CITY OF OAKLAND

AGENDA REPORT

TO: Steven Falk
Interim City Administrator

FROM: Darren Allison
Acting Chief, Oakland Police Department

SUBJECT: SUPPLEMENTAL – OPD RSI Helicopter Maintenance Contract

DATE: March 23, 2023

City Administrator Approval

Date: Mar 24, 2023

RECOMMENDATION

Adopt A Resolution Authorizing The City Administrator Or Designee To Enter Into A Professional Services Agreement With Rotorcraft Support, Inc. (RSI) To Provide Helicopter Maintenance Services To The Oakland Police Department (OPD) For Helicopter Use In Assisting Various Departments With Responding To Emergencies Throughout The City, For The Period Of July 1, 2023 To June 30, 2025 In An Amount Not To Exceed Eight Hundred Fifty Thousand Dollars ($850,000) Per Year For A Total Contract Not To Exceed One Million, Seven Hundred Thousand Dollars ($1,700,000).

REASON FOR SUPPLEMENTAL

This report is being provided in direct response to questions raised by Public Safety Committee after its **February 27, 2023** meeting. Staff was asked to return with a response to the following information from the OPD.

Environmental Impact Report: How much emissions do these emit?

See **Table 1** below. The H125 is the industry standard helicopter that used by CHP, LAPD, and numerous California agencies. The Oakland Police Department's helicopters emit 464.2lbs of CO2 emissions per hour. While this is nearly half of the industry standard, the requested DA62PP fixed wing will further reduce emissions by nearly 66%.

Regarding emissions comparisons among fixed wing aircraft, the Cessna Caravan emits 878.4lbs of CO2 Emissions per hour. This aircraft would effectively double the emissions of the City's current aircraft. The Cessna C206 would have no tangible environmental benefit to the City, as it emits nearly the same amount of emissions as the current flight. Additionally, the aircraft is a single engine which does not have the safety standards of the DA62MPP.

In conclusion, the DA62MPP, is considered the best in class for safety and has "Exceptional fuel efficiency." Over the 40+ year life of the aircraft, the savings both environmentally and financially will be immense.

Table 1: Emissions Per Hour Comparison Chart

	CO2 Emissions/hr.	**Lead Emissions/hr.**
Standard SUV		
Ford Explorer	48 lbs. @ 60 MPH	0
Aircraft Type		
Helicopter		
MD500E (OPD)	464.2 lbs	0
H125 (CHP)	892.53 lbs	0
Fixed Wing		
DA62MPP	168.8 lbs	0 (industry leading efficiency)
C206	457.5 lbs	55 grams (uses low lead fuel)
Cessna Caravan	878.4 lbs	0

Data obtained from Federal Aviation Administration (FAA) Emissions estimates for CO2 production due to usage of Jet-A and 100LL (Low Lead) fuels.

Fuel burn rates obtained from respective Aircraft manufacturers hourly fuel burn estimates.

https://www.faa.gov/newsroom/faa-industry-chart-path-eliminate-lead-emissions-general-aviation-end-2030

https://www.faa.gov/sites/faa.gov/files/202111/Aviation_Climate_Action_Plan.pdf

Fiscal Report: Estimated Fiscal Savings

The simple chart estimate OPD noted represents each year of fiscal commitment starting at year "1." and adding upon each other for subsequent years. It should be noted that the fixed wing aircraft rapidly pays for itself due to dramatically reduced maintenance and fuel usage. Emissions would also be reduced by nearly two-thirds (66%) every year.

