated to occur on or around the year 2024/2025 (assuming the 700 flight hours per year average remains steady).
- 6C). ASD should research alternate funding sources now for current and future aircraft needs.

7. Aviation Service Extraditions and prisoner intakes have increased significantly and appear to be increasing over time.

The Sheriff’s Office Has Been Mandated by Law to Provide Extradition Services, as defined in the Arizona Revised Statutes under Title 11 (reference ARS 11-441) which states:

“The Sheriff **shall** arrest and take before the nearest magistrate for examination all persons who attempt to commit or who have committed a public offense.”

Other AZ Law Enforcement Agencies also conduct extradition missions, however, the Maricopa County Sheriff’s Office has extradited more prisoners than any other AZ Agency, as documented below:

Benchmarking Survey Respondents: 2016 Extradition Trips

| Responding Agency: | Extradition Missions |
|---------------------------------------|-----------------------------|
| MCSO Aviation Services: | 219 |
| Mohave County Sheriff's Office | 165 |
| Pima County Sheriff's Office: | 10 |
| AZ DPS Aviation Unit: | 10 |

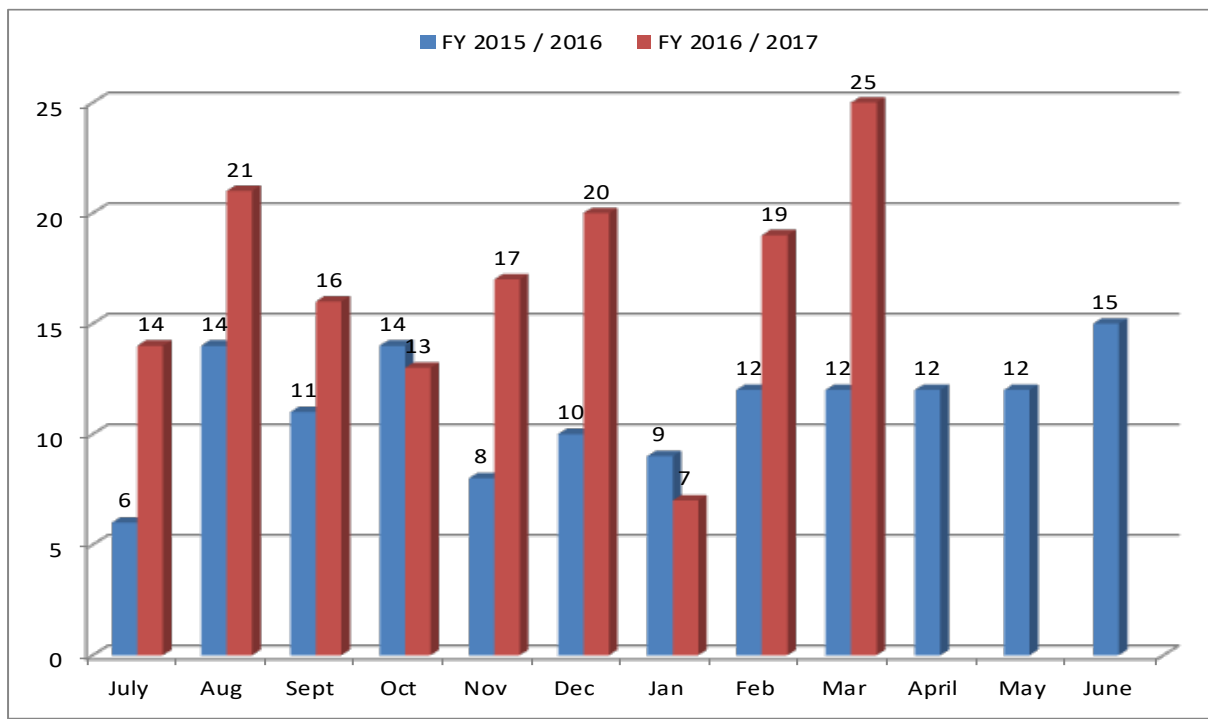
The MCSO Policy on the Organizational Structure of the Sheriff’s Office dated 10/30/98 (see Policy # GK-1, Section A, Number 1 on Page 13) references the Aviation Division and states in part:

“The fixed wing aircraft is also available for in-state prisoner transport, and the support of detectives and other office personnel in the performance of their official duties”

This statement is incorrect and misleading as Aviation Services extradites out-of- state prisoners, while our Detention Ground Transport Division has been providing all of our in-state extradition services (since approximately 2002).

A comparative analysis of Fiscal Year 2015/16 to Fiscal Year 2016/17 indicates that as of August 2016, prisoner intakes through fixed wing Extradition missions have increased significantly and appear to be increasing over time. The increase in the prisoner rate also correlates with a monthly increase in flight hours, indicating that our man hours are being more effectively utilized than in the past. This increase in productivity is illustrated below:

MCSO Prisoner Intakes Increase Significantly: FY 2016/17



Data obtained through a query of the Digital AirWare System (DAW) for the period July 2015 through March 2017. April, May and June Extradition data were not available at the time of this writing.

While the AZ Revised Statutes mandates the retrieval of prisoners as a County Sheriff responsibility under Title 11, it also provides for the recovery of extradition expenses under the Criminal Code, in Title 13 (reference ARS 13-3870.02):

“On conviction of the crime that caused a person to be extradited to this state, the state of political subdivision, either jointly or severally, may recover from the convicted person the actual expenses incurred by the extraditing agency.”

Recommendation: Aviation Services should maintain its increase in prisoner intakes in support of the Sheriff’s mandated responsibility to return fugitives to justice and should also pursue reimbursement for the provision of these services, as stated by law.

- 7a). Aviation Services should continue to maintain/exceed the current prisoner intakes as a performance measure which illustrates the value MCSO provides to our taxpayers.
- 7B). Aviation Services should pursue all reimbursements available to them, per the AZ Revised Statutes.
- 7C). The MCSO must correct Policy GK-1 to accurately reflect the extradition support provided by the Aviation Division.

