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# MEMORANDUM

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Date: June 2, 2020

To: The Honorable Chairman and Members  
Pima County Board of Supervisors

From: C.H. Huckelberry  
County Administrator

A handwritten signature in black ink, appearing to read "CHH", is written over the printed name "C.H. Huckelberry".

Re: **Modification to the County Capital Improvement Program for the Fiscal Year 2020/21**

I will be modifying the Capital Improvement budget for Board of Supervisors consideration and adoption with the Final Budget on June 23, 2020. The modification will include the purchase of two aircraft and two surveillance and data cameras. This Capital expenditure will equal approximately \$7.5 million and I believe is a necessary purchase at this time based on a detailed analysis associated with our aging Air Unit equipment of the Sheriff. This equipment is now more than 20 years old, out of date and is not the best technology available for law enforcement purposes.

The Sheriff's Air Unit has proven to be an invaluable asset in law enforcement and significantly improve officer safety for those officers engaged in on the ground law enforcement operations. Hence, my belief is that this equipment is essential and needed to improve public safety in Pima County as well as officer safety for those engaged in ground operations.

I have authorized the Sheriff to begin the procurement of these assets and have set aside \$7.5 million in the Capital Improvement budget to pay for these Air Unit assets. These new units will significantly enhance air operations and support ground law enforcement activities, particularly since our two aging aircraft and outdated electronic equipment is grounded for maintenance issues approximately 50 percent of available flight time.

I recommend that the Board adopt the modified Capital Improvement Program, which finances the acquisition of air support systems for the Sheriff. Justification for this acquisition is detailed in the attached May 18, 2020 memorandum from Sheriff Napier. I have authorized the Sheriff to proceed with Option C in his memorandum of May 18, 2020.

CHH/lab

Attachment

c: The Honorable Mark Napier, Pima County Sheriff



# Pima County Sheriff's Department

Mark D. Napier – Sheriff

## MEMORANDUM

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Date: May 18, 2020

To: Chuck Huckelberry  
County Administrator

From: Mark D. Napier  
Sheriff

Subject: PCSD Air Operations

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The Pima County Sheriff's Department Air Unit has been utilizing various airframe platforms, equipment, and technologies that are approaching the end of their service life, or are obsolete in performance, effectiveness, and/or efficiency. In order to sustain operational readiness and maintain the region's expected capabilities and competencies, serious thought needs be considered for the future of the patrol aircraft and its components. Several of these items come with expensive costs, but remain within the scope of the unit's long range planning, and the Department's strategic goals. Over the past several years, the anticipated replacement of components of the patrol aircraft such as FLIR cameras, spare engine, and the airframes have experienced significant challenges with regard to funding opportunities, parts availability, and continued support from vendors.

The Department's air support platform consists of two (2) 1999 Cessna 206 Soloy conversion aircraft, powered by a Rolls Royce turbine engine. Both aircraft also have an observer window, and both are equipped with a FLIR Star Safire III camera (mounted on the left wing). Along with the Soloy conversion are many other modifications to the Cessna 206, and to date, are supported by existing FAA Supplemental Type Certificates (STC).

Some current limitations of deployment and continued operation of one or both patrol aircraft, also known as "Survey 1" and "Survey 2," involve specified overhauls of the turbine engines at intervals of 1,750 hours. These overhauls involve removing the engines, shipping them to our vendor in Pennsylvania, waiting for the overhaul completion (up to several months), and replacing the engine into the aircraft. Currently, while the engine is with the vendor, the aircraft is grounded and ultimately useless, or available as a donor aircraft to keep the other aircraft operational. The purchase of an additional engine could keep both aircraft operational and available for patrol support, but still places limitations on the ability for the current aircraft to loiter and/or orbit western Pima County for any extended periods. In April 2019, the Air Unit was tasked to research the cost and availability of an engine (B-17 F/2) as a spare. Several quotes were obtained for an engine with costs ranging between \$623,000 and \$704,000. These quotes were for crate engines, and did not include the required accessories for installation that total \$40,000. The "lead

time" or delivery time was also estimated at 588 days. The current estimate of a spare engine for the Survey aircraft is unavailable due to the lack of response from multiple vendors.

The availability of the Rolls Royce B-17 F/2 engine and its internal parts, and related accessories has been increasingly more difficult to locate and/or procure. This has been a result of Rolls Royce production and operations. The supply and availability of this engine and parts will continue to diminish, while associated wait times for parts will increase.