Helicopter Cost Schedule:

1. $850,000 (Maintenance and Fuel) + $500,000 (Bi-Annual overhaul) = $1,350,000 Annual Cost
2. $$2,700,000
3. $4,050,000
4. $5,400,000
5. $6,750,000
6. $8,100,000
7. $9,450,000
8. $10,800,000
9. $12,150,000
10. *$13,500,000*

Fixed Wing: Diamond DA 62 Cost Schedule

1. $586,297 (*Payment annually for 10yrs*) + $300,000 Fuel Maintenance = $900,000 Annual Cost
2. $1,800,000
3. $2,700,000
4. $3,600,000
5. $4,500,000 – *At Year 5, the City has saved nearly a million dollars.*
6. $5,400,000
7. $6,300,000
8. $7,200,000
9. $8,100,000
10. $9,000,000 – *Saved $4,500,000 (Aircraft has now paid for itself)*

There are significant savings once the aircraft is paid off:

11. $300,000
12. $600,000
13. And so on…

With the City no longer having a $600,000 payment, costs are more dramatically reduced.

Instead of averaging $1,350,000, maintenance costs will be reduced to only $300,000, demonstrating a 78% reduction in operating costs. This translates to ten of millions of dollars saved over the 40+ life expectancy of the aircraft vs ARGUS.

Air Support for missing persons? How many were resolved (people located) and what impact did ARGUS have on each?

- ARGUS assisted with 27 missing persons during 2022. Unfortunately, OPD did not have a tracking system in place for the disposition of these investigations. Upon purchase of a new aircraft, a tracking mechanism could be developed if desired.

- Air Support provides the following advantages for missing persons:
    - Covering terrain that ground vehicles often have difficulty in maneuvering (Forests, mountains, off road, etc).
    - Rapid response and city-wide coverage in only minutes with a single unit.
    - Search of debris fields from large scale industrial accidents to natural disasters.
    - Locate missing persons on waterways or stranded vessels.

How much airtime was dedicated to Oakland Fire Department (OFD)?

- 4% of annual flight time or 57 flight hours was for OFD.

Why not utilize drones exclusively for fires?

- Drones have limitations (Note: OPD proposed drones for fire use) and when the Air Unit is necessary.
- Air unit is used for ingress, and egress. It is used for evacuations, spotting fires, and using the Forward Looking Infrared (FLIR) camera for hot spots.
- Setting perimeters. Giving best access to and from fires.
- Drones are a compliment to the Air Support Unit, but are highly limited due to current technology challenges as noted below:
- Limited Distance: Currently, the longest distance to fly with a drone is limited to 4.3 miles. Examples of some of the best drones on the market are the Phantom 4 Pro and Inspire 2 are even limited to this distance. The limited distance can pose multiple challenges for officers. An example is an officer engaged in a car chase; if the suspect is out of range, the drone can no longer follow them due to the signal limitations.
- Although, the distance for drones will continue to improve, the drones will not replace helicopters and other aircraft. DJI, the top leading drone manufacturer, recently announced the Mavic 2 drone that has an incredible control range up to five miles. This means the pilot can fly over larger areas at a great distance. In a situation where a remote pilot is flying above the forest area, their range gets limited because the signals are bouncing off the trees. As of result, the drone gets less focused signals which makes it harder to communicate with the remote controller.
- Flight Time: The best drones on the market usually have a flight time between 25 to 30 minutes. These batteries use Li-Po that operates with limited capacity. Additionally, the drones are also limited by their battery capacity, resulting in the need for the remote pilot to bring at least a few additional batteries to keep the drone running if the mission is going to take several hours.
- Weather Limitations: Most of the top-end drone models have a wind resistance up to 22.4 miles per hour. However, in certain cases, the drones can be put into overdrive mode, allowing them to slice through the winds with ease. This isn't recommended, however, because the drones are not built to withstand high wind speed due to their light weight. The drones also have less propulsion force as compared to helicopters and jets. Finally, flying drones in rain or snow can damage the electronic components and interfere with the communication between the drone and the controller.

- The Future: Drones are a rapidly evolving technology, however, according to UAV expert Keith Ericksen, drone technology is decades away from making helicopters and airplanes obsolete for police work.