8. Fixed Wing Fox 10 May Be Nearing End of Useful Life.

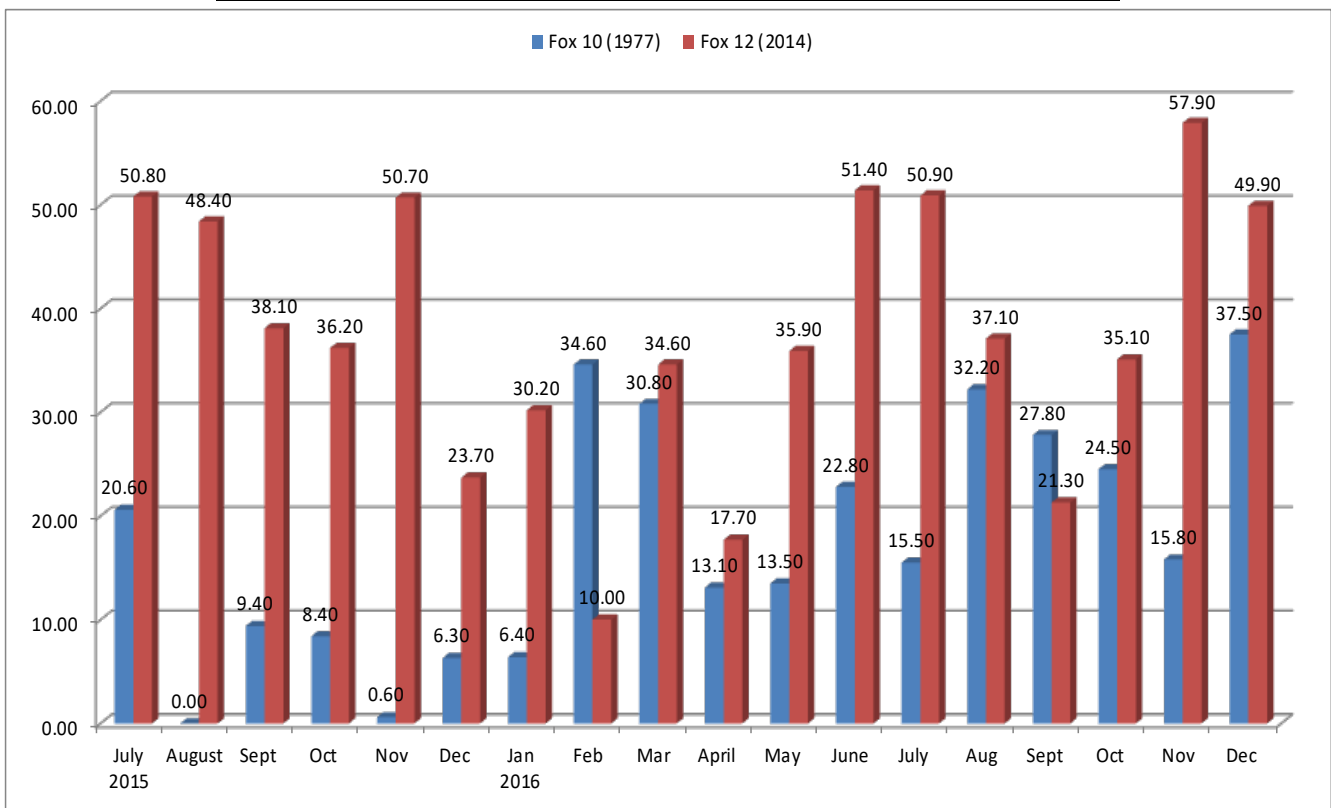
Aviation Services fixed wing fleet consists of two general purpose, single-engine aircraft manufactured by Cessna. These airplanes are considered “light” aircraft and are designed with six seats. As documented below, Fox 10 is 40 years old, while Fox 12 is only 2.5 years old:

ASD Fixed Wing Fleet (per DAW System), as of 04/13/17:

| <u>Aircraft Call Sign:</u> | <u>Make/Model:</u> | <u>Mfg. Date:</u> | <u>Age</u> | <u>Registration:</u> | <u>SN:</u> | <u>Flight Hours</u> | <u>Landings:</u> |
|----------------------------|--------------------|-------------------|------------|----------------------|------------|---------------------|------------------|
| Fixed Wing - Fox 10 | Cessna 206 | Nov. 1977 | 40 | N756HQ | U20604107 | 10,503 | 704 |
| Fixed Wing - Fox 12 | Cessna T206H | Dec. 2014 | 2.5 | N1423W | T20609150 | 1,087 | 606 |

With the exception of February and September of 2016, Fox 12 was flown an average of approximately 20 more hours per month than FOX 10 (or, a total of 360 more flight hours during this period). In August of 2015, FOX 10 was not flown at all, and in November of 2015, Fox 10 was flown for less than one hour, as illustrated below:

Annual Fixed Wing Flight Hrs., Fox 10 vs. Fox 12 (07/15 – 12/16):



- **68.01%** of all fixed wing flight hours were flown in FOX 12, while
- **31.99%** of all fixed wing flight hours were flown in FOX 10

Similar to our rotorcraft fleet, owning two of the same model airplane has drawbacks, such as maximum useful cargo load. The “tipping point” for this aircraft is its age and the law of “diminishing returns” to an engine’s life.

Recommendation: Aviation Services must complete an analysis of Fox 10’s repair expenditures versus active flight hours to find the cost per flight hour, as needed to plan for replacement or disposal.

8A). If the cost ratio to maintain this aircraft is higher than the value received by the County, it may be fiscally more prudent to either trade this aircraft in towards a new aircraft with a higher useful load and capacity to pick up additional prisoners per trip, or

8B). If there is no plan for replacement of this model of aircraft, then at a minimum, a plan must be developed for its eventual disposal/sale, prior to its depreciation as an asset.

9. Current performance measurements indicate that Aviation’s productivity levels have increased (and are above the national median) and an additional mechanic may be required to sustain this growth over time.

The Bureau of Justice Statistics produced a special report titled “Aviation Units in Large Law Enforcement Agencies” based on data from the 2007 Census of Law Enforcement Aviation Units (CLEAU). This report provides valuable aviation benchmarking data for State, Municipal and County Police and Sheriff Agencies on a nationwide basis. Included in the Report were performance measures which can be used to analyze productivity: a) the number of flight hours logged and b) the number of missions flown.

The MGT of America Staffing Study which was completed for the MCSO in 2012 also included a comparative analysis of our Aviation Services Division against the 2007 aviation census. At that time, the MGT consulting team concluded that Aviation Services was not as productive as they should be considering the number of available pilots on staff. Because the MGT Study is already more than five years old, and Aviation Services staffing levels have decreased during the interim, a review of current data is required.

The MGT Study’s finding on this issue was *“The cost of operations including personnel costs is rather high while fuel and maintenance costs are close to the national averages. In order to bring costs more in line with national averages and make this unit operate in a more efficient manner, flight hours need to be brought up or the number of pilots reduced.”*

The Study then makes the recommendation that the Division should *“increase the average number of flight hours based on need by improving maintenance so aircraft are ready when needed and missions do not have to be cancelled because equipment is in need of repair. As flight hours increase, a review of pilot hours should be conducted to ensure the appropriate number of pilots are assigned to the division.”*

MGT’s contention that Aviation had too many pilots per the number of flight hours provided back in 2012 provided has reversed itself in 2017: the volume of pilots have decreased by four (3 rotor/1fw) and flight hours increased by 659 hrs. , indicating that Aviation has become more cost-effective during the six year interim.