Both aircraft are equipped with aging FLIR cameras that enable the air unit personnel to support patrol operations, perform surveillance, assist with search and rescue missions, and help with target identification, both day and night. The two Star Safire III cameras are over a decade old and have recently been consistently plagued with operational failures and have been out of service more than available for service.

- Star Safire III S/N 341104 Purchased 2005 Refurbished Cost \$406,472
- Star Safire III S/N 341857 Purchased 2008 New Cost \$691,970
  - Annual repair warranty costs per camera are \$55,321.

The FLIR Star Safire 380-HD would be a similar operating system and comparable camera for replacing the FLIR Safire III. The Air Unit has conducted extensive research in this camera, as well as L3's MX-15, with the recommendation to stay with FLIR and its 380-HD. The cost of this camera system varies depending on whether the purchase is new or refurbished. The cost of a new camera is \$790,000, and the ongoing quote we have received over the past year for a refurbished camera is \$463,000. The camera FLIR Systems placed on reserved for the Department is no longer available, as continued attempts to secure funding were unsuccessful. Additionally, this camera system has been on several grant proposals and awards, which were ultimately declined. Alternate funding sources have been explored and considered with no solid resolution to replace these camera systems.

The current cameras have established a lifespan of approximately 15 years of service. Considering the reduced cost of the 380's warranty of \$32,350/year, over 15 years the savings compared to the current warranties would be \$344,565 per camera. The cost savings of the newer camera's warranty will essentially offset almost 80% of the cost of a refurbished 380-HD. Although the cost difference between the refurbished camera and a new camera is quite significant, the amount of our trade-in value would be increased to \$150,000 per camera if a new camera were purchased.

Historically, presently, and leading into the future, the Air Unit and its capabilities serve more than just support to law enforcement functions. The Air Unit is a regional resource, but more importantly, it has been available to a variety of Pima County Departments such as Attractions and Tourism, Communications, Department of Transportation, NRPR, and Office of Emergency Management. The unit's operations cover mission areas of prevention, protection, mitigation, response, and recovery. While covering these mission areas, the unit, and its equipment also enable successful capabilities in some of the following core capabilities:

- Planning
- Public Information
- Operational Coordination
- Forensics
- Threats/Hazard Identification
- Fire Management
- Infrastructure Systems
- Search and Rescue
- Operational Communications
- Situational Awareness

- Intelligence/Information Sharing
- Interdiction/Disruption
- Screening, Search, and Detection
- Risk Management

The unit recently displayed its capabilities of displaying video of several wildfires and cast the video on the screens in the Pima County Emergency Operations Center (PCEOC) to enable real time situational awareness and operational coordination during the current COVID-19 EOC operations. As explained and demonstrated, the importance of continuing and improving the Air Unit's aerial observation platform and capabilities is paramount for County operations and staff safety.

The Air Unit's mission profile and capabilities are only as good as being able to maintain the aircraft in an airworthy state and flying. Over the past several years, both Survey aircraft have experienced breakdowns and unexpected repairs, outside of their routine maintenance and/or "wear and tear." Their percentage of availability over the past 5 years has fluctuated but remained available less than 50% of the time. The known operational costs of the aircraft are approximately \$150-200/hour for the 206 and \$190-194/hour for the 208. The cost of the Survey aircraft grounded for repairs costs approximately \$251.17/hour in auxiliary costs. Some of these ancillary costs include the support staff, such as the pilots, mechanics, and Tactical Flight Deputy (TFD). There is no cost benefit with a grounded aircraft, as it is providing absolutely no public safety value and does not enable the Air Unit staff to perform their objectives of supplementing the Patrol Division. Further, the actual per flight hour cost of the existing aircraft is greater due to the frequency of them being out of service yet still having all the normal costs associated with operations. New aircraft would provide a more consistent, reliable, and cost effective alternative to the existing 206 fleet. As per Cessna, the reliability rating of the newer aircraft is in the upper 90 percentile (98%). Considering the new airframe, 5-year warranty, and no unexpected repair costs, the new aircraft will be more efficient and economically stable. With the less time grounded, the aircraft will perform their function and further benefit personnel requesting staff.

Following extensive research, comparison, and resource allocation, the Air Unit and Section/Division Commanders recommend the purchase/upgrade of the aging FLIR camera systems. Considering the alternatives and maintaining fiscal responsibility, it is recommended to purchase (2) two new Stat Safire 380-HD camera systems, and (1) one refurbished FLIR 380HD camera for the 206's Ajo District operations.