Additional drone considerations:

- An OPD drone trained Officer is not always on duty.
- An OPD watch commander must give permission for a drone deployment.
- The drone Officer must call the Federal Aviation Administration (FAA) in DC and request permission to operate.
    - Typically, this process takes between 10 to 20 minutes.
    - This permission from the FAA is required because of the proximity to the Oakland International Airport. Most of Oakland is underneath the Class C airspace of Oakland International Airport.
    - It is not safe for occupied and unoccupied aircraft to operate in the same airspace.
    - Typically, when the FAA grants permission for the drone to operate, it will restrict the drone to 100 feet or less. This is to keep separation from other occupied aircraft.
    - This 100-foot ceiling restriction limits the visibility of the drone.
- The drone Officer must respond to the scene. Typically to drive across Oakland to the scene will take 10 to 20 minutes. This furthers the deployment time.
- The drone Officer must operate the drone within line of sight, which means the operator must be able to always see the drone. This requirement, combined with the altitude restriction, means the drone can usually only operate within one City block radius of the drone Officer / operator.
- The drones have a 5-pound payload. This limits the size of the camera it can carry. The size of the camera limits its quality. Which also limits the distance the camera can see. Typically, with our current drone and camera combinations the drone can only effectively work a 2 or 3 house radius at a time.
- Drones cannot mitigate pursuits due to their technical limitations.
- Drones cannot respond to a call in seconds or minutes, like an occupied aircraft can.
- Drones cannot fly for routine patrol or handle calls for service.

Are used aircraft a good option?

- Financing options tend to be very limited resulting in significant “Upfront” costs to the City.
- Many used aircraft are environmentally unfriendly because of their fuel:
    - There are two types of fuel that aircraft use; (1) 100 low lead (Also known as “LL”) and (2) jet fuel. 100LL is worse for the environment as it contaminates the air with lead-based particles.
    - 100LL is double the price of jet fuel. 100LL is $8.00 per gallon and jet fuel is $4.00 per gallon.

- Oakland International Airport is phasing out 100LL over the next 5 years. Due to the impending ban of LL fuel, it would be prudent to avoid any long-term purchases utilizing this fuel.

- FAA Regulation and Certifications limit options:
  - Few aircraft are capable of search and rescue, fire, and law enforcement support.
  - Due to technology fixtures that must be affixed to the aircraft and strict FAA's Supplemental Type Certificates (STC), only specialized aircraft may be certified and used.

- Longevity:
  - The opportunity cost of investing in used aircraft may provide consequences. The City of Oakland invests in and rigorously maintains its fleets for the safety of its members and the community. Used aircraft provide a level of unknown maintenance and reliability record to the investment. This is also why the City does not invest in used patrol or fire vehicles.
  - A new aircraft, maintained at our standards, could last nearly a half a century.
  - The new aircraft could be financed through the vendor to include all of the necessary fixtures for the City's needs significantly reducing immediate fiscal impact.

- **Why new is the better option:**
  - The Diamond Aircraft DA 62 exemplifies the standards of the City in that it is the safest and "greenest" aircraft in its class that can fulfill the needs of the City and the regulations of the FAA.
  - It efficiently operates on jet fuel and only uses 7.5 gallons an hour compared to our helicopter that burns 26 gallons per flight hour. This is considered the best in the industry.
  - The Diamond Aircraft DA 62 only costs an estimated $150.00 an hour to operate compared to $600.00 per hour for our helicopter. While these are estimates only, OPD has tabulated potential significant savings to the City based on the purchase of a new Diamond Aircraft DA 62.
  - Lastly, the aircraft can be purchased, equipped, *and financed at* a significantly lower cost that purchasing a used aircraft and paying high retrofit costs which cause delays and may impact reliability long term.

ACTION REQUESTED OF THE CITY COUNCIL

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For questions concerning this report, please contact Sgt. Jonathan Vanerwegen, OPD, Helicopter Unit, at (510) 615-5875.

Respectfully submitted

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