2007 Census of Law Enforcement Aviation Units Versus Current MCSO Aviation Data

| Aviation Performance Measures: | National Sheriff Agency Score | MCSO Score, per | MCSO Score, | MCSO Variance over |
|--|-------------------------------|-----------------------|------------------------|------------------------------------|
| | (2007 Median Value): | MGT Audit / 2011 CY | per 2016 CY | National Median Value |
| Annual Combined Flight Hrs (Rotor & FW) | 600 | 1345 | 2004 | + 1,404 |
| Annual Missions Flown | 500 | not avail. | 1640 | + 1,140 |
| Annual Helicopter Flight Hrs (per Rotor) | 360 | 959.5 | 1297 | + 937 combined, or + 468 per rotor |
| Annual Airplane Flight Hrs, (per Aircraft) | 160 | 385.5 | 707 | + 547 combined, or + 273 per FW |
| Annual Flight Hrs, Per Pilot | 170 | 116 | 331.94 | + 161.94 |
| Avg. Helicopter Flt. Hrs, Per Day | Not Available | approx. 2.6 hrs daily | approx. 3.6 hrs. daily | Not Avail. |
| Avg. Airplane Flt. Hrs, per Day | Not Available | approx. 1 hr daily | approx. 1.9 hrs. daily | Not Avail. |
| Total Combined Flt. Hrs, per Day | Not Available | 3.6 | 5.5 | Not Avail. |

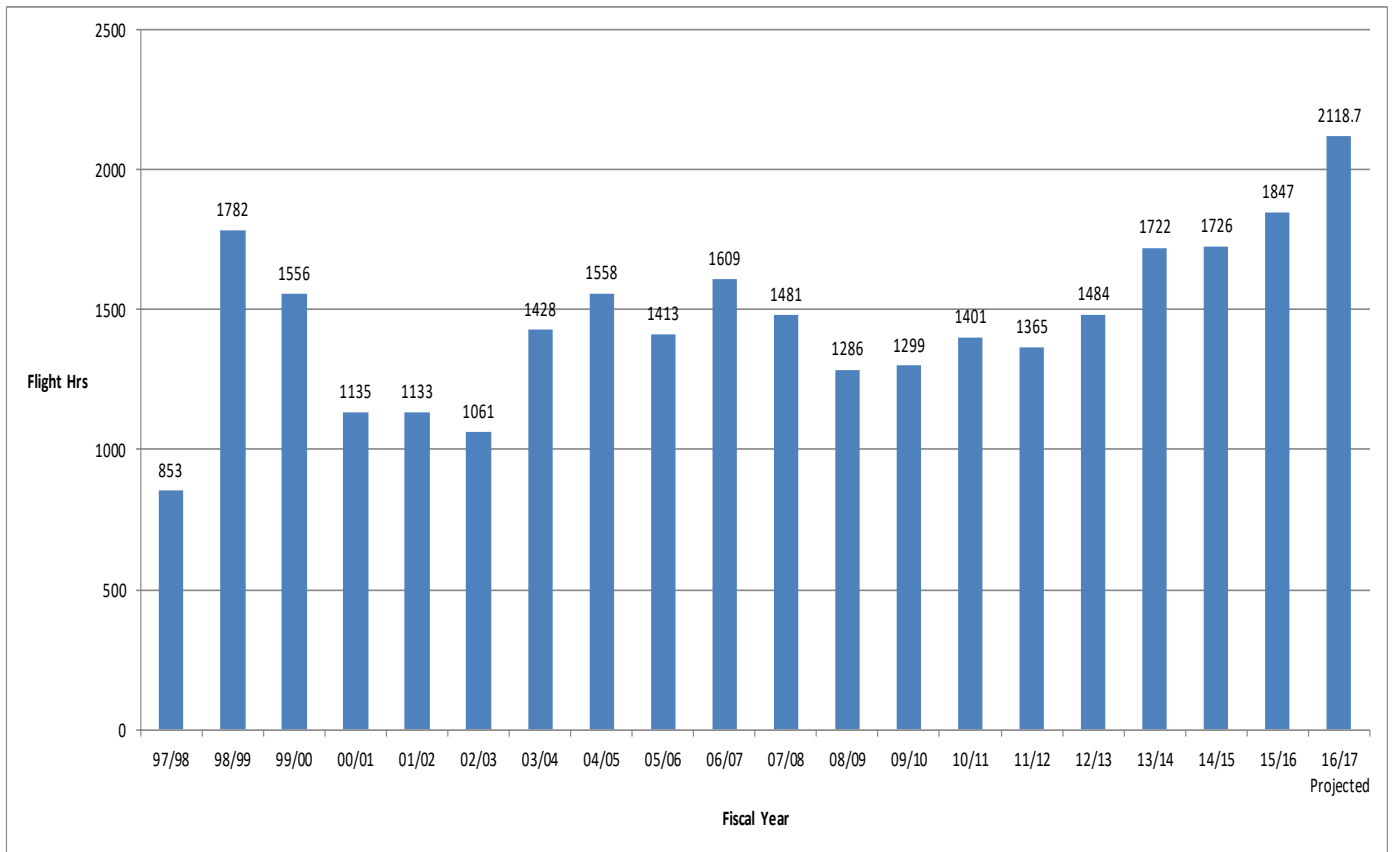
Reference MGT Staffing Study, Exhibit 4-19, for calendar year 2011 flight data (see page 4-33).

The MGT Study also included a chart illustrating Aviation’s flight hour history, which identified the annual volume of flight hours over a fourteen year time span (ending in FY 2010/11), which yielded an averaged volume of 1,357 flight hours, annually. The study cites the 1,357 hour average as “dismal” and discusses issues with various aircraft being inoperable at this time (due to parts on backorder and lengthy engine rebuilds) which accordingly limited the division’s ability to conduct flight missions and resulted in a decrease of annual flight hours.

The 2012 Study documented that the Maintenance Division must be fully staffed with a Maintenance Supervisor and two mechanics to support the (4) rotorcraft and (2) airplanes operated by the MCSO at that time. The MGT consultants go on to recommend that MCSO “*should fill the vacant mechanic position as soon as possible in order to be able to provide the appropriate level of care required to operate the aviation fleet when called upon in a safe manner pursuant to federal aviation rules and regulations.*”

The 2012 MGT Flight History chart is recreated here, with the addition of six years of our most recent flight hour history:

Aviation Services Total Annual Flight Hours – 20 Year History



Note: Annual flight hours include both fixed wing and rotor craft hours. In addition, three months of the FY 16/17 flight history were projected based on an average of 176.6 flight hours per month, or 529.7 total hours for the period).