Regarding the spare engine, considering the current research concerning the possibility of replacing these aircraft in the next several years, the purchase of a third engine for our current aircraft is not recommended, as it is unsustainable and the fiscal commitment outweighs the operational benefit. It is recommended to dedicate the approximate cost of the engine (\$750K) toward the new aircraft.

Options:

- A. Purchase (1) one B-17 F/2 engine and (2) two new FLIR 380-HD cameras, and keep both Survey aircraft. Cost: \$2,370,000
  - o Pros:
    - Purchasing an additional engine will ensure both aircraft will remain operational while one engine is being overhauled.
    - The spare engine could be used as a donor in case there is a long wait time for parts.
    - New FLIR cameras would provide increased capabilities for aerial support to Patrol.
  - o Cons:
    - Excessive lead-time for new engine (580+ days) and cost

- The spare engine still does not cover the gap in capabilities related to air support in Ajo, as the flight to Ajo and remaining in the district exceeds the capability of the airframe (fuel capacity).
  - The cost of new camera systems
  
- B. Purchase (1) one new aircraft (Cessna 208), Purchase (2) two new FLIR 380-HD cameras, and keep both Survey aircraft. This allows to keep (1) 206 operational and (1) for parts. Cost: \$4,245,000
  - Pros:
    - Cessna 208 better fits the mission profile of the unit to fly to Ajo and remain in the district for extended flight hours.
    - New FLIR cameras could be fitted with adaptors for use on both the 206 and 208 airframes.
    - New airframe will provide additional 20+ year life service for the unit and region.
  - Cons:
    - Retaining both 206 aircraft will continue to need repairs related to age and type of use uses. Over \$100K spent on the current aircraft in the past 2 years.
    - The cost related to new camera systems.
    - Training and maintenance will now include the addition of another system and could lead to mistakes in operations and maintenance. (Risk Management)
  
- C. Purchase (2) two new aircraft (Cessna 208), purchase (2) two new FLIR 380-HD cameras for the 208s, purchase a refurbished FLIR 380HD and keep both Survey aircraft. One 206 would be stationed and operational in Ajo, while the second could be available for a supply chain of parts. Cost: \$7,500,000
  - Pros:
    - Increase fleet size to better serve the region and maintain operations in western Pima County.
    - Permanent Air Unit footprint in the western part of the county and a law enforcement aviation presence at the Ajo Airport.
    - New aircraft and camera systems provide increased capabilities to the current fleet.
  - Cons:
    - Costs for both 2 new planes, 2 new camera systems, while maintaining both current 206s is the most expensive option.
    - Continued flights and retention of the 206s do not solve the issue regarding the current expenses relating to age/type of use maintenance.
    - Additional FLIR cameras would need to be purchased for both sets of aircraft.
  
- D. Purchase (2) two new aircraft (Cessna 208), 2 new FLIR cameras, and sell both current Survey 206 aircraft. Cost: \$4,500,000 (*includes sale of 206s*).
  - Pros:
    - New fleet for Patrol resources, single type with same systems
    - Training provided to Pilots and Mechanics from Cessna as part of purchase.

- Cameras will provide advanced/increased capabilities over current systems.
- Cons:
  - 9 months to 1 year for both Cessna 208s to be built
  - Additional costs associated with transferring equipment from the current 206s to the new 208s, as well as down time of a 206 during this process limits availability of the unit as a resource.
  - All mechanics, pilots, and TFD staff will need to complete training and get qualified to operate the new airframe, which could potentially be time consuming.

Recommendations:

It is recommend the purchase of (2) two new aircraft (Cessna 208) and (2) two new FLIR380-HD camera systems, and (1) one refurbished FLIR 380HD camera system (see analysis option C above). The current 206 fleet will move its operations to western Pima County, stationed in Ajo. Maintaining the current Cessna 206s for operations in Ajo provides a significant increase of capabilities that has never been seen before in western Pima County. The operations of the two new aircraft could simultaneously patrol both metro and western areas of Pima County and provide increased interoperability within the department, other Pima County Departments, and our regional partners throughout the County. With the larger fuel capabilities of the Cessna 208, these aircraft could supplement the 206s and remain in the district for an extended period of time, and return, if needed. The new FLIR cameras will provide additional capabilities and will cost less to maintain than the current warranties.