As is illustrated in the chart above, Aviation’s flight hour volume has been consistently increasing over time and the average annual volume during the last six years has increased to 1710.4 (or, 353.4 more flight hours annually). Presently the Sheriff’s office must support a total of (4) aircraft, but as previously mentioned, two of those aircraft are nearing the end of their useful lives and accordingly will require more time-consuming repairs and labor hours to keep them operational.

Recommendation: The previously noted extradition performance improvement correlates with an increase in flight hours. Accordingly, an additional mechanic may be required to sustain this increase in flight activities.

9A). Aviation Services should conduct their own analysis of mechanic staffing levels as required to provide repair services and remain in compliance with federal aviation rules and regulations.

9B). Administrative responsibilities of the Maintenance Director will increase as a result of Safety Management System requirements and will reduce the Director’s ability to provide direct, hands-on repair service to our air fleet.

10. Aviation’s solution for consolidated hangar and office space is an improvement but still isn’t the best choice for the Sheriff’s Office.

The MGT Consultants stated in their 2012 audit that Aviation services was (at that time) operating its fixed wing fleet from the Glendale Municipal Airport and the rotor fleet from its current location at the Central AZ Project property. The 25 mile distance between the two hangars presented an obstacle for the maintenance team to expeditiously complete all the required maintenance due to commute time. Since that time, Aviation was able to lease fixed wing hangar space at the Deer Valley Airport, located approximately two miles from the CAP site. While the Deer Valley site is a much more cost- effective and time-saving solution for the Division than the Glendale hangar, there are still some other drawbacks with the CAP site:

- The CAP property is not a secure site. Because we are in a tenant/landlord relationship with CAP, the leased spaces can be accessed by CAP personnel on demand, which can present issues with information confidentiality and potentially theft of MCSO property.
- The CAP must conduct routine system-testing which results in power outages within the office that could potentially affect MCSO operations.
- The CAP property is available to the MCSO by means of a lease agreement which accepts aerial surveillance services “in lieu of cash” (equivalent to the value of \$134,000 annually), but does not specify that the account must balance back to zero at the end of the billing cycle.

Recommendation: The MCSO should seek to own a permanent aviation site rather than remain in a tenant relationship which will always be a less than ideal solution. Real property would be an asset to the organization and could be used to effectively remedy other MCSO office space issues (for example, by possibly providing District One with a substation, which would enable Sgts. to supervise more field incidents due to the reduction in the travel time required to cover such a large area).

10A). The ASD should explore all possibilities for a permanent, future location. One such site was discovered while conducting research to complete this audit and should be visited to determine potential suitability (reference: hangar/office space property offered for sale at the Phoenix-Mesa Gateway Airport. Airport property information may be retrieved from the following weblink: <http://www.gatewayairport.com/AvailableProperties.aspx>).

11. Aviation’s Flight Hour rates have not been reviewed or adjusted in over nine years which may have “cost” the Sheriff’s Office much more than the \$134,000 annual lease expense.

A review of flight and billing documents indicate that Aviation has billed the CAP only \$896 per flight hour since 2009. The 2009 flight rate was based on two years of rotor Fox One’s operating costs averaged together during the period 2007-08, and includes expenditures for fuel, aircraft maintenance and flight personnel (note: additional expenditures for insurance and aircraft storage were omitted from the calculation). Billing at a rate of \$896 per flight hour would require nearly 150 hours of aerial surveillance to meet the annual lease requirements.

In contrast, a 2009 Maricopa County Contract used by the Telecommunications Division for Helicopter Services (as needed to fly repairmen to our cellphone towers for routine maintenance) had two external vendors providing aerial services: one billed at a rate of \$1,680 per hour plus \$95 per hour standby time, and the other billed at a rate of \$1,695 per hour plus \$250 per hour standby, as illustrated below:

Benchmark of Billable Flight Hour Rates

| <u>Time Period:</u> | <u>Operator Name:</u> | <u>Rotor Model</u> | <u>Billable Flt. Hr.:</u> | <u>Standby Time:</u> | <u>Additional:</u> | <u>Reference:</u> |
|------------------------|------------------------|--------------------|-------------------------------|--------------------------|--|------------------------------------|
| Oct. 2003 to Oct. 2006 | Westcor Aviation | AS 350 | \$ 995.00 | \$ 150.00 | - | County Contract # 03146-S |
| Oct. 2003 to Oct. 2006 | Westcor Aviation | AS 355 | \$ 1,295.00 | \$ 150.00 | - | County Contract # 03146-S |
| Oct. 2006 to Oct. 2009 | Westcor Aviation | AS 350 | \$ 1,400.00 | \$ 150.00 | - | County Contract # 03146-S |
| Oct. 2006 to Oct. 2009 | Westcor Aviation | AS 355 | \$ 1,500.00 | \$ 150.00 | - | County Contract # 03146-S |
| 2009 to Present | MCSO Aviation | Bell 407 | \$ 896.00 | \$ - | - | rate based on 2007/08 costs |
| Nov. 2009 to Oct. 2015 | Gold Coast Helicopters | Bell 206L | \$ 1,680.00 | \$ 95.00 | 1 hr. minimum & 10 min. billable increments | County Contract # 09075-S |
| Nov. 2009 to Oct. 2015 | Vertical Aviation | AS 350B2 | \$ 1,695.00 | \$ 250.00 | 1 hr. minimum & 10 min. billable increments | County Contract # 09075-S |

Aviation’s current flight rate is \$100 less than the rate billed in 2003 and approximately half the rate billed by outside contractors in 2009. If the fair value of aerial services should be in the \$1,600 per hour range, aviation may have provided services valued in excess of the lease obligation.

Recommendation: Aviation must be proactive and take steps to determine if they are billing a rate sufficient to cover internal costs and to ensure they are not providing aerial services at a loss to the MCSO. As a result, they should:

- 11A). Conduct benchmarking studies to determine if the nearly 10 year old flight rate is sufficient and revise the lease agreement to reflect a 2018 flight rate.
- 11B). The hourly flight rate should automatically be reviewed and adjusted on an annual basis to control for any significant changes that would affect billable costs (such as use of a different aircraft, increased fuel costs, or other unpredictable expenditures).
- 11C). An annual review of flight costs should be a requirement written into Policy, which should specify that the results of the annual cost review should be documented and retained in a file with the Lease agreement.

12. Aviation must strengthen internal controls over the CAP billing process and the Lease Agreement.

Three annual billing cycles were reviewed for the purpose of this audit. Some minor deviations in the volume of flight hours previously recorded were noted (i.e., those flight hours submitted and recorded by means of written memo vs. those that were recorded and retrieved directly from the DAW System) but were not considered significant.

However, Aviation’s internal controls over the CAP billing process and the Lease Agreement have been noted as weak and require improvement in the following areas:

- The lack of a written Policy documenting how flight hours are managed and the process used to reconcile the accounts in meeting the annual lease obligation.
- Reconciliation procedures did not include verifying flight hours submitted by CAP against Aviation’s original source documentation (i.e., either the Pilot’s flight logbook or mission data documented in the DAW System).
- The standard practice of “rolling flight hours owed” into the new billing cycle for multiple years rather than completing an annual reconciliation process which resolves all debt prior to the next billing cycle.

| <u>Billing Cycle:</u> | <u>Flt. Hrs. Provided (per ASD billing)</u> | <u>ASD Hrlly. Flt. Rate:</u> | <u>Aerial Services Provided:</u> | <u>Annual CAP Obligation:</u> | <u>Current Cycle Variance:</u> | <u>Previous Cycle Variance ("Carried-Over"):</u> | <u>Total Debt "Carried-Over" into Next Billing Cycle:</u> |
|-----------------------|---|------------------------------|----------------------------------|-------------------------------|---|--|---|
| 2014/2015 | 129.5 | \$ 896.00 | \$ 116,032.00 | \$134,000 | Owe \$17,968 (or 20.05 more hrs) | Owe \$58,777.60 (or 65.60 more hrs.) | Owe \$76,745.00 (or 85.65 more hrs) |
| 2015/2016 | 222.5 | \$ 896.00 | \$ 199,360.00 | \$134,000 | \$65,360.00 in excess (or exceeded debt by 72.95 hrs.) | Owe \$76,697.60 (or 85.60 more hrs.) | Owe \$11,337.60 (or 12.65 more hrs) |
| 2016/2017 | 91.8 | \$ 896.00 | \$ 82,252.80 | \$134,000 | Owe \$51,747.20 (or 57.75 more hrs.) | Owe \$11,361.28 (or 12.68 more hrs) | Owe \$63,108.48 (or 70.43 more hrs) |

Rolling hours over across multiple years is problematic in many ways: the cost of the debt accrued in one cycle may increase significantly at a later point and ending up “costing” much more than when originally incurred (for example, due to fuel cost increases or change of aircraft, etc.). This process also legally obligates MCSO to long-term financial commitment to CAP which MCSO did not initiate.

The resolution of financial obligations in a timely manner and within specific timeframes is a standard business practice which should be strictly adhered to. Completing all transactions within a specific cycle limits the possibility of errors continuing over time undetected and is used as a form of internal control for this very reason.

Recommendation: Aviation must increase internal control over the billing process and the lease agreement through the following actions:

- 12A). Aviation must develop a written procedure or operating manual to define the process and steps taken internally to verify the accuracy of CAP flight hours recorded and the reconciliation of any variances noted.
- 12B). Aviation Command Staff must negotiate with CAP to implement a reconciliation process that is completed on monthly basis and resolved annually. Flight services should be tracked by cost (not by volume of hours). If Aviation is unable to provide services equivalent to the full lease value, it is recommended that any variance be settled on a cash basis so that each new billing cycle begin with a “zero balance owed”.
- 12C). Aviation Command Staff must begin working with contract personnel now to Amend the current Lease Agreement prior to its expiration/renewal date of Sept. 30, 2019. The Agreement (which has a Five year term) should be modified to address the following:

1. Include verbiage to provide Aviation with an annual opportunity to adjust the flight hour rate, if necessary.
2. Include written specifications that Aviation has met the lease obligation when the value of services provided reaches \$134,000 (i.e., not based on a volume of 150 flight hours or assuming a standard cost of \$896 per hour), as flight costs may be subject to change over time .
3. Specify that the monthly carry-over of services owed should be resolved and finalized on an annual basis (rather than rolled over indefinitely) and settled in cash, if necessary.

13. Aviation Does Not Have Internal Controls in Place Over Part Inventories and Asset Lists Have Not been Corrected on a Regular Basis.

The Aviation Maintenance Division currently utilizes a combination of resources to service its air fleet, which includes in-house services provided by its own mechanical staff and also outside service providers, currently under contract with the County. In addition to these two resources, Aviation purchased a software system approximately two years ago called Digital Air Ware (DAW). DAW is utilized to manage a variety of aviation data, including: maintenance records, pilot licensure, mission details, safety documentation and flight logs all in a centralized electronic repository. DAW also includes inventory and maintenance modules, which should be used to track assets and costs.

The Maintenance Director advised that due to being short-staffed and the resulting time-constraints, parts are only being loaded into the system as they are currently being ordered, and a full listing of all warehouse parts presently does not exist. Work order data (i.e., a breakdown of invoiced costs by parts and labor) has only recently begun to be entered into the system, but no prior histories have been loaded into the system. It was also noted that asset lists on file at the Finance Department have not been reviewed and corrected for accuracy on an annual basis, as they should have been (although the current Commander has been in the process of updating the Finance asset list).

Deficiencies in each of these areas are a serious matter which must be corrected as soon as possible. Without detailed aviation documentation, physical inventories are not known and it is not possible to determine the efficiency and effectiveness of operations. But by adhering to best practices in inventory controls, visibility improves and “accountability over the inventory helps to ensure continuation of operations, increased productivity, and improved storage and control of excess or obsolete stock.”

Furthermore, “an Agency’s lack of reliable information impairs ability to (1) know the quantity, location, condition and value of assets it owns, (2) safeguard its assets from physical deterioration, theft, loss, or mismanagement, (3) prevent unnecessary storage and maintenance costs or purchase of assets already on hand, and (4) determine the full costs of programs that use these assets.” (U.S. GAO, March 2002).

Recommendation: A full inventory of all Aviation parts should be scheduled for completion and should be conducted annually thereafter. The parts inventory and their monetary value should be documented in the in the DAW System and utilized to maintain par levels (i.e., the minimum quantity required to have on hand to meet demand before replacement) .

- 13A). Aviation should consider contacting MCSO’s Inventory Control Manager for advice/possible assistance with implementing a “wall to wall” inventory of parts/assets, Policy, etc.
- 13B). Aviation should investigate the possibility of obtaining “special project” assistance with the inventory count through the Posse, if necessary.

- 13C). Aviation should consider purchasing a barcode scanner that is compatible with the DAW inventory module (approx. \$500) to quickly and efficiently scan in large inventories of parts.
- 13D). Aviation should contact DAW to inquire about the possibility of electronically downloading previous data histories into the system (i.e., scan?) in lieu of manually keying data from hard copy.

14. Aviation Flight Crews Lack Training Needed to Deliver “Seamless” Rescue Services

Aviation should seek to increase mission effectiveness by standardizing specialized training across all flight staff. For example, of the twelve flight staff, only two (or 17%) have been credentialed to provide medical assistance: one is a pilot and the other is a TFO, both licensed as Emergency Medical Technicians (EMT). This training is available at no additional expense through the Sheriff’s Office via our Coordinator for Emergency Medical Services. This additional training is justified by the volume of AZ SAR victims who are typically under heat distress and/or dehydration. In these rescues, medical assistance must be provided and the victim’s medical condition stabilized prior to commencing with the airlift. If the arriving flight crew lacks a certified EMT or Paramedic on board, then an additional flight must be made to airlift someone with the required medical expertise (i.e., rural metro paramedic or other) and deliver them to the victim for assistance before the rescue can be finalized. If all flight crew members were equally trained than each rescue would be more quickly and efficiently resolved, cost-savings in fuel and air time would be generated and the delays which currently occur would cease to exist.

Recommendation: Aviation flight staff should receive mandatory medical training to increase mission effectiveness.

- 14A). Aviation’s Standard Operating Manual should define this requirement as mandatory & the 180 hour internship requirement should be supported by management as work-related duty.

15. Aviation Is Responsible for Managing the accuracy of Flight Data recorded for each SAR Incident

Mischaracterized CAD codes are problematic in any law enforcement agency and SAR Incidents share the same opportunities for inaccuracy in data mining and reporting as any other type of patrol incident. For example, when a SAR mission is incorrectly characterized the end result may be that the mission does not get captured in the monthly data report and does not get submitted to the State for fuel reimbursement which it is eligible for. SAR missions typically start out as a patrol welfare check (CAD Code # 670) and then transition into an “official” SAR after the initial investigation is completed. At this point, the incident should be re-categorized under CAD Code # 667 (Missing Persons) or Code # 667S (Missing Person/ Search). Depending on who clears the call (patrol or ASD), the incident may not get recorded correctly and the volume of SAR missions will appear deceptively low due to having been categorized as merely as a welfare check.

It is critical that this information be verified for accuracy in reporting by all Deputies involved in the incident regardless of the Division they work in, as this information is also captured in the Managing For Results (MFR) Program, which management utilizes in making organizational and funding decisions.

Recommendation: Aviation should review SAR Incident/CAD Code procedures to confirm that all staff understand the importance in reporting data accurately.

- 15A). The topic of accuracy in CAD Code Reporting is a universal need and should be a recurrent staff meeting theme.

16. Aviation Must Track Detailed SAR Mission Expenditures and Pursue Eligible Fuel Reimbursements

Aviation is eligible to apply for State reimbursement of aircraft fuel expenses per each “authorized” SAR mission they complete. In other words, while each SAR mission completed might procedurally appear to be routine, those that have been designated as a State SAR mission are eligible for reimbursement and expenditures on those missions should be monitored and tracked carefully.

A routine SAR mission becomes a State SAR mission at the request of one of MCSO’s seven SAR Coordinators, located throughout the County at the various lake and river substations. After the mission is authorized by the State Department of Emergency Medical Affairs, a State SAR number is assigned and the following expenses may be reimbursed:

- Fuel expenses of SAR Coordinators leading the mission
- Fuel expenses of the Posse members providing the rescue service
- Fuel expenses of any aircraft utilized in the mission
- Food and Overtime expenses (must be submitted by receipt and will be reimbursed on a sliding scale of 50 to 80% of total value)

The total cost per SAR mission must also address intangible, operational costs such as “wear and tear” on our aircraft. In addition, the value of the “free” manpower provided by the rescue Posses, the use of rescue equipment (none of which MCSO currently owns) including carabiners, ropes, pagers, helmets, etc. and the mandatory training and recertification expenses that the rescue Posses pay out of their own pocket must all be factored in when calculating the total cost per mission.

Recommendation: Aviation must track intangible operating costs to develop a cost per SAR mission for justification of budgetary dollars required to provide mandated SAR services. In addition, any fuel or expense reimbursements should be returned for deposit to Aviation’s operating budget.

16A). Any State DEMA reimbursements deposited to MCSO Finance should be adjusted by Journal Voucher back to Aviation’s budget.

16B). Aviation Command should designate responsibility for oversight of all reimbursements to a specific staff member to ensure that all monies due to their low org has been received and deposited.

17. Aviation Lacks a FLIR Digital Camera Recording Policy

Aviation’s Rotor FOX 2 has been equipped with Forward Looking Infrared (FLIR) technology which provides high definition thermal imaging and digital camera recording capability. The FLIR unit purchased by MCSO is the “Star Safire”, at a total of approximately \$1.3M.

While our Patrol Divisions must abide by our Body Worn Camera Policy, there is no equivalent Policy for the FLIR digital camera. Aviation advised that they will record any event on the request of a commanding officer, but does not automatically record any events. In addition, they are not responsible for maintaining any video footage, other than turning the recording over to the requesting officer to archive.

Aviation also stated that the FLIR technology does not operate in the same manner as Body Worn Technology as the FLIR must be pointed at the image being photographed. Because they typically fly in two man crews, it is not practical to record, as the Pilot’s primary job is to fly the aircraft, and the Tactical Flight Officer’s (TFO) primary responsibility is multi-faceted and includes: 1) the aerial observation of

criminal activity, 2) directing ground patrol in following/apprehending suspects, 3) to proactively observe for any air space obstacles, such as electrical lines, rock outcroppings, other aircraft, etc. As a result, a two man flight team is less than optimal for filming criminal incidents.

The Benchmarking survey conducted for the purpose of this audit found that other Agencies have made accommodations to routinely utilize digital recording technology – one solution is to utilize three man flight crews. Another solution utilized was to utilize two man crews with the addition of a helmet mounted camera which would automatically film in the direction the crew is looking, alleviating the need to deliberately “point and shoot” the camera.

Recommendation: Aviation should utilize this expensive technology to its fullest capacity in filming criminal incidents.

- 17A). Aviation should solicit feedback from Patrol to define how they might better support ground patrol with this resource.
- 17B). Aviation should develop a specific Policy and Procedure for the FLIR camera, equivalent to the Policy and Procedures which define how patrol’s Body Worn Cameras are to be utilized.

Conclusion:

The Aviation Division is most likely the Sheriff Office’s most expensive operation, and also a provider of vital services to the residents of Maricopa County. The MGT Consultants suggested that the Division be outsourced if it could not be funded and supported adequately by management.

However, it is critical that the Sheriff’s Office and Aviation work together to develop a funding plan for future needs and to also explore and pursue every other financial resource available including: applying for grants, reimbursement opportunities, surplus equipment and supplies, and possibly generating revenues by extraditing prisoners on behalf of other AZ agencies.

In addition, the Sheriff’s Office should promote the Aviation Division on our website to better illustrate the value we provide to Maricopa County residents and our on-going commitment to law enforcement excellence.

Summary of Recommendations

1. Aviation Service's Internal Controls Over Documentation Must Be Remedied and Continue to Show Improvement Over Time.

a). It is recommended that the MCSO develop a system-wide "Transition Policy" which requires all Command staff to verify that Policies, Procedures and any other documents are current and in compliance prior to accepting a new command post. It is the responsibility of existing Command Staff to support the new Command staff by identifying all critical tasks and developing checklists with timelines to ensure the success of new command staff, and ultimately the success of the Sheriff's Office during the next rotation.

b). Current Aviation Command staff must prioritize the review and revision of the 2012 Operations Manual and submit the corrected copy to senior management for approval and authorizing signature.

2. Newly assigned, inexperienced Aviation Command staff should automatically be enrolled in accredited coursework to obtain the background needed for this position.

a). There are many options for obtaining the knowledge base needed to manage an aviation division. Some examples include the Airborne Law Enforcement Association (ALEA) annual conference which offers a 24 hour course for Aviation Unit Managers, or the GSA's Federal Aviation Safety Officer Certificate Program, accredited University flight program, etc.

b). Command assignments requiring the attainment of a specialized knowledge base (such as Aviation) should be retained for a minimum assignment of three years (or longer), as required to provide the best value for both the Division and the Sheriff's Office.

3. Aviation Services must implement an active and cohesive Safety Management System, in accordance with best practices established by ALEAC/PSAAC.

a). Aviation Services must review the current organizational chart and adjust the reporting structure to accommodate a dedicated Safety Officer to which reports directly to the Aviation Commander (to assure the independence and integrity of the Safety Program).

b). Aviation Services must appoint designated personnel to serve on the Safety Committee.

c). Aviation should seek Safety Accreditation through ALEAC as a long-term performance goal.

4. Management should re-evaluate the organizational structure of the Aviation Services Divisions and add additional personnel as needed to meet the increasing volume of administrative duties and address the need for additional aviation support for our fixed wing and rotor fleets.

a). The former Assistant Commander position should be filled with a Sergeant to provide Managerial assistance commensurate with the increase in administrative tasks.

- b). The Fixed Wing and Rotor Flight Supervisor positions formerly held by Sergeants should be revised to accommodate a senior pilot in each Division, based on merit (either of sworn or civilian status).
- 5. A plan should be developed for the purchase of one new helicopter specifically configured to provide safe and effective SAR missions and effectively deploy Deputies in accordance with our First-Responder status.**
- a). Interior space of new helicopters must be configured specifically for SAR missions
- b). Helicopter must include winching capability and ability to hoist minimum of 600 lb. external load.
- c). Helicopter must be a more powerful model with the ability to hover in hot/high/windy conditions, with a useful load capability in excess of 5,000 lbs.
- 6. Aviation Services must seek to develop a “Cradle to Grave” procurement plan for its air fleet and explore funding opportunities.**
- a). FOX 1 has exceeded the time frame utilized by DPS for rotor replacement. Due to the need for a more powerful aircraft for SAR missions, FOX 1 should be considered for a trade-in towards a SAR- specific aircraft.
- b). Based on DPS’s 10 year/10,000 hour guideline for replacement, budgetary dollars will need to be set aside annually in preparation for FOX 2’s eventual replacement, which is estimated to occur on or around the year 2024/2025 (assuming the 700 flight hours per year average remains steady).
- c). ASD should research alternate funding sources now for current and future aircraft needs.
- 7. Aviation Services should continue to support the Sheriff’s mandated responsibility to return fugitives to justice and should also pursue reimbursement for the provision of these services, as stated by law.**
- a). Aviation Services should continue to maintain/exceed the current prisoner intakes as a performance measure which illustrates the value MCSO provides to our taxpayers.
- b). Aviation Services should pursue all reimbursements available to them, per the AZ Revised Statutes.
- c). The MCSO must correct Policy GK-1 to accurately reflect the extradition support Services provided by the Aviation Division
- 8. Aviation Services must complete an analysis of Fox 10’s repair expenditures versus active flight hours to find the cost per flight hour, as needed to plan for replacement or disposal.**

a). If the cost ratio to maintain this aircraft is higher than the value received by the County, it may be more fiscally prudent to either trade this aircraft in towards a new aircraft with a higher useful load and capacity to pick up additional prisoners per trip, or

b). If there is no plan for replacement of this model of aircraft, then at a minimum, a plan for its disposal/sale must be developed prior to its depreciation as an asset.

9. The previously noted extradition performance improvement correlates with an increase in flight hours. Accordingly, an additional mechanic may be required to sustain these activities over time.

a) Aviation Services should conduct their own analysis of mechanic staffing levels as required to provide repair services and remain in compliance with federal aviation rules and regulations.

b). Administrative responsibilities of the Maintenance Director will increase as a result of Safety Management System requirements and will reduce the Director's ability to provide hands on repair service to our air fleet.

10. The MCSO should seek to own a permanent aviation site rather than remain in a tenant relationship which will always be a less than ideal solution. Real property would be an asset to the organization and could be used to effectively remedy other MCSO office space issues (for example by possibly providing District One with a substation, which would enable Sgts. to supervise more field incidents due to the reduction in the travel time required to cover such a large area).

a). The ASD should explore all possibilities for a permanent, future location. One such site was discovered while conducting research to complete this audit, which should be visited to determine potential suitability (reference: Phoenix-Mesa Gateway Airport property located at 5703 South Sossaman Road. Additional information may be retrieved from: <http://www.gatewayairport.com/AvailableProperties.aspx>).

11. Aviation's Flight Hour rates have not been reviewed or adjusted in over nine years which may have "cost" the Sheriff's Office much more than the \$134,000 annual lease expense. Aviation must be proactive and take steps to determine if they are billing a rate sufficient to cover internal costs and to ensure they are not providing aerial services at a loss to the MCSO. As a result, they should:

a). Conduct benchmarking studies to determine if the nearly 10 year old flight rate is sufficient and revise the lease agreement to reflect a 2018 flight rate.

b). The hourly flight rate should automatically be reviewed and adjusted on an annual basis to control for any significant changes that would affect billable costs (such as use of a different aircraft, increased fuel costs, or other unpredictable expenditures).

c). An annual review of flight costs should be a requirement written into Policy, which should specify that the results of the annual cost review should be documented and retained in a file with the Lease agreement

12. Aviation must strengthen internal controls over the CAP billing process and the Lease Agreement through the following actions:

- a). Aviation must develop a written procedure or operating manual to define the process and steps taken internally to verify the accuracy of CAP flight hours recorded and the reconciliation of any variances noted.
- b). Aviation Command Staff must negotiate with CAP to implement a reconciliation process that is completed on monthly basis and resolved annually. Flight services should be tracked by cost (not by volume of hours). If Aviation is unable to provide services equivalent to the full lease value, it is recommended that any variance be settled on a cash basis so that each new billing cycle begin with a “zero balance owed”.
- c). Aviation Command Staff must begin working with contract personnel now to Amend the current Lease Agreement prior to its expiration/renewal date of Sept. 30, 2019. The Agreement (which has a Five year term) should be modified to address the following:
 - 1. Include verbiage to provide Aviation with an annual opportunity to adjust the flight hour rate, if necessary.
 - 2. Include written specifications that Aviation has met the lease obligation when the value of services provided reaches \$134,000 (i.e., not based on a volume of 150 flight hours or assuming a standard cost of \$896 per hour), as flight costs may be subject to change over time.
 - 3. Specify that the monthly carry-over of services owed should be resolved and finalized on an annual basis (rather than rolled over indefinitely) and settled in cash, if necessary.

13. A full inventory of all Aviation parts should be scheduled for completion and should be conducted annually thereafter. The parts inventory and their monetary value should be documented in the in the DAW System and utilized to maintain par levels (i.e., the minimum quantity required to have on hand to meet demand before replacement).

- a). Aviation should consider contacting MCSO’s Inventory Control Manager for advice/possible assistance with implementing a “wall to wall” inventory of parts/assets, Policy, etc.
- b). Aviation should investigate the possibility of obtaining “special project” assistance with the inventory count through the Posse, if necessary.
- c). Aviation should consider purchasing a barcode scanner that is compatible with the DAW inventory module (approx. \$500) to quickly and efficiently scan in large inventories of parts.
- d). Aviation should contact DAW to inquire about the possibility of electronically downloading previous data histories into the system (i.e., scan?) in lieu of manually keying data from the hard copy.

14. Aviation flight staff should receive mandatory medical training to increase mission effectiveness.

a). Aviation's Standard Operating Manual should define this requirement as mandatory & the 180 hour internship requirement should be supported by management as work-related duty.

15. Aviation should review SAR Incident/CAD Code procedures to confirm that all staff understand the importance in reporting data accurately.

a). The topic of accuracy in CAD Code Reporting is a universal need and should be a recurrent staff meeting theme.

16. Aviation must track intangible operating costs to develop a cost per SAR mission for justification of budgetary dollars required to provide mandated SAR services. In addition, any fuel or expense reimbursements should be returned for deposit to Aviation's operating budget.

a) Any reimbursements deposited to MCSO Finance should be adjusted by Journal Voucher back to Aviation's budget.

b). Aviation Command should designate responsibility for oversight of all reimbursements to a staff member to ensure that all monies due to their low org has been received and deposited.

17. Aviation should utilize this expensive technology to its fullest capacity in filming criminal incidents.

a). Aviation should solicit feedback from Patrol to define how they might better support ground patrol with this resource.

b). Aviation should develop a specific Policy and Procedure for the FLIR camera, equivalent to the Policy and Procedures which define how patrol's Body Worn Cameras are to be utilized.

Attachment:

The Aviation Benchmarking Study completed for the purpose of this Audit is attached as a separate document in Excel format.

References

Airborne Law Enforcement Accreditation Commission. (2016, Version 6.2). *Standards for Law Enforcement Aviation Units*. As obtained by request from: <http://alea.org/>

Boito, Keating, Wallace, DeBlois and Blum. (2015). *Metrics to Compare Aircraft Operating and Support Costs in the Department of Defense*. The Rand Corporation. Retrieved from: http://www.rand.org/content/dam/rand/pubs/research_reports/RR1100/RR1178/RAND_RR1178.pdf

Maryland General Assembly, Office of Legislative Audits. (2008, August). Performance Audit: The Department of State Police, Aviation Command Helicopter Operations. Retrieved from: <https://www.ola.state.md.us/Reports/Performance/Aviation08.pdf>

MGT of America, Inc. (2012, June). Maricopa County Sheriff's Office Law Enforcement Staffing Study. (Draft Report).

Public Safety Aviation Accreditation Commission (2016, Version 6.2). Standards for Law Enforcement Aviation Units. Retrieved from: <http://www.psaac.com/standards/law-enforcement/>

Shinnamon, Chief Donald Sr. (Winter 2003-4). *Aviation Safety for Police Managers*. Rotor Magazine. Retrieved from: <https://www.rotor.org/membership/rotor/rotorpdf/034.pdf>

Solosky, Kenneth J. (2010, October). *Aviation Safety Management Systems*. Officer Magazine. Retrieved from: <http://www.officer.com/article/10232312/aviation-safety-management-systems>

State of Arizona, Office of the Auditor General. (June 2000). Performance Audit: The Department of Public Safety, Aviation Section. Retrieved from: <https://www.azauditor.gov/sites/default/files/00-7.pdf>

Wilber, Del Quentin, Zapotosky, Matt and Morse, Dan. (2008, September 29). *Worsening Weather Cited in Fatal Maryland Copter Crash*. The Washington Post. Retrieved from: <http://www.pressreader.com/usa/the-washington-post/20080929/283003985618596>

United States Department of Justice, Office of Justice Programs. (2009, July). *Aviation Units in Large Law Enforcement Agencies, 2007*. Bureau of Justice Statistics Special Report. Retrieved from: <https://www.bjs.gov/content/pub/pdf/aullea07.pdf>

United States General Accounting Office. (2002, March). *Best Practices in Achieving Consistent, Accurate Physical Counts of Inventory and Related Property*. Executive Guide (# GAO-02-447G). Retrieved from : <http://www.gao.gov/new.items/d02447g.pdf>

United States General Services Administration (GSA). (2006, March). *Guide for the Conduct of Aviation Resource Management Surveys (ARMS) Checklist*. Interagency Committee for Aviation Policy (ICAP). Retrieved from: <https://www.gsa.gov/portal/category/26772>